Port of Portland

# PDX 2045

# Existing Conditions

## Portland International Airport Master Plan Update

**Prepared for**
Port of Portland

**Prepared by**
Ricondo & Associates, Inc.

**In Association with**
Donaldson Consulting, LLC
EnviroIssues, Inc.
InterVISTAS Consulting Group, LLC
JMG Consulting, LLC
Kimley Horn and Associates, Inc.
Mead & Hunt, Inc.

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# 1. Introduction

This study, referred to as PDX 2045, is the Airport Master Plan Update for Portland International Airport (PDX or Airport). The purpose of PDX 2045 is to help guide development of the Airport over the next 20 years. The primary function of PDX 2045 is to evaluate development needs, priorities, and alternatives for PDX; examine triggers and timing for development at the Airport; and facilitate future PDX studies and implementation planning.

This section summarizes physical, operational, and contextual characteristics of the Airport and its immediate environs that are relevant to evaluating future planning needs. This information was compiled in 2024; therefore, it represents the conditions of PDX at that time. All information presented in this section can be assumed to be an existing condition as of early 2024, unless identified as a "baseline" condition. Baseline conditions indicate an in-progress or near-term project that is anticipated to be completed prior to the conclusion of PDX 2045 in late 2025. The existing and baseline conditions provide the foundation for evaluating PDX facilities and determining future facility needs in subsequent PDX 2045 sections. Therefore, for all subsequent sections of the Existing Conditions chapter, all information presented will assume the baseline conditions of late 2025.

## 1.1 AIRPORT OWNERSHIP, MANAGEMENT, AND ECONOMIC IMPACT

The Port of Portland (Port) owns and operates PDX. The Port is a state-chartered regional governmental entity encompassing Clackamas, Multnomah, and Washington Counties, directed by a nine-member commission appointed by the governor of Oregon and confirmed by the Oregon State Senate. The commission appoints the Port's executive director and holds monthly public meetings. In addition to managing PDX, the Port also owns and operates Portland-Hillsboro Airport (HIO) and Portland-Troutdale Airport (TTD), four marine terminals, and five business parks.[1]

PDX is a critical contributor to the Port's overall economic impact. The Port of Portland – Economic Impact Study (2023) summarizes the Airport's economic contributions as follows:

- **PDX operations** directly support 9,572 jobs including terminal operations, administration, air traffic control, and security personnel; and up to 15,581 jobs when considering indirect and induced impacts. PDX operations contribute to the economy by providing a total of $1.2 billion of labor income and $1.7 billion of value added, when taking full account of the direct, indirect, and induced impacts.
- **Visitor spending** by those that travel to the region directly supports 23,337 jobs and up to 33,592 jobs when considering the indirect and induced impacts. PDX facilitates the arrival of a large portion of these visitors to the region. Visitor spending contributes to the economy by providing a total of $1.7 billion of labor income and $2.8 billion of value added, when taking full account of the direct, indirect, and induced impacts.
- **Capital expenditure** at Port facilities directly supports 2,440 jobs and up to 3,849 jobs when considering the indirect and induced impacts. The capital expenditure contributes to the economy by providing a total of $321 million of labor income and $406 million of value added, when considering the direct, indirect, and induced impacts as of 2023.

## 1.2 PORT OF PORTLAND STRATEGIC PRIORITIES

The Port has identified three strategic priorities for PDX 2045: shared prosperity, sustainability, and resiliency. These overarching priorities are intended to provide perspective to the Port, the planning team, the public, and other stakeholders throughout the PDX 2045 planning effort. Shared prosperity, sustainability, and resiliency are overarching goals that will influence decision-making across all planning elements.

[1] Port of Portland, https://www.portofportland.com/About (accessed December 2023).

### 1.2.1 Shared Prosperity

The Port seeks to enhance the region's economy and quality of life through its movement of people and goods. The Port's vision is a region where prosperity is shared by all. Shared prosperity is using the Port's resources—including its contracts, people, airports, marine terminals, and industrial development tools—to enable more people to share and drive the prosperity of the region. The Port's vision for shared prosperity includes three nonnegotiable principles:

1. Maximize benefits to individuals of various communities, including Black and Indigenous people, people of color, low-income workers, and people with disabilities.
2. Identify new opportunities for engagement with the community.
3. Create a financially sustainable path for the Port.

Shared prosperity will be reflected in PDX 2045 through public and stakeholder engagement, which will help to inform the evaluation of various alternatives to better understand potential community impacts. The Port's ongoing shared prosperity work sits on a foundation of deep commitment, intentional investment, and diligent effort. Because of these strong roots, the Port now has a dedicated Shared Prosperity Division and representation on the Port's Executive Team.[2]

### 1.2.2 Sustainability

The Port has a historical commitment to sustainability and a strong legacy of incorporating sustainability into its planning practices. Sustainability was an overarching goal and an integral part of Airport Futures, the previous master planning effort completed in 2010. In Airport Futures, the Port defined sustainability as "meeting the region's air transportation needs without compromising the livability and quality of life of future generations." This focus required a balancing of economic, environmental, and social values (the "Triple Bottom Line"). As sustainability was a core consideration in Airport Futures, it resulted in the following sustainable measures:

- Inventory emphasizing natural resources located on or adjacent to Airport property
- Probabilistic forecasts of aviation demand, identification of key issues and trends affecting future demand, and a logical structure to incorporate stakeholder input to the forecasts
- Future requirements that were optimized to reflect the anticipated benefits of technology, changing processes, and common-use facilities
- Development alternatives conceived, evaluated, and recommended based on sustainability criteria
- Long-range development plan that will meet the region's aviation needs, is flexible, enhances capacity by increasing operational efficiency, and favors reuse over new development
- Implementation strategy that is affordable and based on demand

PDX 2045 will build on the approach developed in Airport Futures by incorporating sustainability as an overarching priority in all aspects of planning and continuing to reinforce the Port's commitment to sustainable planning.[3]

### 1.2.3 Resiliency

Resiliency generally refers to the ability to respond to and recover from difficult or challenging situations, adapting well in the face of adversity, threats, or other negative outcomes. While airport resiliency is often associated with climate change, its true meaning spans all areas of airport operations and their associated risks, as illustrated by the background statement for the Airport Cooperative Research Program's (ACRP) Emerging Issues for ACRP: Enhancing Resiliency of Airports and Interrelated Systems:

> "Several recent incidents have highlighted the serious consequences of disruptive events in the airport community. These include the ATL [Hartsfield-Jackson Atlanta International Airport] power outage (2017), the shootings at LAX [Los Angeles International Airport]

[2] The most recent Annual Shared Prosperity Report at the time of this document's publication can be accessed here: https://cdn.portofportland.com/pdfs/DEI_Progress.pdf

[3] Airport Futures documentation can be accessed here: https://www.portofportland.com/Committees/CAC

(2013) and FLL [Fort Lauderdale–Hollywood International Airport] (2017), hurricane damage in Houston, Florida, and Puerto Rico (2017), terminal flooding at JFK [John F. Kennedy International Airport] (2018), and many other examples. It is imperative for airports to have resources and measures to ensure continuity, contain the damage, and maintain or resume operations as quickly as possible."

The Port has embraced resiliency in planning through implementation of and investment in the development of resilient facilities and operations. Detailed descriptions of seismic resilience investments—implemented or considered—are discussed in sections related to those facilities. Planning for resiliency in PDX 2045 focuses on survivability of facilities, diversity and redundancy, operational flexibility, and ongoing financial viability.

## 1.3 AIRPORT HISTORY

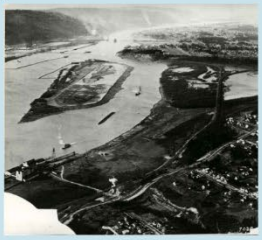
The Port has invested considerable effort and resources in the development of its aviation facilities to support aviation demand. **Exhibit 1-1** presents an overview of the Airport's major historical milestones. Key development milestones are summarized as follows:[4]

- The Port constructed Portland's first municipal airport in 1927 on the east side of the Willamette River at Swan Island known as Swan Island Airport. Within a few years, increasing commercial aviation activity outgrew the original site; therefore, recognizing the economic significance of the growing aviation industry, Portland voters approved a $300,000 bond issue to purchase 700 acres east of the city, where the Airport is located today. Renamed Portland-Columbia Airport, it opened in 1940. It was again renamed in 1948 to Portland International Airport.
- The original configuration of runways was comprised of three intersecting runways in an asterisk layout: one east-west runway, one northwest-southeast runway, and one northeast-southwest runway (the only remaining runway still in operation, the "Crosswind Runway.") By 1956, Runway 10R-28L ("South Runway") was built as an additional 8,800-foot facility.
- Anticipating the additional facilities needed to accommodate newer jet-engine aircraft, the Port constructed a new passenger terminal complex, dedicated in 1958. The new terminal was designed to accommodate approximately 1.5 million annual passengers and, at the time, was served by seven commercial airlines.
- In addition to its growing portfolio of commercial aviation facilities, the Port also developed a system of general aviation (GA) airports to accommodate increasing demand. The Port purchased Troutdale Airport in 1942 and Hillsboro Airport in 1966, thus becoming Portland-Troutdale Airport and Portland-Hillsboro Airport, respectively.
- Shortly after the construction of the new terminal complex, plans were drafted for an additional 8,000-foot runway (10L-28R, "North Runway",) which was completed by 1960. After completion of the North Runway, the older east-west and northwest-southeast runways that formed the original "X" shape were re-purposed as taxiways leaving PDX with a three-runway configuration.
- In 1969, Runway 2-20 (now called Runway 3-21 or the Crosswind Runway) was slated for an extension from 2,400 to 6,000 feet, completed by 1972. Shortly thereafter, in 1973, Runway 10R-28L was extended to 11,000 feet. 10L-28R was later extended to 9,825 feet in 2011.
- By 1968, plans were drafted to expand the terminal with the construction of what would become Concourse E, along with extensions of the now-demolished Concourses L and K. Terminal expansions continued through the 1970s, along with the introduction of international air service offered by Pan Am Airways and the construction of a cargo complex, now known as the Airtrans Center.

[4] Port of Portland, 2025.

## Exhibit 1-1 Major Historical Milestones

### 1927
Portland's first municipal airport opened on Swan Island. Within a few years, increasing commercial aviation activity outgrew the original site. The Port then purchased 700 acres east of the city, where the Airport is located today.



### 1956


The original configuration of runways was comprised of three intersecting runways in an asterisk layout. But as the airport grew, a new South Runway was built.

### 1958
A new $6 million passenger terminal complex was built that was served by seven passenger airlines.

### 1960
A new North Runway was constructed and two of the original runways were re-purposed as taxiways.

### 1970s


A major Airport expansion program was completed, including a larger terminal building, various expansions, the introduction of international air service, and a new air cargo complex.

### 1990s and 2000s
Construction of Concourses A, B, and C, expanded the airport. PDX also pursued massive overhauls of all five concourses, along with the central terminal. The PDX 2000 Expansion Project accommodated growth to 21 passenger airlines and 12 all-cargo carriers through terminal, parking, and access improvements.

### 2010
The previous PDX Airport Master Plan Update, Airport Futures, was published. The three-year process of updating the plan emphasized sustainability as a core theme and identified several key Airport development projects through 2035 that became a part of the PDX Next program.

### 2020s
The Airport completed several PDX Next projects including extending Concourse E, closing Concourse A, upgrading Concourse B, constructing additional parking capacity, and reconfiguring the main terminal.

**SOURCES:**
Port of Portland, Airport Futures Planning Advisory Group (PAG) Final Report, September 2010; Port of Portland, https://pdxnext.com/About (accessed April 2024); Oregon Encyclopedia, https://www.oregonencyclopedia.org (accessed April 2024); The Oregonian/OregonLive, https://www.oregonlive.com/ (accessed January 2025), Ricondo & Associates, Inc., January 2025.

- By 2001, construction of three additional concourses: A, B, and C, expanded the footprint of the airport. With passenger demand at PDX increasing rapidly in the 1990s, PDX pursued massive overhauls of all five concourses, along with the central terminal, including "straightening out" what would become Concourses C and D starting in 1991. The PDX 2000 Expansion Project, an ambitious program of terminal, parking, and access improvements, accommodated growth to 21 passenger airlines and 12 all-cargo carriers.
- Beginning in fall 2007 and concluding in summer 2010, a collaborative process began that included the City of Portland (City) and community members in the Portland-Vancouver metro area to update the long-range master plan for PDX and establish a City land use plan governing the Airport and its environs. The three-year process emphasized sustainability as a core theme and identified several key Airport development projects through 2035. The Port carried forward several recommendations from the master plan and subsequent follow-on studies, including extending Concourse E, closing Concourse A, upgrading Concourse B, constructing additional parking capacity, and reconfiguring the main terminal. Many of these projects were implemented in the PDX Next program, which commenced in 2017 and continued through 2026.

## 1.4 AIRPORT SETTING

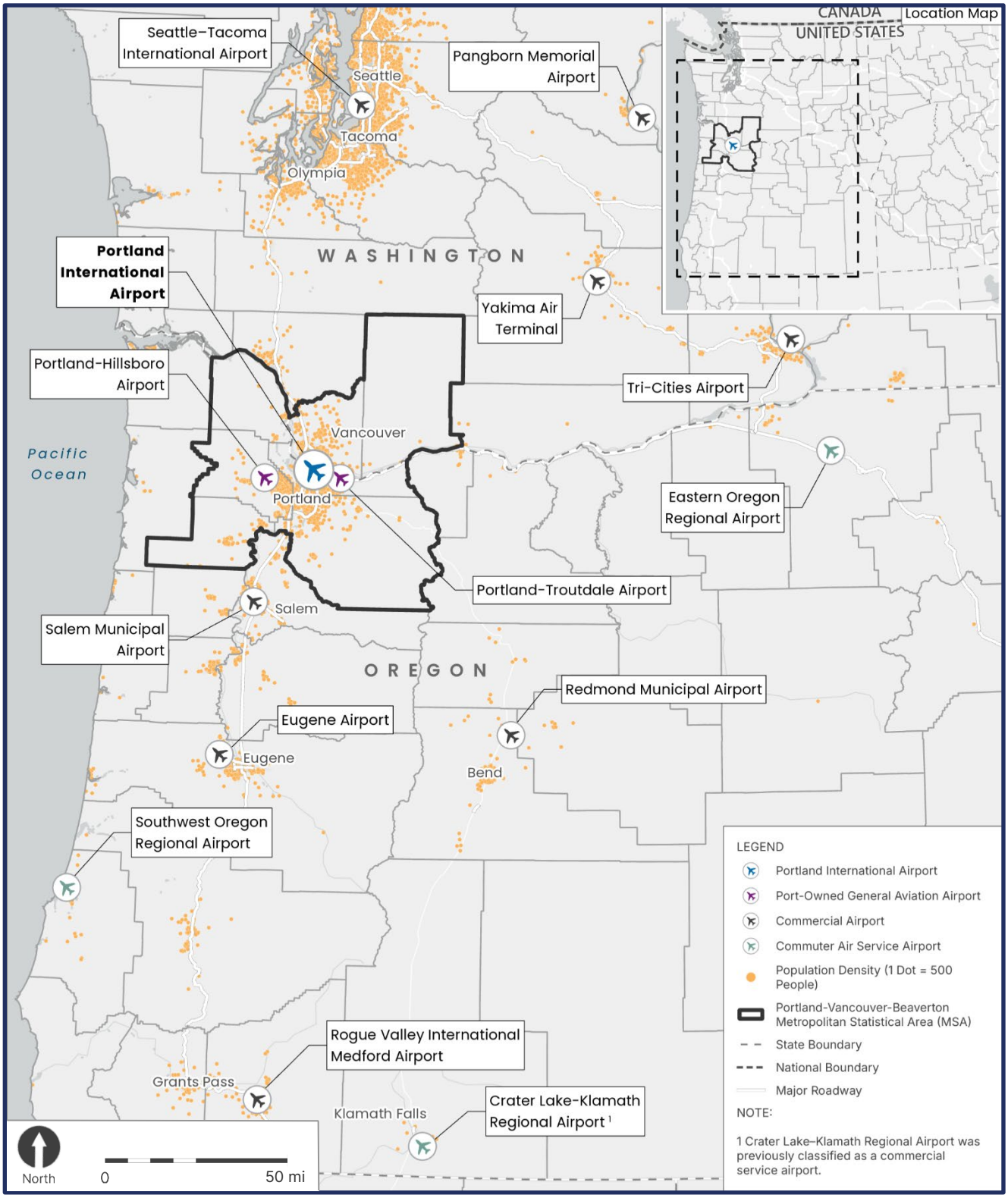
PDX is located south of the Columbia River, approximately five miles northeast of downtown Portland, Oregon, and approximately three miles southeast of Vancouver, Washington. The Airport property encompasses approximately 3,400 total acres and lies completely within the city of Portland, Oregon, which is part of Multnomah County. **Exhibit 1-2** shows the location of PDX within the region, population density, and other major airports in Oregon and Washington. **Exhibit 1-3** identifies the extents of the Airport's property and neighboring communities.

**Exhibit 1-4** depicts the land use within the Airport's immediate vicinity, which is defined as within three miles for purposes of this report. Nearby land uses include a variety of commercial uses, including office, hotel, and retail uses on Northeast (NE) Airport Way and Cascades Station Parkway west and east of Interstate 205 (I-205). Scattered single-family residential properties are located to the immediate south and west of the Airport. Land uses within approximately three miles of the Airport include the following:

- **The area to the south of NE Lombard Street / NE Sandy Boulevard (US 30 Bypass):** This area is developed primarily in single-family residential neighborhoods, with nodes of higher-density housing, open space, and commercial uses along major thoroughfares.
- **The area between NE Lombard Street / NE Sandy Boulevard (US 30 Bypass) and the north side of the Columbia River:** This area is where PDX is located and primarily contains a mix of industrial and commercial uses, as well as some undeveloped open space areas. Several islands are located within the Columbia River near the Airport, including Hayden Island and Government Island. Hayden Island consists of a mixture of single- and multi-family residential uses, industrial, mixed-use, and rural areas. Government Island consists of entirely open space and is owned and managed by the Port.
- **The area north of the Columbia River:** This area is located in the state of Washington and consists of predominantly single- and multi-family residential areas with some commercial uses. To the northwest, the downtown area of Vancouver consists primarily of mixed-use, industrial, and commercial uses.

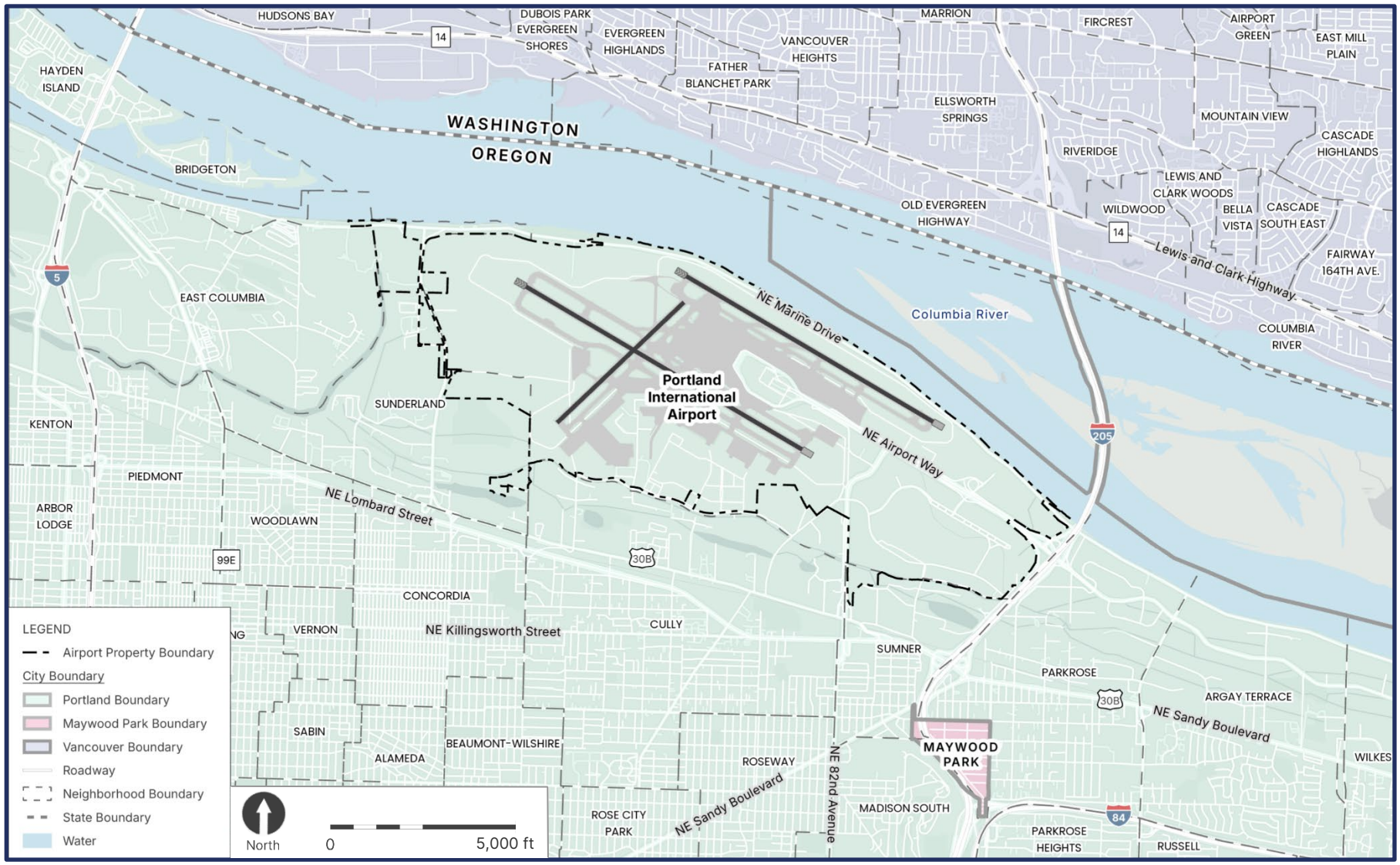
Generalized zoning in the Airport's proximity is depicted on **Exhibit 1-5** and summarized in **Table 1-1**; this reflects the same development patterns as existing land uses. Port-owned acreage for PDX is predominately zoned as industrial; however, Port-owned acreage on Government Island is zoned as open space, and the Port-owned acreage on Hayden Island is currently zoned primarily as agricultural. Areas immediately adjacent to the Airport area are zoned as industrial, commercial, or open space. Zoning within the study area is largely residential, industrial, and commercial.

## Exhibit 1-2 Airport Location Map



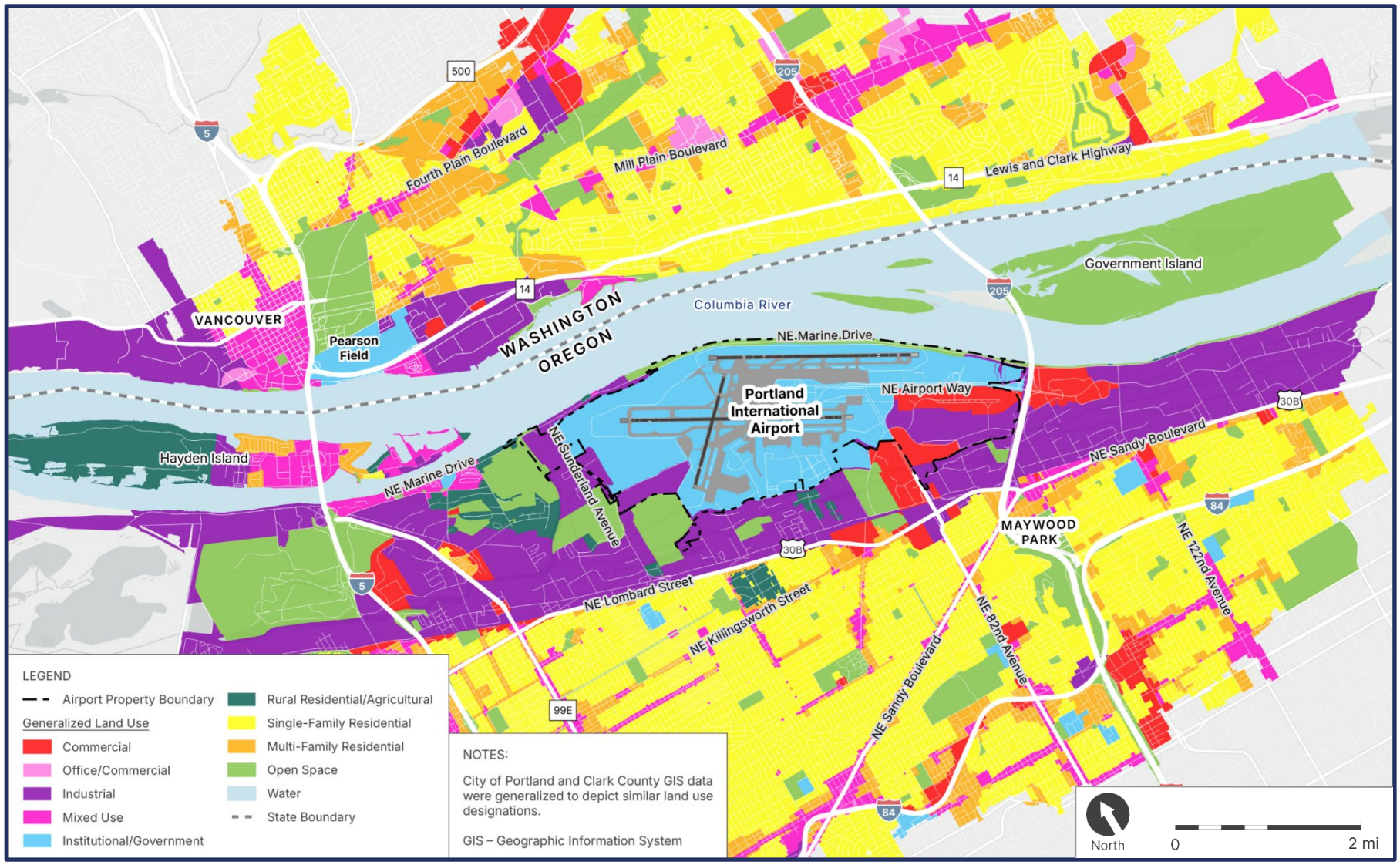

**SOURCES:**
Oregon State Parks, Esri, TomTom, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS, USFWS, August 2024 (basemap); Esri, 2023 (airports, counties, states, countries); US Census Bureau, 2023 (places, metropolitan statistical area, population density).

## Exhibit 1-3 Airport Vicinity Map



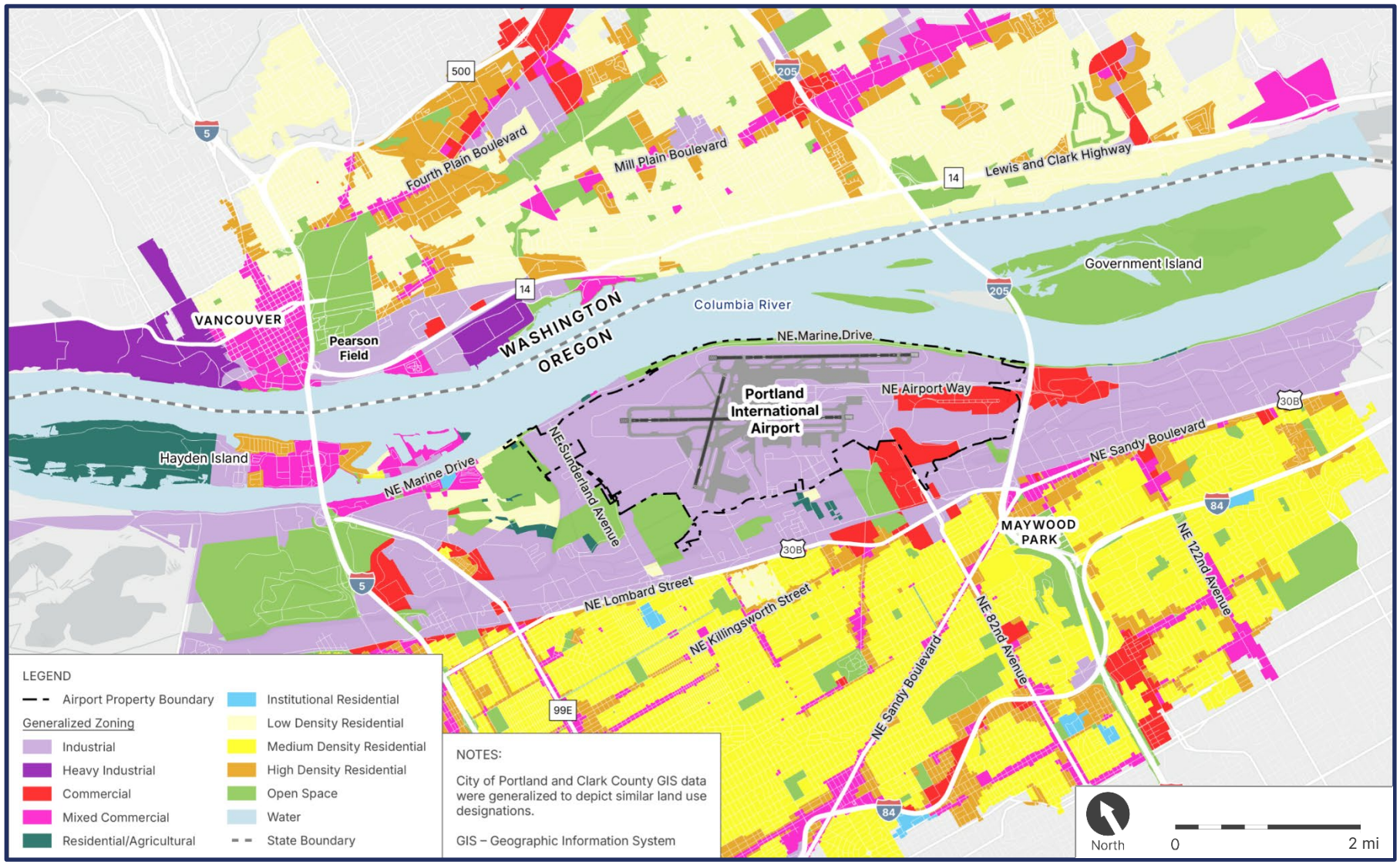

**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc., METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, August 2024 (basemap); Esri, 2023 (states, water, airports, city and neighborhood boundaries); Port of Portland, Portland International Airport, Airport Layout Plan, June 2021 (Airport property boundary, airfield).

## Exhibit 1-4 Generalized Land Use in the Vicinity of the Airport




**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc., METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, August 2024 (basemap); US Census Bureau, 2023 (roads, state boundaries); Port of Portland, Portland International Airport, Airport Layout Plan, June 2021 (airfield, buildings); City of Portland Corporate GIS, September 2023 (zoning, water); Clark County, Washington Geographic Information Services, February 2020 (zoning).

## Exhibit 1-5 Generalized Zoning in the Vicinity of the Airport




**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc., METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, August 2024 (basemap); US Census Bureau, 2023 (roads, state boundaries); Port of Portland, Portland International Airport, Airport Layout Plan, June 2021 (airfield, buildings); City of Portland Corporate GIS, September 2023 (zoning, water); Clark County, Washington Geographic Information Services, February 2020 (zoning).

**Table 1-1 Generalized Zoning in the Airport Vicinity**

| Generalized Zoning Designation | Total Acreage within 3 miles of PDX | PDX Acreage | Percentage |
|---|---|---|---|
| Industrial | 8,929 | 2,991 | 33% |
| Heavy Industrial | 260 | 0 | 0% |
| Commercial | 1,443 | 236 | 16% |
| Mixed Commercial | 3,357 | 0 | 0% |
| Residential/Agricultural | 411 | 0 | 0% |
| Institutional Residential | 155 | 0 | 0% |
| Low-Density Residential | 6,412 | 3 | 0% |
| Medium-Density Residential | 9,304 | 0 | 0% |
| High-Density Residential | 3,807 | 0 | 0% |
| Open Space | 7,058 | 121 | 2% |
| **TOTAL** | **41,136** | **3,351** | **8%** |

**NOTE:**
City of Portland and Clark County geographic information system (GIS) data were generalized to depict similar zoning designations.

**SOURCES:**
City of Portland, September 2023 (geographic information system – zoning, water); Clark County, Washington, February 2020 (geographic information system – zoning).

## 1.5 AERONAUTICAL ROLE

According to the National Plan of Integrated Airport Systems (NPIAS) 2023–2027,[5] the Federal Aviation Administration (FAA) designates PDX as a primary commercial service airport, which is a public airport that receives scheduled passenger service and has 2,500 or more enplaned passengers per year. PDX is also classified as a medium-hub airport, which is defined as an airport that enplanes 0.25 to 1.0 percent of annual United States (US) commercial enplaned passengers. PDX was previously classified as a large-hub airport prior to the COVID-19 pandemic; however, current PDX passenger levels have not yet returned to pre-pandemic levels. PDX serves as the primary airport for passenger and cargo airline activity for the Portland metro area and beyond.

## 1.6 RECENT AVIATION ACTIVITY

Aviation activity can be characterized by the volume of passengers or cargo handled at the Airport, as well as the aircraft operations using its facilities. An operation is defined as the arrival or departure of an aircraft. These factors, primarily passenger volumes and aircraft operations, are used as important metrics for measuring aviation demand at airports.

The outbreak and spread of COVID-19 in 2020 resulted in a severe contraction in demand for air travel that was driven by fear of illness, as well as government-imposed travel restrictions and quarantine requirements/recommendations. The impact to air travel began in East Asia in December 2019 and rapidly accelerated to other regions of the world in March and April 2020. By April 2020, which represented the low point in terms of enplaned passengers decreased to 4 percent of April 2019 passengers for all US airports and 4 percent of April 2019 passengers at PDX. A modest recovery in airline passengers occurred over the second half of 2020. By March 2021, passengers for all US airports had increased to 52 percent of March 2019 volumes, and enplaned passengers at PDX had increased to 42 percent of March 2019 volumes.

[5] US Department of Transportation, Federal Aviation Administration, National Plan of Integrated Airport Systems (NPIAS) 2023–2027: Appendix A – List of NPIAS Airports, September 30, 2022.

Airlines accelerated the restoration of capacity as COVID-19 vaccines became widely available in the US and demand for air travel increased. In March 2022, enplaned passengers represented 89 percent of March 2019 volumes for all US airports. For PDX, March 2022 enplaned passengers represented 72 percent of March 2019 enplaned passengers. The restoration of enplaned passengers increased through 2023, despite interruptions in demand recovery that coincided with spikes in COVID-19 infections related to the subsequent variants of the virus. December 2023 enplaned passengers represented 98 percent of December 2019 enplaned passengers for all US airports and 79 percent for PDX.

**Table 1-2** summarizes the total passenger volumes and aircraft operations from 2013 to 2023. Both total passengers and total operations at PDX increased from 2013 to 2019, from approximately 15 million passengers and 210,000 operations to almost 20 million passengers and 240,000 operations. Total passengers and operations peaked in 2019 before activity at the Airport significantly decreased due to the global pandemic. In 2023, there were approximately 16.5 million total passengers and 190,000 total operations.

**Table 1-2 2013-2023 Total Passengers and Aircraft Operations at PDX**

| Year | Total Passengers[1] | Annual Percent Change | Aircraft Operations | Annual Percent Change |
|---|---|---|---|---|
| 2013 | 15,029,569 | 4.4% | 209,909 | -2.9% |
| 2014 | 15,916,512 | 5.9% | 216,253 | 3.0% |
| 2015 | 16,850,952 | 5.9% | 218,021 | 0.8% |
| 2016 | 18,352,767 | 8.9% | 227,709 | 4.4% |
| 2017 | 19,080,494 | 4.0% | 228,949 | 0.5% |
| 2018 | 19,882,788 | 4.2% | 233,993 | 2.2% |
| 2019 | 19,891,365 | <0.1% | 238,384 | 1.9% |
| 2020 | 7,084,543 | -64.4% | 150,854 | -36.7% |
| 2021 | 11,806,921 | 66.7% | 170,627 | 13.1% |
| 2022 | 14,818,654 | 25.5% | 176,507 | 3.4% |
| 2023 | 16,486,688 | 11.3% | 190,150 | 7.7% |

**NOTE:**
1. Includes charter passengers.

**SOURCES:**
Port of Portland, 2024 (statistics reported by airlines); Ricondo & Associates, Inc., March 2024.

**Table 1-3** presents the cargo volumes at the Airport from 2013 to 2023. The Airport primarily processes domestic cargo, which represented 94.7 to 98.0 percent of cargo tonnage at the Airport during this 10-year period. Overall cargo tonnage at the Airport increased from 219,341 metric tons to 282,733 metric tons in this timeframe. Total cargo tonnage peaked at 345,867 metric tons in 2021, reflecting the increased demand for air cargo during the pandemic. Several factors influenced this increase, including supply chain and logistics availability and the need for rapid fulfillment of key products, of which air cargo was uniquely well-suited. Recovery to more traditional cargo demand patterns is occurring across the global logistics network, and likely explains the decrease in cargo volumes at PDX since 2021.

**Table 1-3 2013-2023 Total Cargo Volumes at PDX**

| | Cargo Volumes (Metric Tons) | | | | Share of Total Cargo Volume | |
|---|---|---|---|---|---|---|
| Year | Domestic | International | Total[1] | Annual Percent Change | Domestic | International |
| 2013 | 209,816 | 9,525 | 219,341 | 0.1% | 95.7% | 4.3% |
| 2014 | 221,542 | 7,022 | 228,564 | 4.2% | 96.9% | 3.1% |
| 2015 | 231,131 | 6,674 | 237,805 | 4.0% | 97.2% | 2.8% |
| 2016 | 234,143 | 6,445 | 240,588 | 1.2% | 97.3% | 2.7% |
| 2017 | 249,021 | 11,483 | 260,504 | 8.3% | 95.6% | 4.4% |
| 2018 | 257,818 | 14,305 | 272,123 | 4.5% | 94.7% | 5.3% |
| 2019 | 303,394 | 14,009 | 317,403 | 16.6% | 95.6% | 4.4% |
| 2020 | 305,162 | 7,551 | 312,713 | -1.5% | 97.6% | 2.4% |
| 2021 | 338,862 | 7,005 | 345,867 | 10.6% | 98.0% | 2.0% |
| 2022 | 325,843 | 7,273 | 333,116 | -3.7% | 97.8% | 2.2% |
| 2023 | 275,749 | 6,984 | 282,733 | -15.1% | 97.5% | 2.5% |

**NOTES:**
1. Totals may not sum due to rounding.

**SOURCES:**
Port of Portland, 2024 (statistics reported by airlines); Ricondo & Associates, Inc., March 2024.

## 1.7 PREVIOUS PLANNING STUDIES

PDX 2045 will build on the foundation established by prior planning and development work and will continue the Port's commitment to community engagement and sustainability. PDX 2045 will seek to validate recent studies' findings; evaluate current issues, trends, and opportunities; and further develop the existing long-term plan for PDX.

### 1.7.1 Airport Futures

Airport Futures, the PDX Master Plan immediately preceding PDX 2045, was completed in 2010 as a collaborative effort among the City, Port, and the Portland-Vancouver metropolitan community to create an integrated, long-range development plan for PDX, with sustainability as a central theme. Airport Futures looked at planning for PDX through 2035, with just under 27 million annual passengers anticipated by that date.

The following is a list of key findings from Airport Futures:[6]

#### AIRFIELD

- Reserve the area required for a third parallel runway, if needed and approved.
- Reserve the area required for crossfield connector taxiways, if needed and approved.

[6] Port of Portland, Airport Futures Planning Advisory Group (PAG) Final Report, September 2010.

### PASSENGER TERMINAL

- Reserve the area required to accommodate the Terminal Expansion.
- Continuously modify passenger security screening areas within the terminal, as dictated by the Transportation Security Administration (TSA).
- Increase terminal gate productivity by constructing additional remote aircraft parking to the north of NE Airport Way and to the west of Runway 3-21.

### ON-AIRPORT GROUND TRANSPORTATION AND PARKING

- Provide additional capacity at selected roadway intersections.
- Increase the productivity of rental car facilities by providing low-cost, at-grade service facilities.
- Provide additional lanes to the on-Airport roadway system.
- Construct a grade-separated interchange at the intersection of NE Airport Way and NE 82nd Avenue.
- Provide additional structured parking.
- Reorganize the commercial vehicle area to increase capacity of the deplaning curbside and roadway.

### AIR CARGO

- Improve undeveloped parcels or redevelop facilities within Airtrans Center.
- Provide additional cargo facilities in the Southwest Quadrant[7] or other nearby locations that may be available.

### GENERAL AVIATION

- Redevelop underutilized areas for other aeronautical purposes.

### SUPPORT

- Provide additional aircraft fuel system capacity.

## 1.7.2 List of Other Recent and Relevant Studies

**Table 1-4** presents a list of selected recent and relevant studies, organized from earliest to most recent, that refined and elaborated on the framework developed as part of Airport Futures. Several efforts supported the design and programming necessary to build recently opened and under-construction facilities at PDX. The continuity of planning from Airport Futures through these follow-on studies illustrates the Port's commitment to continuous planning, as well as its preferred practice of gathering the appropriate amount of information to support decision-making at the appropriate time.

[7] The Southwest Quadrant consists of approximately 250 acres located east of NE 33rd Drive, north of NE Elrod Road, and southwest of Runway 10R-28L.

**Table 1-4 (1 of 2) Selected Recent Planning Efforts**

| Study Name | Year | Assessment |
|---|---|---|
| Northside Redevelopment Strategy | 2013 | Aimed to redevelop the northern portion of the PDX property to preserve, maintain, and develop the commercial airline aviation facilities at PDX. Proposed development included relocation of GA campus, extension of Concourse E, remain overnight (RON) parking for aircraft, fuel rack relocation and future permanent facility plan, and final plan for 82nd Avenue and Airport Way interchange. |
| Terminal Area Master Plan Phase I | 2014 | Evaluated the terminal building in its entirety and developed a comprehensive strategy and plan to incrementally reconfigure the facility and avoid a piecemeal approach to improvements. This aimed for the most effective possible passenger processing, the best possible passenger experience, the maximum possible revenue generation, and a long-range plan that is sustainable, affordable, and adaptable to changes in the aviation industry. |
| 2014 Bicycle and Pedestrian Master Plan | 2014 | Addressed bicycle/pedestrian facility and circulation needs at PDX and included key agency stakeholder engagement. |
| Stormwater Design Standards Manual | 2014 | Outlined the central component of the Post-Construction Stormwater Pollutant and Runoff Control Program that is required under Schedule A.4.f of the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. |
| Stormwater Management Plan | 2015 | Described the best management practices for preventing and reducing stormwater pollution to the maximum extent practicable at PDX to protect water quality and satisfy the requirements of the Port's NPDES MS4 permit and the Clean Water Act. |
| Terminal Area Parking and Rental Car Development Plan | 2015 | Demonstrated the feasibility of building new close-in rental car and public parking facilities to accommodate the demand expected to occur during the next 10, 20, and 30 years. |
| Federal Inspection Services (FIS) Facility / International Gate Optimization Study | 2015 | Summarized the FIS Facility / International Gate Optimization Study analysis and recommended development strategies to increase domestic gate utilization, maintain international growth opportunities, improve the Concourse D passenger experience, and implement a phased plan to meet growth objectives. |
| RON Aircraft Parking Study | 2016 | Evaluated existing off-gate RON parking facilities and potential new off-gate RON capacity to determine the optimal remote RON parking program for PDX. |
| Making the Business Case for Implementing a Consolidated Receiving and Distribution Center (CRDC) | 2017 | Analyzed the possibility of implementing a CRDC at PDX. The main evaluation categories were operational assessment, a comparison of the status quo against a new paradigm, a review of industry standards and best practices, and an implementation and operational impact investigation. |
| Utility Master Plan | 2017 | Identified future utility system load requirements and defined utility system options for the production and distribution of utilities. |
| Technical Evaluation: Conversion to Electric Ground Support Equipment (eGSE) | 2017 | Evaluated the possibility of installing electric charging stations to allow airlines to convert to eGSE. |

## Table 1-4 (2 of 2) Selected Recent Planning Efforts

| Study Name | Year | Assessment |
|---|---|---|
| Allocation Plan Following Rental Car Relocation | 2018 | Developed facility requirements, potential allocation strategies, and draft evaluation; identified alternatives; and selected a preferred alternative for the relocation of the rental car facilities. |
| Southside Development Study Airtrans Center and Reserve Area | 2018 | Confirmed which functions and developments are best accommodated in the Airtrans Center and Reserve Area to recommend an interim land use plan and strategy. |
| PDX Southwest Quad Development Feasibility Study | 2018 | Aimed to identify the steps needed to create a development-ready site for aviation and non-aviation industrial development within the Southwest Quadrant. |
| South Runway Selection Memorandum | 2020 | Identified future utility system load requirements and defined utility system options for the production and distribution of utilities. |
| Seismic Resilience Infrastructure Plan | 2020 | Evaluated the risks to Airport infrastructure posed by seismic activity at PDX. |
| Infrastructure Resilience Program Summary | 2020 | Assessed the risks posed by major natural disasters to the City's infrastructure and identified near- and long-term steps to build the resilience of those systems. |
| Transportation Network Company (TNC) Hold Lot Relocation Memorandum | 2020 | Assessed the possibility of relocating the hold lot currently designated for TNCs. |
| Solar Energy Siting Assessment | 2020 | Comprised a two-phase analysis of solar development siting opportunities for solar development at PDX. |
| Portland Resilient Runway Benefit-Cost Analysis | 2021 | Evaluated the estimated cost of broadening the resiliency measures of the runways at PDX. |
| Economic Impact Analysis (EIA) | 2023 | Investigated the economic and equity impacts of the Port's facilities; comprised of three individual studies: EIA study, Wider Economic Benefits study, and Workforce Demographics and Equity study. |
| Central Utility Plant (CUP) Resilience Alternatives | Anticipated 2024 | In-progress study to analyze and propose a preferred alternative to improve the seismic resiliency of the existing CUP facility. |

**NOTE:**
The information presented in this table is based on studies retrieved from the Port of Portland's SharePoint.

**SOURCE:**
Port of Portland, January 2024.

# 2. On-Airport Land Use

This section summarizes generalized land uses on-Airport which includes the airfield, terminal, ground transportation and parking, air cargo, GA, airport and airline support, military, non-aeronautical development, natural resource mitigation, and reserve areas. The Airport occupies an approximate 3,400-acre site that is bounded by the Columbia River to the north, NE Cornfoot Road and the Columbia Slough to the south, NE 33rd Drive to the west, and I-205 to the east. **Exhibit 2-1** illustrates land uses within the boundaries of the Airport.

- **Airfield.** The airfield occupies approximately 1,140 acres, or one-third of the total Airport land area, and it includes three runways—two parallel runways (10R-28L and 10L-28R) and one crosswind runway (3-21)—and associated taxiways, movement areas, and safety areas, as described in Section 3.
- **Terminal.** The terminal area encompasses approximately 80 acres in the center of the Airport property, between the two parallel runways, east of the crosswind runway, and west of the split between eastbound and westbound NE Airport Way. The terminal is accessed by vehicles, public transit, bicycles, and pedestrians via NE Airport Way as described in Section 5. The terminal area includes a central passenger processing area that accommodates ticketing, baggage claim, and security screening functions, as well as four concourses and their associated aprons, as described in Section 4.
- **Ground Transportation and Parking.** The area dedicated to ground transportation covers approximately 230 acres. This area includes the access roads to the terminal and three parking garages immediately east of the terminal: a short-term parking garage, P1, and two long-term parking garages, P2 and P3. Additional landside facilities are located along NE Airport Way, including multimodal access facilities, such as the Tri-County Metropolitan Transportation District of Oregon (TriMet) Metropolitan Area Express (MAX) light rail, a multi-use path, rental car facilities, economy parking lots, cellphone lots, and employee parking lots, as described in Section 5.
- **Air Cargo.** Air cargo facilities occupy a total of 150 acres of land and are located in two separate areas on the Airport. The PDX Cargo Center is located in the center of the Airport, along NE Airport Way, and accommodates belly cargo facilities (i.e., facilities handling cargo that is shipped in the lower deck of passenger aircraft). The Airtrans Center is located on the south side of the Airport, along NE Cornfoot Road, and accommodates facilities used by all-cargo operators, as described in Section 6.
- **General Aviation (GA).** GA facilities are primarily located along NE Airport Way, where one fixed base operator (FBO) provides a wide range of services to GA and corporate users. Additionally, a corporate hangar used by the Bonneville Power Administration (BPA) is located west of the intersection between Runways 3-21 and 10R-28L. Land dedicated to GA facilities totals approximately 30 acres, as described in Section 7.
- **Airport and Airline Support.** Support facilities are located throughout the Airport and occupy a total of approximately 190 acres. Airline support facilities include aircraft maintenance, repair, and overhaul (MRO) facilities; ground run-up enclosure; flight kitchen; ground service equipment (GSE) storage and maintenance facilities; fuel farm and fuel dispensing systems; and deicing facilities. Airport support facilities include Airport maintenance facilities, Airport administrative offices, consolidated receiving and distribution center (CRDC) for concessionaires, response operation and coordination center, aircraft rescue and firefighting (ARFF) facilities, airport traffic control tower (ATCT), and FAA offices, as described in Section 8.
- **Military.** The Airport is home to the 142nd Wing of the Oregon Air National Guard (ORANG). The Air National Guard installation at PDX is located on a 220-acre site on the south side of the Airport, along NE Cornfoot Road, as described in Section 9.

- **Non-Aeronautical Development.** Commercial development encompasses 470 acres and is primarily located on the east side of the Airport, southwest of the intersection of I-205 and NE Airport Way. Cascade Station encompasses the land located along NE Cascades Parkway; it has been developed as a mixed-use commercial area, featuring offices, hotels, and retail. The Portland International Center (PIC) encompasses the development along NE Alderwood Road. It includes a mix of industrial and Airport-related uses.
- **Natural Resource Mitigation.** Fifty acres of land on the south side of the Airport are designated for natural resource impact mitigation. These natural areas provide compensation for unavoidable impacts to wetlands and other natural resources from Airport development.
- **Reserve.** Undeveloped Airport land comprises 790 acres, primarily on the southwest and west sides of the Airport property.

**Table 2-1** summarizes the on-Airport land use and approximate acreage by functional designation based on the previous PDX Airport Layout Plan (ALP).

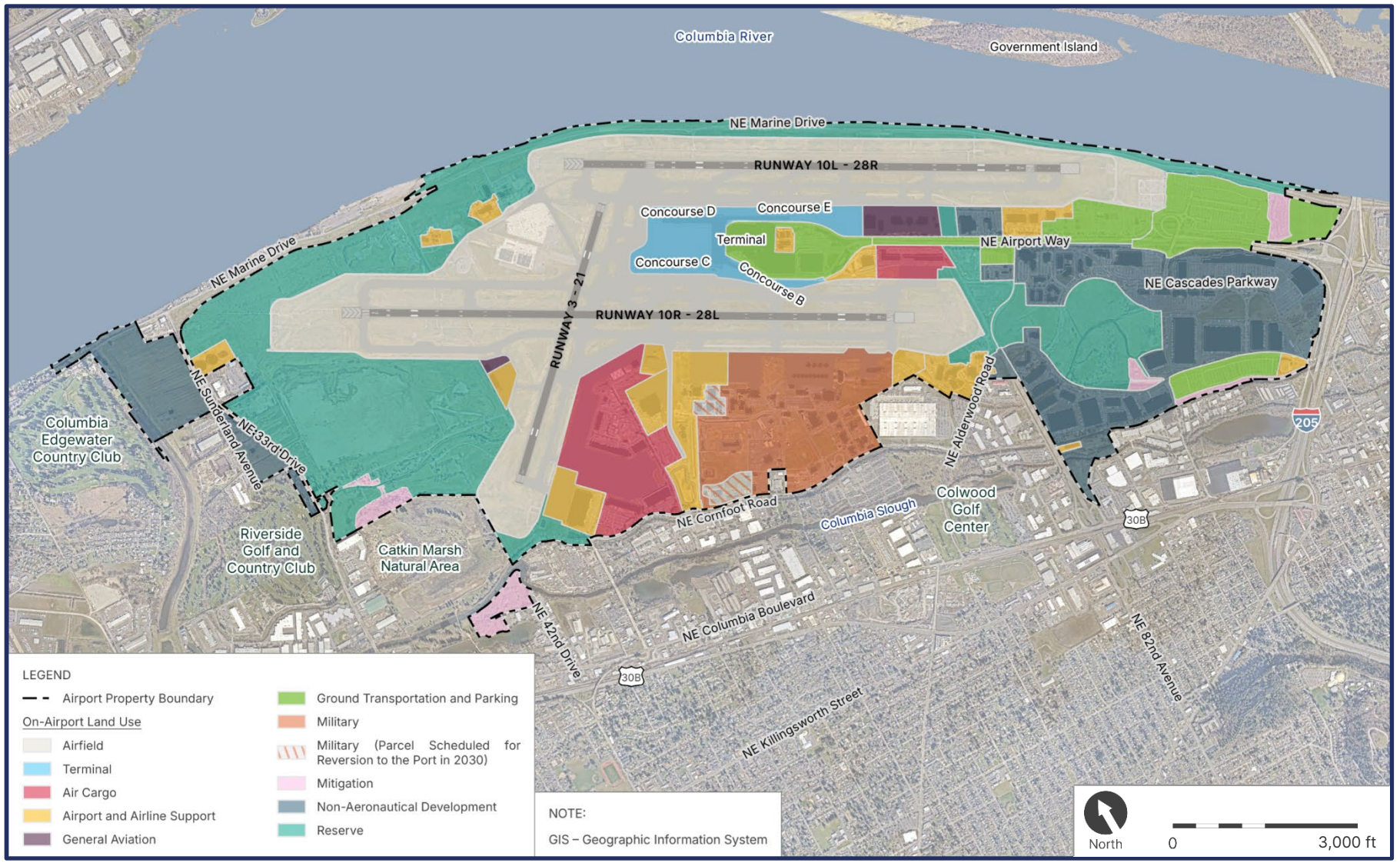
### Table 2-1 On-Airport Land Use

| Land Use | Area (Acres) | Percent of Total | Key Characteristics/Restrictions |
|---|---|---|---|
| Airfield | 1,140 | 34% | FAA provides guidelines for airfield design to promote safety and noise compliance. |
| Terminal | 90 | 3% | |
| Ground Transportation and Parking | 230 | 7% | |
| Air Cargo | 150 | 4% | Land use restrictions include the responsibility to operate aircraft according to noise abatement procedures established at an airport and within the local airspace. |
| General Aviation | 30 | 1% | |
| Airport and Airline Support | 190 | 6% | |
| Military | 220 | 7% | |
| Non-Aeronautical Development | 470 | 14% | PIC/Cascade Station has prohibited land uses that include household living, group living, self-service storage, commercial outdoor recreation, community service, schools, medical centers, religious institutions, vehicle repair, and detention facilities. |
| Mitigation | 50 | 1% | This area is reserved for wetland mitigation purposes. |
| Reserve | 790 | 24% | |
| **TOTAL** | **3,360** | **100%** | |

**NOTES:**
FAA – Federal Aviation Administration; PIC – Portland International Center
All land use areas were approximated based on the previous Airport Layout Plan drawing.
Totals may not add up exactly due to rounding.

**SOURCES:**
Port of Portland, Airport Layout Plan, June 2021; City of Portland, 33.508 Cascade Station/Portland International Center Plan District, November 2023; US Department of Transportation, Federal Aviation Administration, Land Use Compatibility and Airports, August 2022; JMG Consulting, LLC, April 2024.

## Exhibit 2-1 On-Airport Land Use




**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc., METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, August 2024 (basemap); Esri, 2023 (states, water, airports, city and neighborhood boundaries); Port of Portland, Portland International Airport, Airport Layout Plan, June 2021 (Airport property boundary, airfield).

# 3. Airfield and Airspace

This section describes the airfield and airspace at PDX, including meteorological conditions at the Airport, runway coverage, airfield operating configurations, Airport Traffic Control (ATC) procedures, airspace/airfield traffic movements, and all facilities related to aircraft operations at the Airport, including runways, taxiways, taxilanes, aircraft aprons, and other aircraft pavements, as well as navigational aids (NAVAIDs). **Exhibit 3-1** provides an overview of all airfield facilities.

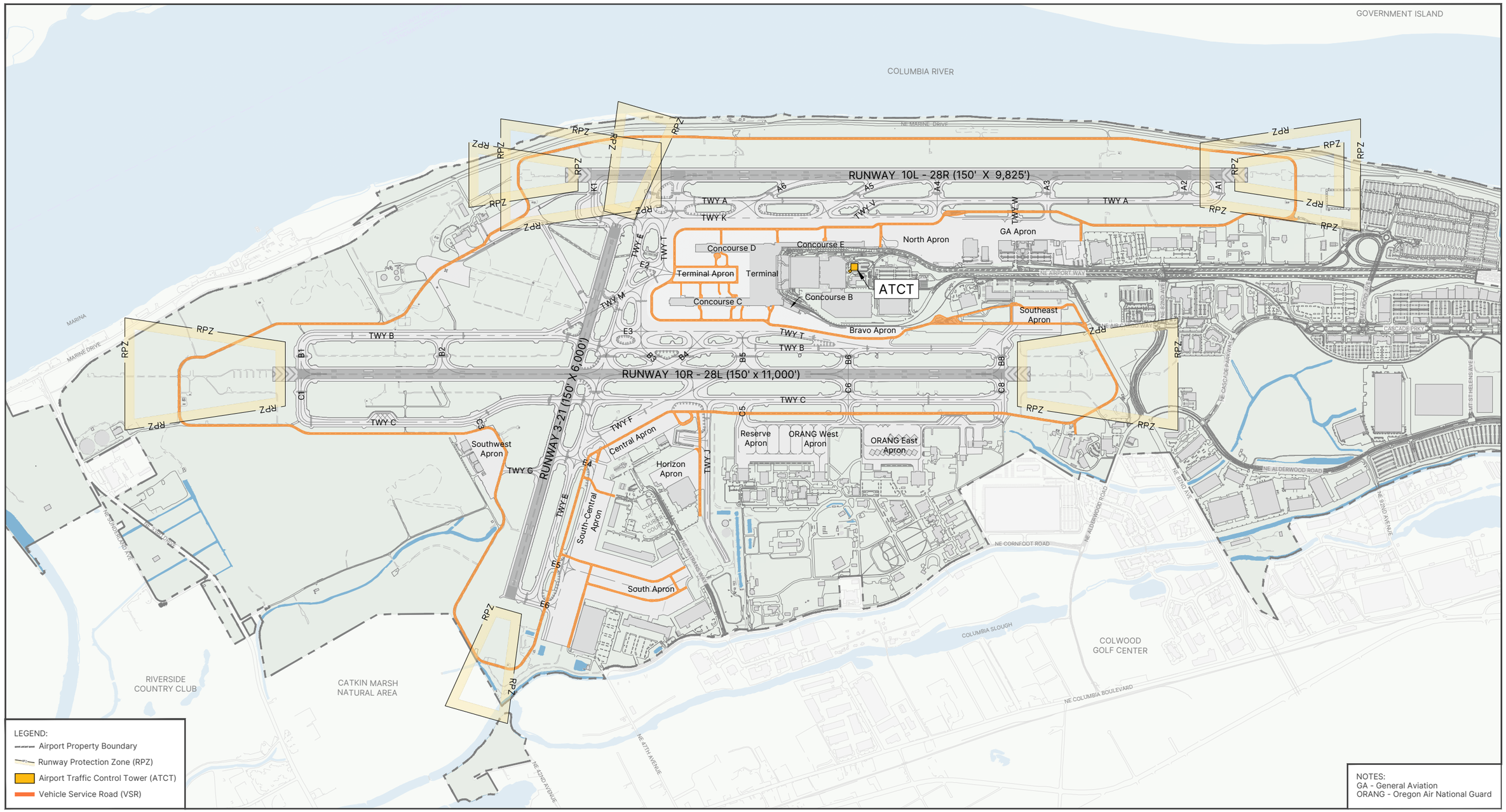
## 3.1 RUNWAYS

PDX has two parallel runways, Runways 10R-28L (south runway) and 10L-28R (north runway), aligned in a southeast–northwest direction, and a crosswind runway, Runway 3-21, oriented in a northeast–southwest direction. The parallel runways are separated by 3,100 feet and are located north and south, respectively, of the terminal. The crosswind runway is located west of the terminal and intersects the south runway. As part of an ongoing effort to increase the Airport's resiliency to seismic events, the Port is (as of 2024) considering a resilience investment in the eastern 7,500 feet of the south runway. **Table 3-1** summarizes characteristics of the three runways at PDX. **Table 3-2** lists the runway NAVAIDs at the Airport.

Additional surveillance equipment at PDX includes the following:[1]

- Airport Surveillance Radar (ASR) – integrated primary and secondary radar system that provides six-level National Weather Service calibrated weather capability
- Airport Surface Detection Equipment (ASDE) – surveillance system using radar, multilateration, and satellite technology that allows air traffic controllers to track the surface movement of aircraft and vehicles
- Airport Movement Area Safety System (AMASS) – software enhancement to the ASDE Model 3 (ASDE-3), Model X (ASDE-3X), and Model 3X (ASDE-3X) that predicts the path of aircraft landing and/or departing, and/or vehicular movements on runways
- Tactical Air Navigation (TACAN) – pulse system; operates in the ultrahigh frequency (UHF) band of frequencies
- Runway Visual Range (RVR) – provides air traffic controllers with a measurement of the visibility at key points along a runway (e.g., touchdown, midpoint, and rollout)
- Outer, Middle, and Inner Markers – beacons required by the FAA to indicate the final approach fix based on the category approach operation and RVR
- Rotating Beacon – light beacon that displays flashes of white and/or colored light to indicate the location of an airport, a heliport, a landmark, a certain point of a federal airway in mountainous terrain, or an obstruction
- Surface Movement Guidance and Control System (SMGCS) – facilitates the safe movement of aircraft and vehicles on the airport by establishing more rigorous control procedures and requiring enhanced visual aids

[1] US Department of Transportation, Federal Aviation Administration, https://www.faa.gov (accessed August 2024).




SOURCES: Port of Portland, March 2024; Ricondo & Associates, Inc., April 2024.

**Exhibit 3-1**

Airfield Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Airfield Facilities.dwgLayout: Ex-01 Plotted: Jan 6, 2025, 11:46AM

## Table 3-1 Runway Characteristics

| | Runway | | | | | |
|---|---|---|---|---|---|---|
| | South | | North | | Crosswind | |
| | 10R | 28L | 10L | 28R | 3 | 21 |
| **RUNWAY INFORMATION** | | | | | | |
| Dimensions | 11,000' x 150' | | 9,825' x 150' | | 6,000' x 150' | |
| Surface Pavement Type | Concrete/Grooved | | Asphalt/Grooved | | Asphalt/Grooved | |
| Surface Condition[1] | Good Condition | | Good Condition | | Good Condition | |
| Weight Bearing Capacity[2] | PCN 89 /R/D/W/T | | PCN 133 /F/D/W/T | | PCN 82 /F/D/X/T | |
| Single Wheel | 200,000 lbs | | 200,000 lbs | | 120,000 lbs | |
| Double Wheel | 200,000 lbs | | 200,000 lbs | | 250,000 lbs | |
| Double Tandem | 360,000 lbs | | 400,000 lbs | | 380,000 lbs | |
| Runway Edge Lights | High Intensity | | High Intensity | | Medium Intensity | |
| Elevation (above mean sea level) | 22.7 | 22.7 | 29.5 | 30.8 | 22.2 | 26.4 |
| Gradient | 0.01% | | 0.03% | | 0.06% | |
| Displaced Threshold | - | - | 1,290' | 535' | - | - |
| **DECLARED DISTANCES** | | | | | | |
| Takeoff Run Available (TORA) | 11,000' | 11,000' | 9,825' | 9,825' | 6,000' | 6,000' |
| Takeoff Distance Available (TODA) | 11,000' | 11,000' | 9,825' | 9,825' | 6,000' | 6,000' |
| Accelerate-Stop Distance Available (ASDA) | 11,000' | 11,000' | 9,825' | 9,825' | 6,000' | 6,000' |
| Landing Distance Available (LDA) | 11,000' | 11,000' | 8,535' | 9,290' | 6,000' | 6,000' |
| Visual Approach Slope Indicator | 4-light PAPI | | 4-light PAPI | | 4-light PAPI | |
| | 3.0-degree glide path | | | | 3.3-degree glide path | 3.6-degree glide path |
| | Left | Right | Left | Right | Left | Right |
| Runway Centerline to Runway Centerline Separation | 3,100' | | | - | | |
| Runway Design Code | V | | V | | III | |

**NOTES:**
PAPI – Precision Approach Path Indicator; PCN – Pavement Classification Number
1. Surface Condition values are based upon the FAA's Pavement Condition Index (PCI). According to the FAA, the PCI is a numerical indicator that reflects the structural integrity and surface operational condition of a pavement. Therefore, "Good" condition indicates pavement quality based upon surface functionality. Pavement subsurface conditions may vary.
2. Pavement Classification Number Value / Rigid (R) or Flexible (F) / Subgrade Category D / Allowable Tire Pressure (W or X) / Calculation Method T

**SOURCES:**
US Department of Transportation, Federal Aviation Administration, Airport/Facility Directory, November 30, 2023; US Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal, March 2024; Port of Portland, Airport Futures, 2010; Ricondo & Associates, Inc., December 2023.

**Table 3-2 Runway Navigational Aids**

| | Runway | | | | | |
|---|---|---|---|---|---|---|
| | South | | North | | Crosswind | |
| | 10R | 28L | 10L | 28R | 3 | 21 |
| **APPROACH AIDS** | | | | | | |
| Distance Measuring Equipment (DME) | ● | ● | ● | ● | | ● |
| Localizer | ● | ● | ● | ● | | ● |
| Precision Approach Path Indicator (PAPI) | ● | ● | ● | ● | ● | ● |
| **APPROACH LIGHTING SYSTEM** | | | | | | |
| Standard 2,400-Foot High-Intensity Approach Lighting System with Centerline Sequenced Flashers (ALSF-2) | ● | | | | | |
| 1,400-Foot Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) | | ● | ● | ● | | |
| High-Intensity Runway Lights (HIRLs) | ● | | ● | | | |
| Medium-Intensity Runway Lights (MIRLs) | | | | | ● | |

**SOURCES:**
US Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal, March 2024; US Department of Transportation, Federal Aviation Administration, Airport/Facility Directory, November 30, 2023; Ricondo & Associates, Inc., December 2023.

## 3.2 METEOROLOGICAL CONDITIONS

Meteorological conditions were analyzed to determine historical wind and weather patterns at the Airport, including ceiling, visibility, wind speed, wind direction, temperature, and the resulting airfield operating configurations. The data consist of hourly observations for the 10-year period beginning January 1, 2014, and ending December 31, 2023.

Visual meteorological conditions (VMC) and instrument meteorological conditions (IMC) are defined by cloud ceiling height above ground level (AGL) and visibility. These conditions, shown in **Table 3-3**, determine the procedures that ATC can use, as well as the aircraft operating rules. Cloud ceiling heights of 1,000 feet AGL or greater and visibility of three statute miles or greater is considered VMC, allowing the use of visual flight rules (VFR). When cloud ceiling heights are less than 1,000 feet AGL or visibility is less than three statute miles, conditions are IMC, and instrument flight rules (IFR) must be used.

### Table 3-3 Meteorological Condition Requirements

| Category | | Cloud Ceiling | | Visibility | Percent Occurrence at PDX |
|---|---|---|---|---|---|
| Visual Meteorological Conditions (VMC) | | ≥1,000 feet AGL | and | ≥3.0 miles | 94.9% |
| Instrument Meteorological Conditions (IMC) | CAT I | 200 to 1,000 feet AGL | and/or | 0.5 to 3.0 miles | 4.1% |
| | CAT II | 100 to 200 feet AGL | and/or | 1,200-foot RVR[1] to 0.5 miles | 0.7% |
| | CAT III | <100 feet AGL | and/or | < 1,200-foot RVR[1] | 0.3% |
| All Weather Conditions | | | | | 100.0% |

**NOTES:**
AGL – Above Ground Level; CAT – Category; RVR – Runway Visual Range
1. A 1,200-foot RVR was assumed to be 0.25 miles for compatibility with the visibility unit of measurement for the hourly weather observation.

**SOURCES:**
National Centers for Environmental Information, April 2024 (data for January 1, 2014, through December 31, 2023); Ricondo & Associates, Inc., April 2024 (analysis).

IMC is further subdivided into three categories to determine airfield infrastructure requirements and certify aircraft and flight crew to conduct instrument landing system (ILS) approach procedures. ILS Category (CAT) I approaches require at least a 200-foot cloud ceiling height and 0.5-miles visibility. ILS CAT II approaches require a 100-foot cloud ceiling height and 1,200-foot RVR.[2] As shown in Table 3-3, a cloud ceiling height and/or visibility less than CAT II is considered CAT III. Low cloud ceiling heights and/or low visibility can negatively affect airfield performance by mandating the use of less efficient ATC procedures that require increased spacing between aircraft landing at and departing from the Airport. The increased spacing between aircraft reduces the number of aircraft that can use a runway during a given period. **Table 3-4** provides an overview of the instrument landing approach categories currently operational on the Airport's existing runways.

### Table 3-4 Runway Instrument Landing Approach Categories

| | Runway | | | | | |
|---|---|---|---|---|---|---|
| | South | | North | | Crosswind | |
| Category | 10R | 28L | 10L | 28R | 3 | 21 |
| CAT I | ● | ● | ● | ● | | |
| CAT II | ● | | | | | |
| CAT III | ● | | | | | |

**NOTE:**
CAT – Category

**SOURCES:**
Port of Portland, Airport Futures, 2010; Ricondo & Associates, Inc., December 2023.

[2] Runway visual range is the horizontal distance that a pilot can see down the runway; it is reported in feet.

### 3.2.1 Wind Speed and Direction

Wind speed and direction affect all aircraft to a degree. The wind's direction and speed relative to the runway's orientation can result in crosswinds and/or tailwinds that make that runway unsuitable for landing and/or departing aircraft. **Exhibit 3-2** presents the percent occurrence of wind speeds by direction at the Airport. For this analysis, wind velocities of three knots or less were considered calm.

### 3.2.2 Runway Coverage

The prevailing winds at the Airport are from the northwest and southeast, which is reflected in the orientation of the Airport's primary runways. **Table 3-5** lists the wind coverage for all runways in all weather conditions. The 10-year weather data show that Runways 10L-28R and 10R-28L provide over 95 percent coverage in all conditions.

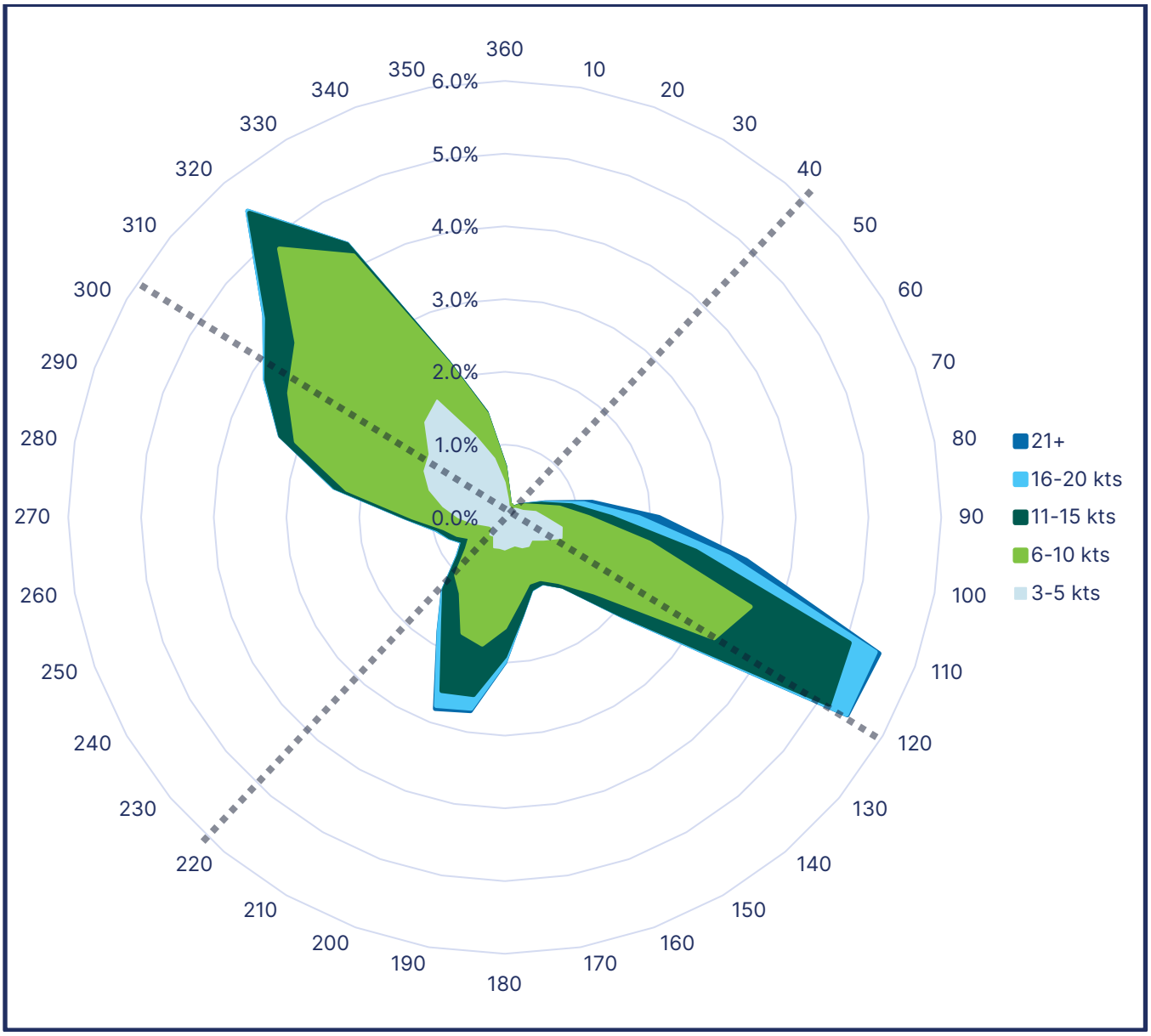
**Table 3-5 Wind Data Summary**

| Airfield | Crosswind Component | VMC Coverage | IMC Coverage | All Weather Coverage |
|---|---|---|---|---|
| North and South Runways (10L-28R and 10R-28L) | 10.5 knots | 96.0% | 99.6% | 96.2% |
| | 13.0 knots | 98.2% | 99.8% | 98.3% |
| | 16.0 knots | 99.4% | 100.0% | 99.4% |
| | 20.0 knots | 99.9% | 100.0% | 99.9% |
| Crosswind Runway (3-21) | 10.5 knots | 91.1% | 95.8% | 91.4% |
| | 13.0 knots | 96.7% | 98.1% | 96.8% |
| | 16.0 knots | 99.0% | 99.2% | 99.1% |
| | 20.0 knots | 99.8% | 99.9% | 99.8% |
| All PDX Runways | 10.5 knots | 99.3% | 99.8% | 99.3% |
| | 13.0 knots | 99.8% | 100.0% | 99.8% |
| | 16.0 knots | 100.0% | 100.0% | 100.0% |
| | 20.0 knots | 100.0% | 100.0% | 100.0% |

**NOTES:**
VMC – Visual Meteorological Conditions; IMC – Instrument Meteorological Conditions
This reflects 87,592 total observations.

**SOURCES:**
National Centers for Environmental Information, Hourly Weather Observations, January 1, 2014, through December 31, 2023, April 2024 (data); Ricondo & Associates, Inc., April 2024 (analysis).

## Exhibit 3-2 All Weather Wind Speed and Direction




**NOTE:**
This reflects 87,592 total observations from January 1, 2014 through December 31, 2023.

**SOURCES:**
National Centers for Environmental Information, April 2024 (data for January 1, 2014 through December 31, 2023); Ricondo & Associates, Inc., April 2024 (analysis).

### 3.2.3 Temperature and Precipitation

**Table 3-6** summarizes the mean daily temperatures at the Airport. As seen in the table below, for January, the mean average daily temperature was 44.1°F, and the average minimum temperature was 36.8°F. For July, the mean average daily temperature was 70.6°F, and the mean maximum temperature was 82.3°F. Based on data from 1991 to 2020, the maximum average precipitation total was observed in November with 5.77 inches, and a minimum average of 0.51 inches was observed in June.

**Table 3-6 Weather Conditions (30-Year Normals)**

| | Annual | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max Temperature (°F) | 63.9 | 51.5 | 56.8 | 62.0 | 69.3 | 74.3 | 81.9 | 82.3 | 76.7 | 64.4 | 53.5 | 46.9 | 47.5 |
| Average Min Temperature (°F) | 46.2 | 36.8 | 39.7 | 43.7 | 49.4 | 54.1 | 58.5 | 58.9 | 54.1 | 46.7 | 40.6 | 36.2 | 36.2 |
| Average Temperature (°F) | 55.1 | 44.1 | 48.3 | 52.8 | 59.4 | 64.2 | 70.2 | 70.6 | 65.4 | 55.6 | 47.1 | 41.6 | 41.9 |

**NOTE:**
All temperatures are an average of the daily temperatures between 1991 and 2020.

**SOURCES:**
National Centers for Environmental Information, 1991–2020 Summary of Monthly Normals, April 2024 (data); Ricondo & Associates, Inc., April 2024 (analysis).

### 3.2.4 Airfield Operating Configurations

Airfield operating configurations identify the runways that are used for arrivals and departures under various operating conditions and ATC procedures. Wind speed and wind direction may dictate the direction in which the runways can be used for arrivals and departures. Ceiling height and visibility determine the ATC procedures that are in effect. In addition, an operating configuration may be used based on air traffic controller preference, noise abatement, local airspace restrictions, or periodic runway closures.

FAA Aviation System Performance Metrics (ASPM) hourly airport efficiency data for January 1, 2012, through December 31, 2023, were analyzed to identify the historical occurrence of airfield operating configurations used at the Airport. ASPM provides hourly data indicating the arrival and departure runways in use and the meteorological conditions, including ceiling height and visibility. **Table 3-7** lists the annual occurrence of airfield operating configurations used at the Airport.

**Table 3-7 Annual Occurrence of Airfield Operating Configurations**

| Runway(s) Used[2] | Percent Annual Occurrence[1] | | |
|---|---|---|---|
| | VMC | IMC | Total |
| 28R and/or 28L (west flow) | 44.6% | 11.9% | 56.5% |
| 10L and/or 10R (east flow) | 26.9% | 16.6% | 43.5% |
| **TOTAL[3]** | **71.5%** | **28.5%** | **100.0%** |

**NOTES:**
VMC – Visual Meteorological Conditions; IMC – Instrument Meteorological Conditions
1. The percent annual occurrence was normalized to account for variations in Aviation System Performance Metrics (ASPM) data collection.
2. Runway 3 and/or Runway 21 were available for arrival and/or departure in 0.34 percent of observations in all weather conditions.
3. Totals may be off due to rounding.

**SOURCES:**
US Department of Transportation, Federal Aviation Administration, Aviation System Performance Metrics Daily Weather by Hour Report, March 2024 (data for January 1, 2012, through December 31, 2023); Ricondo & Associates, Inc., June 2022 (analysis).

As shown in Table 3-7, the Airport generally operates in two configurations, west flow or east flow. West flow is when aircraft land and depart on Runways 28R and 28L. East flow is when aircraft land and depart on Runways 10L and 10R. **Exhibit 3-3** depicts the runways used for arrival and departure operations in east flow and west flow at PDX. In VMC, west flow was the most frequently used airfield operating configuration, with 44.6 percent of observations. In IMC, east flow was the most frequently used configuration, with 16.6 percent of all observations. Overall, west flow was the most frequently used configuration, with 56.5 percent in all conditions.

Crosswind runway usage by all jet aircraft is heavily restricted by an FAA-approved noise compatibility program. Runway 21 is made available for use by jet aircraft when the wind speed exceeds a certain level from the south. Wind conditions from the north are almost never strong enough to require Runway 3; however, Runway 3 is commonly used by air cargo feeder aircraft under VMC as it is a visual runway. The crosswind runway was available for arrivals and/or departures in 0.34 percent of observations in all weather conditions over the 12-year dataset.

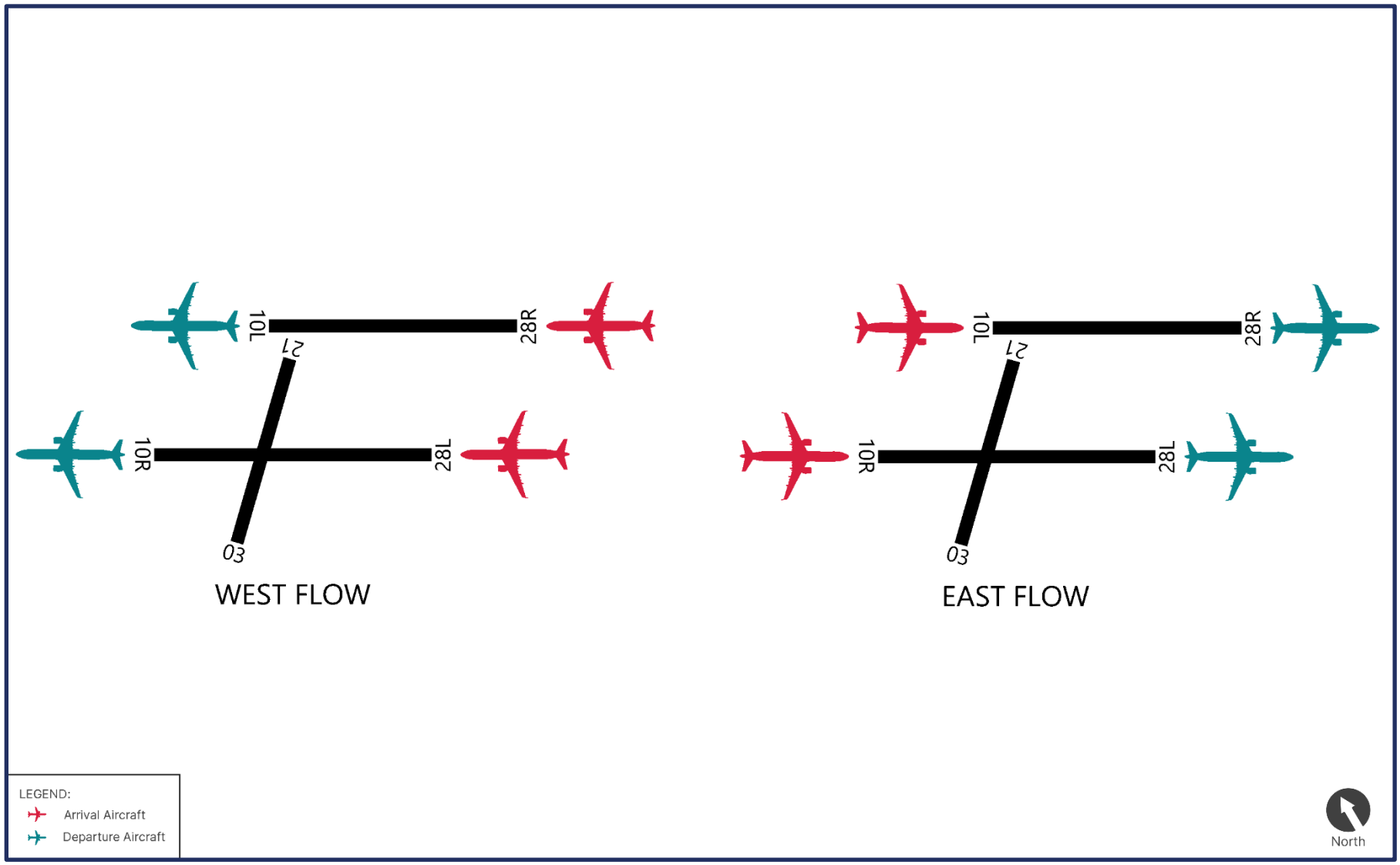
## 3.3 AIRPORT TRAFFIC CONTROL (ATC) PROCEDURES

The National Airspace System (NAS) consists of various airspace components, which are monitored, controlled, and coordinated by FAA ATC personnel. Three-dimensional volumes of airspace are defined based on the type of activity occurring in each and relationship to the NAS. The ATC facilities that manage air traffic vary depending on the type of airspace. Coordination between facilities occurs when aircraft transition from one type of airspace to another.

### 3.3.1 Air Route Traffic Control Center

The Seattle Air Route Traffic Control Center (ZSE ARTCC), located in Auburn, Washington, is responsible for managing high-altitude enroute traffic over a region encompassing Washington, parts of Idaho, Montana, Nevada, California, and most of Oregon, including PDX.

**Exhibit 3-3** Airfield Operating Configurations




**SOURCE:**
Ricondo & Associates, Inc., April 2024.

### 3.3.2 Terminal Radar Approach Control Facility

The Portland Terminal Radar Approach Control (TRACON) facility, or P80 TRACON, is located at PDX, and provides radar control service into and out of PDX outside the Class C airspace. Typically, the Class C airspace is a cylindrical volume centered on the airport extending out to 40 miles and up to 14,000 feet. **Exhibit 3-4** and **Exhibit 3-5** depict the terminal airspace surrounding PDX (shown as KPDX on the exhibits) and the location of other airports within the region.

### 3.3.3 Airport Traffic Control Tower (ATCT)

The FAA operates the PDX ATCT 24 hours every day, and ATCT personnel are responsible for controlling arrivals on the final approach to the airfield and for clearing departures off the runways and transferring them to the TRACON facility. ATCT personnel are also responsible for aircraft activities within the movement area. This includes the runways, taxiways, and other areas of the Airport that are used for the taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas.

### 3.3.4 Apron Control

The airfield areas not expressly designated as movement areas comprise the non-movement areas. Sometimes, non-movement areas are controlled by apron control; however, there is no apron control at PDX.

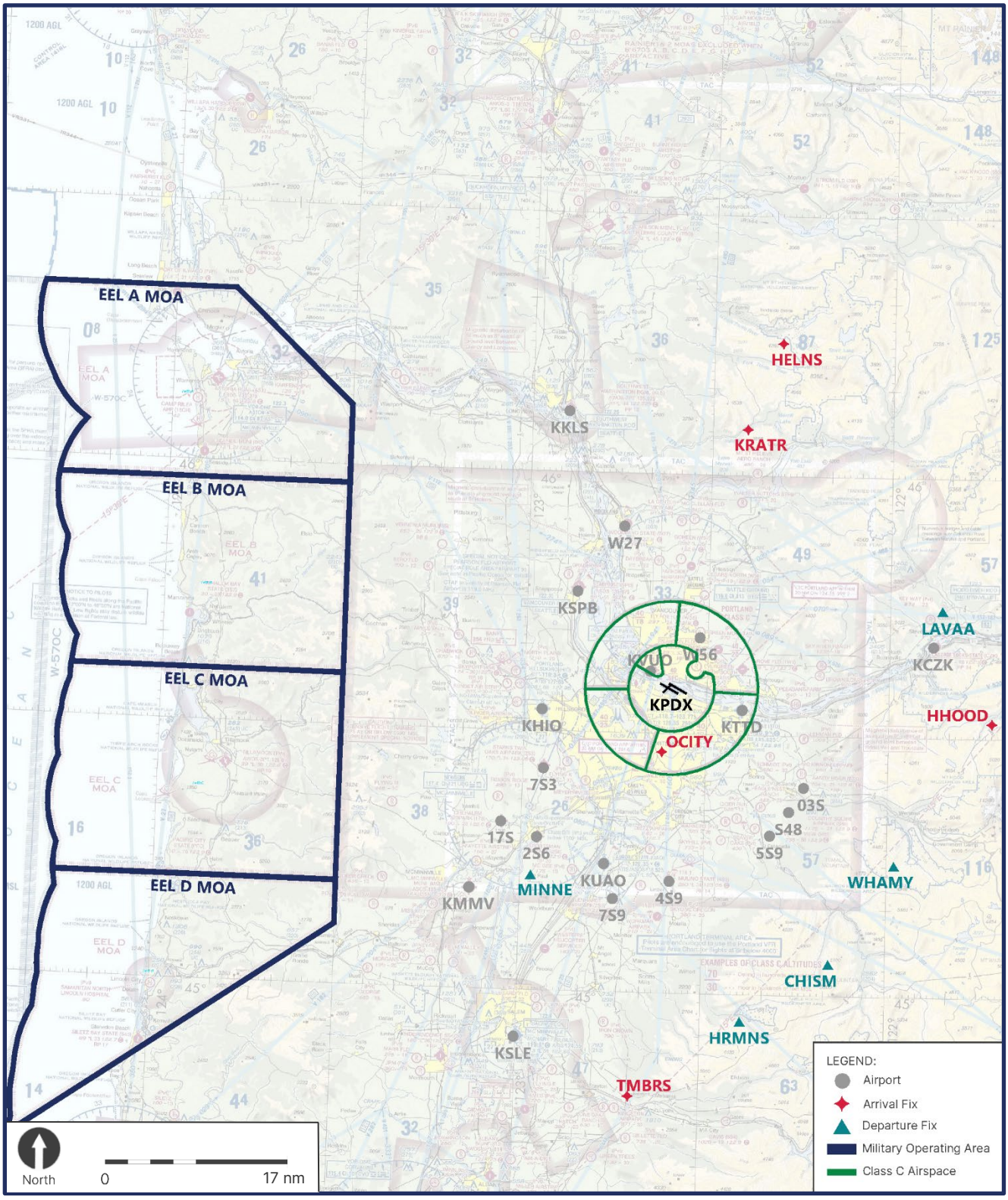
## 3.4 AIRSPACE OPERATIONS

### 3.4.1 Terminal Airspace Operations

Aircraft arrivals to the Airport generally enter the terminal airspace from the north, east, or south. Aircraft departures generally exit the terminal airspace to the northeast, southeast, or south. Arrival and departure fixes define the points at which aircraft enter and exit the terminal airspace, respectively, on a series of routes that connect them to the rest of the NAS. Only the Airport's traffic and procedures are considered for master planning purposes, so long as other facilities do not affect or are not affected by the master planning recommendations.

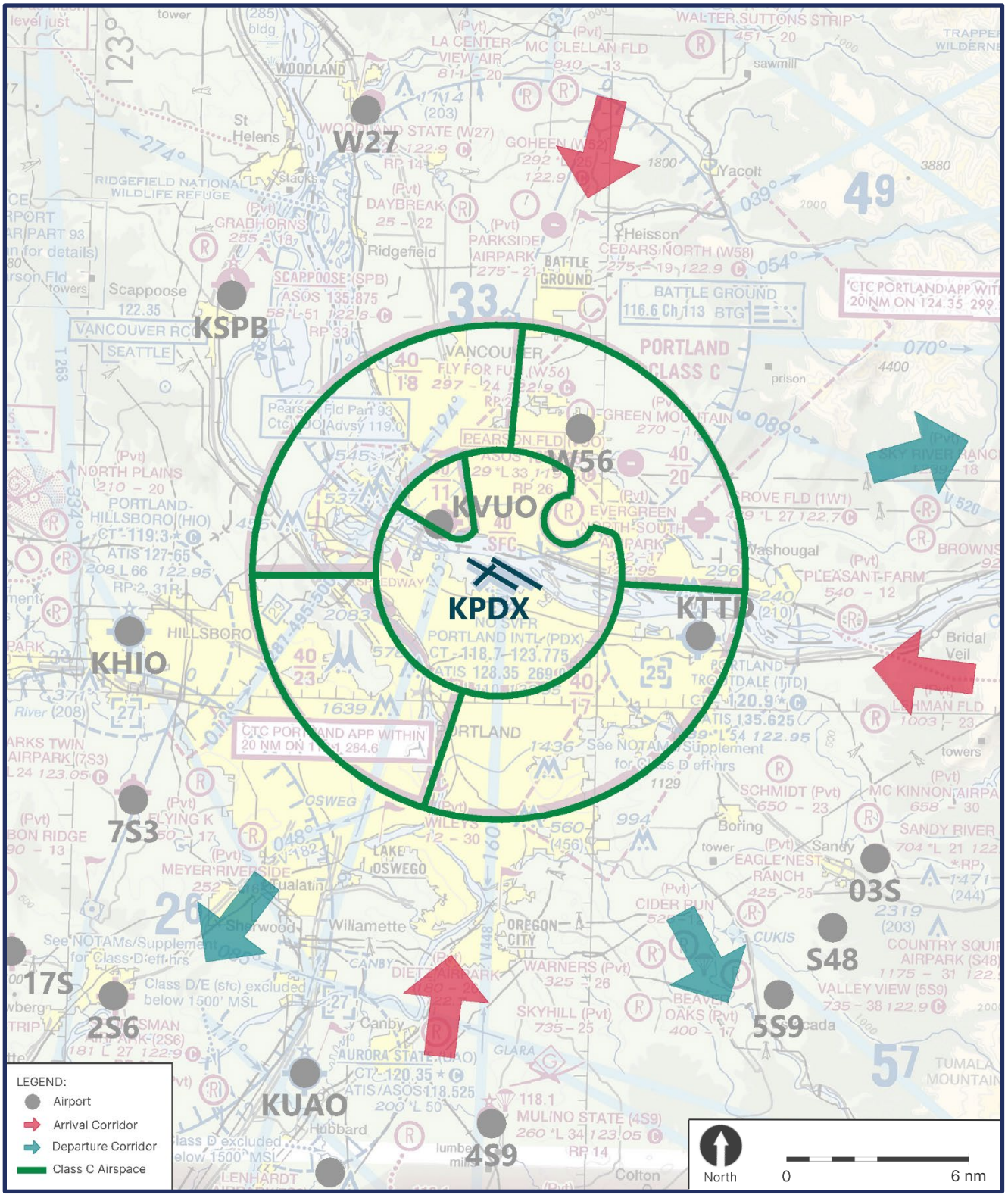
As previously mentioned, the Airport typically operates in either a west flow or east flow configuration, as depicted on Exhibit 3-3. **Exhibit 3-6** depicts arrival and departure routes within the terminal airspace when the Airport is operating in west flow. **Exhibit 3-7** depicts arrival and departure routes when the Airport is operating in east flow. Underlying historical flight track data on the exhibits illustrate how air traffic controllers vector aircraft within departure and arrival corridors to achieve and maintain horizontal separations between aircraft and most effectively direct them through the terminal airspace.

## Exhibit 3-4 Terminal Airspace – Greater Portland Area



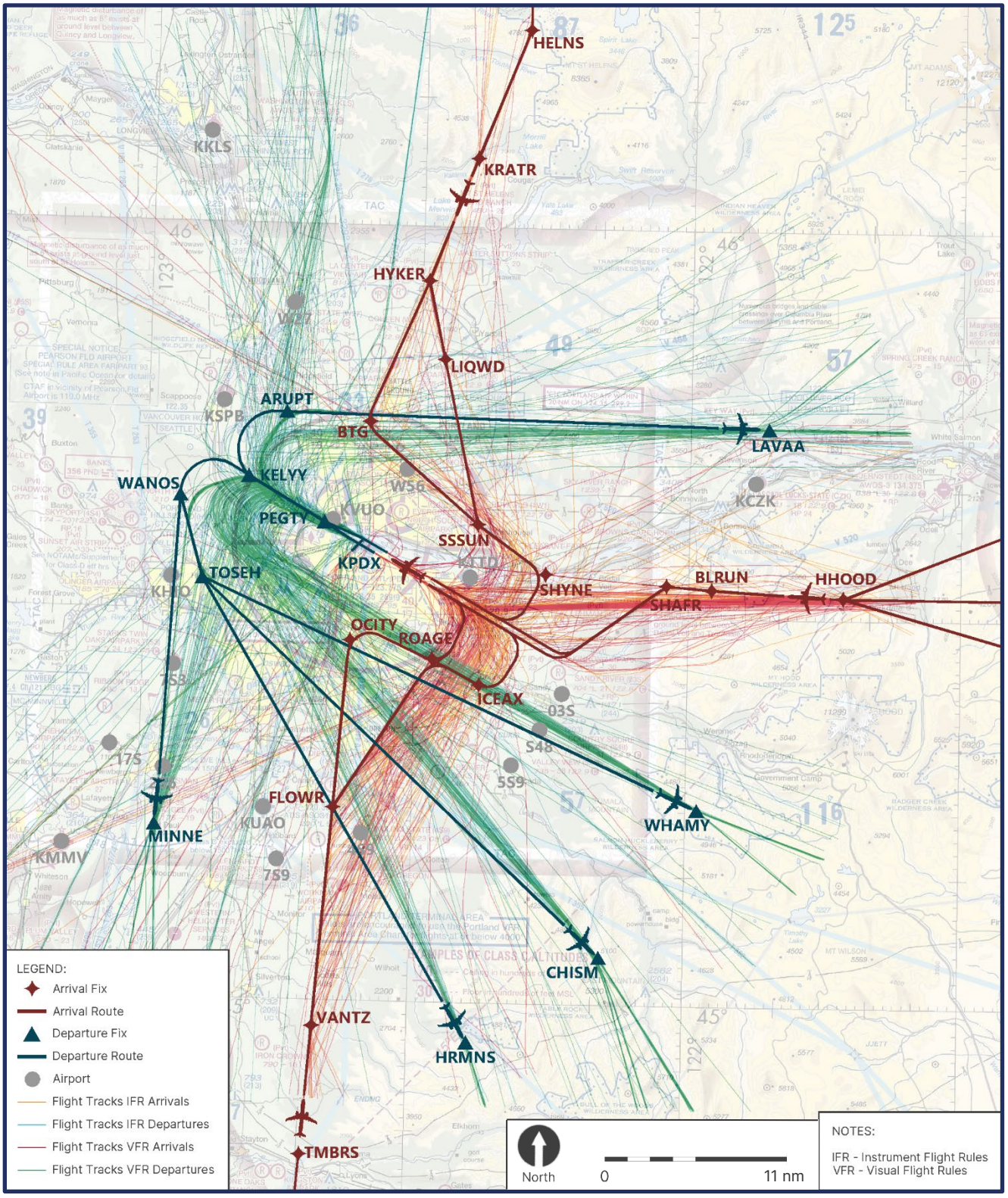

**SOURCES:**
US Department of Transportation, Federal Aviation Administration, KPDX Instrument Procedures, April 2024; US Department of Transportation, Federal Aviation Administration, VFR Raster Chart, March 21, 2024; Ricondo & Associates, Inc., April 2024.

## Exhibit 3-5 Terminal Airspace – Local Portland Area



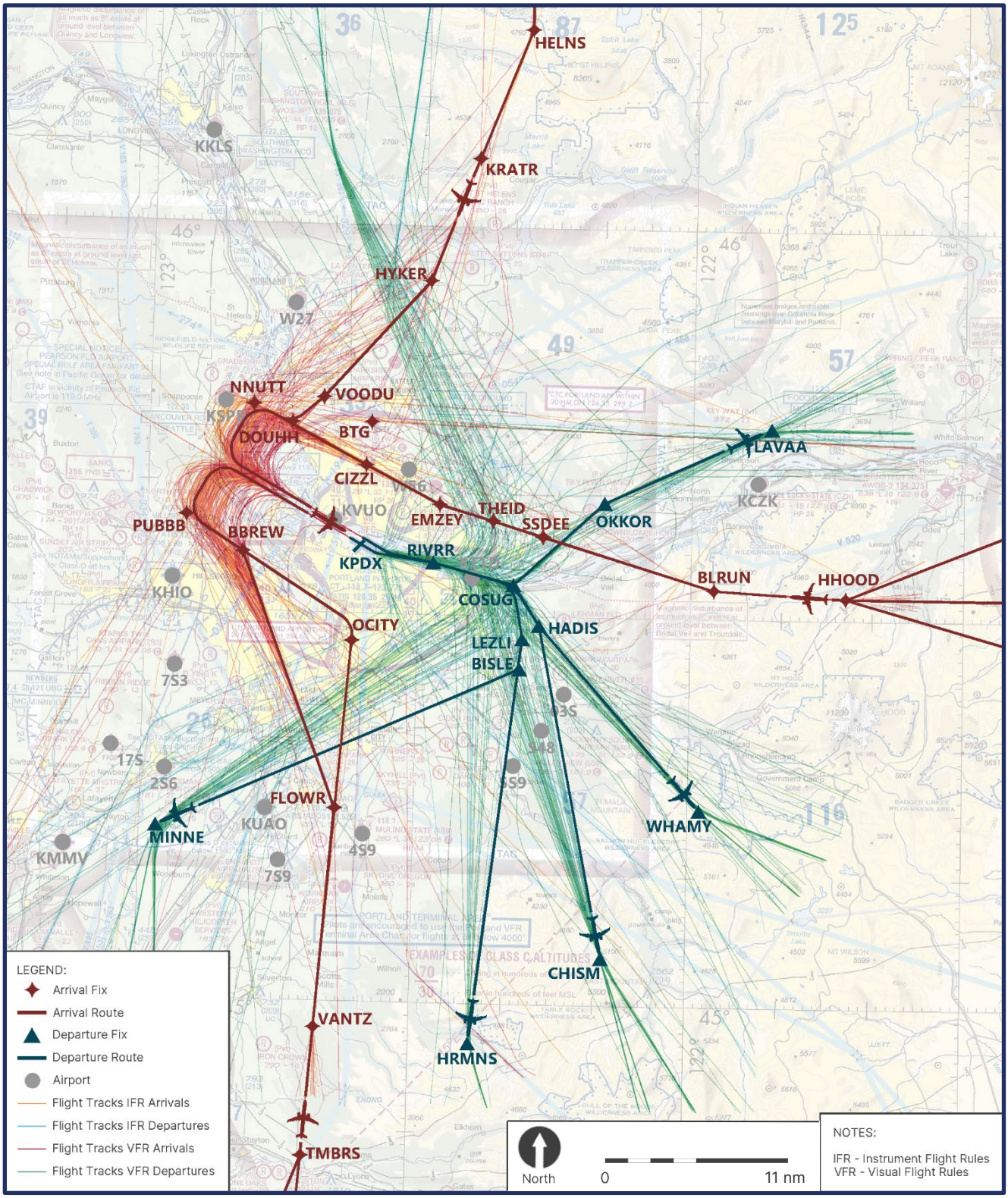

**SOURCES:**
US Department of Transportation, Federal Aviation Administration, KPDX Instrument Procedures, April 2024; US Department of Transportation, Federal Aviation Administration, VFR Raster Chart, March 21, 2024; Ricondo & Associates, Inc., April 2024.

## Exhibit 3-6 Published Arrival and Departure Routes – West Flow




**SOURCES:**
US Department of Transportation, Federal Aviation Administration, KPDX Instrument Procedures, April 2024; US Department of Transportation, Federal Aviation Administration, VFR Raster Chart, March 21, 2024; Ricondo & Associates, Inc., April 2024.

## Exhibit 3-7 Published Arrival and Departure Routes – East Flow




**SOURCES:**
US Department of Transportation, Federal Aviation Administration, KPDX Instrument Procedures, April 2024; US Department of Transportation, Federal Aviation Administration, VFR Raster Chart, March 21, 2024; Ricondo & Associates, Inc., April 2024.

**Table 3-8** lists all standard terminal arrival (STAR) and standard instrument departure (SID) procedures. Airborne procedures and protocols for using them are generally provided, but specific circumstances often apply, and procedures may be used that are not discussed in this document.

**Table 3-8 Instrument Flight Procedures**

| Departure Procedure | STAR | Instrument Approach Procedure |
|---|---|---|
| CASCADE TWO (RNAV) | HELNS SIX | RNAV (RNP) Y RWY 28L |
| HRMNS FIVE (RNAV) | HHOOD FOUR (RNAV) | RNAV (RNP) Y RWY 28R |
| LAVAA SIX (RNAV) | KRATR TWO (RNAV) | RNAV (RNP) Z RWY 10L |
| MINNE FIVE (RNAV) | OCITY THREE | RNAV (RNP) Z RWY 10R |
| PORTLAND TWO | TIMBRS TWO (RNAV) | RNAV (RNP) Z RWY 28L |
| WHAMY FOUR (RNAV) | | RNAV (RNP) Z RWY 28R |
| | | RNAV (GPS) X RWY 28L |
| | | RNAV (GPS) X RWY 28R |
| | | RNAV (GPS) Y RWY 10L |
| | | RNAV (GPS) Y RWY 10R |
| | | LOC / DME RWY 21 |
| | | VOR-A |

**NOTES:**
DME – Distance Measuring Equipment; GPS – Global Positioning System; LOC – Localizer; RNAV – Area Navigation; RNP – Required Navigation Performance; STAR – Standard Terminal Arrival; VOR – Very High Frequency Omnidirectional Range
**SOURCE:**
US Department of Transportation, Federal Aviation Administration, KPDX Instrument Procedures, April 2024.

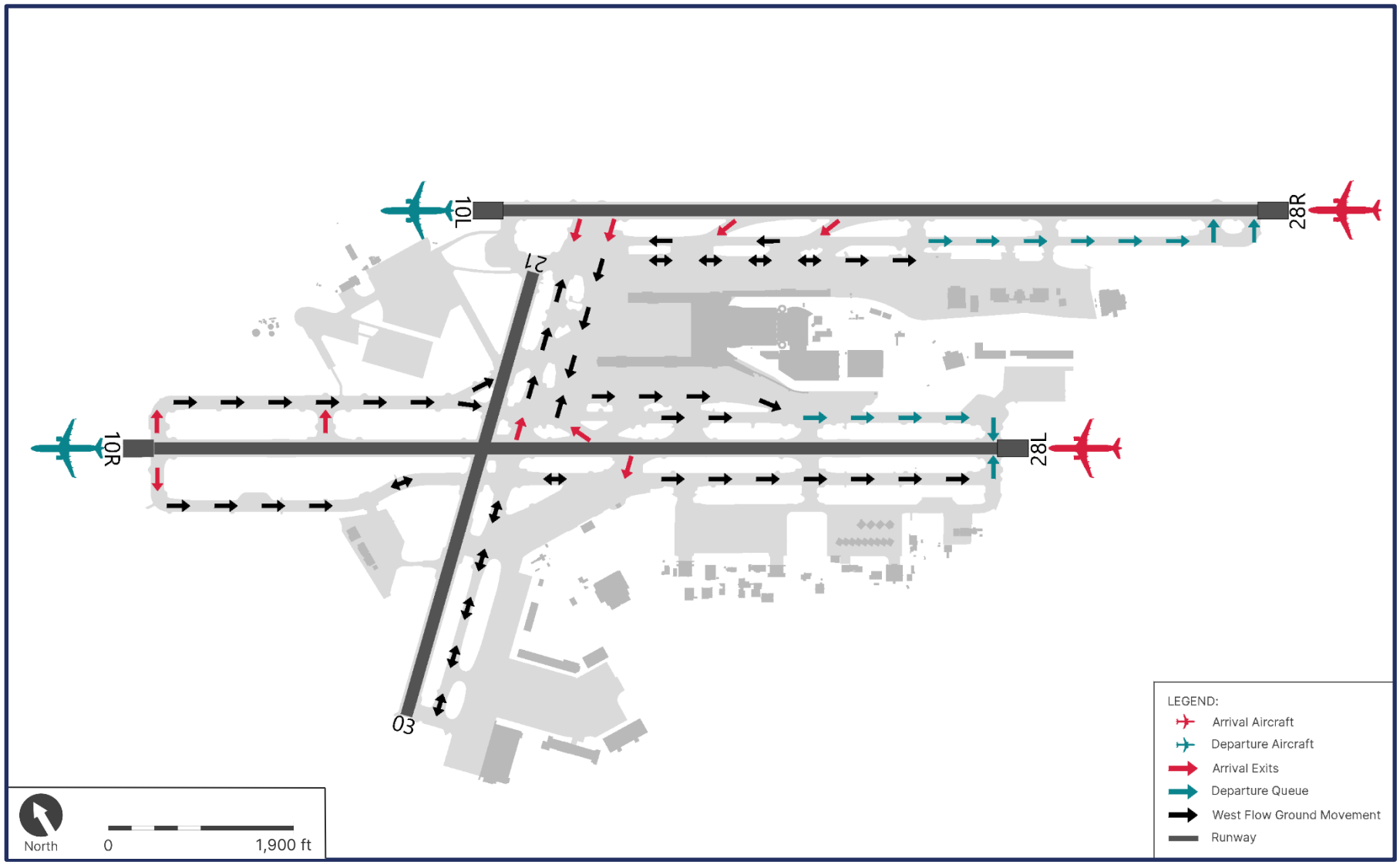
### 3.4.2 Airfield Movements

Aircraft ground movements are dynamic, and controllers continually monitor conditions and make adjustments to manage aircraft queues and optimize efficiency. The ground movements discussed in this section generally indicate how the airfield operates in each flow. However, specific circumstances may dictate movements that are not shown or discussed in this document. Generalized ground movements in west flow and east flow are depicted on **Exhibits 3-8** and **3-9**, respectively.

### 3.4.3 Nighttime Operations

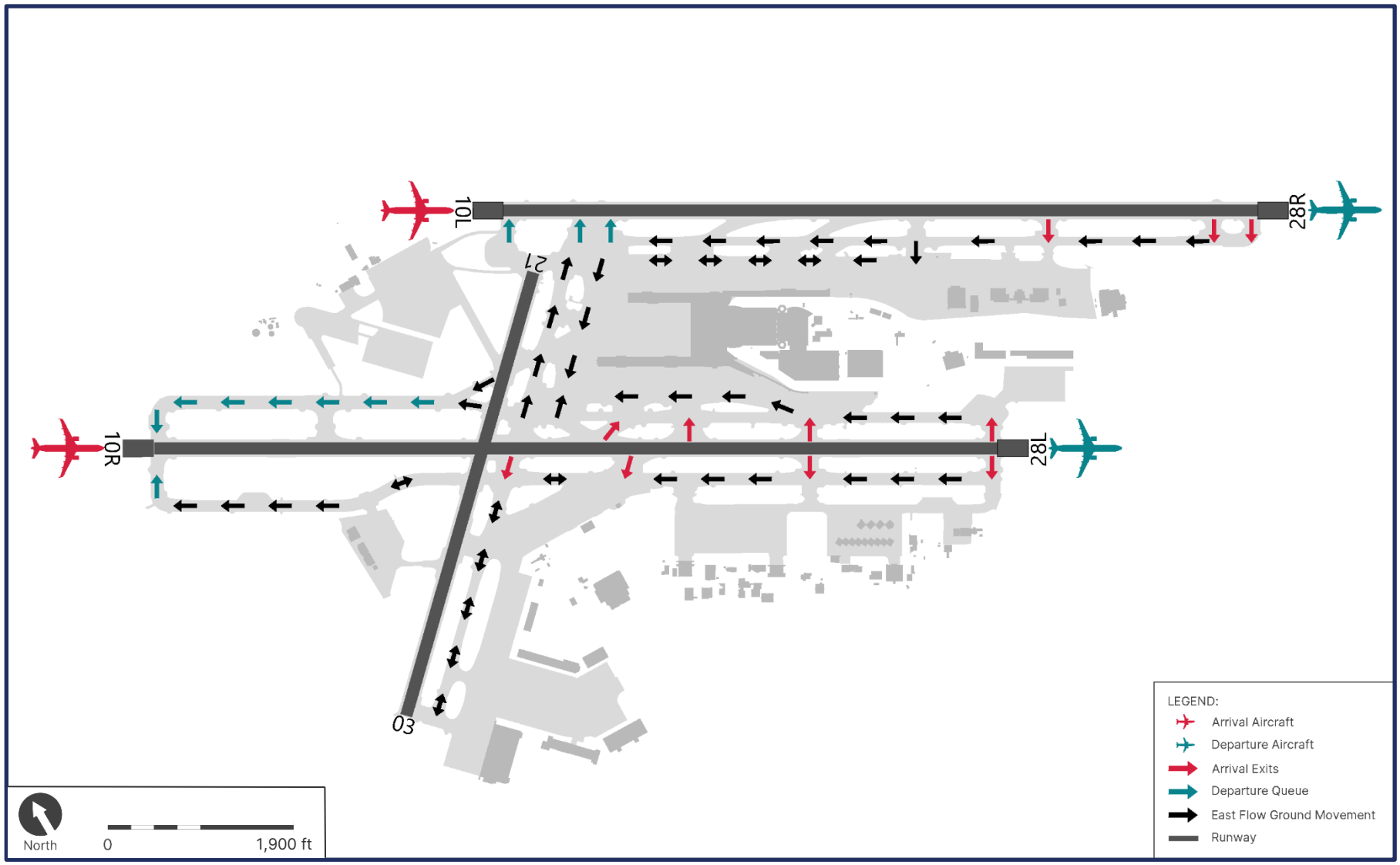
The Port initially completed the Code of Federal Regulations (CFR) Part 150 Noise and Land Use Compatibility Study in 1983, which established preferential runway and flight tracks that typically follow the Columbia River and are used for both arrivals and departures. The Airport has no curfew and is operational 24 hours every day; however, preferential runway use procedures are in effect from 11:00 p.m. to 7:00 a.m. to minimize the effects of noise caused by aircraft operations at night in communities surrounding the Airport. The Port's Noise Management Office works with the FAA, aircraft operators, and residents, as well as federal, state, and local governments, to address deviations from established flight paths.

## Exhibit 3-8 Typical Airfield Movements – West Flow




**SOURCES:**
Port of Portland, March 2024 (basemap); Ricondo & Associates, Inc., April 2024.

## Exhibit 3-9 Typical Airfield Movements – East Flow




**SOURCES:**
Port of Portland, March 2024 (basemap); Ricondo & Associates, Inc., April 2024.

## 3.5 ADDITIONAL AIRFIELD FACILITIES

Additional airfield facilities at PDX include taxiways, taxilanes, various aprons for aircraft parking, and remote aircraft parking positions, oftentimes referred to as remain overnight (RON) positions; maintenance, GA, cargo, and deicing facilities; ground service equipment (GSE) storage; and vehicle service roads (VSRs). All additional airfield facilities are illustrated on Exhibit 3-1.

### 3.5.1 Taxiways

The taxiway system, including taxiway names, is depicted on Exhibit 3-1. Separation of the runways and taxiways is determined by the Airplane Design Group (ADG) of the design aircraft operating at the Airport. Taxiway pavement width, shoulder width, and edge safety margin standards are based on the Taxiway Design Group (TDG). Most taxiway and shoulder widths at the Airport can accommodate TDG 5 aircraft, although some portions of the taxiway system are limited to TDG 4.

### 3.5.2 Aprons

There are 12 aprons at the Airport. **Table 3-9** summarizes each apron, including the apron name and its primary uses.

### 3.5.3 Vehicle Service Roads

VSRs provide vehicular access to various facilities located throughout the airfield. A perimeter VSR encircles the airfield and primarily runs along the secured fence-line of the Airport Operations Area (AOA). Access to the AOA is provided through controlled access gates located along the perimeter fence. Additional portions of the VSR not along the perimeter offer further connectivity throughout the airfield, such as around the terminal or to and from the various aprons.

### 3.5.4 Pavement Conditions

The most recent pavement condition survey at PDX was completed in 2023. Pavement conditions are rated using a standard pavement condition index (PCI) that uses a numerical value to represent the remaining usable lifespan of the pavement based on the structural integrity and surface operational condition of a pavement. PCI only accounts for surface pavement and does not account for subsurface conditions. This value ranges from 0 (failed) to 100 (excellent) and is shown for all portions of the pavement on **Exhibit 3-10**. In 2023, the average rating of all airfield pavement at the Airport was 80.

## 3.6 IDENTIFIED AIRFIELD DEFICIENCIES

Some areas of existing airfield pavement at the Airport deviate from the standard FAA recommendations. This includes modifications of standards (MOS), known hot spots, and other deviations from the FAA's airfield design-related advisory circulars (ACs), which are meant to provide the best planning practices for an airport's airfield geometry.

### 3.6.1 Non-Standard Conditions

A non-standard condition is any deviation from standards, or addition to standards, applicable to airport design, material, and construction standards, or equipment projects resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis.[3] A complete list of the non-standard conditions from the previous ALP are shown on **Exhibit 3-11** through **Exhibit 3-13**.

[3] US Department of Transportation, Federal Aviation Administration, Order 5300.1F, Modifications to Agency Airport Design, Construction, and Equipment Standards, June 30, 2000.

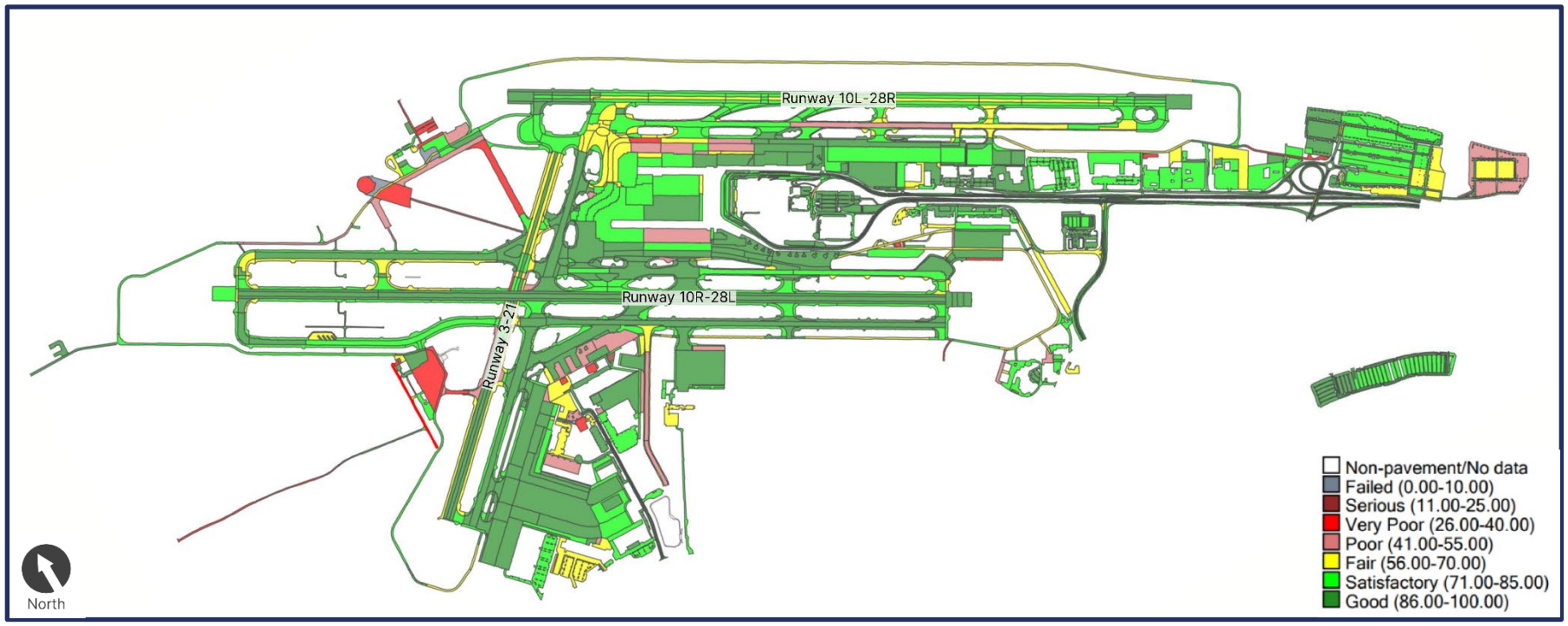
## Table 3-9 Apron Areas

| Apron Name | Primary Use(s) | Lessees |
|---|---|---|
| Terminal | Terminal contact and ground-loaded gate operations, GSE storage, deicing | All airlines |
| North | RON parking and GSE storage | N/A |
| GA | GA | Atlantic Aviation<br>Boutique Air<br>Empire Airlines |
| Southeast | RON parking | N/A |
| Southwest | GA | BPA Corp. |
| South | Cargo (Airtrans Center) | Boeing Co.<br>PD ACC1<br>Prologis, Inc. |
| South-Central | Cargo | Aero Portland, LLC<br>United Parcel Service, Inc.<br>Hawaiian Airlines |
| Central | Cargo | Ameriflight LLC<br>United Parcel Service, Inc. |
| Horizon | Aircraft maintenance | Horizon Air |
| Reserve | RON parking, aircraft maintenance | United Airlines<br>Alaska Airlines |
| ORANG West | Military | Oregon Air National Guard |
| ORANG East | Military | Oregon Air National Guard |

**NOTES:**
GA – General Aviation; GSE – Ground Service Equipment; N/A – Not Applicable; ORANG – Oregon Air National Guard; RON – Remain Overnight

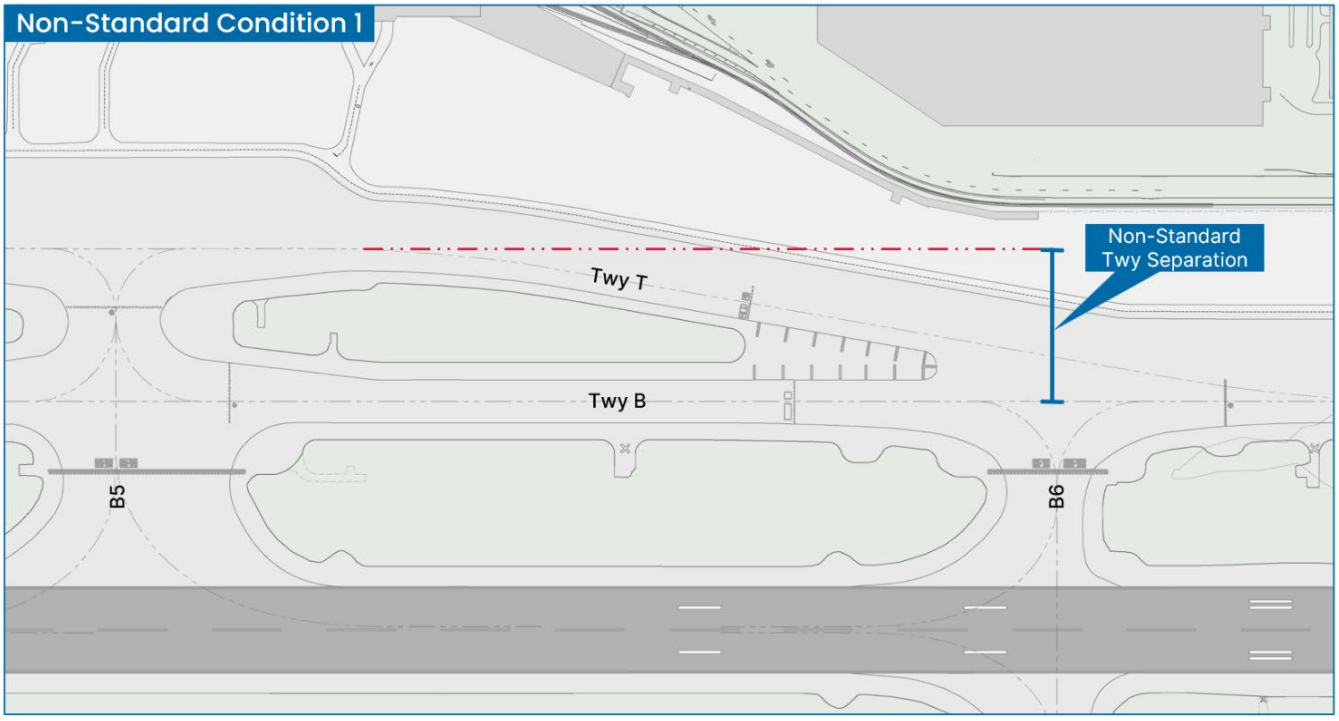
**SOURCES:**
Port of Portland, Airport Futures, 2010; Ricondo & Associates, Inc., December 2023.

## Exhibit 3-10 2023 Pavement Condition Index



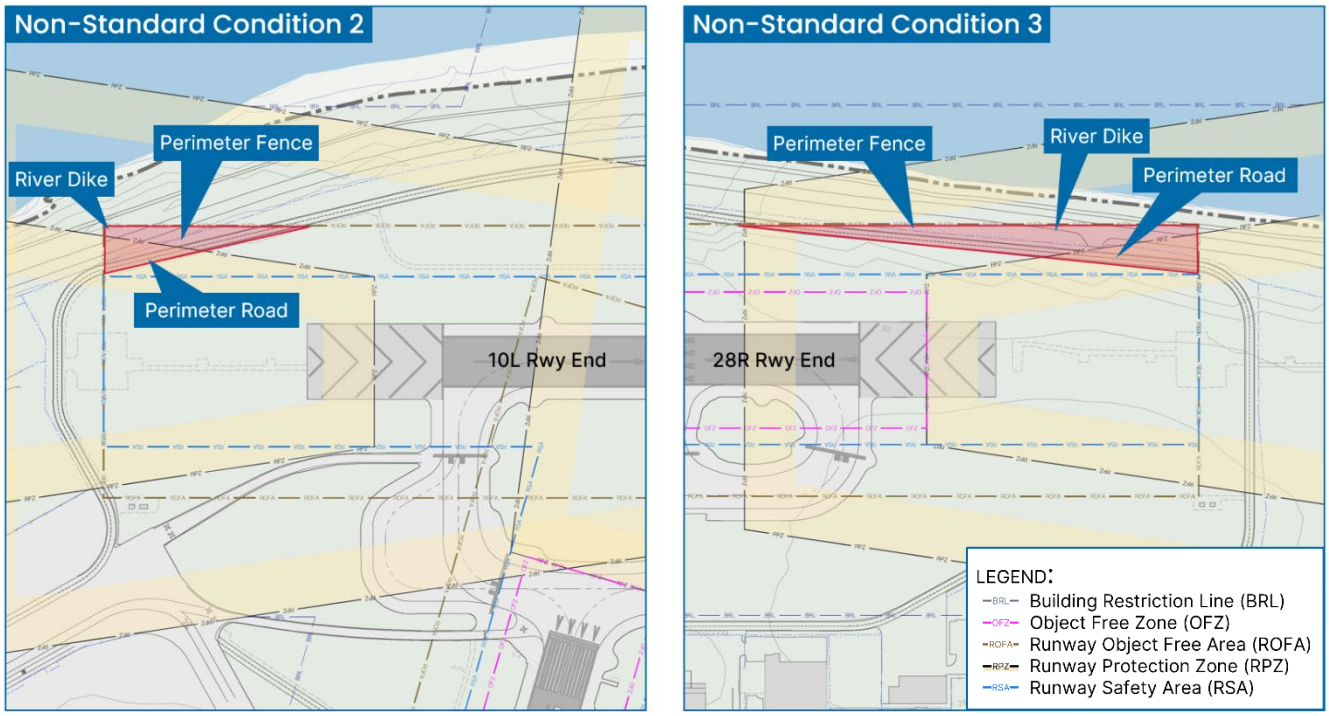

**SOURCES:**
Port of Portland, PDX Database Rollup Report, 2023; Ricondo & Associates, Inc., February 2024.

## Exhibit 3-11 Non-Standard Condition 1



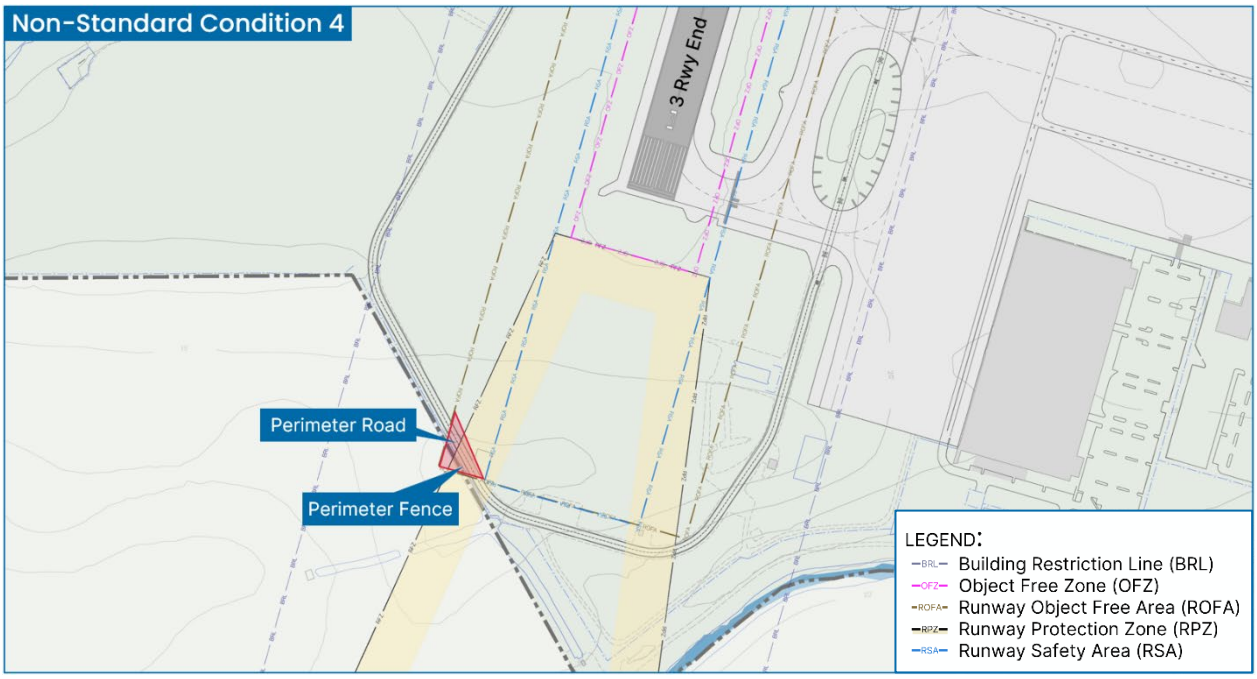

**SOURCE:**
US Department of Transportation, Federal Aviation Administration, Order 5300.1F, Modifications to Agency Airport Design, Construction, and Equipment Standards, June 30, 2000.

## Exhibit 3-12 Non-Standard Conditions 2 and 3




**SOURCE:**
US Department of Transportation, Federal Aviation Administration, Order 5300.1F, Modifications to Agency Airport Design, Construction, and Equipment Standards, June 30, 2000.

**Exhibit 3-13 Non-Standard Condition 4**




**SOURCE:**
US Department of Transportation, Federal Aviation Administration, Order 5300.1F, Modifications to Agency Airport Design, Construction, and Equipment Standards, June 30, 2000.

### Non-Standard Condition 1

Taxiway B/T separation standards: The separation between Taxiway B and Taxiway T does not meet the Airport Reference Code (ARC) D-IV design standard of 215 feet between exits B5 and B6. Taxiway T merges into Taxiway B at exit B6. Regarding long-term planning, the separation standard will be met by relocating Taxiway T to the north, as shown on the existing ALP.

### Non-Standard Condition 2

North runway 28R end runway object free area (ROFA): The perimeter road, perimeter fence, and toe of the Columbia River dike encroach on the north side of the ROFA, beginning at a point about 395 feet west of the end of the runway on the north side of the ROFA. The encroachment widens to form a narrow triangle, which is about 138-feet wide at the eastern limit of the ROFA. The non-standard condition is indefinite, as it is not practical to move the Columbia River dike to allow the perimeter road and fence to be relocated outside the ROFA.

### Non-Standard Condition 3

North runway 10R end ROFA: The perimeter road, perimeter fence, and toe of the Columbia River dike encroach on the north side of the ROFA, beginning at a point about 406 feet west of the end of the runway on the north side of the ROFA. The encroachment widens to form a narrow triangle, which is about 143-feet wide at the eastern limit of the ROFA. The non-standard condition is indefinite, as it is not practical to move the Columbia River dike to allow the perimeter road and fence to be relocated outside the ROFA.

### Non-Standard Condition 4

Crosswind runway 3 end ROFA: The perimeter road and perimeter fence encroach on the southwestern side of the ROFA, beginning at a point about 845 feet off the south end of the runway on the west side. The encroachment widens to form a triangle that is about 155-feet wide at the southern limit. The non-standard condition is indefinite, as it is not practical to move the perimeter road and fence due to a

drainage feature and different property ownership on the opposite side of the fence that is encroaching onto the ROFA.

### 3.6.2 Hot Spots

FAA defines a hot spot as a location on an airport movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.[4] There are three defined hot spots at the Airport, as identified on **Exhibit 3-14.** The following subsections describe each hot spot.

#### Hot Spot 1

There is limited wing-tip clearance at the Taxiway T and Taxiway B convergence point due to the geometry of the taxiways. Pilots taxiing eastbound on either taxiway should hold at the taxiway holding position marking when directed by ATC to avoid the risk of collision with another aircraft.

#### Hot Spot 2

The hold line for the crosswind runway is on Taxiway K. Pilots should be prepared to hold short of Runway 21 on Taxiway K, unless an authorization to cross is issued by ATC.

#### Hot Spot 3

There is direct access from the GA apron to the north runway. Pilots taxiing outbound from the GA apron via Taxiway A3 enter the north runway without authorization if they miss the turn onto Taxiway A.

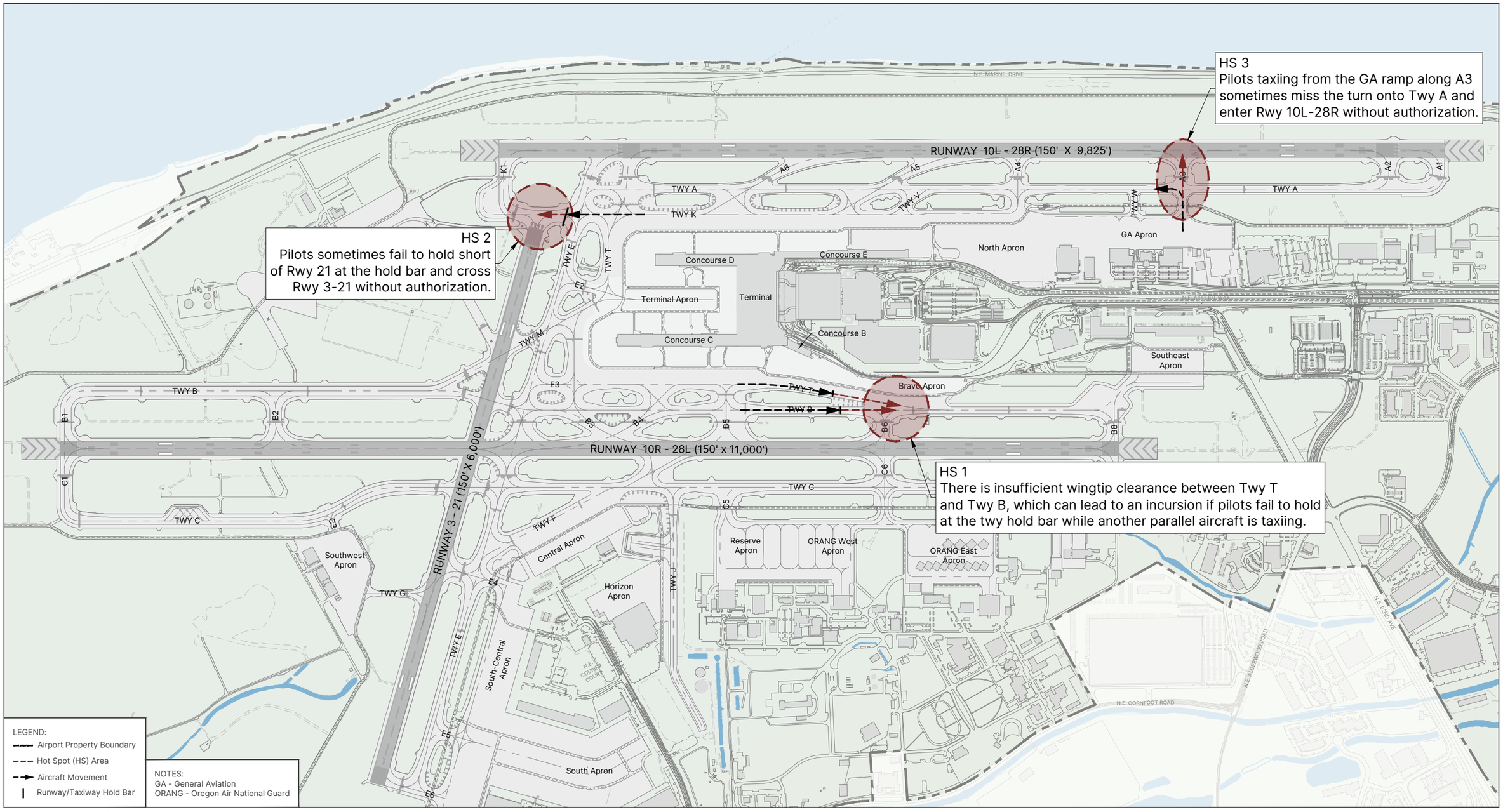
### 3.6.3 Deviations from Taxiway Design Guidance

In AC 150/5300-13B, Airport Design, FAA provides general guidance regarding recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions. The following list summarizes these design methods:

- Provide adequate taxiway width to allow for additional wander allowance of “cockpit over centerline” taxiing.
- Ensure the taxiway steering angle is less than 50 degrees.
- Establish a simple taxiway system (no more than three nodes).
- Avoid wide expanses of pavement.
- Limit runway crossings.
- Avoid “high-energy” intersections (within the middle-third of the runway).
- Increase visibility (90-degree intersections).
- Avoid “dual purpose” pavement.
- Avoid direct access to a runway.
- Redesign hot spots.
- Provide a 50- to 100-foot parallel taxiway offset within 1,500 feet of the runway end for increased pilot visibility.

While not always required by FAA, addressing these deviations is often necessary to build future projects with FAA grant funding. It is the responsibility of the sponsor to adequately analyze the practicality and financial feasibility of addressing all deviations. The Airport prefers to use FAA’s design guidance for future improvements to help increase the safety and efficiency of the overall airfield. **Exhibit 3-15** shows locations where airfield geometry deviates from FAA guidance.

[4] US Department of Transportation, Federal Aviation Administration, https://www.faa.gov/airports/runway_safety/hotspots (accessed April 2024).

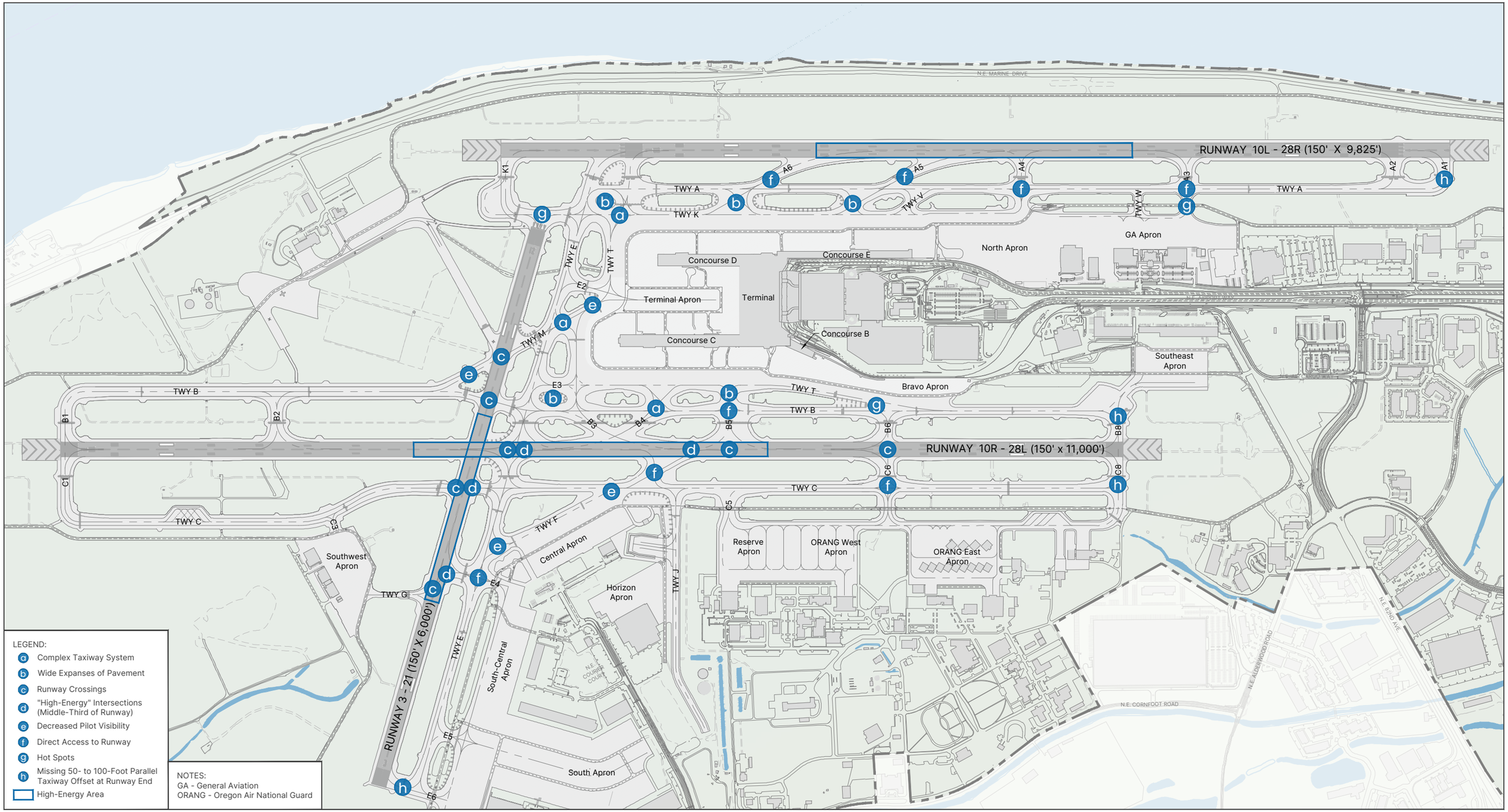



SOURCES: US Department of Transportation, Federal Aviation Administration, Portland International (Intl.) Airport Diagram, March 2024; Port of Portland, March 2024; Ricondo & Associates, Inc., April 2024.

**Exhibit 3-14**

Airfield Hot Spots

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Airfield Hot Spots.dwgLayout: Ex-01 Plotted: Jan 2, 2025, 03:25PM




SOURCES: US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/1300-13A, Airport Design, February 2014; US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/1300-13B, Airport Design, March 2022; Port of Portland, March 2024; Ricondo & Associates, Inc., April 2024.

**Exhibit 3-15**

Taxiway Design Guidance Deviations

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Airfield Taxiway Design Guidance.dwgLayout: Ex-01 Plotted: Jan 2, 2025, 03:27PM

# 4. Passenger Terminal Complex

This section discusses the passenger terminal facility (terminal) at PDX. The Airport has one central terminal consisting of a main terminal processor where passengers enter and exit the terminal, check in, go through security, and retrieve their luggage and four concourses where aircraft park and passengers board and exit the aircraft at the gates (Concourse B, C, D, and E). The terminal layout is defined as a pier configuration and is shaped like the letter "H." The terminal is located between parallel Runways 10L-28R and 10R-28L, with the crosswind Runway 3-21 located immediately to the west. The existing terminal at PDX provides 59 aircraft gates: 51 with passenger boarding bridges and eight that require ground-loading.

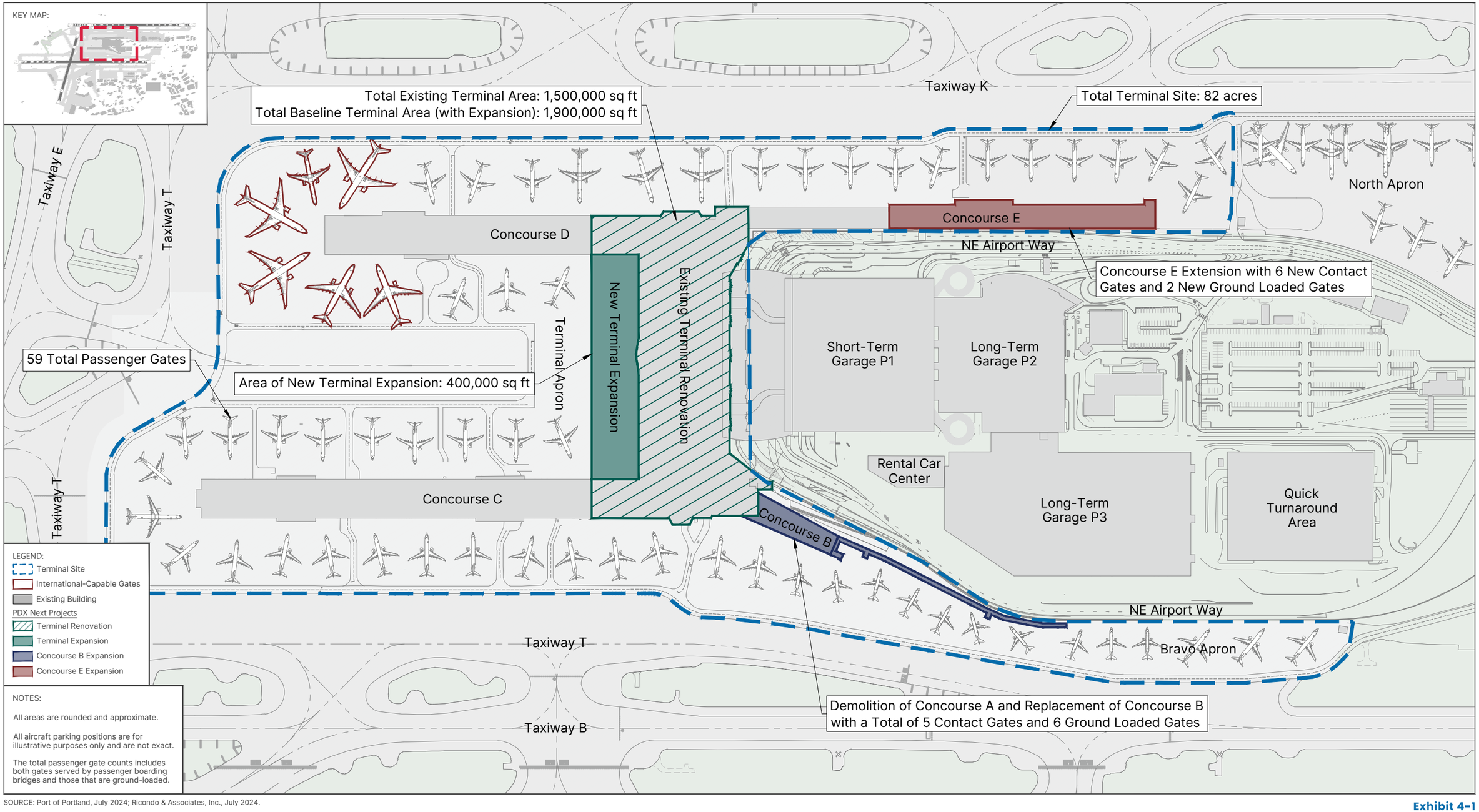
At the time of this study, an expansion and renovation of the main terminal was underway. Much of the newly expanded and renovated terminal, henceforth referred to as the "new" terminal, opened in August 2024, with the remainder of the new terminal expected to open by early 2026. The full construction of the new terminal project is considered a baseline condition for this study.

In addition to the new terminal, several terminal enhancement projects have been completed since the 2010 Airport Futures Master Plan as a part of the PDX Next program. These improvements are also considered baseline conditions for PDX 2045. The following provides a summary of the major completed projects relating to the terminal facilities:[1]

- Demolition of Concourse A in 2019
  - Concourse A was demolished to accommodate the expansion of Concourse B.
- Concourse E extension in 2020
  - The new portion of Concourse E expanded the existing facility and provided six new contact gates and two ground loaded gates. The extension was built to be seismically resilient.
- New Concourse B in 2021
  - The new Concourse B replaced Concourse A and expanded the existing Concourse B facility with an ultimate capacity of five contact and six ground loaded gates. The new concourse was built to be seismically resilient.
- New main terminal (Phase One) in 2024
  - The new main terminal nearly doubles the size of the previous terminal and provides new ticketing, lobby, concessions, and security checkpoint areas.
- New main terminal (Phases Two and Three) in 2026
  - Phases Two and Three complete the reconfiguration and renovation of the existing terminal areas and the new main terminal. Portions of the new main terminal are built to be seismically resilient.

**Exhibit 4-1** highlights the baseline terminal conditions used for this study which includes the expanded main terminal and those PDX Next projects which are relevant to the discussion of the terminal facilities. PDX Next projects excluded from this section include the Parking and Rental Car (PACR) Project, the Rental Car Center (RCC), and the Quick Turnaround Area (QTA). These projects relate to Access, Parking, and Transit and are discussed further in Section 5. **Exhibit 4-2** provides an orientation map of the new terminal facility.

[1] Port of Portland, https://pdxnext.com (accessed December 2023).



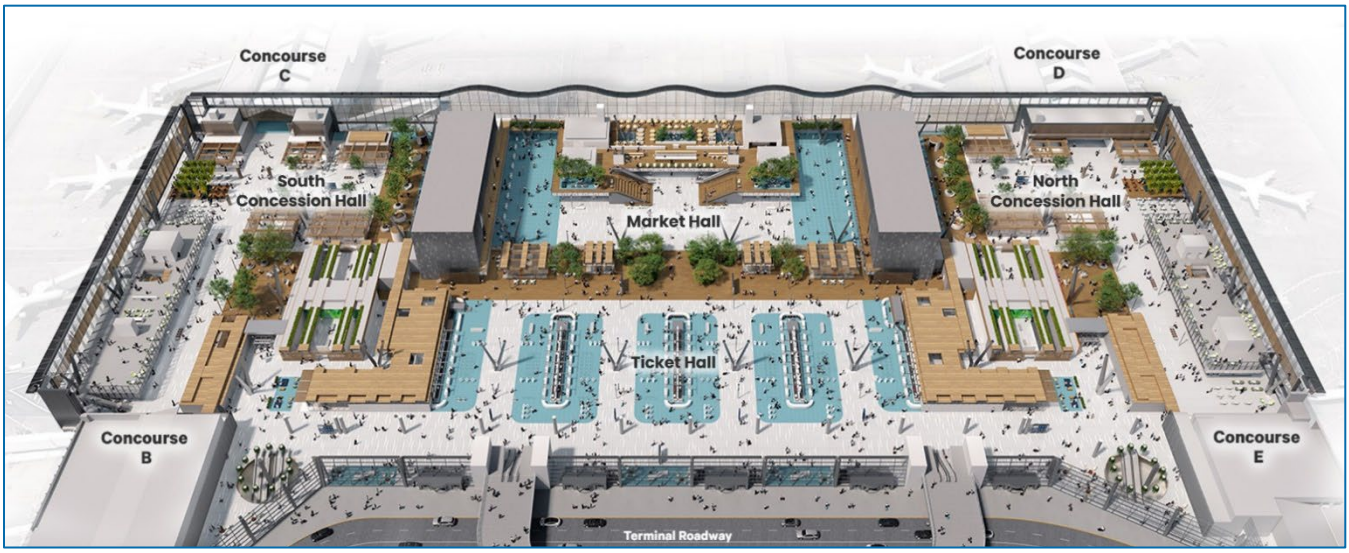

SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

**Exhibit 4-1**

Terminal Facilities
PDX Next Projects

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Passenger Terminal Complex Facilities.dwgLayout: Ex-01 Plotted: Jan 7, 2025, 11:21AM

## Exhibit 4-2 New Terminal Expansion Orientation Map




**SOURCE:**
Port of Portland, https://www.pdxnext.com (accessed January 2025).

## 4.1 TERMINAL FACILITY OVERVIEW

The total terminal building area, including all levels of the terminal processor and the concourses, comprises approximately 1.9 million square feet of enclosed space on an 82-acre property site, as illustrated on Exhibit 4-1. **Table 4-1** summarizes the total square footage by function and lease assignment. Major terminal area categories are described in Sections 4.1.1 through 4.1.10. Areas not used by the owner/operator (Port) are leased to entities operating at the Airport through use or lease agreements with the Port. Some facilities, like check-in counters, baggage claim devices, holdrooms where passengers wait to board, and/or gates can be designated as a common-use lease agreement where usage is open to all airlines, preferential-use lease agreement where usage is typically assigned to a specific airline but may be used by other airlines and flights when adequate common-use facilities are not available, or exclusive-use lease where usage is by one airline only.

**Table 4-1 Terminal Facilities Area Summary**

| Building Function | Total Area (Square Feet) | Percent of Total |
|---|---|---|
| Airlines | 337,030 | 17% |
| Transportation Security Administration | 178,780 | 9% |
| US Customs and Border Protection | 37,300 | 2% |
| Concessions | 163,120 | 8% |
| Restrooms | 51,860 | 3% |
| Amenities | 88,740 | 4% |
| Airport Operations | 79,370 | 4% |
| Pedestrian Circulation[1] | 762,290 | 38% |
| Vehicle Circulation | 128,680 | 6% |
| Building Systems | 194,590 | 10% |
| **TOTAL** | **2,021,770** | **100%** |

**NOTES:**
Total area values were rounded to the nearest 10 square feet.
Table totals may not sum due to rounding.
1. Pedestrian circulation refers to circulation spaces primarily intended for the movement of people including passengers and non-passengers, but may also include the movement of objects such as carts, electric passenger shuttles, etc.

**SOURCES:**
Port of Portland, July 2024; Ricondo & Associates, Inc., November 2024.

### 4.1.1 Airlines

These areas are used by airlines for outbound/inbound passenger processing. At PDX, these areas include the following:

- **Check-in**: Space dedicated for passengers to obtain boarding passes and check baggage (i.e. ticket counters, kiosks, and self-service bag drops), as well as other outbound passenger-related services.
- **Airline Support**: Space dedicated to airline personnel for a variety of administrative and operational functions.
- **Baggage Service Office**: Space dedicated to airline personnel for addressing issues related to checked baggage.
- **Holdrooms**: Space dedicated to airlines for passengers awaiting aircraft boarding and disembarkation; space includes seating/standing area and gate processing equipment (e.g., agent desk and boarding pass reader podiums).
- **Baggage Makeup**: Work areas and automated baggage handling systems for sorting, storing, loading, and unloading checked bags on or off bag carts or bag containers for transfer to and from aircraft. Baggage makeup includes space for storage and staging of carts as well as space for circulation of ground service equipment used to move baggage carts to and from aircraft.
- **Baggage Claim**: Baggage claim device(s) and associated inbound baggage handling system staging, unloading, and feed for inbound checked bag organization and pickup. At PDX, all baggage claim devices are designated as common-use and are shared by all airlines.

### 4.1.2 Transportation Security Administration (TSA)

This area is dedicated to TSA for screening passengers and baggage prior to aircraft boarding, including:

- **TSA Checkpoint**: Space to conduct security screening of outbound passengers and their possessions prior to passengers entering a sterile or secured area; includes screening equipment and adjacent or remote viewing stations, queuing area, divestiture and recompose areas[2], and manual search areas or rooms. At PDX, there are two security checkpoints, a north and a south checkpoint.
- **TSA Office**: Office space dedicated to the TSA personnel for administrative and operational functions. As part of the new terminal project at PDX, additional space was reserved for future TSA expansion needs including two vacant rooms for remote TSA screening operations. At PDX, additional TSA support space is provided on the second level of the Rental Car Center (RCC).
- **Baggage Screening**: Dedicated area for checked baggage equipment and baggage screening rooms to conduct security screening of outbound checked bags; this includes enclosed and non-enclosed rooms, baggage conveyance systems, and space for baggage tractors and carts to load screened baggage.

### 4.1.3 US Customs and Border Protection (CBP)

This area is dedicated to CBP for screening international passengers entering the US, including:

- **Federal Inspection Services (FIS) Facility**: Space dedicated to primary inspection of international arriving passengers and baggage, international baggage claims, secondary inspection, and baggage recheck, if needed. At PDX, FIS is on Level 1 (deplaning) at the west end of Concourse D.
- **CBP Office**: Space dedicated to CBP personnel for administrative and operational functions, including office space on Level 1 (deplaning) of Concourse D.

### 4.1.4 Concessions

At PDX, concessions include three main groups: Food and Beverage, Retail, and Services. These areas and associated support facilities are leased to vendors for a variety of operations, including:

- **Food and Beverage**: Space for kitchen operations and storage, as well as dining and seating areas.
- **Retail**: Space for concessionaires that is used for storage and sale of merchandise, including dedicated duty-free stores. PDX currently does not have any duty-free stores; however, concessionaires have the option of providing duty free shopping if they choose.
- **Services**: Space for additional concessionaire services such as Smarte Carte, ATMs, mailing services, and currency exchange.
- **Concessions Office and Storage**: Space for concessionaires' administrative and operational functions, including storage space for concessionaires to store merchandise for sale.

### 4.1.5 Restrooms

Restrooms are provided throughout the Airport for the public and airport employees in both pre- and post-security areas. These areas include general use facilities (men, women, single all user, multi-all user) as well as additional amenity facilities (companion care and family restrooms). Additional restroom facilities have been categorized as amenities as their location and space requirements are driven by Port policy instead of an industry standard restroom calculation as defined in Airport Cooperate Research Program (ACRP) Report 130: Guidebook for Airport Terminal Restroom Planning and Design.[3]

[2] Divestiture spaces are the areas of the checkpoint for passengers to remove shoes, belts, jackets, et cetera to be placed into bins. Recompose spaces are the areas beyond the checkpoint dedicated for passengers to replace all belongings from the bins.

[3] Rothausen-Vange, J. R., Cooper, S., Wirth, S., Bruggemann, K., Kindvall, K., Agnew, R., de Keyzer, I., Ambrose, D., & Duffy, C. (2015). ACRP Report 130: Guidebook for Airport Terminal Restroom Planning and Design. Transportation Research Board of the National Academies, Washington, D.C.

### 4.1.6 Amenities

These areas are for non-airline or non-government agency leaseholders providing special services to passengers and employees, including:

- **Traveler's Aid**: Space for passengers to obtain information regarding flight information, local regional information, and general information.
- **Club Room/Lounge**: Space provided to passengers who purchase memberships or certain types of tickets that provides seating, Wi-Fi, snacks and beverages, and other amenities. At PDX, this includes club/lounge spaces operated by airlines, independent lounge operators, and vacant club/lounge spaces.
- **Miscellaneous**: All other spaces that provide specific special services to passengers. At PDX, free Wi-Fi throughout the terminal, pet relief areas, lactation rooms, children's play areas, sensory rooms, art installations/galleries, the Hollywood Theatre microcinema, the Employee Interfaith Prayer Room, the Community Room, and the Conference Center are included as additional amenities.

### 4.1.7 Airport Operations

These areas are for Port staff or other leased spaces that support the operations of the Airport. These areas include the following:

- **Airport Offices**: Space dedicated to Port staff for general administrative and operational functions within the terminal building. At PDX, there are also administrative Port offices in the Port of Portland Headquarters which is located above the P2 parking garage and connected to the terminal via the north tunnel; it is not included in this section of the study.
- **Maintenance**: Space dedicated to Port staff for functions related to maintaining building systems. Additional maintenance facilities are also located outside of the terminal and are discussed further in Section 8.
- **Police**: Space dedicated to the Port of Portland Police for administrative and operational functions. At PDX, additional Police space is provided in office space above the Rental Car Center (RCC) which is not included in this section of the study.
- **Other Agencies and Service Providers:** Areas dedicated to third-party agencies and contractors handling airport- or airline-related operations, maintenance, or special project works. The areas include offices, conference rooms, storage, and other miscellaneous spaces for administrative or operational support. At PDX this includes Relay Resources, Tri-County Metropolitan Transportation District of Oregon (TriMet), and various wheelchair providers.

### 4.1.8 Pedestrian Circulation

These areas are dedicated to secure, non-secure, sterile, and egress circulation of people throughout the terminal and include facilities such as walkways, hallways, stairs, and elevators.

### 4.1.9 Vehicle Circulation

These areas are dedicated to the movement of ground service equipment (GSE), baggage carts, and other vehicles within the building footprint. Areas that are specifically designed for access and staging at the inbound and outbound baggage systems are included in the airline space allocation category (Section 4.1.1). At PDX, this is located only on Level 1 (deplaning) of the terminal.

### 4.1.10 Building Systems

These areas are dedicated to structural, mechanical, electrical, plumbing, communication, and life-safety operations and functions within the terminal facilities. Detailed information on all utilities at PDX can be found in Section 10.

## 4.2 TERMINAL FACILITY LEVELS

The terminal at PDX consists of three levels: Level 1 (Deplaning), Level 2 (Enplaning), and Level 3 (Mezzanine) as shown on **Exhibits 4-3**, **4-4**, and **4-5**. The following subsections describe the facilities on each level.

### 4.2.1 Level 1 (Deplaning)

Level 1 includes the inbound and outbound baggage handling system, baggage claim, in-line explosives detection system (EDS) baggage screening, GSE circulation, FIS, airline operations spaces, airline holdrooms for ground-loaded gates, loading docks, waste management space, and public and non-public pedestrian circulation space. This level also provides access to Level 2, as well as the north and south tunnels. The tunnels connect to the Port Headquarters, P1 short-term parking garage, P2 and P3 long-term parking garages, PDX Rental Car Center (RCC), and Transportation Plaza, as well as various utility spaces. Level 1 is approximately 840,000 square feet[4] and is shown on **Exhibits 4-6**, **4-7**, and **4-8**.

#### BAGGAGE CLAIM

Baggage claim is located on the eastern side of the terminal and consists of 10 baggage claim devices. Additionally, there are three concessions spaces, the Oregon Welcome Center, two restrooms, and pedestrian circulation to the curbside for vehicular and light rail access. Six sets of escalators are also located in baggage claim. Four provide access to Level 2 and the two others provide access to the north and south tunnels. Baggage service offices and the international passenger arrival area are also located in this area.

Additional baggage facilities for international service are provided on the secure operational side and consist of bag rooms for outbound bag makeup and inbound unloading, a checked baggage inspection system (CBIS), two international baggage claim devices, and three inbound baggage claim devices. All international baggage claim facilities are located at the end of Concourse D as a part of the FIS facilities which are discussed further in the next paragraph and Section 4.2.4.

#### FEDERAL INSPECTION SERVICES (FIS)

All FIS facilities are located at the end of Concourse D and include US CBP and other Federal agency facilities, including primary inspection, international baggage claim, secondary inspection, additional inbound baggage devices, various support areas, pedestrian circulation, and passenger amenities, including restrooms and waiting spaces. Escalator and elevator connections are also provided for connecting international passengers to access the international security checkpoint located on Level 2. This checkpoint consists of two checkpoint lanes. Additional information regarding FIS operations is provided in Section 4.2.4.

#### GROUND-LOADED HOLDROOMS/GATES

There are eight gates at PDX that are ground-loaded. These eight gates have combined holdroom areas for passengers to wait to board located on Level 1 and include B6 through B11, and E13A/E13B.

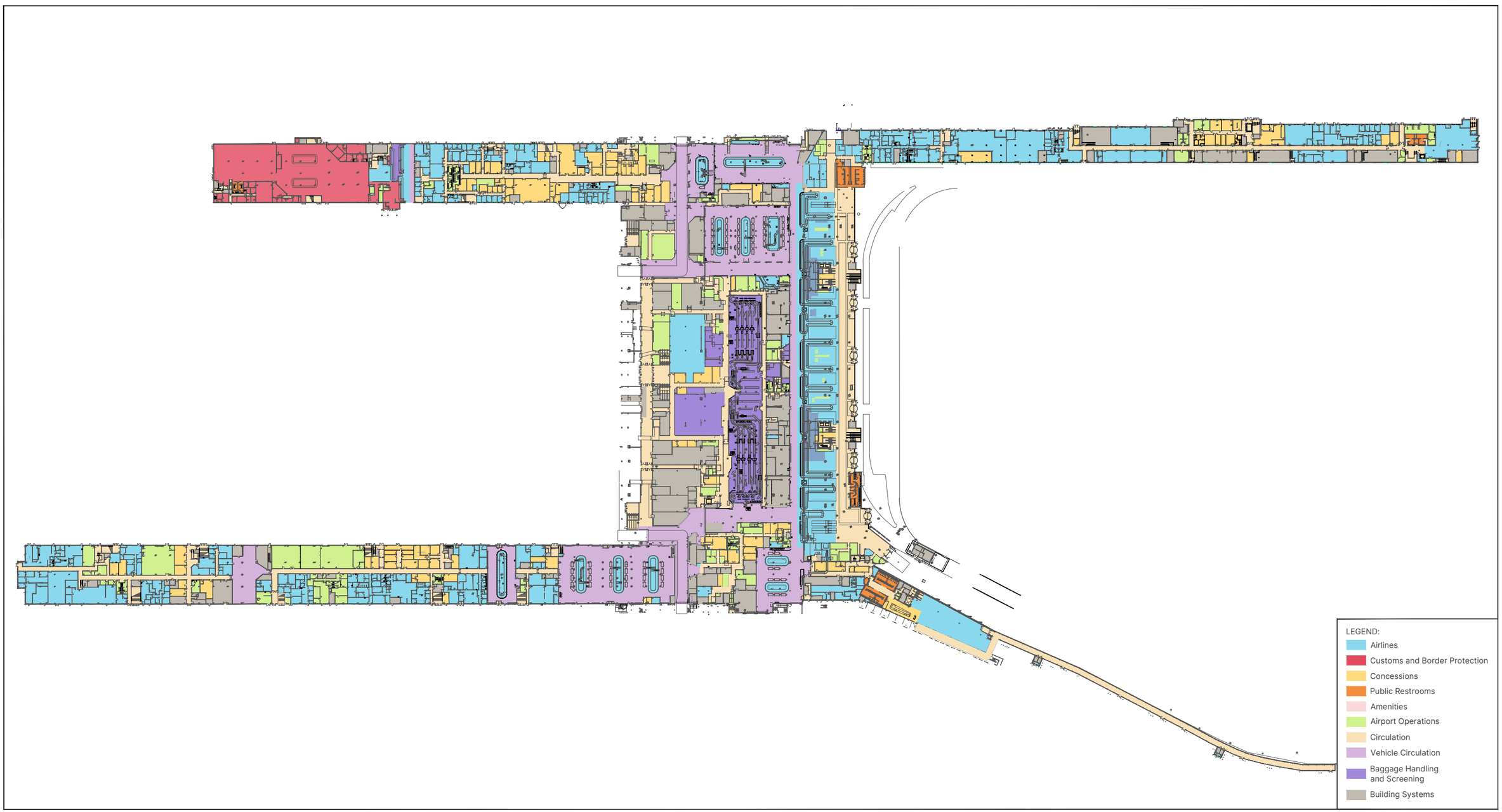
#### AIRLINE/AIRPORT OPERATIONS

All other space on Level 1 consists of a variety of operational and support areas for the Airport, airlines, and concessions; and circulation for people and vehicles. Currently, the Port's Wildlife Operations is located on Concourse C while Airport Operations space is on Concourse E.

#### BUILDING SYSTEMS

A large portion of Level 1 consists of various building system spaces that support the terminal's utility needs. Detailed information on the utilities at the Airport can be found in Section 10.

[4] This value does not include the square footage of the north or south tunnel as they are outside of the terminal footprint.




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., February 2025.

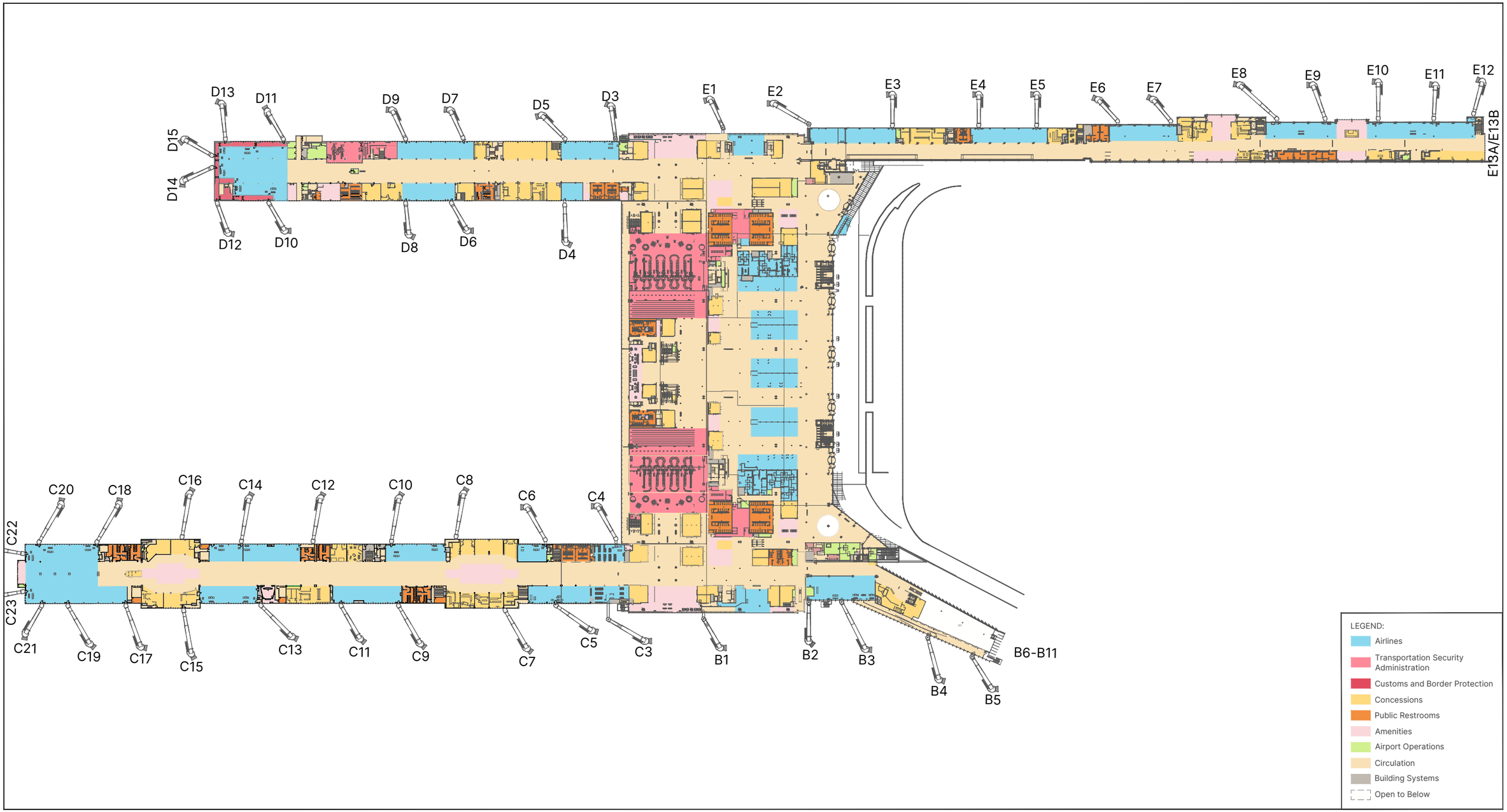
North

0 200 ft

**Exhibit 4-3**

Terminal Facility Areas
Level 1 (Deplaning)

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3-E_Conditions.dwgLayout: Ex 4-3 Plotted: Mar 24, 2025, 03:08PM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

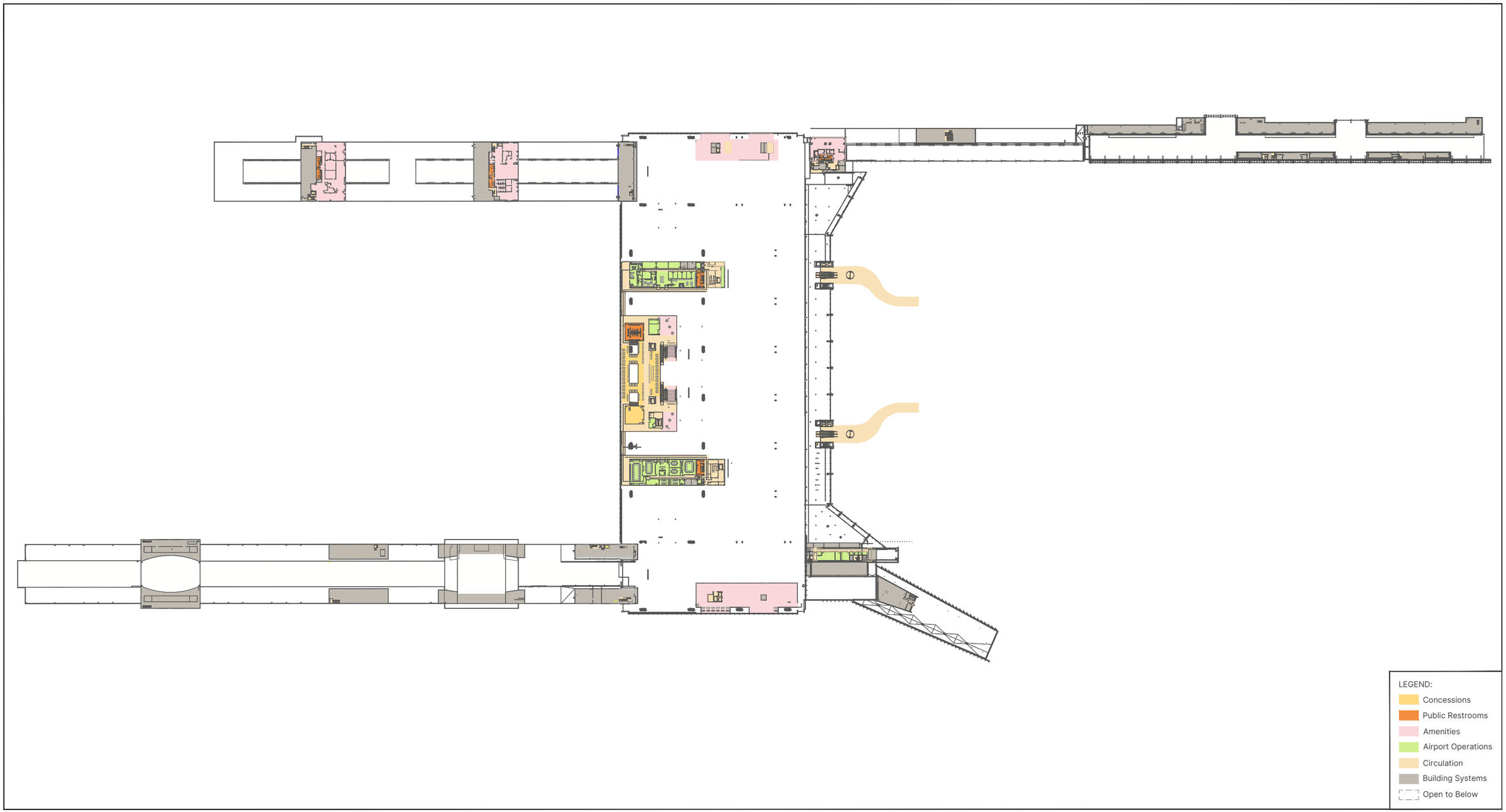
North

0 200 ft

**Exhibit 4-4**

Terminal Facility Areas
Level 2 (Enplaning)

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-4 Plotted: Jan 21, 2025, 09:15AM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

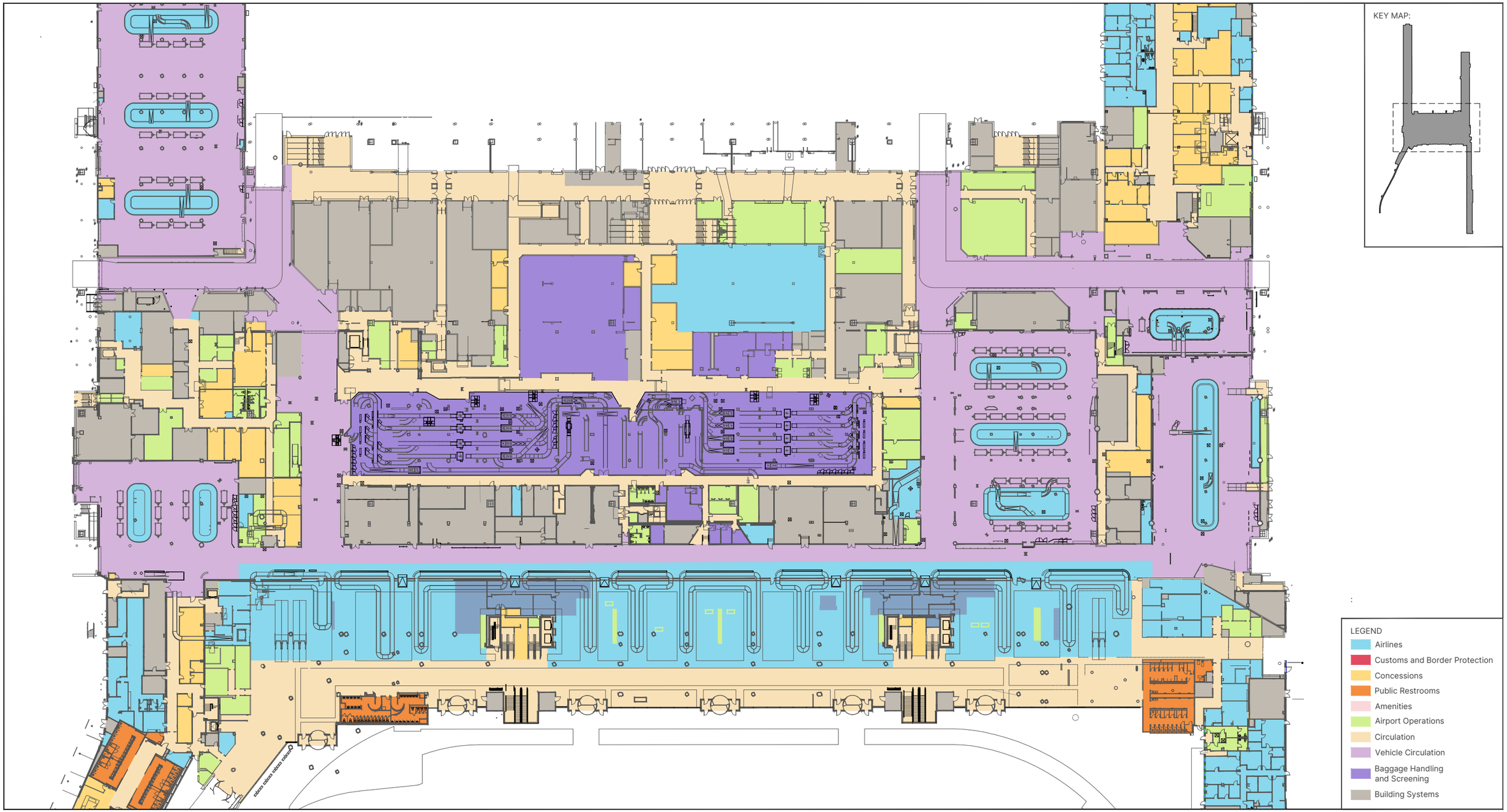
North

0 200 ft

**Exhibit 4-5**

Terminal Facility Areas
Level 3 (Mezzanine)

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-5 Plotted: Jan 21, 2025, 11:49AM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., February 2025.

North 0 80 ft

**Exhibit 4-6**

Terminal Facility Areas
Level 1 (Deplaning) - Terminal Processor

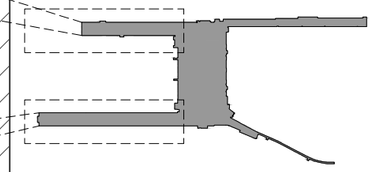
Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3-E_Conditions.dwgLayout: Ex 4-6 Plotted: Mar 24, 2025, 03:12PM

CONCOURSE D

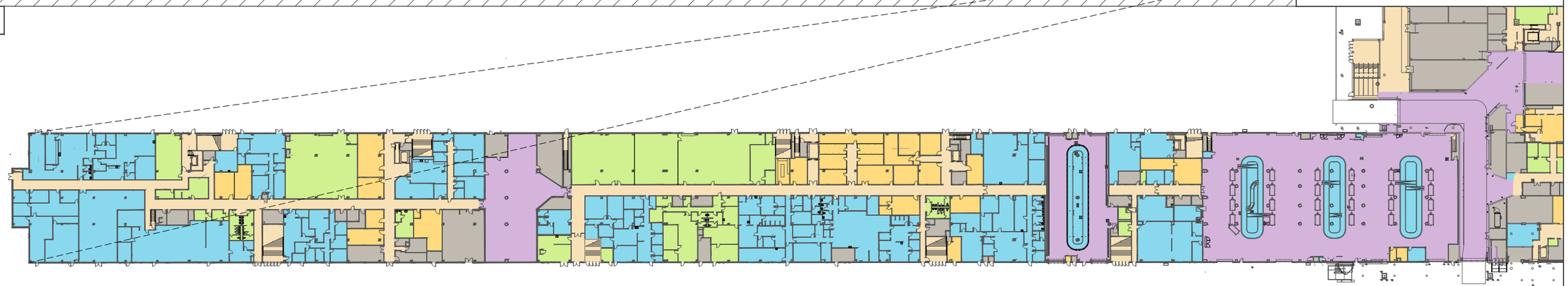
LEGEND:

- Airlines
- Customs and Border Protection
- Concessions
- Public Restrooms
- Amenities
- Airport Operations
- Circulation
- Vehicle Circulation
- Baggage Handling and Screening
- Building Systems

KEY MAP:



CONCOURSE C



SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., February 2025.

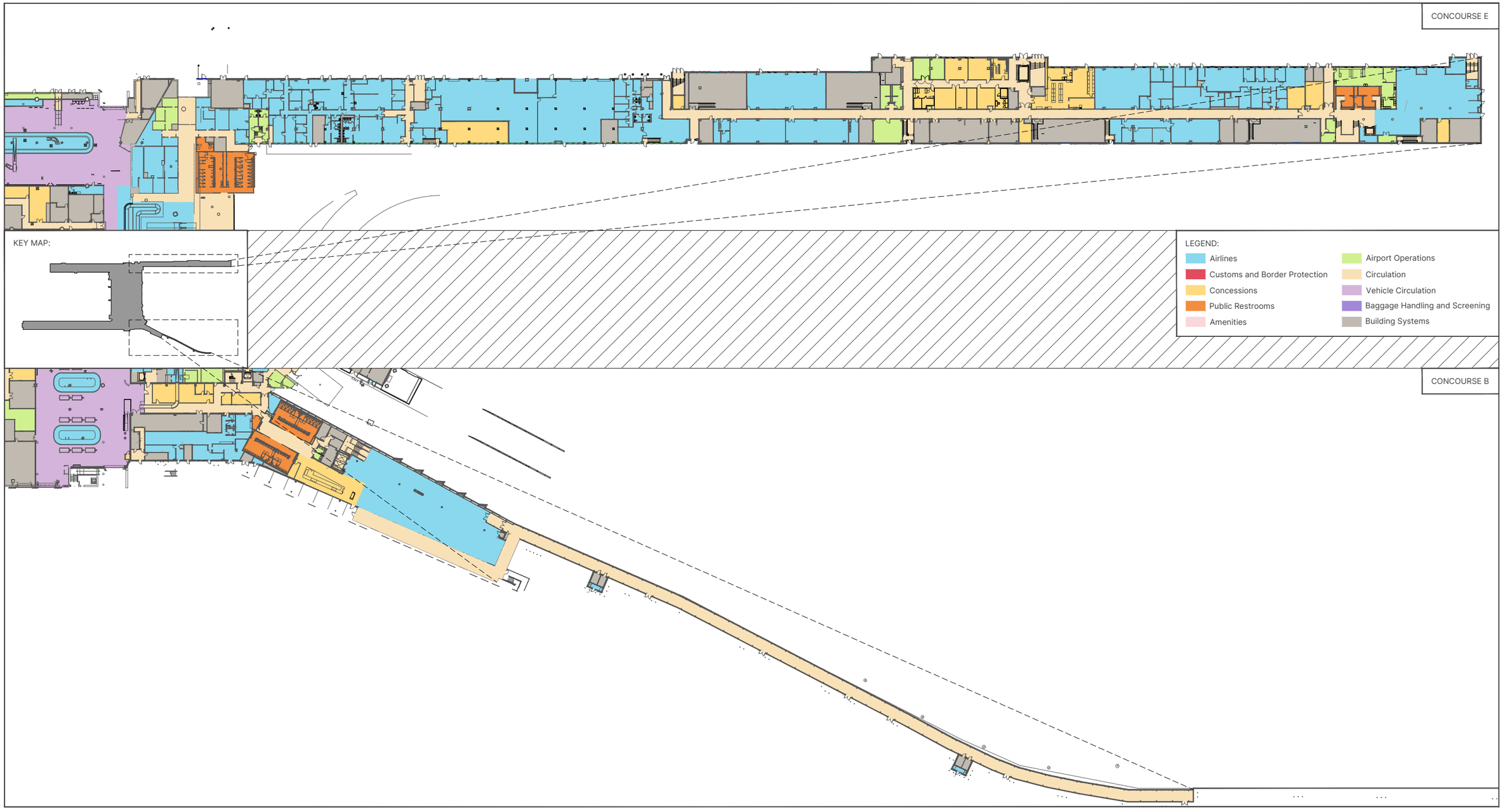
North

0 100 ft

**Exhibit 4-7**

Terminal Facility Areas
Level 1 (Deplaning) - Concourses C and D

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3-E_Conditions.dwgLayout: Ex 4-7 Plotted: Mar 24, 2025, 03:14PM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., February 2025.

North 0 100 ft

**Exhibit 4-8**

Terminal Facility Areas
Level 1 (Deplaning) - Concourses B and E

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3-E_Conditions.dwgLayout: Ex 4-8 Plotted: Mar 24, 2025, 03:14PM

### LOADING DOCKS AND WASTE MANAGEMENT AREAS

The centralized loading dock is on the western side of the terminal and consists of two dock-height truck loading bays. Adjacent are three parking spaces for larger trucks, but height clearances vary, and they may not be usable for medium sized trucks, as well as six traditional parking spaces. There are several distributed drop locations in the form of designated parking spots around the terminal. These are used by Bradford Logistics, the operator of the Airport's Central Receiving and Distribution Center (CRDC). Further information on the CRDC can be found in Section 8.2.3.

The waste management area for the terminal is collocated with the loading bay with adjacent parking for waste unloading. It consists of three garbage areas including one with a cart tipper, a glass recycling area, a food waste area, a carboard recycling area, and a mixed recycling area. Additionally, there is one interior area for collection of food donations and additional recyclables such as plastic film, Styrofoam, and rigid plastics.

## 4.2.2 Level 2 (Enplaning)

Level 2 consists of the Ticket Hall, the Market Hall, as well as the South and North Lobbies (see Exhibit 4-2) which contain the two TSA checkpoints that lead to aircraft holdrooms, aircraft boarding gates, and other amenities and operational spaces located on concourses as shown in Exhibit 4-2. Level 2 is approximately 830,000 square feet and is shown on **Exhibits 4-9**, **4-10**, and **4-11**.

### TICKET HALL

The Ticket Hall provides 110 airline check-in counters with 14 automated bag drops, 108 check-in kiosks and bag-tag printers, oversize bag drop locations (one current/one future), two meeter/greeter areas, wheelchair and baggage cart services, airline storage, airport utility areas, and airline and airport support operational spaces. Additional spaces include six concession spaces, two large all-user restrooms, two family restrooms, and two lactation rooms as well as pedestrian circulation and seating space. There are also two employee screening checkpoints, located on the north and south sides of the Ticket Hall.

### MARKET HALL

The Market Hall provides four concession spaces, two sets of large stadium stairs, four restroom facilities, two family restrooms, one lactation room, and pedestrian circulation to both the security checkpoints and the main terminal's Level 3 amenities. There are also various airport utility areas.

### NORTH AND SOUTH CONCESSION HALLS

The North and South Concession Halls provide security checkpoints, TSA support areas, various concessions, restrooms, pedestrian circulation and storage spaces. There are two passenger security checkpoints each with support areas, one in the North Concession Hall and one at the South Concession Hall located at the north and south ends of the Market Hall, respectively. Each checkpoint provides 10 lanes: eight standard lanes and two TSA PreCheck lanes. One PreCheck lane at each checkpoint is also used as a dedicated wheelchair lane, for a total of two wheelchair lanes. Additionally, CLEAR has one dedicated queue at each checkpoint, but no dedicated screening lane. Both checkpoints consist of queuing, divestiture, Travel Document Check (TDC), screening, and recomposure spaces.

### HOLDROOMS/GATES

There are 51 aircraft gates and 51 holdrooms throughout Concourses B, C, D, and E on Level 2. The remaining gates are located on Level 1, as described in Section 4.2.1. Additionally, there are two holdroom overflow areas at the end of Concourses C and D, serving gates C18-C23 and D10-D15. A comprehensive inventory of the baseline gates at PDX, including gate sizes and assignments, is provided in Section 4.3.

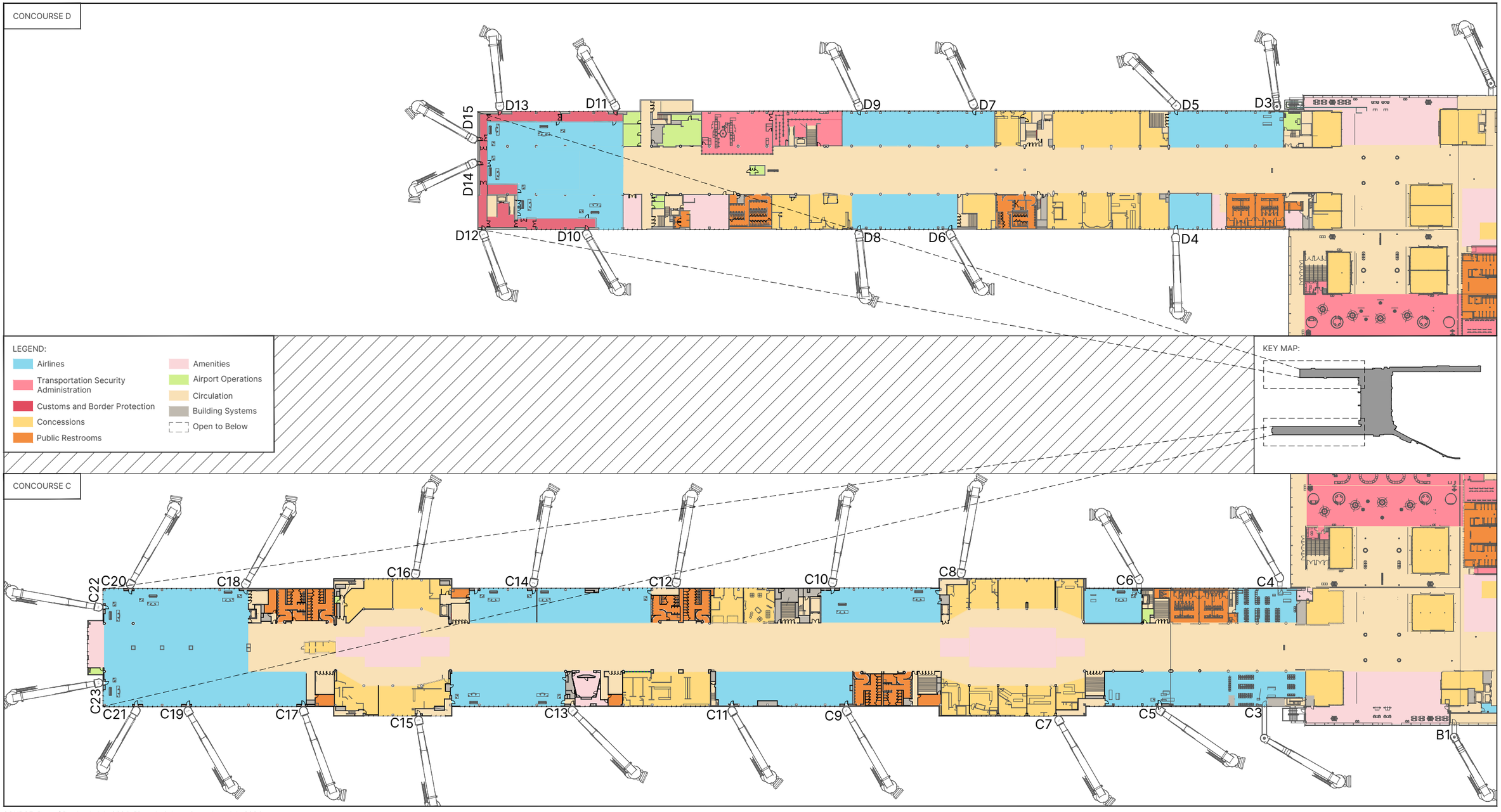

SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North 0 80 ft

**Exhibit 4-9**

Terminal Facility Areas
Level 2 (Enplaning) - Terminal Processor

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-9 Plotted: Jan 21, 2025, 11:24AM



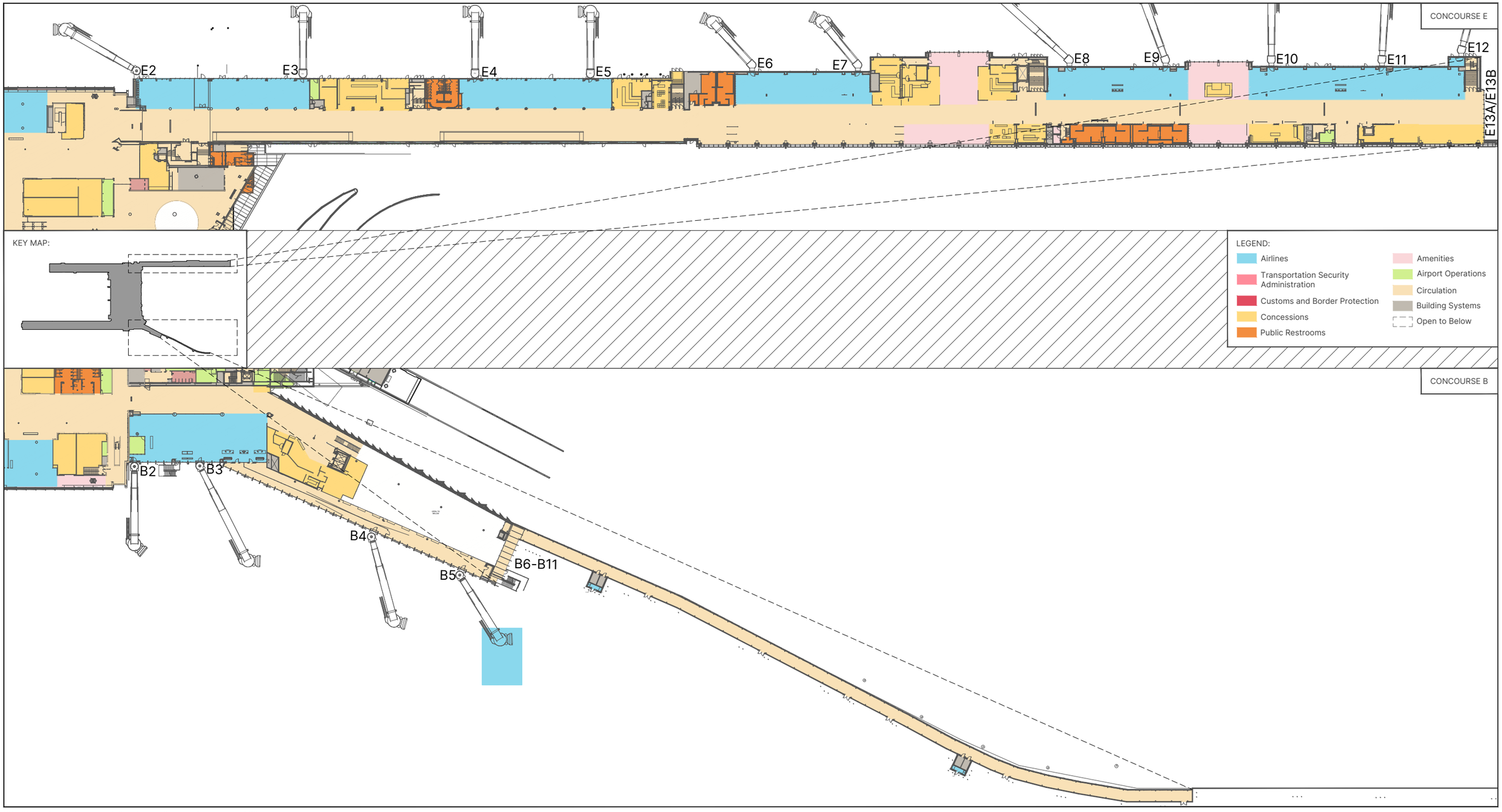

SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North 0 100 ft

**Exhibit 4-10**

Terminal Facility Areas
Level 2 (Enplaning) - Concourses C and D

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-10 Plotted: Jan 21, 2025, 11:33AM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North 0 100 ft

**Exhibit 4-11**

Terminal Facility Areas
Level 2 (Enplaning) - Concourses B and E

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-11 Plotted: Jan 28, 2025, 04:11PM

### CONCESSIONS AND ADDITIONAL AMENITIES

There are 59 concession spaces throughout the terminal totaling approximately 155,000 square feet as shown in Table 4-1. Additional amenities are provided throughout Level 2, including various passenger seating areas, public art program spaces, 14 all-user or gendered restrooms, family restrooms, pet relief areas, lactation rooms, children's play areas, a sensory room, a PDX Employee Interfaith Prayer Room, a PDX Community Room, and access to the amenities on Level 3 that are discussed in the next section.

## 4.2.3 Level 3 (Mezzanine)

Level 3 at PDX is non-contiguous and includes an airport conference center, one concession space, passenger seating, three all-user restrooms, various airport tenant and operations offices, airport utility areas, pedestrian circulation areas, Lost & Found, an art gallery, and five passenger club lounges at various locations throughout the terminal. The current lounges include the following:

- Vacant lounge on the north side of the terminal processor
- Alaska Airlines Lounge on the south side of the terminal processor
- Delta Air Lines Lounge on the inner portion of Concourse D
- Non-airline common-use lounge leased by Escape Lounges on the outer portion of Concourse D
- United Airlines Lounge in Concourse E

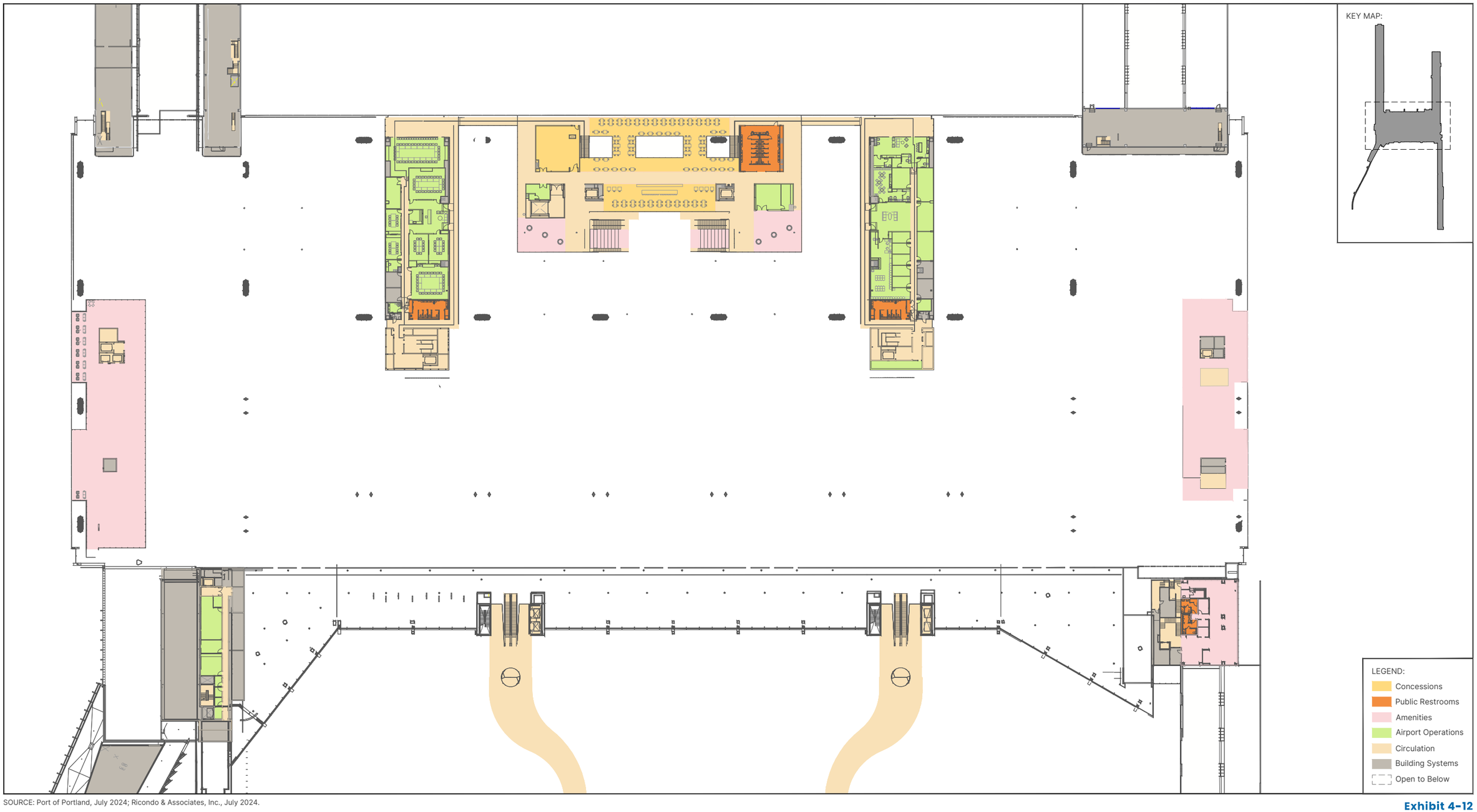
Level 3 is approximately 170,000 square feet and is shown on **Exhibits** 4-5**, 4-12**, **4-13**, and **4-14**.

## 4.2.4 International Facilities

All international gates and FIS facilities are located at the west end of Concourse D, as shown on Exhibit 4-1. The international arrivals gates include D10 through D15. These gates include sterile corridors that can be locked off to prevent mixing of international and domestic passengers thus allowing the accommodation of both international and domestic operations on adjacent gates. International departures can occur from any gate.

After deplaning from the aircraft at an international arrivals gate, passengers walk through a sterile corridor and descend to Level 1 via escalator, elevator, or stairs. Passengers then go through the immigration and passport control areas (primary inspection). After primary inspection, passengers claim their baggage at one of the two international baggage claims and proceed to the customs and agricultural inspection areas (secondary inspection). After clearing both primary and secondary screening procedures, connecting international passengers are directed upstairs and through a two-lane security checkpoint if it is operating. If the checkpoint is not operating, connecting international passengers proceed with all other passengers to the shuttle waiting area. There, connecting passengers can check their bags at a dedicated recheck area. All other passengers keep their bags with them. Passengers are then transported via shuttle to the international arrivals area located at the north end of the baggage claim area. This shuttle route is depicted on **Exhibit 4-15**. There passengers can find complimentary luggage carts, customer service representatives, restrooms, and directions to car rentals, taxis, shuttle buses and light rail service[5]. Passengers whose final destination is PDX exit the terminal to connect to their preferred ground transportation option. Connecting passengers go to Level 2 to go back through one of the two main security checkpoints before heading to their gate. All connecting international passengers at PDX may use the TSA Express Lane. [4]

[5] Port of Portland, https://www.flypdx.com/InternationalArrivals (accessed January 2025).



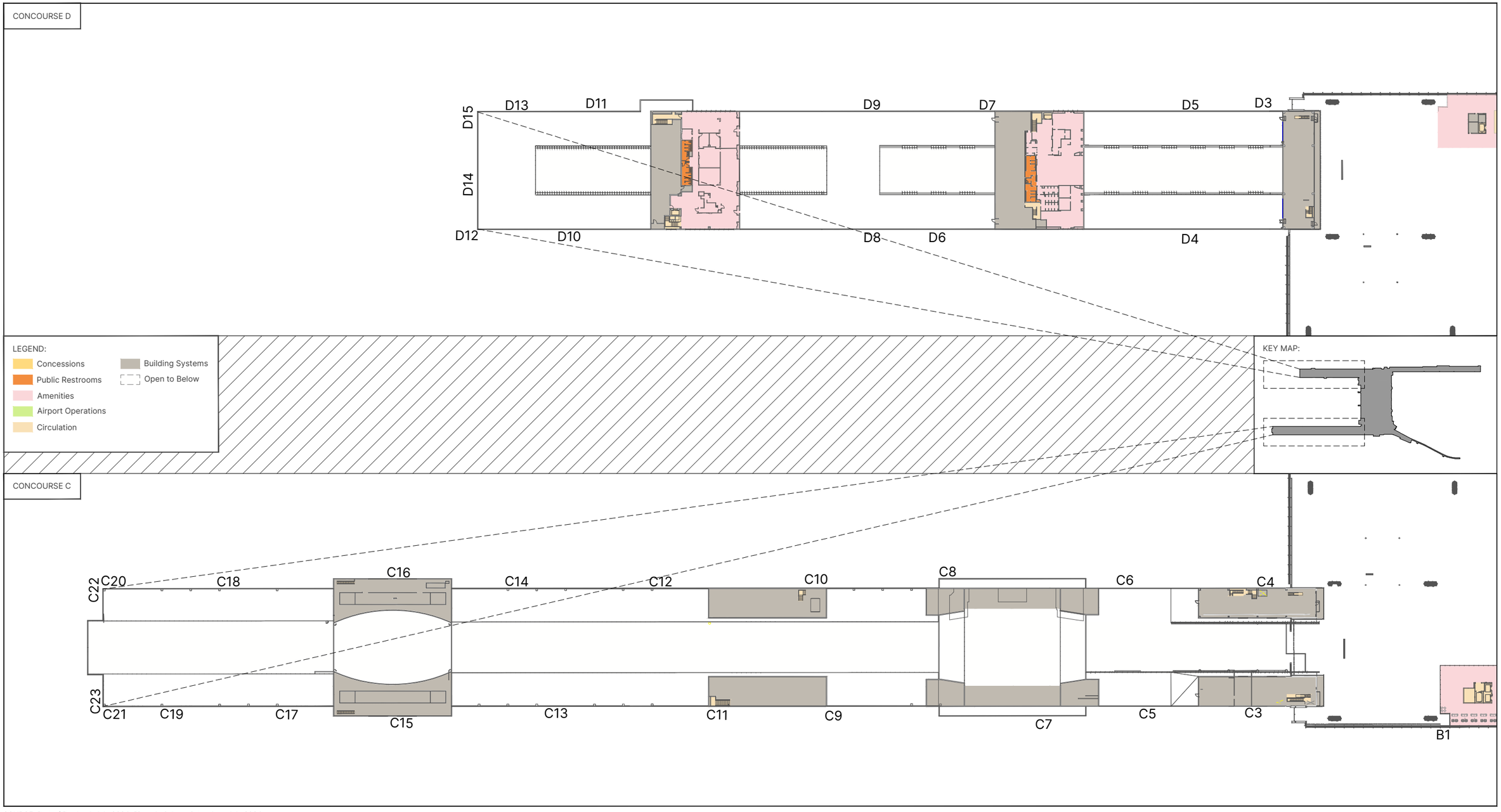

SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North 0 80 ft

**Exhibit 4-12**

Terminal Facility Areas
Level 3 (Mezzanine) - Terminal Processor

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-12 Plotted: Jan 21, 2025, 11:41AM



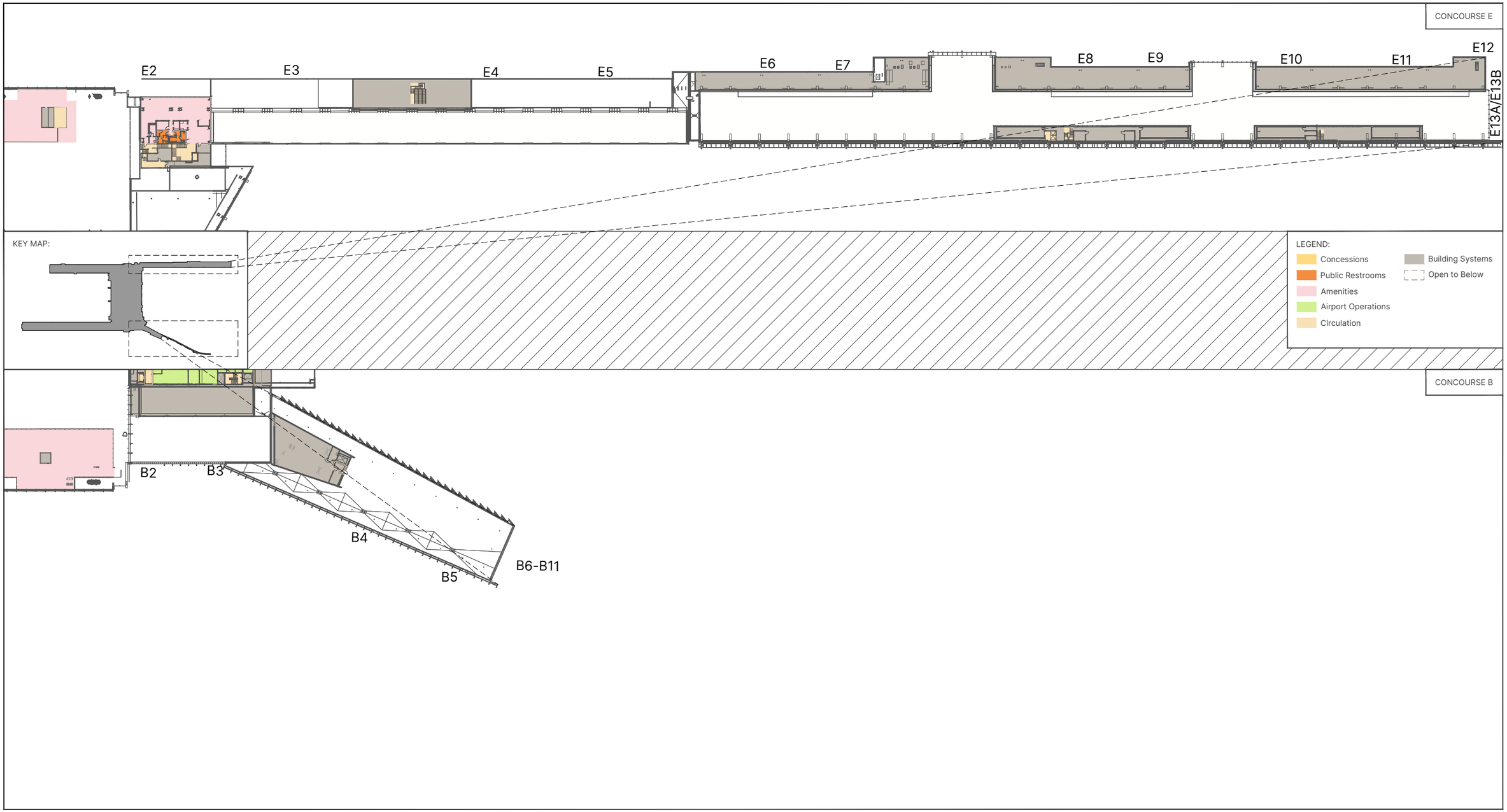

SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North 0 100 ft

**Exhibit 4-13**

Terminal Facility Areas
Level 3 (Mezzanine) - Concourses C and D

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-13 Plotted: Jan 21, 2025, 11:42AM




SOURCE: Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

North

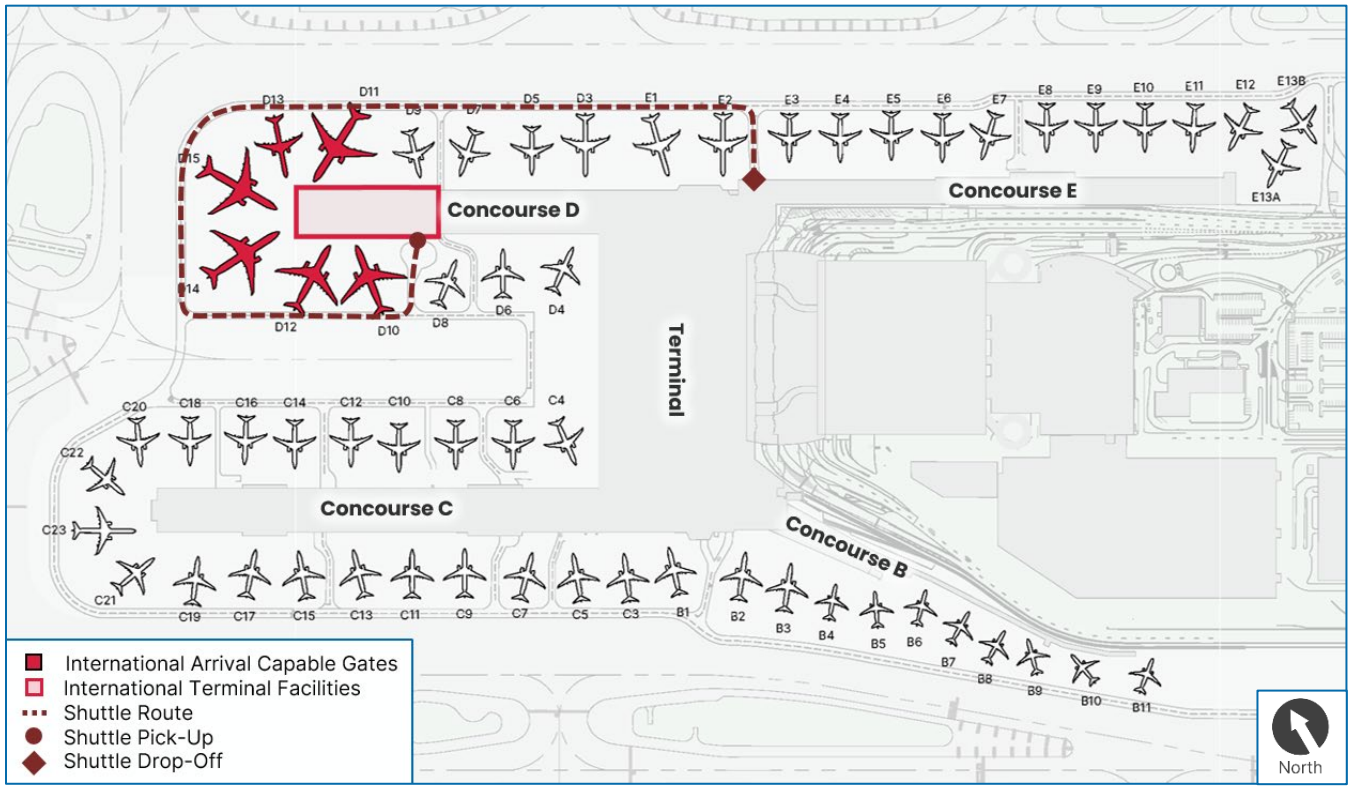
0 100 ft

**Exhibit 4-14**

Terminal Facility Areas
Level 3 (Mezzanine) - Concourses B and E

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Floorplans Lvl 1-3.dwgLayout: Ex 4-14 Plotted: Jan 28, 2025, 04:10PM

### Exhibit 4-15 International Arrivals Shuttle Route




**SOURCE:**
Port of Portland, January 2025; Ricondo & Associates, Inc., January 2025.

## 4.3 AIRCRAFT GATES

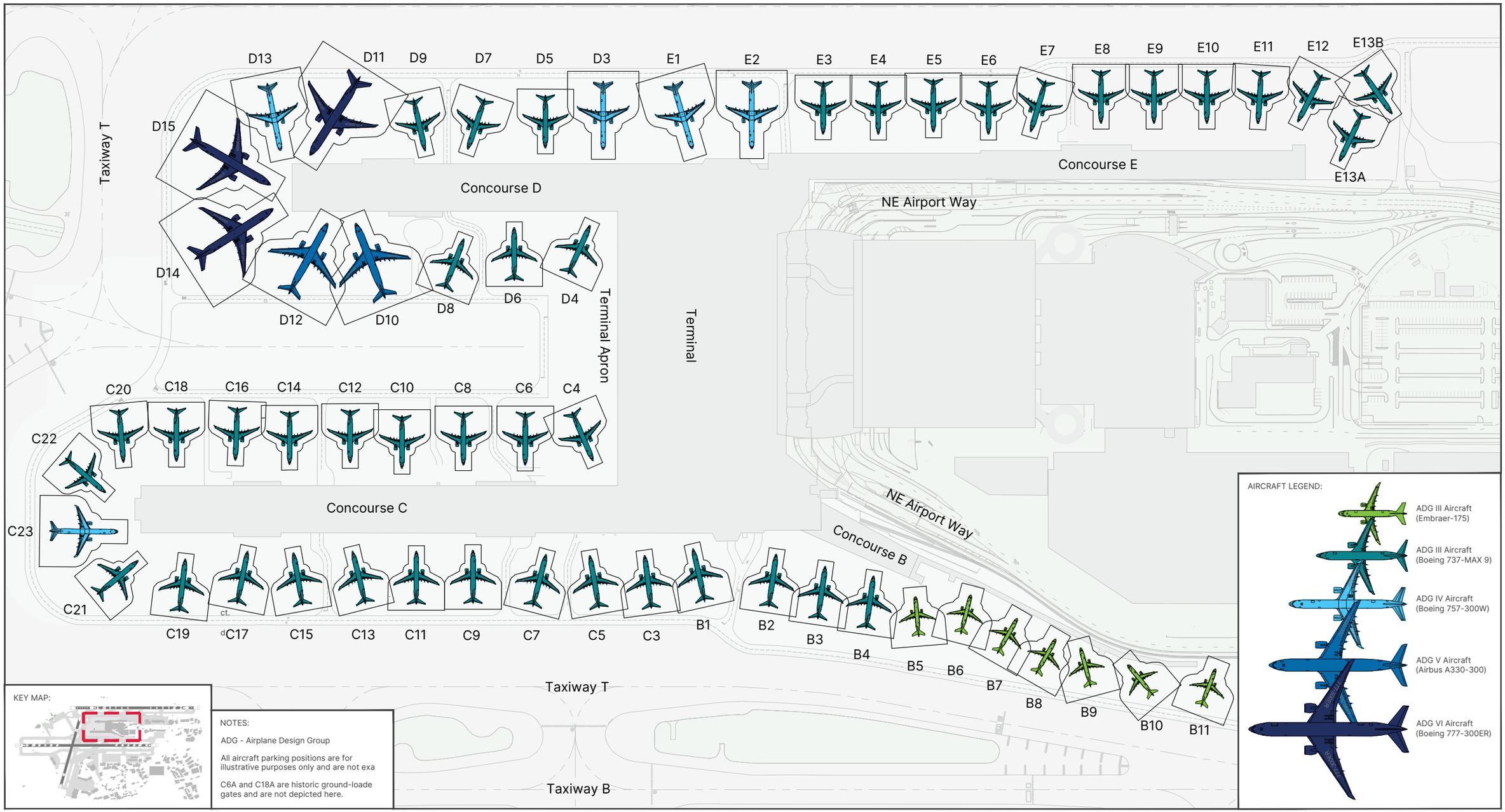
Aircraft gates facilitate the transition of passengers from the terminal building to aircraft at contact gates using passenger boarding bridges and at ground-loaded gates using marked walkways to passenger boarding stairs. **Table 4-2** summarizes the number of gates by concourse and **Exhibit 4-16** shows the layout of these gates. **Table 4-3** presents a detailed gate inventory, including maximum gate size by aircraft design group (ADG), gate dependencies, and airline lease assignments.

### Table 4-2 Gate Summary by Concourse

| Concourse[1] | Contact Gates | Ground-Loaded Gates | Total Gate Count |
|---|---|---|---|
| Concourse B | 5 | 6 | 11 |
| Concourse C | 21 | 0 | 21 |
| Concourse D | 13 | 0 | 13 |
| Concourse E | 12 | 2 | 14 |
| **TOTAL** | **51** | **8** | **59** |

**NOTE:**
1. Concourse A was demolished and replaced with an expansion of Concourse B as part of PDX Next.

**SOURCES:**
Port of Portland, https://www.flypdx.com (accessed December 2023); Ricondo & Associates, Inc., July 2024.




SOURCES: Port of Portland, July 2024; Ricondo & Associates, Inc., August 2024.

North 0 250 ft

**Exhibit 4-16**

Aircraft Parking Positions
Passenger Gates

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Aircraft Parking Positions.dwgLayout: PAX GATES Plotted: Mar 25, 2025, 01:51PM

## Table 4-3 (1 of 2) Detailed Gate Inventory

| Concourse | Gate Number | Position Type | Max ADG | Gate Dependencies | Airline Assignment | Total Per Concourse |
|---|---|---|---|---|---|---|
| Concourse B | B1 | Contact | III | - | Alaska Airlines | 11 |
| | B2 | Contact | III | - | Alaska Airlines | |
| | B3 | Contact | III | - | Alaska Airlines | |
| | B4 | Contact | III | - | Alaska Airlines | |
| | B5 | Contact | III | - | Common-Use | |
| | B6 | Ground-Loaded | III | - | Alaska Airlines | |
| | B7 | Ground-Loaded | III | - | Alaska Airlines | |
| | B8 | Ground-Loaded | III | - | Alaska Airlines | |
| | B9 | Ground-Loaded | III | - | Alaska Airlines | |
| | B10 | Ground-Loaded | III | - | Alaska Airlines | |
| | B11 | Ground-Loaded | III | - | Alaska Airlines | |
| Concourse C | C3 | Contact | III | - | Alaska Airlines | 21 |
| | C4 | Contact | III | - | Common-Use | |
| | C5 | Contact | III | - | Alaska Airlines | |
| | C6/C6A[1] | Contact | III | - | Common-Use | |
| | C7 | Contact | III | - | Alaska Airlines | |
| | C8 | Contact | III | - | Common-Use | |
| | C9 | Contact | III | - | Alaska Airlines | |
| | C10 | Contact | III | - | Common-Use | |
| | C11 | Contact | III | - | Alaska Airlines | |
| | C12 | Contact | III | - | Common-Use | |
| | C13 | Contact | III | - | Alaska Airlines | |
| | C14 | Contact | III | - | Common-Use | |
| | C15 | Contact | III | - | Common-Use | |
| | C16 | Contact | III | - | Frontier Airlines | |
| | C17 | Contact | III | - | American Airlines | |
| | C18/C18A[2] | Contact | III | - | Alaska Airlines | |
| | C19 | Contact | III | - | American Airlines | |
| | C20 | Contact | III | - | Alaska Airlines | |
| | C21 | Contact | III | - | American Airlines | |
| | C22 | Contact | III | - | Alaska Airlines | |
| | C23 | Contact | IV | - | Common-Use | |

## Table 4-3 (2 of 2) Detailed Gate Inventory

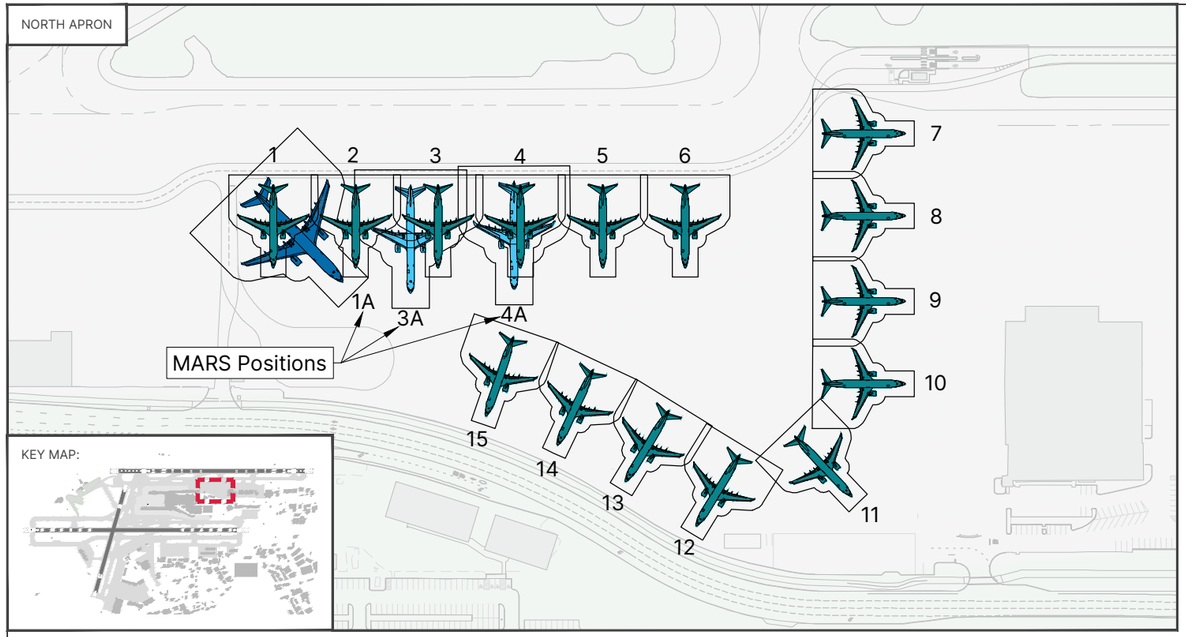
| Concourse | Gate Number | Position Type | Max ADG | Gate Dependencies | Airline Assignment | Total Per Concourse |
|---|---|---|---|---|---|---|
| Concourse D | D3 | Contact | IV | - | Delta Air Lines | 13 |
| | D4 | Contact | III | - | Common-Use | |
| | D5 | Contact | III | - | Delta Air Lines | |
| | D6 | Contact | III | - | Common-Use | |
| | D7 | Contact | III | - | Delta Air Lines | |
| | D8 | Contact | III | - | Common-Use | |
| | D9 | Contact | III | - | Delta Air Lines | |
| | D10 | Contact | V | INT/DOM swing gate[3] | Common-Use | |
| | D11 | Contact | VI | INT/DOM swing gate | Delta Air Lines | |
| | D12 | Contact | V | INT/DOM swing gate | Common-Use | |
| | D13 | Contact | IV | INT/DOM swing gate | Common-Use | |
| | D14 | Contact | VI | INT/DOM swing gate | Common-Use | |
| | D15 | Contact | VI | INT/DOM swing gate | Common-Use | |
| Concourse E | E1 | Contact | IV | - | Common-Use | 14 |
| | E2 | Contact | IV | - | United Airlines | |
| | E3 | Contact | III | - | United Airlines | |
| | E4 | Contact | III | - | United Airlines | |
| | E5 | Contact | III | - | United Airlines | |
| | E6 | Contact | III | - | Common-Use | |
| | E7 | Contact | III | - | Common-Use | |
| | E8 | Contact | III | - | Southwest Airlines | |
| | E9 | Contact | III | - | Southwest Airlines | |
| | E10 | Contact | III | - | Southwest Airlines | |
| | E11 | Contact | III | - | Southwest Airlines | |
| | E12 | Contact | III | - | Southwest Airlines | |
| | E13A | Ground-Loaded | III | E13B[4] | Common-Use | |
| | E13B | Ground-Loaded | III | E13A[4] | Common-Use | |
| | | | | | TOTAL | 59 |

**NOTES:**
ADG – Airplane Design Group; INT/DOM – International/Domestic; RON – Remain Overnight
1. C6A was previously a ground ground-loaded gate; however, it is no longer striped as such and is no longer in use.
2. C18A was previously a ground-loaded gate; however, it is no longer striped as such and is no longer in use.
3. A swing gate is a gate that accommodates international arrivals, as well as all other international and domestic operations. These gates have sterile corridors that can be reconfigured to securely route to the FIS screening facilities or directly into the terminal.
4. E13A and E13B only have a gate dependency if there is an ADG III aircraft parked on either gate.

**SOURCES:**
Port of Portland, July 2024; Ricondo & Associates, Inc., July 2024.

Additional aircraft parking positions for aircraft near the terminal but not used for passenger operations are referred to as the Remain Overnight (RON) positions. RON positions are required for extended ground times or overnight parking at the Airport to optimize gate use and efficiency. Areas currently used for RON positions include the north apron, bravo apron, southeast apron, and reserve apron. No remote positions are currently used for passenger operations. **Exhibit 4-17** shows all RON positions.

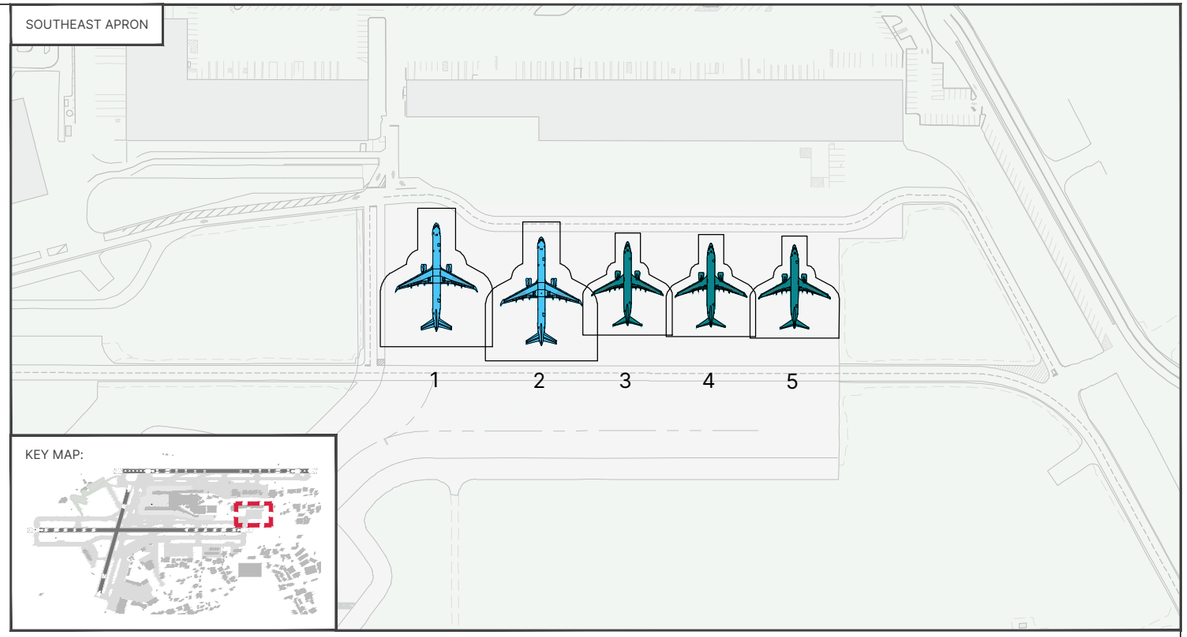
NORTH APRON




KEY MAP:



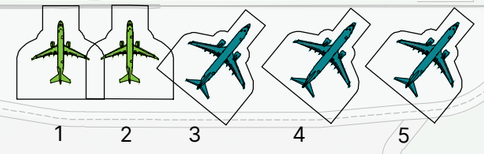
SOUTHEAST APRON



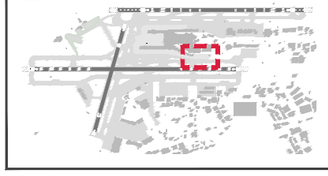

KEY MAP:



BRAVO APRON




KEY MAP:

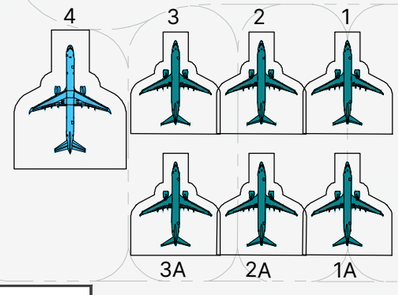


NOTES:

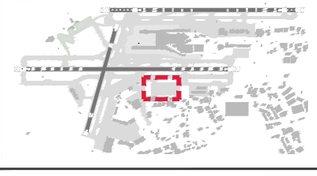
ADG - Airplane Design Group
MARS - Multiple Aircraft Ramp System

All aircraft parking positions are for illustrative purposes only and are not exact.

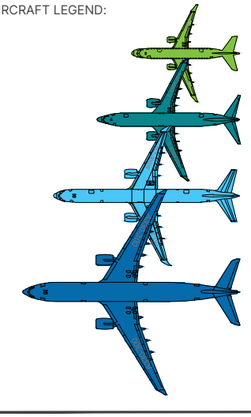
RESERVE APRON




KEY MAP:



AIRCRAFT LEGEND:



ADG III Aircraft (Embraer-175)

ADG III Aircraft (Boeing 737-MAX 9)

ADG IV Aircraft (Boeing 757-300W)

ADG V Aircraft (Airbus A330-300)

SOURCES: Port of Portland, July 2024; Ricondo & Associates, Inc., August 2024.

North

0 250 ft

**Exhibit 4-17**

Aircraft Parking Positions
Remote Positions

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\E-Aircraft Parking Positions.dwgLayout: RON Plotted: Mar 25, 2025, 01:50PM

# 5. Access, Parking, and Transit

This section summarizes the ground transportation facilities at the Airport including on-airport access, roadways, vehicle facilities, parking, and rental cars, as well as transit facilities such as light rail and bus services that provide connection to and from PDX. **Exhibit 5-1** identifies the primary landside facilities discussed in this section, including access and circulation roads; transit facilities; public and employee parking facilities; rental car facilities; curbsides; commercial ground transportation loading and staging facilities; and bicycle/pedestrian facilities.

## 5.1 MODE CHOICE AND TRAVEL PATTERNS

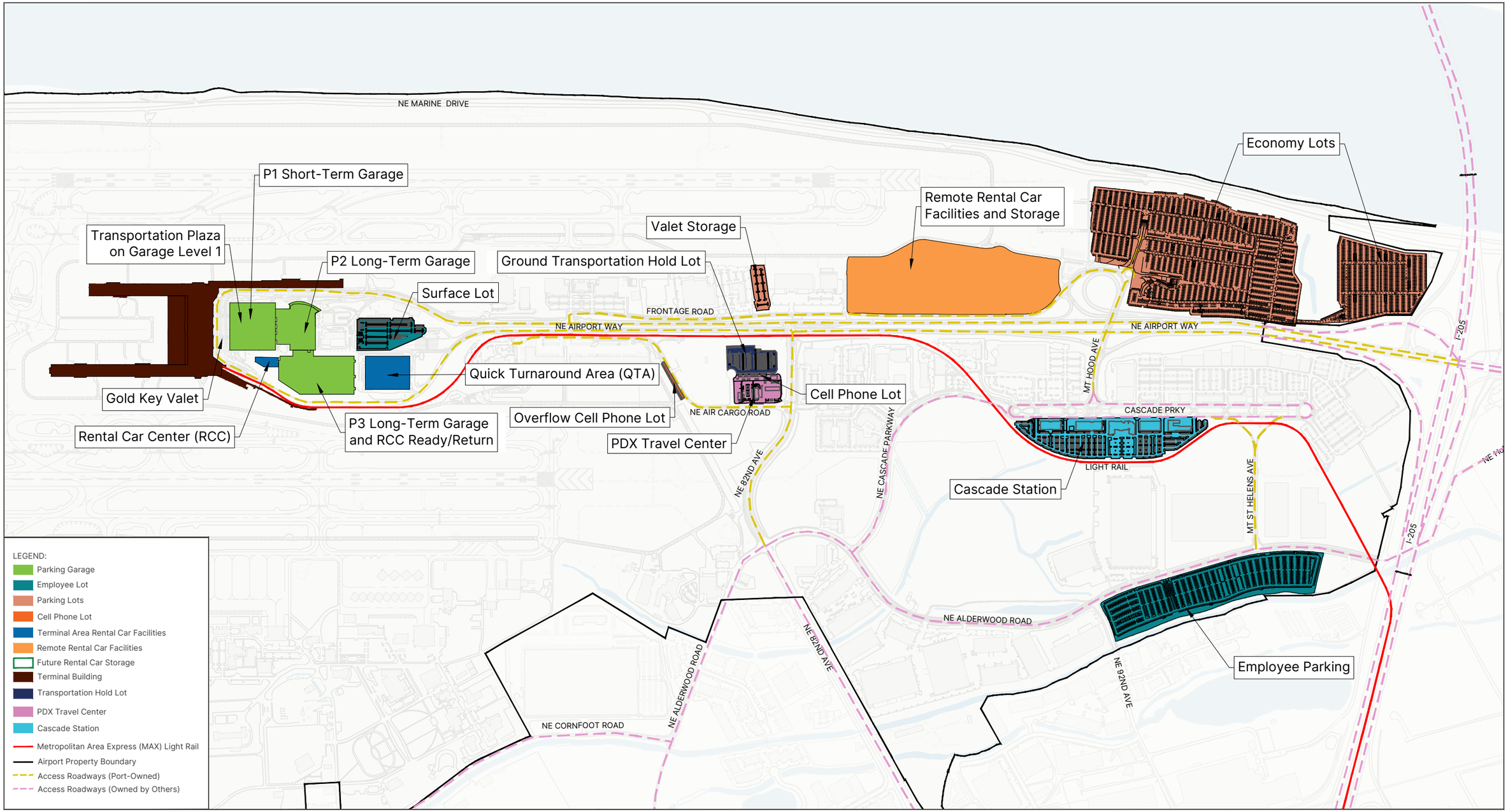
Airport passengers travel to and from PDX using a variety of modes. **Table 5-1** presents the stated mode choice results from passenger intercept surveys conducted by the Port in Fall 2023. As shown, private vehicles comprise the dominant share of trips to the Airport. Intercept surveys focus on enplaning (departing) passengers and do not necessarily reflect the mode shares of deplaning (arriving) passengers or connecting passengers, nor do they reflect the input of all departing passengers as not all passengers participate in the survey.

**Table 5-1 Access Mode Survey Results**

| Access Mode | Share Of Survey Responses[1] |
|---|---|
| Private Vehicle (Curb Drop-Off or Park) | 64% |
| TNC (e.g., Uber, Lyft) | 14% |
| Rental Car | 12% |
| Charter Bus / Shuttle / Coach | 6% |
| Taxicab / Limousine | 1% |
| Light Rail | 1% |
| Other / Unknown | 1% |
| **TOTAL** | **100%** |

**NOTES:**
TNC – Transportation Network Company
Totals may not sum due to rounding.
1. Survey responses were adjusted to reflect travel party size.

**SOURCE:**
Port of Portland, Passenger Intercept Data from August to November 2023, 2024; InterVISTAS, 2024 (analysis).




SOURCE: Ricondo & Associates, Inc., March 2024.

North 0 1,000 ft

**Exhibit 5-1**

Landside Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-1 Landside Facilities Plotted: Mar 25, 2025, 02:23PM

## 5.2 ACCESS

### 5.2.1 Off-Airport Access System

**Exhibit 5-2** shows the existing off-Airport access system, which includes interstate and regional highways and roads connecting to the Airport. For those traveling from the north or south like Clark or Clackamas County, access to the Airport is provided primarily through the Interstate Highway System. The Interstate Highway System is a major component of the off-Airport access system and includes I-205 to the east and Interstate 5 (I-5) to the west. Both interstates run north-south and connect Oregon to Washington across the Columbia River providing access to the airport for the majority of the region.

For those traveling from the east or west from areas such as downtown Portland, Washington County, or the eastern portions of Multnomah County or Clackamas County, primary east-west access is provided through Interstate 84 (I-84) which connects I-5 and I-205. There are also additional secondary east-west connections like SR 14 (Lewis and Clark Highway) in Washington, and NE Lombard Street and NE Sandy Boulevard in Oregon. All east–west roads and highways listed here connect to I-5 and I-205, which then connect to the Airport through smaller arterial roads. Amon these smaller arterial roads is NE Airport Way, which offers direct access to the airport and is the only publicly accessible route into the terminal complex. NE Airport way can be directly accessed by I-205, or by NE 82nd Avenue or NE 181st Avenue which both run north–south and provide a secondary connection to PDX via NE Airport Way. NE Airport Way also provides connectivity between PDX and neighborhoods and businesses east of I-205.

### 5.2.2 Access and Circulation Roadways

Exhibit 5-1 shows key access and circulation roadways. NE Airport Way is the primary access route to and from the terminal building, public parking facilities, rental car facilities, and commercial ground transportation loading facilities. NE Airport Way is also the primary access route to facilities located on the east side of the Airport, including the economy parking lots and Cascade Station. NE Airport Way is a limited-access arterial roadway with three lanes in each direction west of the I-205 interchange and a center island median between I-205 and the terminal area. Additional lanes for turning movements, merges, and diverges are provided at the NE 82nd Avenue intersection, NE Mt. Hood Avenue interchange, and westbound access to and from Frontage Road. As westbound NE Airport Way approaches the terminal area, it adds additional lanes to provide access to terminal area destinations, including the short- and long-term parking garages, rental car facilities, the Transportation Plaza, and the Upper and Lower Roadways of the terminal where passengers are dropped off and picked up, as described in Section 5.3. As eastbound NE Airport Way departs from the terminal area, a right-turn lane to NE Air Cargo Road provides access to cargo facilities.

At the south end of the Upper Roadway and Lower Roadway, lanes of traffic leading from the Upper Roadway, Lower Roadway, and Transportation Plaza merge together to form eastbound NE Airport Way. The exits from the RCC / Quick Turnaround Area (QTA) and short- and long-term parking garages merge with eastbound NE Airport Way as they exit the terminal area.

Because NE Airport Way is designed to be a high-volume, limited-access roadway, direct roadway access to adjacent land uses along the corridor is provided by parallel frontage roadways. On the north side of NE Airport Way is Frontage Road, which runs east–west for over one mile between NE Mt. Hood Avenue and the north GA area. It provides access to uses such as the Economy Lots (red and blue lots), rental car storage areas, the Sheraton and Hampton Inn hotels, the GA area, and shuttle bus storage. On the south side of NE Airport Way is NE Air Cargo Road, which runs west from NE 82nd Avenue and provides direct access to the PDX Cargo Center, cell phone waiting areas, ground transportation hold lot, and PDX Travel Center.

## Exhibit 5-2 Off-Airport Access Roads


**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDS, USFWS, August 2024 (basemap); US Department of Commerce, National Oceanic and Atmosphere Administration, March 2023 (states); Port of Portland, April 2024 (airfield, Airport property boundary); Oregon Metro, Regional Land Information System, January 2021 (water); US Census Bureau, 2023 (roads).

A secondary access route to the Airport is NE 82nd Avenue, which is the main arterial access for many Airport support uses on the south side of PDX. It and also provides the main public access route for much of north and northeast Portland. The portion of NE 82nd Avenue that is on-Airport is a five-lane limited-access arterial roadway (two travel lanes in each direction and a center turn lane), and it passes through the runway protection zone (RPZ) of Runway 28L. South of the Airport, NE 82nd Avenue becomes a major commercial thoroughfare that runs south to Clackamas County. Major changes, discussed in Section 5.1.4, are planned for the intersection of NE 82nd Avenue and NE Airport Way. According to Airport staff, NE 82nd Avenue is used frequently by non-Airport (i.e., cut-through) traffic for access to and from the NE Airport Way / I-205 interchange, as it allows drivers to avoid congestion on portions of I-205. Additionally, NE 82nd Avenue provides access to facilities located on the south side of the Airport and along NE Columbia Boulevard.

Changes to the NE 82nd Avenue / NE Air Cargo Road intersection, which began in 2024, include adding an eastbound right-turn lane from NE Air Cargo Road to NE 82nd Avenue southbound to reduce congestion, as well as updated Americans with Disabilities Act (ADA) pedestrian ramps and pedestrian signals.

NE Alderwood Road connects NE 82nd Avenue to NE Cornfoot Road and NE Columbia Boulevard. NE Cornfoot Road provides access to and from properties on the south side of the Airport, including ORANG, FedEx, Amazon, Boeing Paint Hangar, and the Airtrans Center cargo and MRO facilities.

Seven traffic signals are located on-Airport:

- NE Airport Way / NE 82nd Avenue[1]
- NE 82nd Avenue / NE Air Cargo Road
- NE 82nd Avenue / NE Alderwood Road
- NE Cascades Parkway / NE Alderwood Road
- NE Cascades Parkway / NE Mt. Hood Avenue
- NE Alderwood Road / NE Cornfoot Road
- NE Mt. Hood Avenue / eastbound NE Airport Way on- and off-ramps

Additionally, there are three emergency access signals:

- On westbound NE Airport Way, there is an emergency access signal near Pump Station A Control Building and access point to and from airfield Gate NA-08.
- On westbound NE Airport Way, there is an emergency access signal at the western terminus of Frontage Road. This signal can be used to stop vehicles for inspection prior to entering the terminal area, should vehicle inspections be necessary.
- On Marine Drive, there is an emergency access signal at the ARFF driveway. The signal is used to stop Marine Drive traffic when ARFF enters Marine Drive in response to off-airport emergencies.

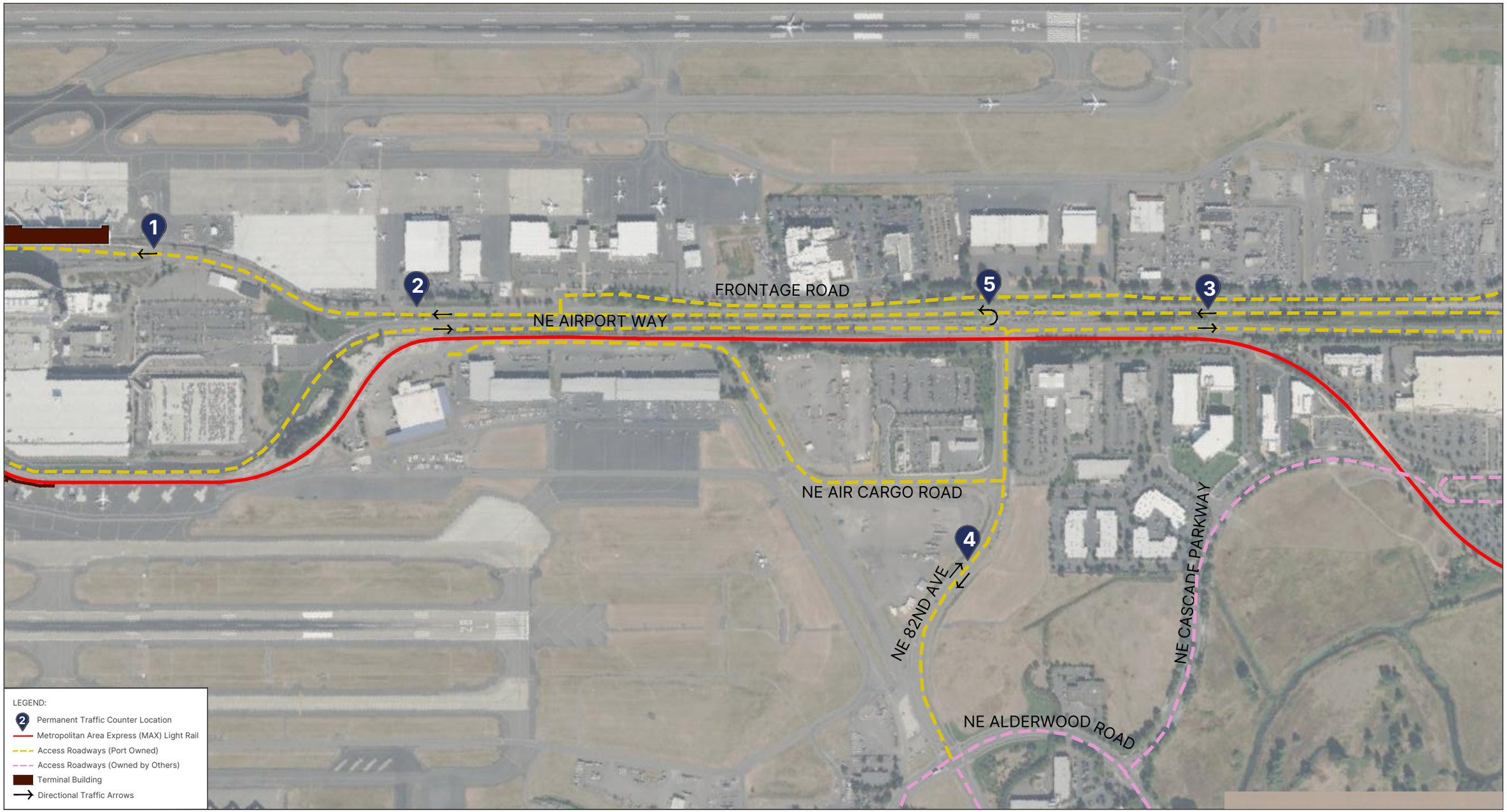
All signals are operated and maintained by the City per an intergovernmental agreement.

### 5.2.3 Traffic Count Locations

Traffic count data is provided by 24-hour machine counts and annual intersection turning movement counts (TMCs) taken by the Port as part of its ongoing traffic count program. The most recent counts were conducted in April 2024.

There are six fixed counting stations, as well as several movable and seasonal counting stations. **Exhibit 5-3** presents the locations of the permanent count stations. **Exhibit 5-4** identifies the six main supplemental TMC locations.

[1] This signal also controls traffic at the at-grade crossing of the MAX light rail tracks with NE 82nd Avenue, immediately south of NE Airport Way. However, the Port's plans to replace this signal with a grade-separated interchange as discussed further in Section 5.1.4.



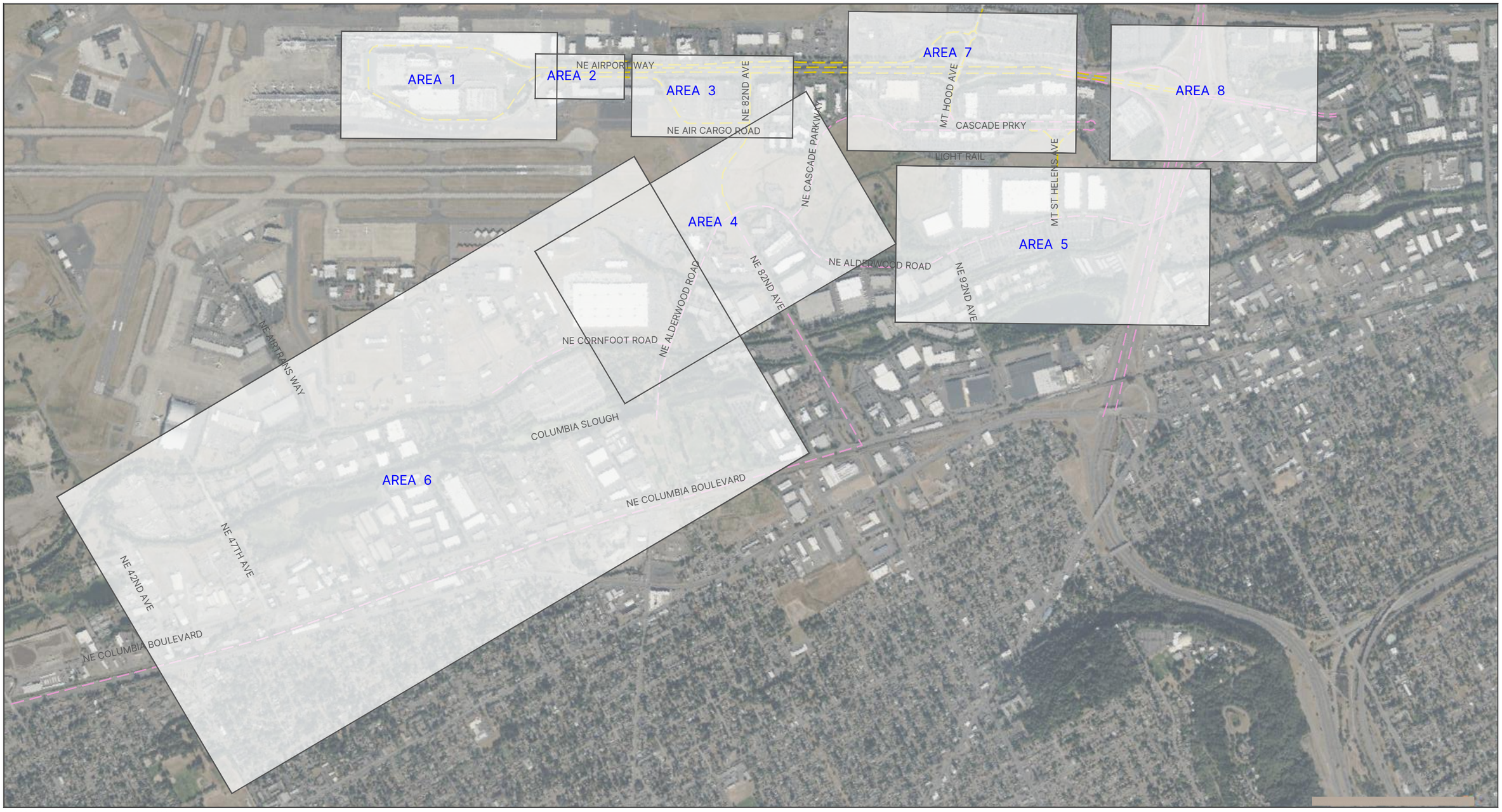

SOURCE: Ricondo & Associates, Inc., March 2024.

North 0 500 ft

**Exhibit 5-3**

Permanent Traffic Counter Locations

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-3 Permanent Traffic Counter Locations Plotted: Mar 25, 2025, 02:23PM




SOURCE: Ricondo & Associates, Inc., March 2024.

**Exhibit 5-4**

North 0 1,500 ft

April 2024 Supplemental Traffic Count Locations

Drawing: C:\Users\dalalj\Documents\PDX\PDX Base Exhibit\X-Base Exhibit.dwgLayout: AprilTraffic Counter Locations Plotted: Jan 7, 2025, 02:24PM

### 5.2.4 Programmed Modifications

The intersection at NE 82nd Avenue and NE Airport Way will undergo substantial transformation, transitioning into a grade-separated interchange as shown on **Exhibit 5-5**. The reconfigured intersection will be constructed when funding becomes available. This design will minimize vehicle delays and congestion as traffic increases at PDX and will simplify and enhance bicycle and pedestrian crossings without impacting the MAX Red Line on-time reliability. Additionally, this solution will substantially reduce overall vehicle congestion. The solution's core features include grade-separated eastbound NE Airport Way, while westbound through lanes will only halt for signalized pedestrian and bicycle crossings. Moreover, traffic signals will govern left turns and the eastbound U-turn return to the terminal, with no alterations to the MAX Red Line operations.

## 5.3 CURBSIDE ROADWAYS

As NE Airport Way approaches the terminal building, it divides into an elevated Upper Roadway and a ground-level Lower Roadway.

### 5.3.1 Upper Roadway

The Upper Roadway provides an unloading area for vehicles dropping off passengers at the terminal. The roadway consists of two four-lane roadways separated by an island curbside, as shown in **Exhibit 5-6**. The inner roadway closest to the terminal building is reserved for the unloading of passengers by private vehicles. The two lanes closest to the terminal building are striped and signed for passenger drop-off, while the other two lanes are for through traffic. At the south end, the lanes merge to a single lane as it leaves the terminal area.

The outer roadway is primarily designated for commercial vehicles dropping off passengers, with the south end designated for valet parking. The two lanes closest to the island curb are striped and signed for passenger drop-off, while the other two lanes are for through traffic. Prior to merging with the inner roadway, the outer roadway merges into a single lane. Exhibit 5-6 shows the Upper Roadway, including current lane configuration, merge and diverge points, and loading areas.

### 5.3.2 Lower Roadway

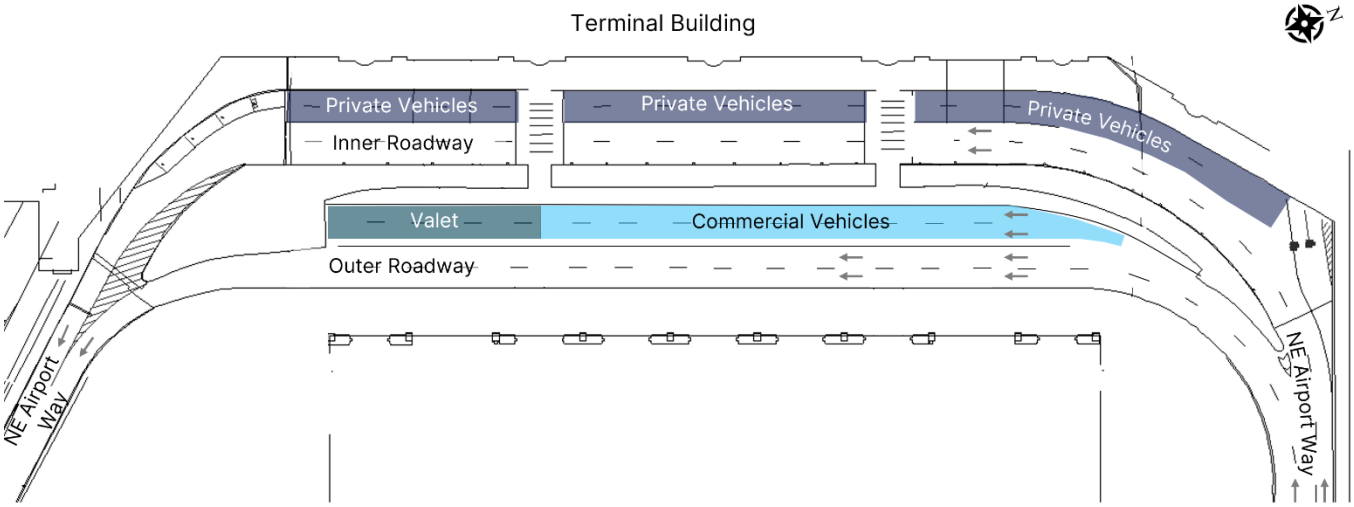
The Lower Roadway provides loading areas for vehicles picking up passengers at the terminal. The Lower Roadway, near the terminal entrance, expands from two lanes to four lanes, as shown in **Exhibit 5-7**. The two innermost lanes (closest to the terminal building) are striped and signed for passenger loading by private vehicles, while the other two lanes are reserved for through traffic. At the south end of the curbside, closest to the MAX station, is an area reserved for the unloading and loading of passengers using C-Tran bus line #67 Airport Regional. Tri-County Metropolitan Transportation District of Oregon (TriMet) also uses the space for buses when Red Line service is not available. TriMet also serves PDX with LIFT van paratransit service, which stops near the south end of the inner Lower Roadway. The three parallel island curbsides are reserved for one or more commercial vehicle modes, as described in Section 5.4. Pairs of crosswalks connect pedestrians who cross between the terminal, three islands, and parking garages. Exhibit 5-7 shows the Lower Roadway, including current lane configuration, merge and diverge points, and loading areas.

## Exhibit 5-5 Planned Grade-Separated Interchange at NE Airport Way and NE 82nd Avenue


**NOTES:**
EB – Eastbound; NE – Northeast; WB – Westbound

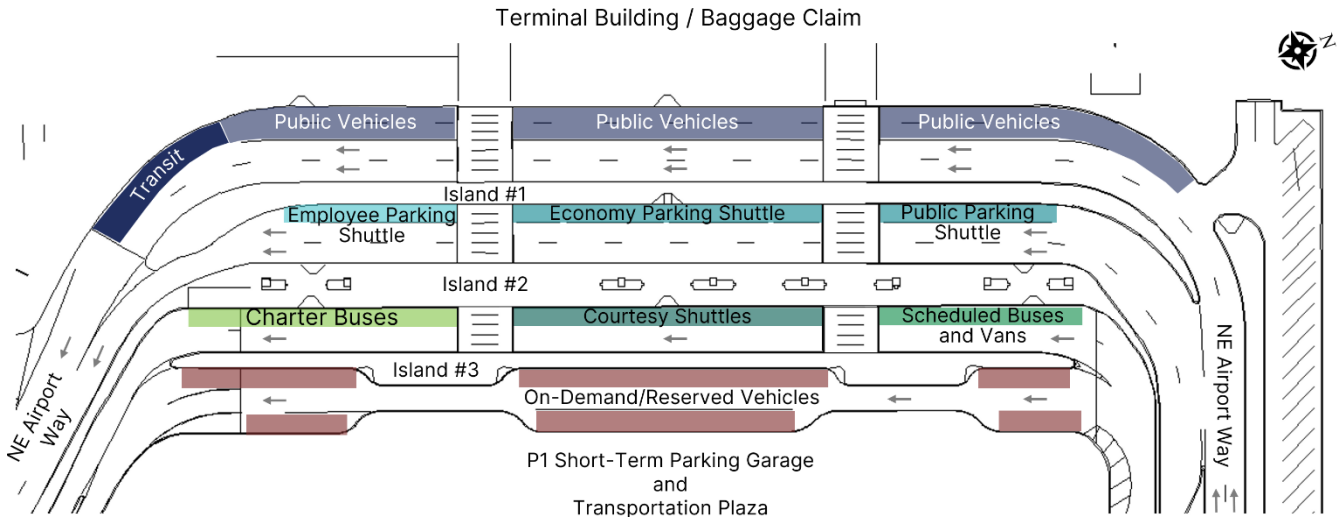
**SOURCE:**
HDR, Final Design Acceptance (DAP) Narrative, February 2021.

## Exhibit 5-6 Upper Roadway: Inner and Outer Roadways




**SOURCE:**
InterVISTAS, September 2024.

**Exhibit 5-7 Lower Roadway**




**SOURCE:**
InterVISTAS, September 2024.

## 5.4 COMMERCIAL VEHICLE FACILITIES

The commercial vehicle facilities at the Airport consist of the Upper Roadway and Lower Roadway, Transportation Plaza, and the ground transportation hold lot.

### 5.4.1 Lower Roadway

The Lower Roadway serves the three parallel islands providing designated pickup areas for commercial vehicles. The first island is designated for shuttles serving the Economy Lots and the Airport employee parking lot. The second island is designated for scheduled airporters[2], charter buses, and courtesy vehicles serving hotels and off-Airport parking. The third island is designated for other reserved vehicles and on-demand vehicles, such as limousines and town cars.

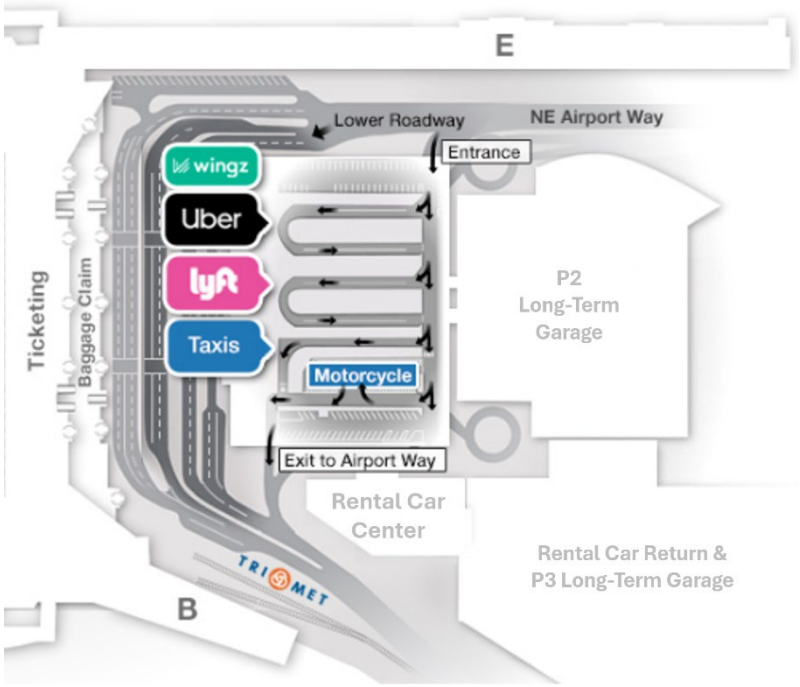
The current allocation of this area is provided on Exhibit 5-7.

### 5.4.2 Transportation Plaza

The Transportation Plaza, shown on **Exhibit 5-8** and **Exhibit 5-9**, is located on Level 1 of the P1 short-term parking garage. The area is divided into three horseshoe-shaped roadways, providing designated pickup areas for transportation network companies (TNCs) and taxicabs. Pickup areas for taxicabs and TNC vehicles are supplemented by nearby staging queues in the ground transportation hold lot. Motorcycle parking is also provided in the Transportation Plaza. The Transportation Plaza is connected to the terminal via an underground tunnel that leads to the terminal baggage claim area.

[2] An airporter is a mode of transportation that uses shuttles, buses, or vans to connect passengers to and from PDX and other transportation hubs.

## Exhibit 5-8 Transportation Plaza Layout




**SOURCE:**
Port of Portland, Portland International Airport, www.flypdx.com (accessed April 2024).

## Exhibit 5-9 Transportation Plaza

**SOURCE:**
InterVISTAS, April 2024.

### 5.4.3 Ground Transportation Hold Lot

Currently, ground transportation providers wait in the ground transportation hold lot before they are dispatched for pickup; the lot is located at NE Air Cargo Court, which is north of the PDX Travel Center and directly off NE Air Cargo Road, as shown on Exhibit 5-1. This lot is approximately 135,000 square feet and accommodates commercial ground transportation providers, including charter buses, reserved vehicles, taxicabs, and TNC vehicles. A geo-fence, a virtual perimeter established using Global Positioning System (GPS), is located around the hold lot to manage requests for TNC Airport pickups by vehicles waiting in the lot. TNC vehicles wait in this staging lot until a passenger requests a ride. Once the driver accepts the ride, it takes approximately five minutes for the vehicle to arrive at the pickup location at the Transportation Plaza. The taxi line can hold up to approximately 120 taxis, while there are about 150 parking spaces for TNC vehicles, 12 spaces for limousines/town cars, and nine spaces for buses in the hold lot. Additionally, there are five Level 3 chargers available in the PDX Travel Center lot for all ground transportation vehicles.

## 5.5 ON-AIRPORT PUBLIC PARKING

Public parking at the Airport is provided in the P1 short-term parking garage, P2 and P3 long-term parking garages, and Economy Lots. Gold Key Valet is provided on the Upper Roadway, as shown on Exhibit 5-6. The locations of these facilities are shown on **Exhibit 5-10**, and the capacities are summarized in **Table 5-2**. P1, P2, and P3 are located within walking distance of the terminal. The Economy Lots are located near the intersection of NE Frontage Road and Mt. Hood Avenue, which requires patrons to ride a shuttle bus to the terminal. The P1 garage is connected to the terminal via skybridges on Level 4 and tunnels running under the Lower Roadway. The P2 and P3 parking garages are connected to the terminal via these same tunnels and connected to the skybridges through the P1 garage. Currently, the P1 and P2 parking garages include an automated parking guidance system (APGS) to help vehicles navigate the parking garage to quickly identify available parking spaces. P3 does not have parking guidance; however, a capital project is underway to install an APGS in P3 in the near future.

**Table 5-2 Existing On-Airport Public Parking Facilities**

| Facility | Current Parking Space Allocations | | | |
|---|---|---|---|---|
| | Standard Spaces | Accessible Spaces | Valet | Total |
| P1 Short-Term Parking Garage[1] | 3,838 | 59 | 0 | 3,897 |
| P2 Long-Term Parking Garage[2] | 3,189 | 40 | 0 | 3,229 |
| P3 Long-Term Parking Garage[3] | 2,242 | 27 | 0 | 2,269 |
| Economy Lots | 7,681 | 119 | 0 | 7,800 |
| Remote Valet Storage | N/A | N/A | 154 | 154 |
| **TOTAL** | **16,950** | **245** | **154** | **17,349** |

**NOTES:**
1. The P1 short-term parking garage also provides 116 motorcycle parking spaces.
2. General parking in the P2 long-term parking garage includes 210 spaces currently reserved for Port of Portland vehicles and other non-public uses.
3. The P3 long-term parking garage space allocations do not include rental car spaces or Port Police spaces.

**SOURCE:**
Port of Portland, August 2024.



NE MARINE DRIVE

Economy Lots

P1 Short-Term Garage

P2 Long-Term Garage

P3 Long-Term Garage

Valet Storage

Valet Pickup/Drop-off

Overflow Cell Phone Lot

Cell Phone Lot

FRONTAGE ROAD

NE AIRPORT WAY

NE AIR CARGO ROAD

NE 82ND AVE

NE CASCADE PARKWAY

MT HOOD AVE

CASCADE PRKY

LIGHT RAIL

MT ST HELENS AVE

I-205

NE ALDERWOOD ROAD

NE CORNFOOT ROAD

NE 92ND AVE

LEGEND:
- Parking Garage
- Parking Lots
- Cell Phone Lot
- Terminal Building
- Metropolitan Area Express (MAX) Light Rail
- Airport Property Boundary
- Access Roadways (Port-Owned)
- Access Roadways (Owned by Others)

SOURCE: Ricondo & Associates, Inc., March 2024.

North 0 1,000 ft

**Exhibit 5-10**

On-Airport Parking Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-10 On-airport Parking Plotted: Mar 25, 2025, 02:25PM

The Economy Lots are divided into two sections, identified as the blue and red lots, which are served by two separate shuttle bus routes that run regularly to the terminal every seven to nine minutes from 4:00 a.m. through midnight, and every 15 minutes from midnight to 4:00 a.m.

Valet parking is provided from the outer curbside of the Upper Roadway, as indicated on Exhibit 5-6. Vehicles are stored in the 154-space lot east of the Hampton Inn located on Frontage Road, as shown on Exhibit 5-10.

Additionally, as indicated on Exhibit 5-8, free motorcycle parking is available inside P1 on Level 1, adjacent to the Transportation Plaza. Free public bicycle parking is available underneath the north and south ramps of the Upper Roadway. Bicycle facilities are further discussed in Section 5.10.

### 5.5.1 Cell Phone Lot

As shown on Exhibit 5-10, a 30-space cell phone parking lot is located at the PDX Travel Center near NE Air Cargo Road and NE 82nd Avenue, a 5-minute drive to the terminal. The cell phone lot is co-located with a gas station and other amenities, such as a coffee shop, restaurants, and convenience store. Additionally, an overflow cell phone lot is located along NE Air Cargo Road, adjacent to the airfield fence and east of the cargo facilities. Drivers may park in the cell phone lots for a limited period of time (e.g., 30 minutes or less) while awaiting a call from their arriving passenger. Port Police noted that there are frequent police dispatches responding to issues at the PDX Travel Center. Police driving routes include NE Airport Way / NE 82nd Avenue as the primary path, with Air Cargo Road as a secondary path. Because of this, travel times to the cell phone lot can be impacted by the rapid access needs of Port Police, highlighting the need for enhanced access routes to the cell phone lot and other key destinations away from the terminal and facilities near the terminal.

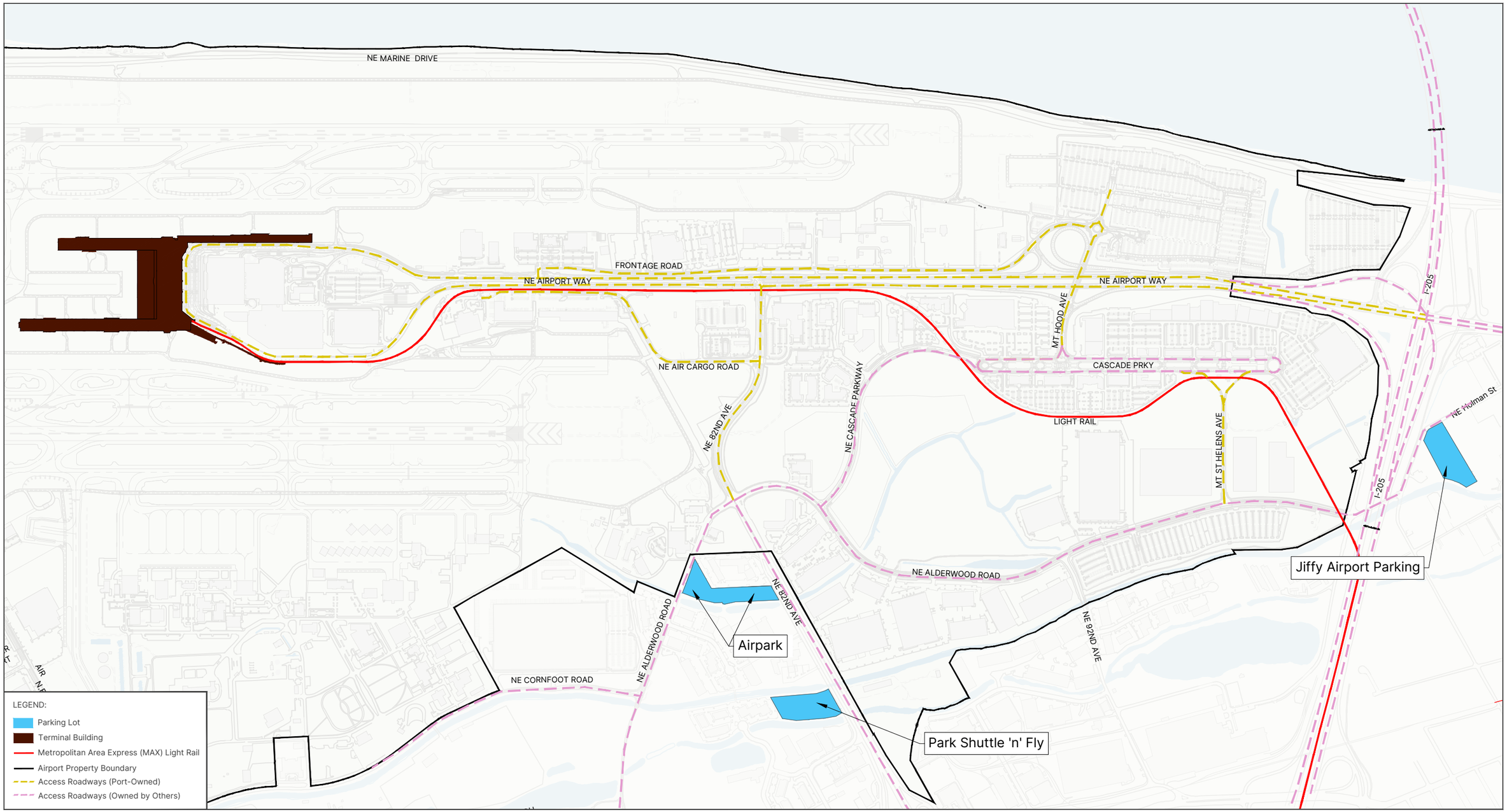
Airport staff expressed concern with the current location of the cell phone lot, as it does not facilitate easy access for those entering the Airport because it requires two left turns at signalized intersections to travel from the cell phone lot to the terminal. Additionally, Airport staff and Port police noted that the PDX Travel Center occasionally becomes congested due to the combined traffic from the Travel Center and the exiting traffic from the ground transportation hold lot. This creates long vehicle queues on the Air Cargo Court cul-de-sac that require additional staff to help manage and direct traffic.

### 5.5.2 Public Electric Vehicle Charging

Electric vehicle charging stations available to the public are located in the P1 and P2 parking garages and the Economy Lots. These charging stations are not time-limited and, aside from the regular parking fee, there is no additional cost. Six Level 2 (240-volt) charging stations are located on the fourth floor of the P1 parking garage near the south skybridge that connects to the Airport terminal building. Ten charging stations are located in P2, and 36 Level 1 (120-volt) charging stations are located in the Economy Lots. The public also has access to an additional five charging stations located in the PDX Travel Center lot.

## 5.6 OFF-AIRPORT PUBLIC PARKING

In addition to the on-Airport public parking spaces, three private operators provide a total of approximately 1,300 parking spaces off-Airport, as shown on **Exhibit 5-11**. Two operators are located on NE 82nd Avenue, south of NE Alderwood Road, and the third is located east of I-205 on NE Holman Street, near the intersection with NE Airport Way. These operators transport customers between the parking facilities and the terminal on private shuttle buses. Some hotels near PDX may also offer off-site parking.




SOURCE: Ricondo & Associates, Inc., March 2024.

**Exhibit 5-11**

Off-Airport Parking Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-11 Off-airport Parking Plotted: Mar 25, 2025, 02:26PM

## 5.7 EMPLOYEE PARKING

The locations of employee parking facilities are shown on **Exhibit 5-12**, and the capacities are summarized in **Table 5-3**. The majority of employee parking is provided in Portland International Center (PIC), off NE Alderwood Road, and is referred to as the Alderwood Employee Lot. Employees using this lot are transported to and from the terminal on shuttle buses; 200 spaces are allocated to airlines, and 200 spaces are allocated for all concessions. Approximately 2,000 spaces remain available for general Airport worker use. Parking permits for Airport tenants and employees are allocated based on specific criteria. Each concession tenant receives two parking credentials, while 200 parking permits are allocated to airlines based on market share.

**Table 5-3 Existing Employee Parking Facilities**

| Facility | Current Parking Space Allocations | | |
|---|---|---|---|
| | Standard Spaces | Accessible Spaces | Total |
| Surface Lot | 430 | 12 | 442 |
| Alderwood Employee Lot | 2,346 | 40 | 2,386 |
| **TOTAL** | **3,216** | **52** | **3,270** |

**NOTE:**
Excludes parking spaces associated with non-terminal-area leaseholds.
**SOURCE:**
Port of Portland, September 2024.

There are approximately 530 active Port employees who hold parking permits. Port of Portland employees have the following options for parking:

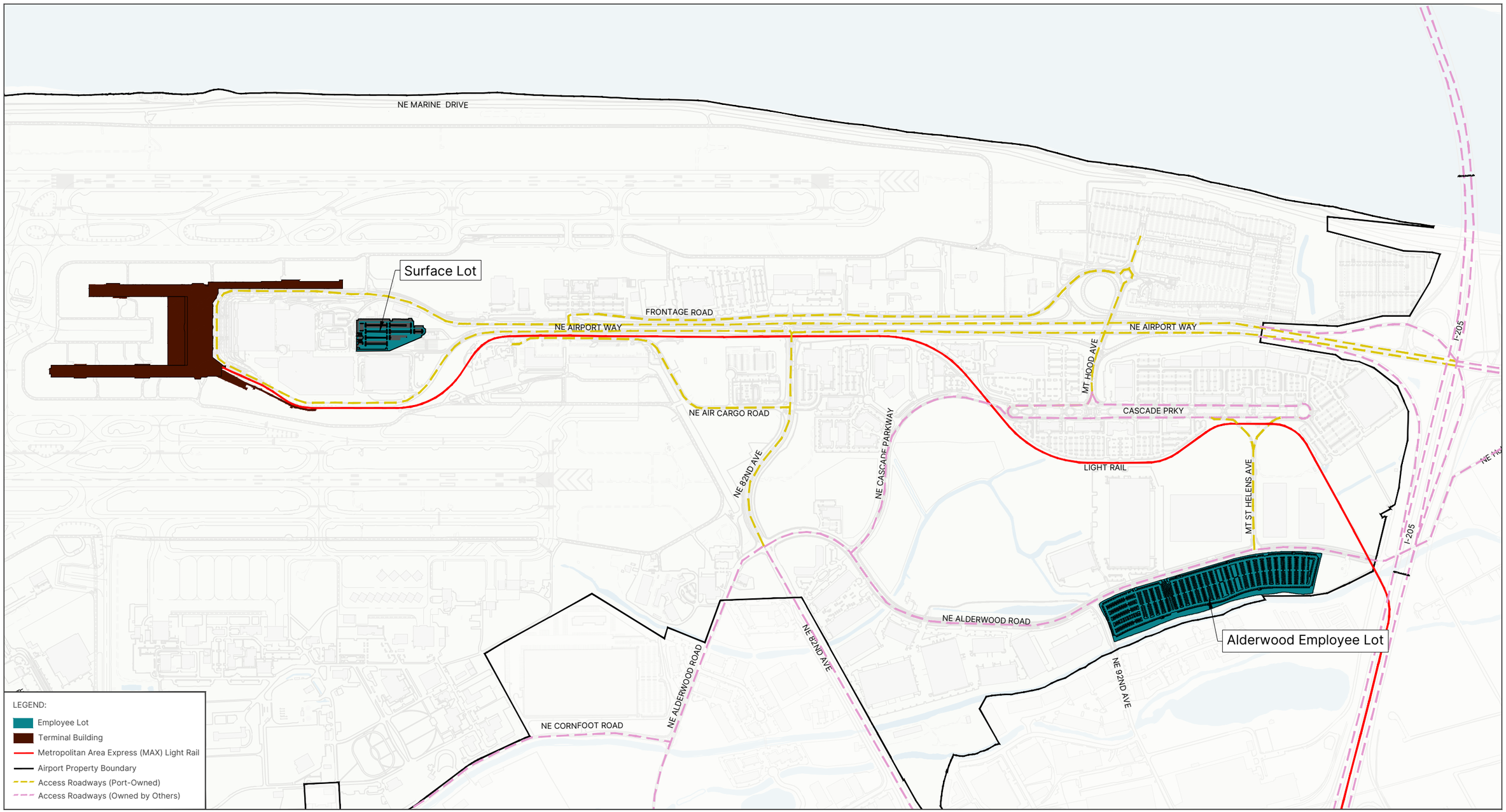
- Free parking in the Alderwood Employee Lot
- Paid parking in the Surface Lot[3]
- Paid parking in the P3 Garage
- Secured bicycle parking in the P2 Garage

PDX employees are permitted to park in the Alderwood Employee Lot. For employees working outside the terminal area (such as the cargo facilities), parking is provided within individual leaseholds or at their designated work location. These spaces may be shared with customers and other visitors.

## 5.8 RENTAL CARS

**Exhibit 5-13** identifies the locations of the RCC near the terminal and the remote rental car facilities located within the Economy Lots. **Table 5-4** summarizes the capacities of key rental car operating areas. For on-Airport rental car companies, the RCC and P3 garage include customer service counters and ready/return areas. The QTA provides fuel and wash facilities and supporting storage. Currently, five rental car companies, providing 11 rental car brands, lease space within the RCC. Rental car customers travel through the south tunnel to access the RCC from the terminal. The QTA facility is located immediately east of the P3 parking garage. The primary additional rental car storage space is located along Frontage Road. Long-term plans are to relocate rental car storage to PIC. Rental cars are occasionally stored in the South Runway RPZ off NE 82nd Avenue and vacant space in Airtrans Center.

[3] The Surface Lot is currently closed for the new terminal expansion but anticipated to be returned to service by 2027 at the latest.



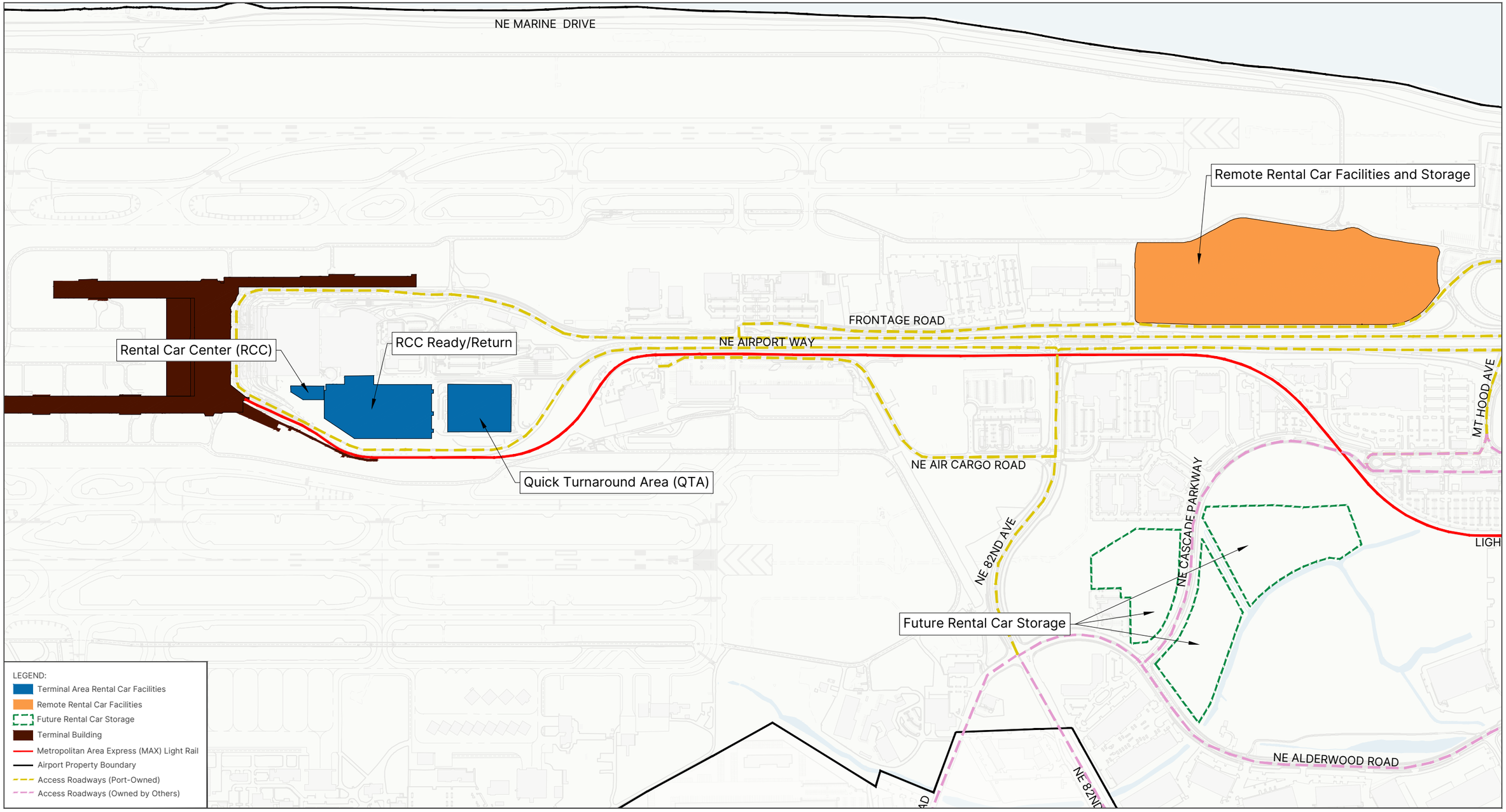

SOURCE: Ricondo & Associates, Inc., March 2024.

North 0 1,000 ft

**Exhibit 5-12**

Employee Parking Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-12 Employee Parking Plotted: Mar 25, 2025, 02:27PM




SOURCE: Ricondo & Associates, Inc., March 2024.

North 0 700 ft

**Exhibit 5-13**

Rental Car Center (RCC) and Remote Rental Car Facilities

Drawing: P:_PROJECTS\PDX\2023 PDX Master Plan Update\00-ACAD\Received\From Subs\PDX-Existing Landside Exhibits-Jan 2025 - Standard\PDX-Existing Landside Exhibits-Jan 2025.dwgLayout: 5-13 Rental Cars Plotted: Mar 25, 2025, 02:27PM

**Table 5-4 Existing Rental Car Facilities**

| Facility | Quantity | Notes |
|---|---|---|
| Rental Car Center (RCC) | | |
| Customer building (Floor 1) | 19,090 square feet | |
| Customer service counters | 42 workstations | |
| Office space (Floors 2 to 4) | 8,600 square feet | |
| Ready / return | 2,070 spaces | |
| Rental Car Storage (includes maintenance bays)[1] | 1,019,000 square feet | On Frontage Road |
| Quick Turnaround Area (QTA) | | |
| Fueling area | 72 nozzles | |
| Car washes | 35 bays | For washing/queuing |
| Roof storage | 800 cars | |
| Office space | 10,400 square feet | |

**NOTE:**
1. An exact number of maintenance bays is not provided as this space serves several functions in addition to storage and maintenance such as office space, equipment storage, employee parking, and infleeting/defleeting.

**SOURCE:**
Port of Portland, September 2024.

There are currently 10 Level 3 (480-volt) electric vehicle chargers in the QTA and 50 Level 2 chargers in the RCC, with further installations anticipated. The Port has established adequate electric capacity to accommodate up to 25 Level 2 chargers for each rental company. However, not all rental companies have used their allocated capacity, resulting in the current installation of only 50 Level 2 chargers.

In recent years, peer-to-peer (P2P) car sharing services, such as Turo, have created online platforms for private citizens to rent out their personal vehicles to people wishing to drive a rental car and not wanting to use traditional rental car companies. The Port entered into an agreement with Turo in 2023 to allow vehicle owners and renters working through Turo to pick up and drop off cars in the P2 and P3 long-term parking garages.

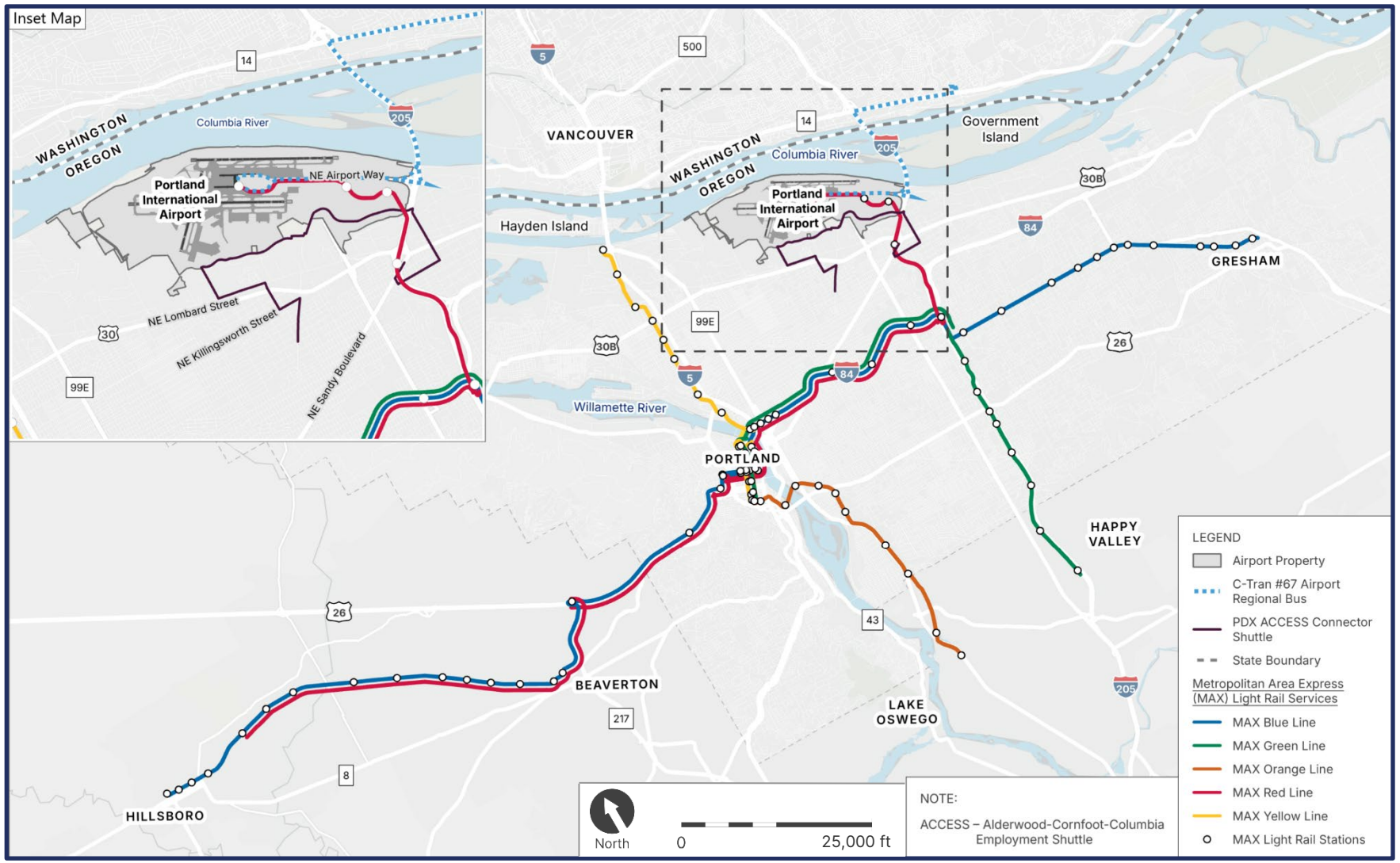
## 5.9 TRANSIT

Transit to and from the Airport is provided by light rail, bus, and shuttle buses. These transit services are a combination of public agencies and private companies connecting PDX to Oregon and Washington.

### 5.9.1 Light Rail

Light rail services are provided by the Tri-County Metropolitan Transportation District of Oregon Metropolitan Area Express light rail system (TriMet MAX light rail or MAX light rail), which connects Portland City Center with Beaverton, Clackamas, Gresham, Hillsboro, Milwaukie, North/Northeast Portland, and PDX. **Exhibit 5-14** shows the MAX light rail system. During peak periods, MAX Red Line trains generally operate at a 15-minute frequency. Service hours between the Airport and Portland City Center typically fall between 4:50 a.m. (first arrival) and 12:30 a.m. (last departure). The trip from PDX to Portland City Center is approximately 40 minutes.

## Exhibit 5-14 Airport Access by Transit




**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDS, USFWS, August 2024 (basemap); US Department of Commerce, National Oceanic and Atmosphere Administration, March 2023 (states); Port of Portland, April 2024 (airfield, Airport property boundary); Oregon Metro, Regional Land Information System, January 2021 (water); US Census Bureau, 2023 (roads); Ricondo & Associates, Inc., June 2024 (shuttle, C-Tran bus).

Recently completed elements of TriMet's A Better Red project resulted in the double-tracking of the Red Line between the Gateway North station and PDX. This improves reliability across the entire MAX system. Red Line trains heading to downtown Portland and farther west now have a faster, more efficient route and serve a new platform at Gateway Transit Center. Following the full completion of A Better Red project, the Red Line will terminate at the Hillsboro Fair Complex station instead of Beaverton Transit Center. Specific improvements at PDX include a double track to the terminal, a new platform at the terminal, and a bike/pedestrian path from the terminal to NE 82nd Avenue that parallels the MAX alignment from the PDX Cargo Center to the terminal. Bike and pedestrian facilities are described in further detail in Section 5.10.

### 5.9.2 Public Bus

Public bus service is provided to and from the Airport by C-Tran, the transit agency located in Clark County, Washington. Route #67 Airport Regional provides direct service to and from the Airport from Fisher's Landing Transit Center in Vancouver, along SR 14 and I-205. As of June 2024, service is generally provided from the early afternoon until midnight, and the trip  is scheduled to take 15 minutes. The route is depicted on Exhibit 5-14. Prior to the pandemic, TriMet provided bus service between PDX and Beaverton that was intended to approximate Red Line service during the early morning hours when the MAX light rail does not operate. This service has not been reinstated, but TriMet is using buses to cover portions of their MAX light rail network (including PDX) in late night hours to allow more time for maintenance in the light rail alignment.

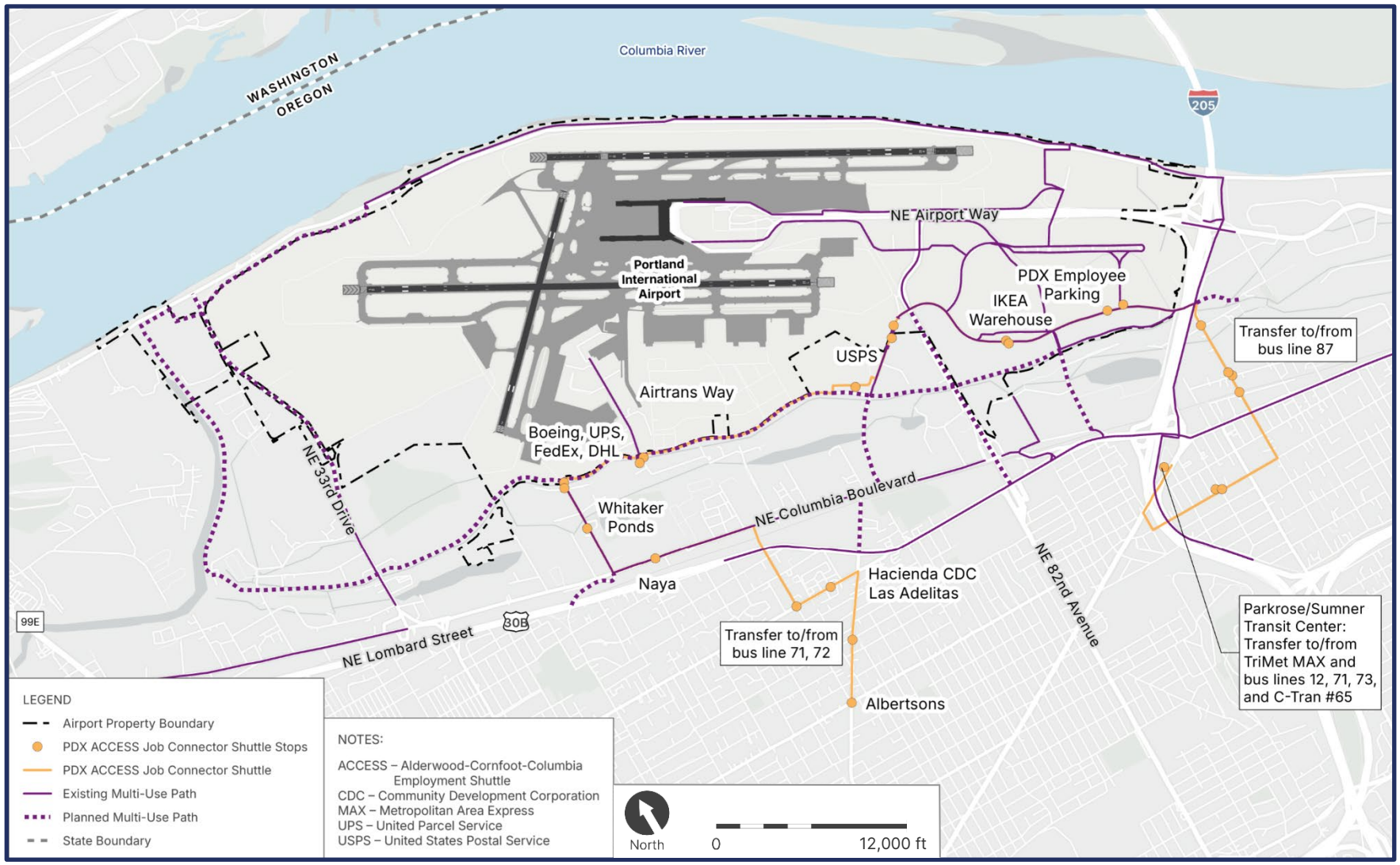
To improve the reliability of travel times of public transit services I-205, the Washington State Department of Transportation (WSDOT) and Oregon Department of Transportation (ODOT) added bus-on-shoulder lanes through changed signage and lane striping designations. Bus-on-shoulder lanes can be found northbound from north of the Airport Way entrance ramp to south of the SR 14 exit ramp and southbound from south of the SR 14 entrance ramp to north of the Airport Way exit ramp[4]. Transit routes that serve PDX and use these freeways benefit from improved travel times and travel time reliability.

### 5.9.3 ACCESS Job Connector Shuttle Service

The Alderwood-Cornfoot-Columbia Employment Shuttle Service (ACCESS) connects the Cully neighborhood, located immediately south of PDX, to businesses along the south side of PDX, PIC, and Cascade Station with MAX light rail, TriMet bus, and C-Tran bus connections at the Parkrose/Sumner Transit Center, as shown on **Exhibit 5-15**. The free shuttle runs Monday through Friday, mornings and afternoons, between the Cully neighborhood and Parkrose/Sumner Transit Center, with multiple stops in between. The shuttle is funded by the Statewide Transportation Improvement Fund and is a partnership with the Portland Bureau of Transportation and Multnomah County. ACCESS serves to strengthen the bus network by providing industrial and manufacturing job access to many more people. An estimated 11,500 employees commute to jobs in this area, including an ever-increasing number of PDX jobs along Airtrans Way.[5]

[4] Oregon Department of Transportation, https://www.oregon.gov/odot (accessed January 3, 2025).
[5] Multnomah County, https://www.multco.us/transit/access-shuttle (accessed October 2024).

## Exhibit 5-15 Shuttle and Multi-Use Path Access Facilities

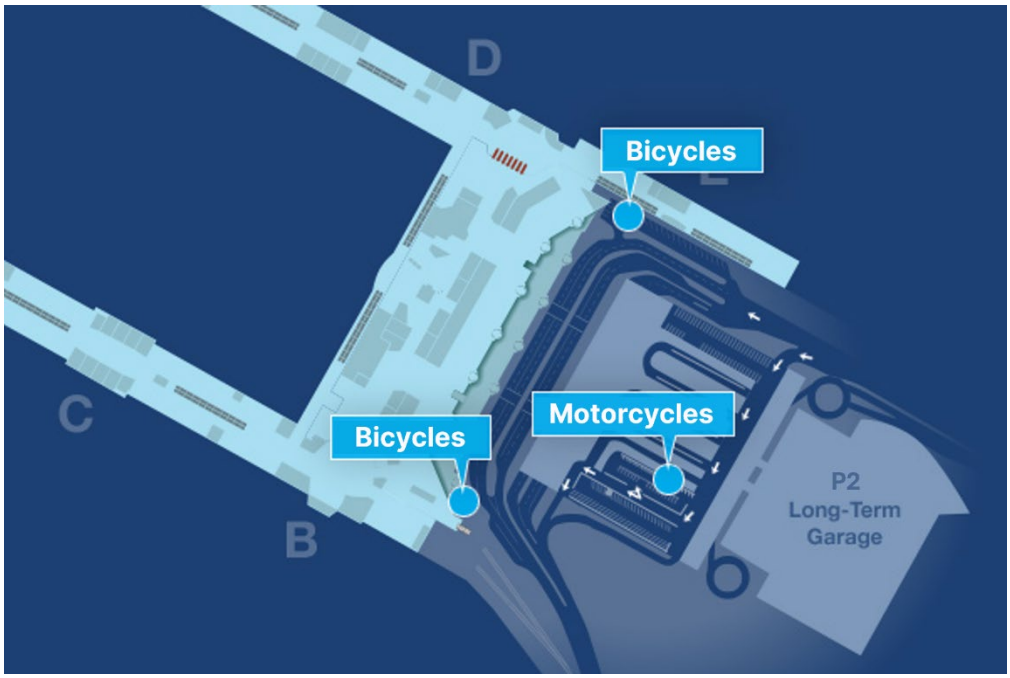



**SOURCES:**
County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDS, USFWS, August 2024 (basemap); US Department of Commerce, National Oceanic and Atmosphere Administration, March 2023 (states); Port of Portland, April 2024 (airfield, Airport property boundary); Oregon Metro, Regional Land Information System, January 2021 (water); US Census Bureau, 2023 (roads); Ricondo & Associates, Inc., June 2024 (shuttle, sidewalk, and multi-use paths).

## 5.10 PEDESTRIAN / BICYCLE FACILITIES

As shown on **Exhibit 5-16**, free public bicycle parking is available underneath the north and south ramps of the Upper Roadway, where bicycles can be locked up in one of two ribbon racks. A bicycle assembly area is provided near the southern bicycle parking area.

**Exhibit 5-16 Bicycle and Motorcycle Parking**




**SOURCE:**
Port of Portland, Portland International Airport, www.flypdx.com (accessed April 2024).

The Port, in conjunction with other groups and agencies, has invested in bicycle and pedestrian access to and from PDX for several decades. Prior investments include multi-use paths, dedicated bike lanes, and shared roadways. Pedestrian and bicycle facilities at, and in the vicinity of, the Airport are shown on Exhibit 5-15. Efforts to improve bicycle and pedestrian safety and access are ongoing.

On June 7, 2024, a new 1.5-mile stretch of two-way, protected bike path was opened to users. The path connects the PDX terminal and MAX light rail station at PDX to the existing path network east of NE 82nd Avenue. This path was developed as part of TriMet's A Better Red project, with funding coming from both the Port and TriMet.

# 6. Air Cargo

This section describes the facilities for processing air cargo at the Airport. For purposes of PDX 2045, cargo is defined to include both freight and mail. Cargo services at the Airport are provided by freight forwarders, passenger airlines, all-cargo carriers, and integrated cargo carriers, with air cargo support services provided by several logistics, trucking, and ground handling companies. Air cargo facilities at PDX are located in two areas:

- Airtrans Center for all-cargo operations
- PDX Cargo Center for belly cargo operations (i.e., cargo that is shipped in the lower deck of passenger aircraft)

In 2023, the Airport processed approximately 283,000 metric tons of freight and mail. Integrated carriers processed 264,000 metric tons (93 percent) of the total cargo tonnage handled at PDX, while the remainder, 19,000 metric tons of cargo, was handled by passenger airlines as belly cargo. Detailed descriptions of the Airtrans Center and PDX Cargo Center are provided in the following subsections.

## 6.1 AIRTRANS CENTER

The Airtrans Center encompasses approximately 190 acres of land on the southwest side of the Airport and is bordered by Runway 3-21 to the west, ORANG to the east, Taxiways C and F to the north, and NE Cornfoot Road to the south, as shown on Exhibit 6-1. The Airtrans Center primarily accommodates all-cargo operations, as well as some airline and airport support functions that are addressed in this section and Section 8, respectively.

The following airlines and companies perform cargo-related activities from the Airtrans Center:

- **Integrated carriers.** Integrated carriers provide door-to-door transportation services with the support of their transportation network. They operate their own aircraft, truck fleet, and warehouses and use aircraft apron parking. They may contract with other carriers for small regional feeder flights. Integrated carriers and associated airlines operating at PDX include:
  - DHL Express, with flights operated by ABX Air
  - FedEx, including feeder service operated by Empire Airlines
  - United Parcel Service (UPS), including feeder service operated by Ameriflight, LLC
- **All-cargo airlines.** These airlines operate on an airport-to-airport basis, relying on third-party operators for warehouse, apron, and surface transportation. They may operate flights on behalf of other airlines on a contractual basis. All-cargo airlines operating at PDX include:
  - Airpac Airlines
  - Amazon Air, with flights operated by Air Transport International, Atlas Air, and Sun Country Cargo
  - Cathay Pacific Airways
- **Freight forwarders.** These companies coordinate and organize the movement of goods on behalf of shippers, book freight on airlines, and consolidate shipments. Freight forwarders at PDX include:
  - Hanjin Transportation Co.
  - Jetstream Freight Forwarding Inc.
  - Peak Supply Chain Solutions
- **Logistics and trucking companies.** These companies move goods from one place to another using trucks. Logistics and trucking companies operating at PDX include:
  - STG Logistics
  - Lanter Delivery Systems

- **Ground handling service providers.** These service providers manage activities in cargo warehouses and logistics centers, such as loading and unloading cargo, transporting cargo, warehousing, and sorting. Ground handling service providers operating at PDX include:
  - PrimeFlight Aviation Services
  - Quantem Aviation Services

In the Airtrans Center, third-party developers, including Aero Portland, LLC, Prologis, L.P., and PD ACC1, lease land upon which they have constructed cargo facilities, with cargo operators being subtenants to these third-party developers. Facilities designated for cargo use at the Airtrans Center provide a total of 388,400 square feet of building space. These buildings are almost fully occupied.

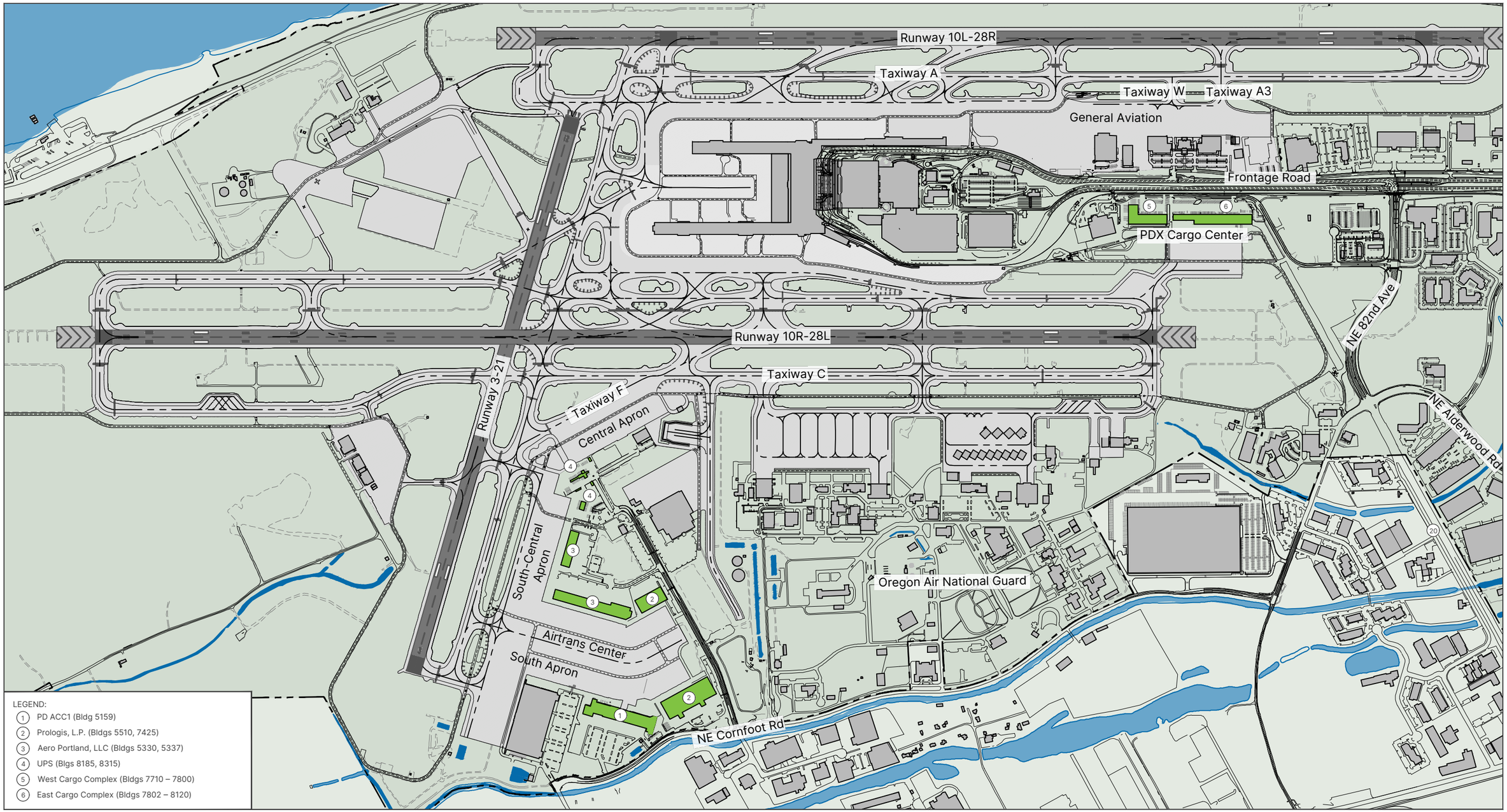
**Exhibit 6-1** shows the location of cargo facilities, and **Table 6-1** presents characteristics of the Airtrans Center facilities.

Three cargo aprons are located at the Airtrans Center: central, south-central, and south aprons. These aprons provide a total of 43 acres of aircraft parking that is used for cargo and MRO activities. **Table 6-2** provides the apron acreages and tenant allocations.

## 6.2 PDX CARGO CENTER

The PDX Cargo Center is located south of NE Airport Way and NE Air Cargo Road, east of the terminal facilities, as shown in Exhibit 6-1. The campus comprises two buildings: West Cargo Complex and East Cargo Complex. The Port owns and manages both facilities.

As listed in **Table 6-3**, the West Cargo Complex provides 53,900 square feet of building space, and the East Cargo Complex provides 73,400 square feet of building space. Approximately 20 percent of the west building and 60 percent of the east building are used for belly cargo and logistics activities. Additional functions, such as airline services, GSE maintenance and storage, and Airport maintenance, are carried out in the PDX Cargo Center (see Section 8).




SOURCES: Port of Portland, Airport Layout Plan, June 2021; JMG Consulting, LLC, December 2024.

North 0 1,000 ft

**Exhibit 6-1**

Cargo Facilities

Drawing: C:\Users\jgueh\OneDrive\Documents\Project Files\PDX Master Plan\3- Existing conditions and data gathering\CAD files\Exhibits for existing conditions report\Exhibit xx - Cargo GA support facilities - Updated.dwgLayout: Exhibit 6-1 Plotted: Nov 19, 2024, 10:42AM

## Table 6-1 Airtrans Center Cargo Facilities

| Exhibit 6-1 Number Key | Building Number | Tenant | Subtenants | Building Area (sq ft) | Landside Area (sq ft)[2] | Apron (acres)[3] | Total Site Area (acres) |
|---|---|---|---|---|---|---|---|
| 1 | 5159 | PD ACC1 | FedEx | 96,700 | 424,200 | 7.5 | 19.5 |
| 2 | 5510 | Prologis, L.P. | Hanjin Transportation Co.<br>Peak Supply Chain Solutions | 45,000 | 95,000 | 3.2 | 6.4 |
| 2 | 7425 | Prologis, L.P. | PrimeFlight Aviation Services<br>Atlas Air | 114,500 | 205,300 | 3.4 | 10.7 |
| 3 | 5330 | Aero Portland, LLC | Quantem Aviation Services<br>DHL Worldwide Express<br>Summit NW Corp<br>Cathay Pacific Airways | 88,300 | 190,500 | 6.9 | 13.3 |
| 3 | 5337 | Aero Portland, LLC | UPS<br>Hawaiian Airlines[1]<br>Jetstream Freight Forwarding Inc. | 33,600 | 102,300 | 1.2 | 4.3 |
| 4 | 8185 | UPS | N/A | 4,200 | 383,000 | 9.2 | 18.2 |
| 4 | 8315 | UPS | N/A | 6,100 | | | |
| TOTAL | | | | **388,400** | **1,400,300** | **31.4** | **72.4** |

**NOTES:**
N/A – Not Applicable; UPS – United Parcel Service
1. Hawaiian Airlines leases space in Building 5337 to perform some aircraft maintenance.
2. Landside includes space for vehicular and truck parking and maneuvering.
3. Details on the aprons and aircraft that can be accommodated are provided in Table 6-2.

**SOURCES:**
Port of Portland, January 2023 (lease and apron management areas data); Port of Portland, February 2023 (geographic information system).

## Table 6-2 Airtrans Center Aprons

| Apron | Airlines/Tenants | Aircraft Positions |
|---|---|---|
| South Apron | Boeing[1] | 2 ADG V positions |
| | Amazon Prime | 1 ADG III position<br>3 ADG IV positions |
| | Amazon Prime / charters | 1 ADG VI position |
| | Cathay Pacific Airways / charters | 1 ADG VI position |
| | DHL | 1 ADG IV position |
| | Empire / FedEx | 8 ADG II positions<br>1 ADG III position |
| | FedEx | 7 ADG IV positions |
| South-Central Apron | Aero Portland, UPS | 6 ADG IV positions |
| Central Apron | UPS | 4 ADG IV positions |
| | Ameriflight, LLC | 12 ADG II positions |

**NOTES:**
ADG – Airplane Design Group; UPS – United Parcel Service
1. Boeing performs maintenance activities out of its Airtrans Center facility.

**SOURCES:**
Port of Portland, January 2023 (lease and apron management areas data); Port of Portland, July 2023 (parking positions inventory); Google Earth, 2023 (aerial imagery).

## Table 6-3 Belly Cargo Facilities

| Exhibit 6-1 Number Key | Building Number | Building Description | Tenants | Building Area (sq ft) | Landside Area (sq ft) | Apron (sq ft) | Total Site Area (acres) |
|---|---|---|---|---|---|---|---|
| 5 | 7710–7800 | West Cargo Complex | All tenants | 53,900 | 39,200 | 15,900 | 3.5 |
| | | Cargo tenants | Performance Logistics | 10,300 | 17,000 | - | |
| | | Other tenants / unleased | | 43,600 | 22,200 | 15,900 | |
| 6 | 7802–8120 | East Cargo Complex | All tenants | 73,400 | 35,200 | 64,500 | 6.5 |
| | | Cargo tenants | Alliance Ground International | 18,100 | 7,200 | 13,300 | |
| | | | Delta Air Lines | 1,500 | 1,000 | 2,300 | |
| | | | Performance Logistics | 1,200 | - | 1,200 | |
| | | | Southwest Airlines | 12,800 | 6,700 | 16,200 | |
| | | | United Airlines | 13,200 | 5,300 | 9,800 | |
| | | Other tenants | | 26,600 | 15,000 | 21,700 | |
| **TOTAL[1]** | | | | **57,100** | **37,200** | **42,800** | |

**NOTE:**
1. The total includes cargo tenants only.

**SOURCES:**
Port of Portland, March 2024 (lease data); Port of Portland, PDX Cargo Center Space Allocation Exhibit, June 2023.

# 7. General Aviation (GA)

GA consists of all civil aircraft operations not classified as either air carrier or air taxi/commuter operations, including those for business travel and recreational flying. The main GA area at PDX occupies approximately 32 acres east of Concourse E and the north RON ramp, as shown on **Exhibit 7-1**. In addition to PDX, the Port owns and operates two reliever airports, TTD and HIO, that provide an alternative for smaller GA aircraft, thereby preserving airfield and airspace capacity at PDX for commercial and larger business aircraft operations.

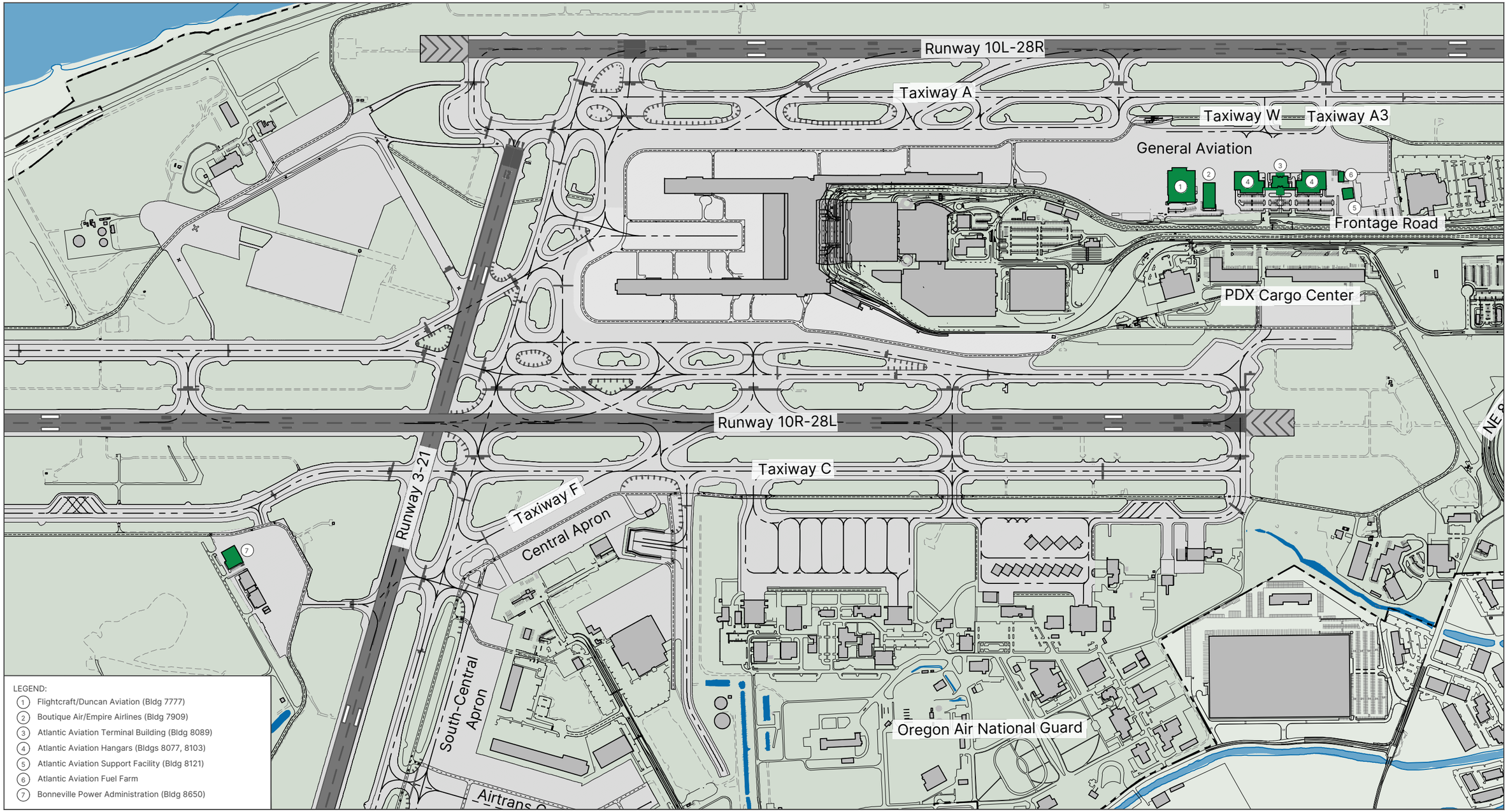
A single FBO, Atlantic Aviation, operates at PDX and provides services such as aircraft parking, aircraft storage, passenger and pilot amenities, fueling, charters, and aircraft maintenance. The FBO can be accessed landside via Frontage Road and airside via Taxiways A3 and W. The Atlantic Aviation site consists of several facilities:

- **Terminal building**: The terminal building was built in 2016 and encompasses 12,100 square feet of space for offices and amenities for passengers and pilots, such as conference rooms and a pilots' lounge.
- **Hangars**: Two hangars, also built in 2016, are located on each side of the terminal building, and each provides 38,000 square feet of space for aircraft maintenance, storage, and offices.
- **GA fuel farm**: Atlantic Aviation's aboveground fuel farm and covered fueling area are adjacent to Hangar 8103. The fuel farm consists of six tanks: three 30,000-gallon Jet A tanks, a 12,000-gallon aviation gasoline (AvGas) tank, a 2,000-gallon diesel tank, and a 550-gallon waste fuel tank. Atlantic Aviation manages their own fuel deliveries to the farm via tanker trucks.
- **Apron**: The Atlantic Aviation ramp, immediately north of the terminal building and hangars, encompasses 7.9 acres of apron. An estimated 12 aircraft are based at Atlantic Aviation's facility, using hangar space.
- **Aircraft maintenance facility**: Flightcraft, a division of Atlantic Aviation, and Duncan Aviation operate out of Building 7777, a 62,200-square-foot hangar located at the west end of the GA ramp. Flightcraft provides maintenance services for corporate aircraft, while Duncan Aviation offers avionics installation, line maintenance services, and engine support services.
- **Ancillary facilities**: These facilities include Building 8121, a 7,700-square-foot building used for the storage and maintenance of GSE.

Boutique Air is an airline that operates scheduled passenger services subsidized under the US Department of Transportation's (USDOT) Essential Air Service program. The airline provides three daily connections to Pendleton's Eastern Oregon Regional Airport using Pilatus PC-12 aircraft. Boutique Air leases a portion of Building 7909, a 21,000-square-foot facility located between the Flightcraft facility and Atlantic Aviation's facilities. Boutique Air also leases 2,400 square feet of office space, 4,000 square feet on the landside for vehicular parking, and 5,000 square feet of apron space. The remainder of the facility is leased to two cargo airlines, Empire Airlines and Airpac Airlines.

Lastly, BPA leases a hangar on a 1.9-acre site west of the intersection of Runways 3-21 and 10R-28L. The facility, Building 8650, is 19,800 square feet and is used to store the two fixed-wing aircraft and the helicopter BPA uses to fly to its different operational sites. The remainder of its leased space is an apron used for aircraft parking, as well as the take-off and landing of BPA helicopters. BPA is currently looking to replace one of its King Air 350 aircraft with a Pilatus PC-24 twin-turbine jet.

**Table 7-1** summarizes the GA facilities and their areas, as well as the Oregon Air National Guard (ORANG) facilities described in Section 9.




SOURCES: Port of Portland, Airport Layout Plan, June 2021; JMG Consulting, LLC, December 2024.

**Exhibit 7-1**

General Aviation Facilities

Drawing: C:\Users\jgueh\OneDrive\Documents\Project Files\PDX Master Plan\3- Existing conditions and data gathering\CAD files\Exhibits for existing conditions report\Exhibit xx - Cargo GA support facilities - Updated.dwgLayout: Exhibit 7-1 Plotted: Nov 19, 2024, 10:40AM

## Table 7-1 General Aviation Facilities

| Facility Number | Building Description | Building Area (sq ft) | Landside Area (sq ft) | Apron (sq ft) | Total Site Area (acres) |
|---|---|---|---|---|---|
| 7909 | Boutique Air (partially occupies Building 7909) | 2,400 | 4,000 | 5,000 | 5.0 |
| 7777 | Flightcraft / Duncan Aviation – Aircraft Maintenance | 62,200 | 53,000 | 141,000 | 6.6 |
| 8077 | Atlantic Aviation – Aircraft Hangar | 38,000 | 292,000 | 344,000 | 19.0 |
| 8089 | Atlantic Aviation – Terminal Building | 12,100 | | | |
| 8103 | Atlantic Aviation – Aircraft Hangar | 38,100 | | | |
| 8121 | Atlantic Aviation – Maintenance/Storage Building | 7,700 | | | |
| 8650 | Bonneville Power Administration | 19,800 | 23,000 | 42,000 | 1.9 |
| **TOTAL** | | **180,300** | **372,000** | **532,000** | **32.5** |

**NOTE:**
Other tenants in Building 7909, in addition to Boutique Air, are Empire Airlines and Airpac Airlines. Empire Airlines uses the facility to perform aircraft maintenance, and Airpac Airlines provides air cargo services.

**SOURCES:**
Port of Portland, March 2024 (geographic information system); Port of Portland, March 2024 (lease data).

# 8. Airline and Airport Support

This section discusses the airline support facilities which includes the maintenance, repair, and overhaul (MRO) facilities, ground run-up enclosure (GRE), flight kitchen, ground service equipment (GSE) storage and maintenance facilities, fuel farm and fuel dispensing systems, and deicing facilities.

Airport support facilities include the Airport maintenance facilities, Port administrative offices, CRDC, Response Operation and Coordination Center (ROCC), ARFF facilities, and ATCT and FAA offices. All airline and airport support facilities are shown on **Exhibit 8-1** except as noted.

## 8.1 AIRLINE SUPPORT FACILITIES

The following subsections describe the airline support facilities.

### 8.1.1 Aircraft Maintenance, Repair, and Overhaul (MRO)

Five aircraft MRO facilities are currently located at the Airport, as listed in **Table 8-1.**

**Table 8-1 Maintenance, Repair, and Overhaul Facilities**

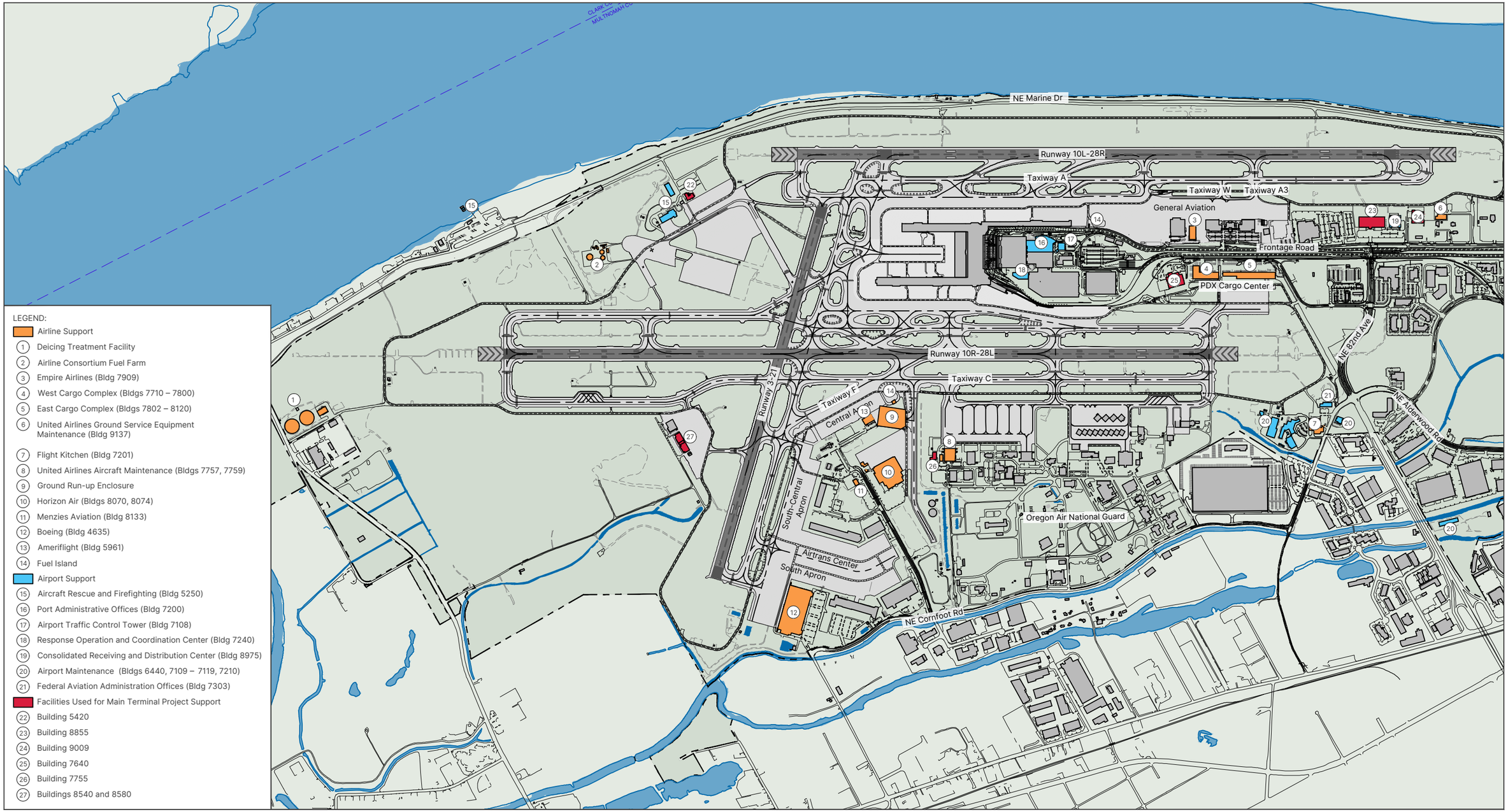
| Exhibit 8-1 Number Key | Building Number | Building Description | Building Area (sq ft) | Landside Area (sq ft) | Apron (sq ft) | Total Site Area (acres) |
|---|---|---|---|---|---|---|
| 12 | 4635 | Boeing | 266,900 | 208,000 | 348,000 | 26.8 |
| 10 | 8070 | Horizon Air – Main Hangar/Offices | 147,700 | 275,000[1] | 271,000 | 16.0 |
| 10 | 8074 | Horizon Air – Support Building | 4,800 | | | |
| 8 | 7757 | United Airlines – Offices | 5,000 | 27,000 | 37,000 | 3.0 |
| 8 | 7759 | United Airlines –Hangar | 34,500 | | | |
| 13 | 5961 | Ameriflight, LLC | 15,800 | 35,000 | 85,000 | 3.1 |
| 3 | 7909 | Empire Airlines (partially occupies Building 7909) | 2,300 | 8,000 | 4,500 | N/A |
| | **TOTAL** | | **477,000** | **553,000** | **745,500** | **48.9** |

**NOTES:**
N/A – Not Available
1. There is 212,000 square feet of parking and circulation space adjacent to the main facility, with an additional 63,000-square-foot lot immediately west of NE Airtrans Way.

**SOURCES:**
Port of Portland, March 2024 (geographic information system); Port of Portland, March 2024 (lease data).

Boeing leases a 26.8-acre area located at the south end of Runway 3-21. The site includes a 266,900-square-foot hangar and 348,000 square feet of apron space. The facility is used to paint Boeing aircraft.

Horizon Air's operations base, training facility, and maintenance facility are located on a 16.0-acre leasehold immediately south of the GRE. The hangar provides 147,700 square feet of space, and the apron is 271,000 square feet.




LEGEND:

- Airline Support
- (1) Deicing Treatment Facility
- (2) Airline Consortium Fuel Farm
- (3) Empire Airlines (Bldg 7909)
- (4) West Cargo Complex (Bldgs 7710 – 7800)
- (5) East Cargo Complex (Bldgs 7802 – 8120)
- (6) United Airlines Ground Service Equipment Maintenance (Bldg 9137)
- (7) Flight Kitchen (Bldg 7201)
- (8) United Airlines Aircraft Maintenance (Bldgs 7757, 7759)
- (9) Ground Run-up Enclosure
- (10) Horizon Air (Bldgs 8070, 8074)
- (11) Menzies Aviation (Bldg 8133)
- (12) Boeing (Bldg 4635)
- (13) Ameriflight (Bldg 5961)
- (14) Fuel Island
- Airport Support
- (15) Aircraft Rescue and Firefighting (Bldg 5250)
- (16) Port Administrative Offices (Bldg 7200)
- (17) Airport Traffic Control Tower (Bldg 7108)
- (18) Response Operation and Coordination Center (Bldg 7240)
- (19) Consolidated Receiving and Distribution Center (Bldg 8975)
- (20) Airport Maintenance (Bldgs 6440, 7109 – 7119, 7210)
- (21) Federal Aviation Administration Offices (Bldg 7303)
- Facilities Used for Main Terminal Project Support
- (22) Building 5420
- (23) Building 8855
- (24) Building 9009
- (25) Building 7640
- (26) Building 7755
- (27) Buildings 8540 and 8580

SOURCES: Port of Portland, Airport Layout Plan, June 2021; JMG Consulting, LLC, December 2024.

North

0 1,500 ft

**Exhibit 8-1**

Airline Support and Airport Support Facilities

Drawing: C:\Users\jgueh\OneDrive\Documents\Project Files\PDX Master Plan\3- Existing conditions and data gathering\CAD files\Exhibits for existing conditions report\Exhibit xx - Cargo GA support facilities - Updated.dwgLayout: Exhibit 8-1 Plotted: Nov 19, 2024, 10:40AM

United Airlines leases a 3.0-acre site adjacent to the ORANG area south of Runway 10R-28L. The site features two facilities: a 5,000-square-foot office building and a 34,500-square-foot hangar that is be used to perform aircraft maintenance. The facilities were previously part of the ORANG area and reverted to the Port in 2016. United Airlines also leases 37,000 square feet of apron immediately in front of its hangar. The apron can accommodate aircraft up to the Boeing 757.

Ameriflight leases a 3.1-acre site in the Airtrans Center, where it performs aircraft maintenance out of a 15,800-square-foot hangar.

Lastly, Empire Airlines performs aircraft maintenance out of Building 7909, located in the GA area, and it leases 2,300 square feet of office space, 8,000 square feet of hangar space, and 4,500 square feet of apron space.

### 8.1.2 Ground Run-up Enclosure (GRE)

The noise produced by aircraft engine run-up maintenance tests is of concern to the Airport's surrounding community, especially during nighttime hours. To reduce noise exposure from these tests, the airlines conduct engine run-up tests inside a sound-insulated GRE. The GRE was constructed in 2001 adjacent to Taxiway J. The three-sided enclosure measures 55 feet high, 236 feet wide, and 291 feet deep and is large enough to accommodate an ADG IV aircraft.

### 8.1.3 Flight Kitchen

LSG Sky Chefs provides in-flight catering amenities to some passenger airlines serving the Airport. LSG Sky Chefs leases a 40,000-square-foot facility on a 3-acre site located on the south side of the Airport, west of the intersection of NE 82nd Avenue and NE Alderwood Road. Catering vehicles access the AOA at Gate SA15.

### 8.1.4 Ground Service Equipment (GSE) Storage and Maintenance

GSE maintenance facilities are primarily located in the PDX Cargo Center. Horizon Air leases 21,900 square feet of space in the East Cargo Complex for GSE repair activities. Several tenants in the West Cargo Complex, listed in **Table 8-2**, provide GSE services as well, occupying 39,900 square feet of building space.

United Airlines leases a 12,900-square-foot GSE maintenance facility located on a 1.7-acre site along NE Airport Way, off the end of Runway 28R.

On-site surveys indicated GSE is also stored in ad-hoc locations throughout the Airport, such as the remote parking aprons.

### 8.1.5 Fuel Farm and Fuel Dispensing Systems

The Airport's fuel farm, which provides storage for fuel used by air carrier aircraft, is located off NE Marine Drive, immediately west of the ARFF facility. There are three aboveground Jet A storage tanks (two 840,000-gallon tanks and one 1,680,000-gallon tank) for a total storage capacity of 3,360,000 gallons of fuel. PDX Fuel Company, LLC, owns the storage tanks in addition to the distribution system that provides fuel to the fuel islands and the terminal apron hydrant system. PDX Fuel Company, LLC, retains Menzies Aviation to operate and manage its fuel distribution system from the tanks to the rest of the Airport.

Jet fuel is pumped to the fuel farm by an underground pipeline system, owned and maintained by Kinder Morgan Portland Jet Line, LLC, from a transfer facility located at Willbridge Cove along the Willamette River. Jet fuel is then pumped from the storage tanks to various sites throughout the Airport via an underground distribution system. Aircraft parked at the terminal contact gates receive fuel via an underground hydrant system.

## Table 8-2 Ground Service Equipment Storage and Maintenance Facilities

| Exhibit 8-1 Number Key | Building Number | Building Description | Tenants | Building Area (sq ft) | Landside Area (sq ft) | Apron (sq ft) | Total Site Area (acres) |
|---|---|---|---|---|---|---|---|
| 4 | 7710–7800 | West Cargo Complex | All tenants | 53,900 | 39,200 | 15,900 | 3.5 |
| | | Ground service equipment (GSE) tenants | Alliance Group International (AGI) | 5,200 | 3,000 | 2,000 | |
| | | | Alaska Airlines | 2,300 | - | 2,000 | |
| | | | Alvest Equipment Services (AES) | 4,800 | 3,000 | 2,000 | |
| | | | Delta Air Lines | 2,900 | - | 1,900 | |
| | | | Elite Line Services | 7,700 | 5,300 | 2,000 | |
| | | | PrimeFlight Aviation Services | 7,000 | 3,000 | 2,000 | |
| | | | United Airlines / Prospect Airport Services | 10,000 | 7,900 | 3,900 | |
| | | Other tenants / unleased | | 14,000 | 17,000 | 100 | |
| 5 | 7802–8120 | East Cargo Complex | All tenants | 73,400 | 35,200 | 64,500 | 6.5 |
| | | GSE tenants | Horizon Air | 21,900 | 11,200 | 16,200 | |
| | | Other tenants | | 51,500 | 24,000 | 48,300 | |
| 6 | 9137 | United Airlines – GSE | | 12,900 | 21,800 | 36,000 | 1.7 |
| | **TOTAL** | **GSE TENANTS ONLY** | | **74,700** | **55,200** | **68,000** | |

**SOURCES:**
Port of Portland, March 2024 (lease data); Port of Portland, PDX Cargo Center Space Allocation Overall View, June 2023.

There are two fuel islands on the Airport:

- One island is located at the intersection of Taxiways J and C. This installation provides jet fuel to the trucks used to fuel aircraft parked at the Airtrans Center.
- One island is located immediately east of Concourse E. This fuel island is used to fuel GSE and fill tankers that fuel aircraft at gates not connected to the hydrant system.

Menzies Aviation occupies Building 8133, located on a 1.3-acre site on NE Airtrans Way at the Airtrans Center. The building provides 5,600 square feet of office space, and the adjacent lot is used for storage of fueling trucks.

### 8.1.6 Deicing Facilities

Deicing of aircraft during winter weather takes place at the gates. After deicing operations, the glycol is collected by glycol recovery vehicles, which vacuum up runoff from aircraft deicing and anti-icing operations. The remainder of the runoff is collected by the Airport's drainage system, where it is then treated and discharged into either the Columbia Slough or the Columbia River. More detailed information on the deicing operations and the fluid collection system can be found in Section 10.6.2.

## 8.2 AIRPORT SUPPORT FACILITIES

The following subsections describe the Airport support facilities.

### 8.2.1 Airport Maintenance and Equipment Storage

The primary airport maintenance campus is located on a 24-acre site northwest of the intersection of NE 82nd Avenue and NE Alderwood Road, off the southeast end of Runway 28L. The campus consists of six buildings, as listed in **Table 8-3**, for a combined total of 79,200 square feet of shop and administrative space:

- Building 7109 - Maintenance hazardous materials storage building. The facility is used to manage, process or contain hazardous materials coming into or leaving the PDX campus.
- Building 7111 - Maintenance administration and shops building. The facility includes administrative offices on east side and shop spaces, including electrical, weld, vehicle, and general maintenance shops, on the west side
- Building 7113 - Maintenance yard and paint building. It houses the paint shop, landscape shop and lamp storage.
- Building 7115 - Maintenance equipment, sand, and bulk storage building. The south end of the building houses the chemical barn, while the rest of the space is used by the storeroom and the electrical group to store and maintain airfield lighting equipment.
- Building 7117 - Maintenance vehicle wash building.
- Building 7119 - Maintenance vehicle barn and parts storage building. The building houses large maintenance equipment, as well as administrative and general maintenance vehicles.

In addition to the maintenance buildings, the site also houses several specialized utilities and operations areas, including an unleaded/diesel fueling island, a high-pressure compressed natural gas fueling station, liquid deicer storage tanks and dispensing system, a gravel laydown area for large equipment, and vehicle storage.

The Maintenance Annex is located on the south side of NE Alderwood Road, across the street from the main maintenance campus. It currently houses the building maintenance group. The facility accommodates a metal shop, wood shop, signage shop, meeting space, break spaces, crew desks, and offices.

The Myers Marx building is located about 0.5 miles south of the main maintenance campus along NE 82nd Avenue. The building is in an advanced state of deterioration and is difficult to supervise due to its remote location. Therefore, it is only used to store items of infrequent use. The building is scheduled to be demolished in 2028.

The Maintenance Campus Master Plan, completed in 2018, assessed the utility, constructability, and affordability of a consolidated maintenance campus. This document served to inform the PDX 2045 analysis related to maintenance facilities.

**Table 8-3 Airport Maintenance Facilities**

| Location | Building Number | Building Description | Building Area (sq ft) | Total Site Area (acres) |
|---|---|---|---|---|
| Main campus | 7109 | Maintenance hazardous materials storage building | 3,500 | 24.0 |
| | 7111 | Maintenance administration and shops building | 38,600 | |
| | 7113 | Maintenance yard and paint building | 7,200 | |
| | 7115 | Maintenance equipment, sand, and bulk storage building | 10,200 | |
| | 7117 | Maintenance vehicle wash building | 1,500 | |
| | 7119 | Maintenance vehicle barn and parts storage building | 18,200 | |
| Secondary locations | 6440 | Myers Marx | 18,000 | 1.5 |
| | 7210 | Maintenance annex | 8,000 | 0.6 |
| | 7802–8120 | East Cargo Complex | 4,600 | 0.1 |
| **TOTAL** | | | **109,800** | **26.2** |

**NOTE:**
N/A – Not Available
**SOURCE:**
dbc architecture inc., PDX Maintenance Facilities Building/Site Inventory and Operational Assessment, September 2015.

### 8.2.2 Port of Portland (Port) Administrative Offices

Port headquarters are located in a three-level building on top of the P2 long-term parking garage, east of the P1 short-term parking garage. The facility, built in 2010, provides 205,000 square feet of space.

### 8.2.3 Consolidated Receiving and Distribution Center (CRDC)

The CRDC is located in a 31,000-square-foot building, Building 8975, along NE Airport Way, east of the Hampton Inn.

Implementation of the main terminal project resulted in the need to relocate the loading docks that were previously located at the terminal building. The Port decided to relocate the delivery functions outside the main terminal construction zone and to build a permanent CRDC. The CRDC started operating in 2019 and is currently managed by Bradford Airport Logistics. The CRDC eliminates the inefficiencies, impacts, and security concerns of concessionaires individually handling their deliveries through the terminal and airfield.

### 8.2.4 Response Operation and Coordination Center (ROCC) and Police

The ROCC is located within the RCC. The RCC, which opened in 2021, is a four-level facility adjacent to the P3 long-term parking garage. The first floor is the customer service center for rental car operators. The top three levels of the facility are used for Airport support functions, including the ROCC, providing 67,000 square feet of space allocated as follows:

- Second floor: TSA
- Third floor: Port Police
- Fourth floor: Port Security Badging Office, Aviation Security, ROCC which includes the PDX Communications Center and the Emergency Operations Center

### 8.2.5 Aircraft Rescue and Firefighting (ARFF) Facilities

Personnel at the PDX ARFF facilities are responsible for all Airport firefighting and emergency medical services. The main ARFF facility is located in the northwest corner of the Airport. The 30,600-square-foot primary ARFF facility contains space for living quarters, administration, training, and equipment storage. It also includes six 10-foot bays (26 feet deep), seven 16-foot bays (42 feet deep), and one 24-foot bay (42 feet deep) for washing vehicles. Other ARFF facilities include a live fire training facility located north of Taxiway B near the end of Runway 10R, a hazardous materials building located off the northeast corner of the Colwood Golf Course (located off-Airport), a boat house and rescue boat on the Columbia River, and an alert shelter located off the Colwood Golf Center and south of the Runway 28L end.

ARFF equipment is required at Part 139 airports, and enough equipment is needed to meet requirements for the Airport's ARFF Index. PDX is currently classified as Index E, which indicates the longest aircraft using the Airport on a scheduled basis is 200 feet in length.

### 8.2.6 Federal Aviation Administration (FAA) Facilities

FAA staff at PDX primarily operate from the ATCT and TRACON facility, located near the parking garages and the terminal roadway loop. The initial level of aircraft departures and the final level of aircraft arrivals are controlled from the ATCT. ATC at the Airport is managed through air/ground communications and visual signaling from the ATCT. The Portland TRACON (P80) is located in the base building of the tower. A 7,800-square-foot building adjacent to the TRACON facility and ATCT provides space for administrative functions.

Additional FAA offices are located in an 11,000-square-foot building near the intersection of NE 82nd Avenue and NE Alderwood Road.

### 8.2.7 Facilities Used on a Temporary Basis for the Main Terminal Project Support

Several facilities are currently used by the main terminal project team and will therefore be vacated once the project is completed (anticipated in 2026). The following buildings are currently used by the main terminal project:

- Building 5420: This building is 10,100 square feet and is located immediately east of the ARFF facility.
- Building 9009: This 33,000-square-foot building was vacant until it was repurposed to support the main terminal project. It is currently occupied by JE Dunn and Daifuku.
- Building 8855: This facility is the former Delta Air Lines cargo building and provides 64,000 square feet of space.
- Building 7640: This 50,000-square-foot building was formerly used by the USPS, before construction of the new USPS processing and distribution center off Airport property at the intersection of NE Cornfoot Road and NE Alderwood Road.
- Building 7755: This 8,400-square-foot building located next to the United Airlines maintenance hangar is currently used for storage.

- Buildings 8540 and 8580: These buildings, also known as the Elrod hangars, and the associated apron are currently used for the storage of GSE and passenger boarding bridges that were removed due to the main terminal project. They are scheduled to be demolished in fiscal years (FYs) 2026 and 2027.
- Laydown area: A temporary laydown yard was built on the north side of the airfield to facilitate the construction of the roof for the new main terminal.

# 9. Oregon Air National Guard

The Airport is home to the 142nd Wing of the ORANG. The military installation at PDX, sometimes referred to as the Portland Air National Guard, is the North American Aerospace Defense Command's principal Aerospace Control Alert location in the Pacific Northwest. A total of 1,506 personnel are assigned to the 142nd Wing of the ORANG.

The ORANG site is located on a 222-acre site on the south side of the Airport, along NE Cornfoot Road, as shown on Exhibit 7-1. The site is leased from the Port, and it shares runways and taxiways with PDX. Airfield facilities specifically for ORANG use include the following:

- **Cable arresting system**: Runway 10R-28L is equipped with a cable arresting system at both runway ends: 2,000 feet from the Runway 28L end and 1,650 feet from the Runway 10R end.
- **Arm/de-arm holding pad**: This pad is located on Taxiway C between C1 and C3 and is used for arming aircraft immediately before take-off and for disarming weapons retained or not expended after the aircraft's return.

The ground lease with ORANG terminates in 2063, with the exception of Parcels 38 and 39. These two parcels are scheduled for reversion in 2030. Parcel 38 is located immediately east of the United Airlines maintenance hangar. Parcel 39 is located at the intersection of NE Cornfoot Road and NE Mary Olson Way, and it currently accommodates several facilities (Buildings 475, 491, 495, 496, 497, and 498) that are scheduled for demolition in 2028, prior to lease expiration in 2030.

The 60-building campus includes facilities for refueling, light repair, and staging of aircraft. The ORANG site also provides vehicle maintenance facilities and other support equipment, as well as facilities and staff to maintain roadways, structures, and grounds.

Currently, 20 F-15 Eagle aircraft are based at the ORANG site . These aircraft are slated to be replaced by a squadron of up to 24 F-15EX Eagle II aircraft. The basing of the F-15EX aircraft will require the demolition, construction, and upgrade of several facilities[1]. Major projects will include the construction of a new hangar and connecting apron, a new simulator facility, and new support buildings.

The scope for PDX 2045 includes the ORANG site to the extent that the planning team needs to ensure the site is sufficient in size for ORANG to perform its mission. However, PDX 2045 does not include any planning work inside the boundaries of the ORANG campus as the site is planned, developed, and managed by the Department of the Air Force.

[1] Department of the Air Force, Final Environmental Assessment for Basing F-15EX Eagle II First Operational Combat Squadron at Portland Air National Guard Installation, Portland, Oregon (May 2024).

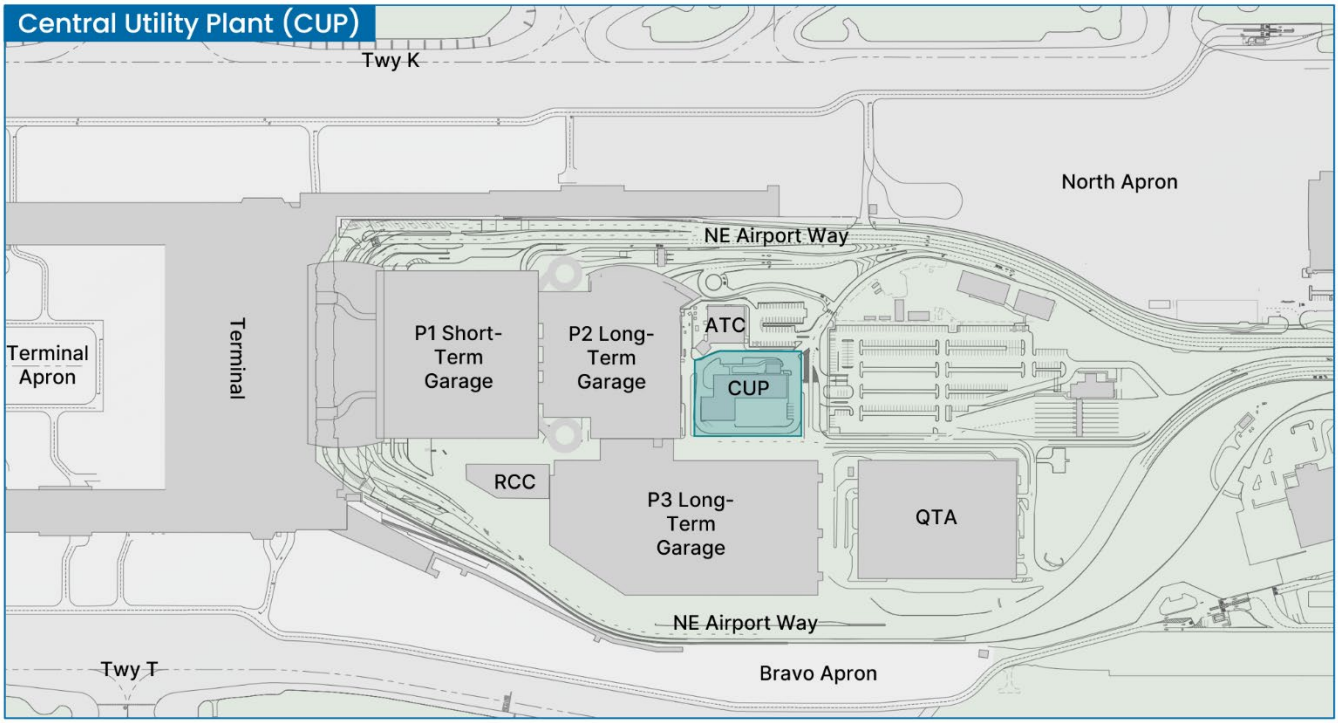
# 10. Utilities

This section outlines the condition of the six major utility systems at PDX including the Central Utility Plant (CUP), the electrical system, the natural gas system, the telecommunications system, the sanitary sewer system, and the stormwater system.

## 10.1 CENTRAL UTILITY PLANT

The Airport's Central Utility Plant (CUP) is the central collection point for three current power feeders, emergency diesel generators, heating and cooling systems, and telecommunication utilities. The CUP provides power to the terminal, concourses, QTA, Rental Car Center, and parking facilities. Via tunnels, the CUP provides the heating and cooling needs for the terminal, concourses, and adjacent supporting areas. It is located just east of the P2 long-term parking garage between the westbound and eastbound lanes of NE Airport Way, as shown in **Exhibit 10-1**.

### Exhibit 10-1 Central Utility Plant




**NOTES:**
ATC – Air Traffic Control; QTA – Quick Turnaround Area; RCC – Rental Car Center

**SOURCE:**
Ricondo & Associates, Inc., November 2024.

The CUP has been upgraded multiple times since its construction in 1972:

- CUP Expansion in 1992

  The CUP was first upgraded with an expanded steam power system, emergency power systems, and a 1,700-square-foot boiler house. The two-story addition provided approximately 2,300 square feet of space for five 10-megawatt generators and switchgear equipment.
- CUP Steam and Emergency Power Systems Expansion in 1994

- CUP Stratified Thermal Energy Storage (TES) Expansion – Phase 2[1] in 1998

  The CUP was expanded to increase the capacity of the steam and chilled water system to meet the demand of the existing facilities and expanded terminal facilities.
- CUP Boiler and Fuel System Upgrades in 2012
- CUP 15-Kilovolt (kV) and 5-kV Switchgear Upgrade in 2014

  Most of the 15-kV incoming primary switchgear was replaced with modern circuit breakers and protection relays.
- CUP Chilled Water Capacity Upgrades in 2016

  Cooling towers in the exterior yard were replaced, and one additional chiller was installed.

The 2024 Central Utility Plant Phase 1 Resilient Options Investigation and Preliminary Cost Estimates Report investigated multiple options to address the seismic integrity of the CUP. This study reviewed the cost and feasibility to retrofit the existing facility, demolish the current CUP and construct a new CUP, or retrofit the existing CUP and add a decentralized second CUP for resiliency.[2] Furter investigation is ongoing to determine how to improve the resiliency of the CUP.

## 10.2 ELECTRICAL SYSTEM

Pacific Power supplies the main power feed to the Airport via four 12.47-kV alternating current 3-phased lines. These feeds connect to the Airport from the south via the Cully Substation, Kennedy Substation, and Killingsworth Substation, and from the east via the Alderwood Substation. The Kennedy, Killingsworth, and Alderwood Substations are the primary feeds, and the Cully Substation is a support feed. The Parkrose Substation is also a support feed during emergency operations. The CUP distributes electricity from the Alderwood and Killingsworth Substations, with each backed up by the Cully Substation during normal operations. All three lines go into the CUP, and two are online at any one time. The CUP provides power to the terminal through a duct bank and distributes electricity to airfield facilities from a series of regulators in the CUP.[3] The Kennedy feeder is routed directly into the terminal, and the Killingsworth feeder is split in the airfield and routed to both the CUP and terminal.

The 2017 Utilities Master Plan identified that the 4,160-volt switchgear in the CUP, which provides power to the heating, ventilation, and air-conditioning (HVAC) system, is one potential point of failure due to its age and the fact that components within it are nearing obsolescence.[4] There is built in redundancy, such that if the CUP building and electrical equipment were impacted, the majority of facilities at the Airport could still be provided with power from the Killingsworth and Kennedy feeder network.

As of the 2017 Utilities Master Plan, the emergency power system was not metered. Therefore, determining the load flows for the emergency power system could only be estimated by calculating the typical load values for Airport systems and building types. Future emergency generator capacity was calculated using the estimated existing loads on a watt-per-square-foot basis.[5]

There is not a single point of failure for the standby and emergency power systems because of the configuration with multiple main and tie breakers in the emergency switchgear. The most vulnerable point of failure is the programable logic controller (PLC) for the generators; however, the PLC was upgraded about five years ago. The four standby diesel generators provide backup for airfield lighting (one generator) and other critical standby and life-safety loads (three generators) and include 5-kV emergency switchgear.[6]

[1] Port of Portland, Utilities Master Plan, Appendix F, 2017.
[2] Port of Portland, Central Utility Plant Phase 1 Resilient Options Investigation and Preliminary Cost Estimates, 2024.
[3] Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.
[4] Port of Portland, Utilities Master Plan, 2017.
[5] Port of Portland, Utilities Master Plan, 2017.
[6] Port of Portland, Utilities Master Plan, 2017.

**Exhibit 10-2** shows the overhead electrical lines throughout the Airport system and outside the Airport boundaries. It also shows the in-pavement lights on the airfield and the location of the Kennedy, Cully, Killingsworth, and Alderwood Substations.

## 10.3 NATURAL GAS SYSTEM

The Airport receives natural gas from NW Natural at three main locations via four lines. The terminal and support facilities are served via a 4.5-inch line and a 2.0-inch line that run parallel to each other and enter Airport property along NE 82nd Avenue, south of the intersection with NE Alderwood Road and continuing along NE 82nd Avenue to the intersection with NE Airport Way. The two lines run along NE Airport Way until just east of the CUP where they tie together. Both lines provide 60 pounds per square inch gauge (psig) level of service. The Airtrans Center is served by a 2.0-inch line off NW Cornfoot Road that runs north along NW Airtrans Way to the Airtrans Center. Finally, the Southwest Quadrant is served by a 2.0-inch line that runs east along a vacated portion of NE Elrod Road, then north along the vacated portion of NE 47th Avenue.[7] **Exhibit 10-3** shows the natural gas pipes that service the Airport and where they enter the Airport property.

NW Natural owns and maintains the main lines up to the meters. The terminal has a 6-inch 10- psig main servicing it. At and beyond the meters, the system is owned and maintained by the Port. At the meters, the system branches into a 6-inch line, regulated at both 2 psig and 5 psig, which serves the terminal complex. The system also branches into a 6-inch 15-psig line and 2-inch 5-psig line that serve the CUP. Along these main service lines are multiple tees, valves, and pipe spools serving each building and concourse level, with a range of sizes from 1.5 to 6.0 inches in diameter and 2 to 5 psig.[8]

## 10.4 TELECOMMUNICATIONS SYSTEM

Lumen (formerly CenturyLink) provides telecommunications, including telephone and internet, to the Airport via a service cabling pathway that enters at both the CUP and terminal building's Room T1196.[9] There is a redundant cabling loop between Room T1196 and the CUP. Additionally, there is adequate cabling between both control rooms and between the network rooms and headquarters at the Airport. The CUP serves as a centralized facility for Lumen with thousands of copper- and fiber-based analog and digital equipment for PDX-based customers, including the Port, airlines, tenants, and government entities (FAA, CBP, TSA, etc.).[10]

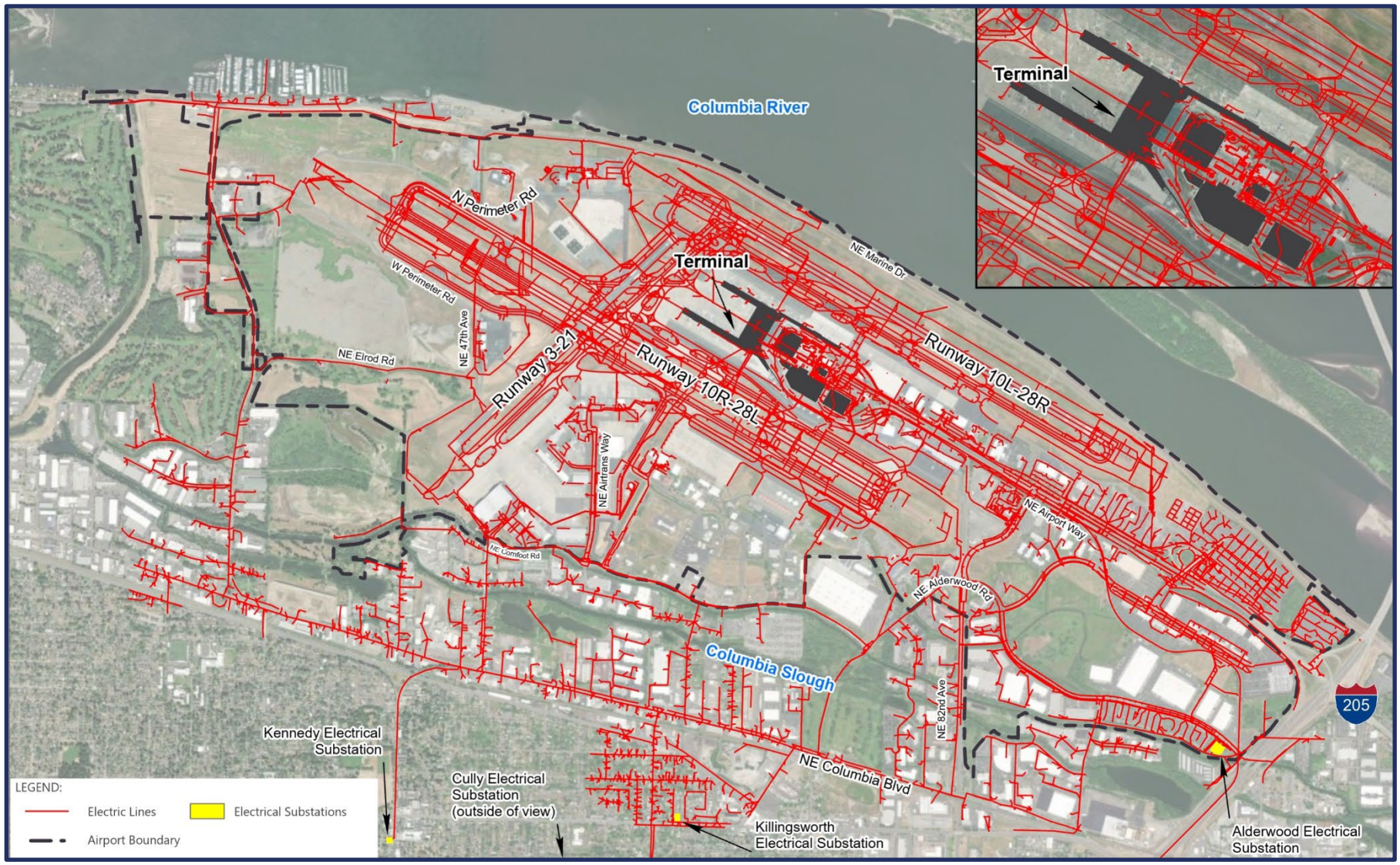
Given the adequate redundant cabling, pathways, hardware, and service provider locations, there is not a single point of failure for telecommunications within PDX. However, because the Airport relies exclusively on Lumen as a provider, the single-source provider could be seen as a potential single point of failure.

## 10.5 SANITARY SEWER SYSTEM

The sanitary sewer system serving the Airport terminal building, facilities along NE Airport Way, and Airtrans Center are owned and operated by the City. The City's sanitary sewer system starts on the Airport as it accepts discharge from two sanitary lift stations located under the elevated Upper Roadway adjacent to Concourse B. The sewer system starts as an 18-inch reinforced concrete force main pipe and runs past the intersection of NE Airport Way and NE 82nd Avenue. At that point it becomes a 36-inch cast iron gravity pipe that runs to NE 105th Avenue and then southeast along NE 105th Avenue to the Holman Pump Station just west of I-205. This main line also services PDX and other private facilities along NE Airport Way through numerous smaller (6- to 14-inch) service lines running parallel to the main line. The Alderwood Pump Station, located near the maintenance facilities, is planned to be replaced in 2026.

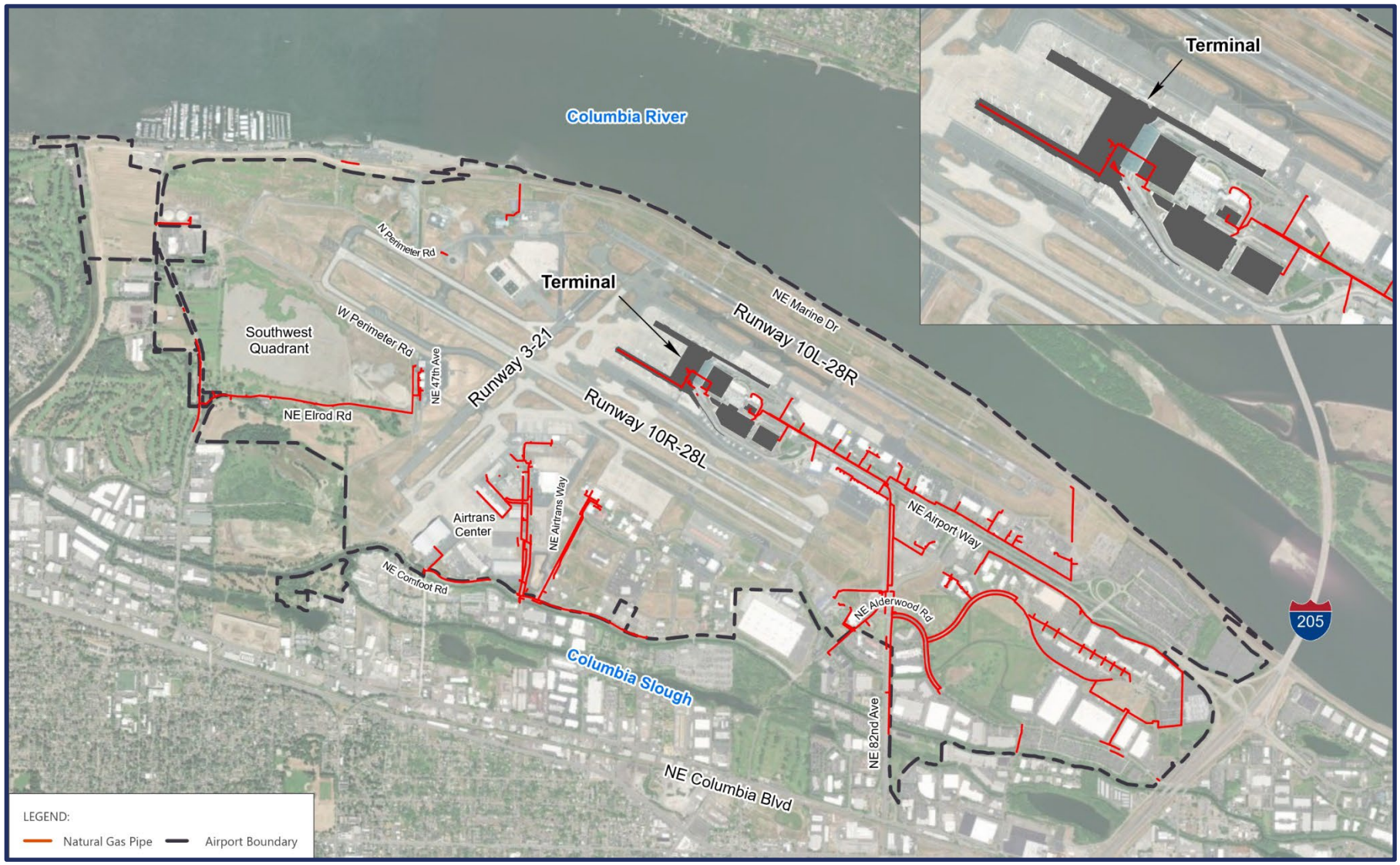
[7] Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.
[8] Port of Portland, Utilities Master Plan, 2017.
[9] Port of Portland, Central Utility Plant Phase 1 Resilient Options Investigation and Preliminary Cost Estimates, 2024.
[10] Port of Portland, Central Utility Plant Phase 1 Resilient Options Investigation and Preliminary Cost Estimates, 2024.

## Exhibit 10-2 Electrical System




**SOURCE:**
Port of Portland, April 2024 (geographic information system data).

## Exhibit 10-3 Natural Gas System




**SOURCE:**
Port of Portland, April 2024 (geographic information system data).

Airtrans Center is serviced by a combination of gravity and force main lines running from NE Cornfoot Road north along NE Airtrans Way. Sanitary waste from the Airtrans Center flows into a City line running along NE Airtrans Way to a small lift station. From there, wastewater is transferred to a Port line crossing the airfield to a pump station on the airfield near Taxiway B. An ORANG line also leads to this airfield pump station. Waste is then pumped to the sanitary lift station, as previously noted.[11] **Exhibit 10-4** shows the sanitary pipe network, outfalls, and lift stations at PDX, with an inset showing the terminal in more detail.

The future utility system load requirements for the sanitary sewer system serving the terminal area were evaluated using the 2017 Utilities Master Plan. All lift stations and force mains have the capacity to handle existing peak flows, with lift station A4LS-1 receiving the largest flows in the system, which come from the terminal processor and Concourses C, D, and E. Most pipes within the system are below 50 percent usable capacity, except sanitary lines A6, A7, and A9. All three of these lines are located in the main terminal. Lines A6 and A7 exceed pipe capacity at peak flows, and A9 was estimated to be operating at approximately 85 percent capacity.[12] These pipe segments have been flagged for replacement to meet current demand.

## 10.6 STORMWATER SYSTEM

The stormwater system at PDX consists of drainage facilities and deicing facilities, as described in the following subsections. Stormwater from PDX discharges either directly into the Columbia Slough or into tributaries of the slough.[13]

### 10.6.1 Drainage System

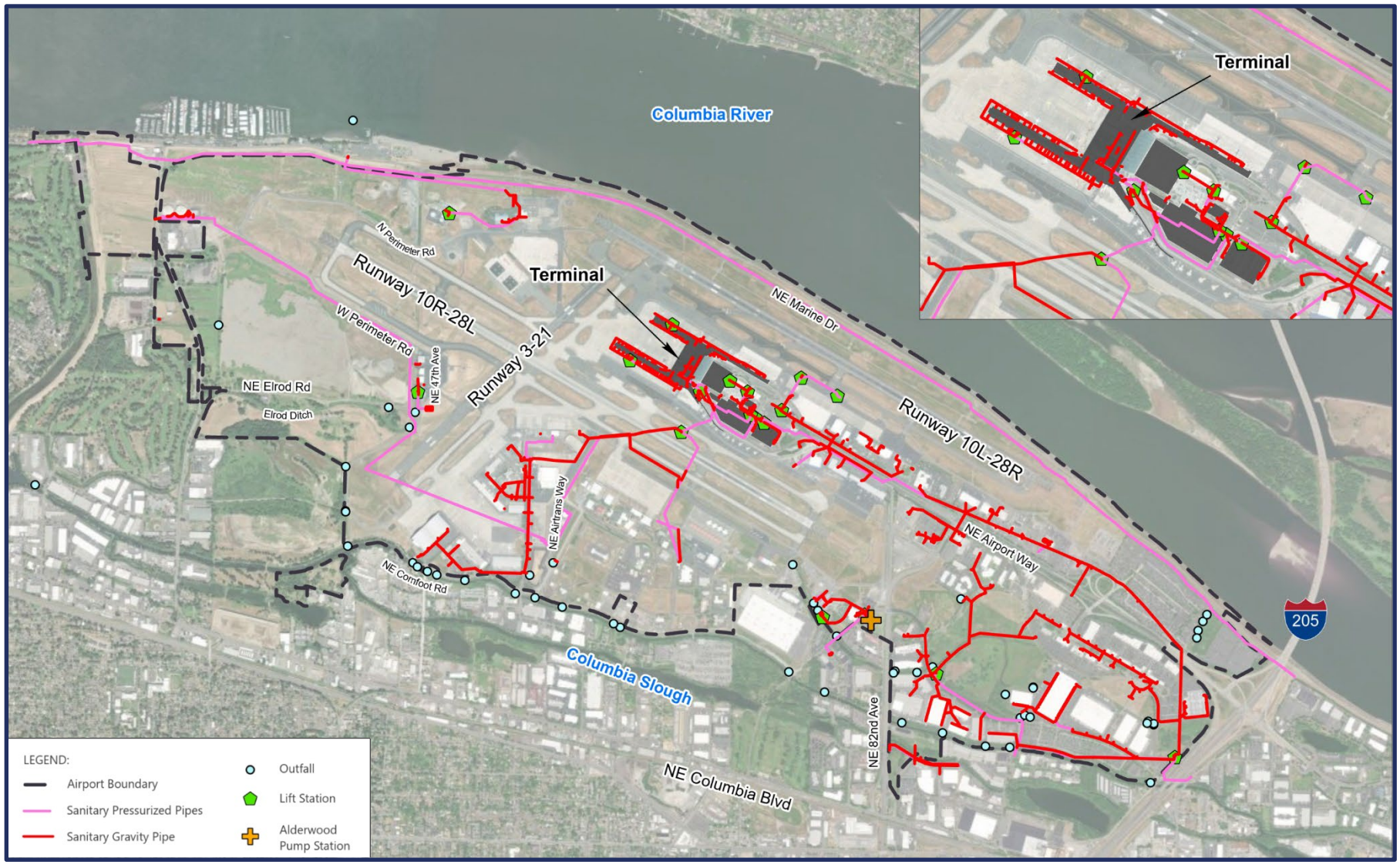
PDX is divided into nine drainage basins as shown in Exhibit 10-4, each with one or more major subbasins where stormwater leaves Airport property. **Table 10-1** describes the catchment area and outfall for each drainage basin. The total catchment area that is discharged through the Port's outfalls is approximately 3,700 acres, which includes runoff from areas not owned or managed by the Port. The stormwater drainage system comprises both closed pipes and open drainage ditches. [14]

Generally, stormwater flows from north to south toward the middle section of the Columbia Slough. From the middle section of the Columbia Slough, water flows or is pumped to the lower section of the Columbia Slough via the Urban Flood Safety and Water Quality District (UFSWQD) Pump Station 1. The lower section of the Columbia Slough flows into the Willamette River and eventually to the Columbia River.[15] The Airport has three quiescent ponds that collect and settle sediments from stormwater runoff and serve as containment for any potential spills. In addition to the quiescent ponds, two detention ponds retain stormwater during major rain events to reduce peak flow to the slough.

**Exhibit 10-5** shows the stormwater pipe and vault network for PDX. It also shows the drainage basins throughout the Airport, the location of the pump stations referenced in the following subsection, the quiescent ponds, and the location of the UFSWQD Pump Station 1 that conveys stormwater from PDX.

[11] Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.
[12] Port of Portland, Utilities Master Plan, 2017.
[13] Port of Portland, Stormwater Pollution Control Plan, 2022.
[14] Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.
[15] Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.

## Exhibit 10-4 Sanitary Sewer System




**SOURCE:**
Port of Portland, August 2024 (geographic information system data).

## Table 10-1 (1 of 2) Drainage Basins

| Drainage Basin | Description | Outfall |
|---|---|---|
| 1 | This basin is the most western drainage basin at PDX. It is divided into three subbasins: 1E, 1N, and 1S. Subbasin 1E conveys stormwater to the Elrod ditch from Hangars 8580, 8540, and Bonneville Power Administration's hanger, as well as their associated aprons. Subbasin 1N includes portions of Runways 10R-28L and 10L-28R; Taxiways D, H, and K; Perimeter Road; ARFF; fire training facility; PFFC fuel farm; and deicing system dilute storage tanks, treatment plant, and pump stations. Subbasin 1S discharges to the Elrod ditch and drains portions of pavement adjacent to the ARFF facilities; portions of Taxiways B, C, E, G, M, and T; and portions of Runway 3-21. | The basin has three major discharge points: one to the Southwest Quadrant ditch and two outfalls through the Elrod ditch. |
| 2 | Drainage Basin 2 is located on the southwestern side of the airfield and includes the southern portion of Runway 3-21; Taxiways E and F; central apron; PFFC remote fuel island; UPS buildings and apron; and deicing Pump Station F. This basin drains to the west quiescent pond and then to the west detention pond. | Stormwater is conveyed through a quiescent pond before discharging to the Broadmore ditch. |
| 3 | The area covered by Basin 3 is located on the southwestern side of the airfield and borders the Columbia Slough. Basin 3 includes the Airtrans Cargo Center buildings and apron, the parking lot adjacent to the PD ACC1 cargo building, as well as deicing Pump Station G. | Stormwater is conveyed from this basin through a quiescent pond before discharging to the Columbia Slough. |
| 4 | This basin is the smallest basin on the Airport and is located on the southwestern side of the airfield, adjacent to the Columbia Slough. All areas within Basin 4 are leased by Boeing. This basin collects drainage from the Boeing hangar and apron, as well as the adjacent parking lot. | The basin discharges directly to the Columbia Slough south of the Boeing hangar. |
| 5 | This basin is located outside the airfield security fence and is one of the central southern basins. Multiple cargo facilities operate in this basin, as well as the Airport's largest mobile fuel provider. Facilities and operations include the landside portions of the Airtrans Cargo Center. There are multiple oil-water separators and water quality vaults and one large, vegetated swale that provide stormwater treatment. | This basin discharges directly to the Columbia Slough off NE Cornfoot Road. |
| 6 | This is the third largest basin at PDX; it is in the central area of the airfield. Basin 6 is divided into four subbasins: 6G, 6H, 6J, and the ORANG basin. Subbasin 6G includes the middle portion of Runway 10R-28L and Taxiway J; portions of Taxiways B and C; Gates B and C and south D gates; a portion of the P1 short-term parking garage; Horizon Air maintenance building and associated apron; US Air Force Reserve buildings and apron; GRE; the terminal building; deicing concentrated storage tanks; dilute detention basin; and deicing pump stations. Subbasin 6H includes the United Airlines hangar roof and apron. Subbasin 6J includes the United Airlines hangar roof and parking lot. | Stormwater from ORANG discharges into the lower east detention pond, just above Pump Station 6. Subbasin 6S discharges into the east quiescent pond, above the location where the ORANG stormwater discharges into the Port of Portland's (Port) detention basin. |

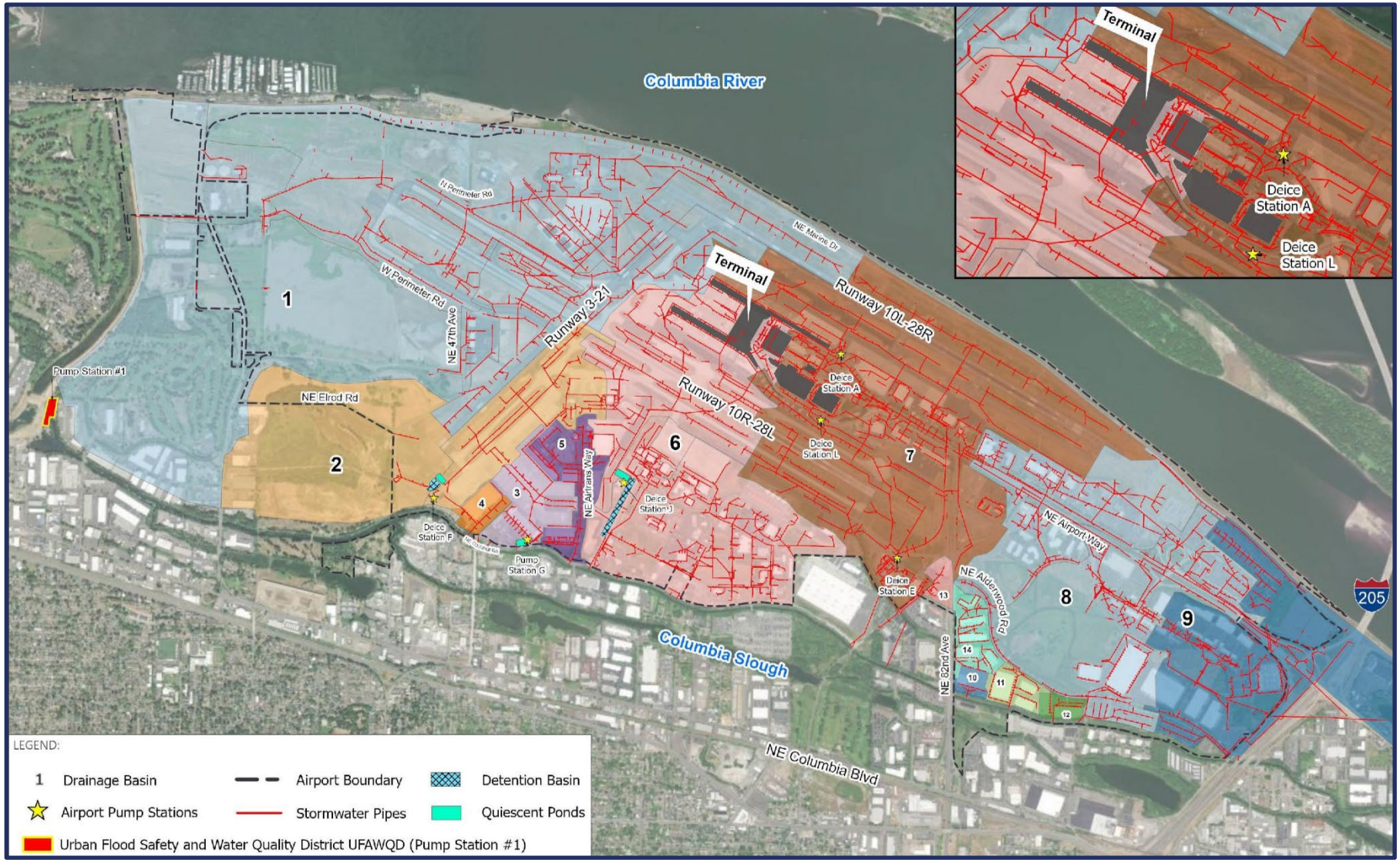
## Table 10-1 (2 of 2) Drainage Basins

| Drainage Basin | Description | Outfall |
|---|---|---|
| 7 | Drainage Basin 7 has four subbasins: 7A, 7B, 7C, and 7D. Subbasin 7A is the largest and covers the following: Runway 10L-28R and east portion of Runway 10R-28L; GA, north, bravo, and southeast aprons; Taxiway A and portions of Taxiways B and C; Gates A and E and north D gates; TNC parking lot; a small portion of the Port maintenance facility, including the hazardous materials building, CUP, and PDX Cargo Center; and NE 82nd Avenue, NE Airport Way, and NE Air Cargo Road. Subbasin 7B is approximately 3.8 acres and contains a portion of the PDX maintenance facility. Subbasin 7C is adjacent to NE Alderwood Road and contains the LSG Sky Chefs building and parking lot. Subbasin 7D contains the employee parking lot for the PDX maintenance facility. | There are three discharge points from this basin to the McBride Slough, which then flows into a culvert and hard pipe to the Columbia Slough. |
| 8 | This basin covers the PIC; parking lots and rental car companies; Sheraton Hotel, Hampton Inn, and Embassy Suites; United Airlines maintenance facility; Port central storage facility; and TriMet MAX light rail. | One detention pond captures runoff from NE Cascades Parkway, then discharges to an open ditch. The west half of the employee parking lot off NE Alderwood Road discharges to Outfall 8. |
| 9 | This basin covers the PIC, Cascade Station retail center and parking lots, and TriMet MAX light rail. | The majority of Basin 9 drains through two detention ponds before discharging to the Columbia Slough. A storm pipe that collects runoff from properties east of Interstate 205 not owned by the Port discharges into the east detention pond. |

**NOTES:**
ARFF – Aircraft Rescue and Fire Fighting; CUP – Central Utility Plant; GA – General Aviation; GRE – Ground Run-Up Enclosure; ORANG – Oregon Air National Guard; MAX – Metropolitan Area Express; PFFC – Portland Fueling Facilities Corporation; PIC – Portland International Center; TNC – Transportation Network Company; TriMet – Tri-County Metropolitan Transportation District of Oregon; UPS – United Postal Service

**SOURCES:**
Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010; Port of Portland, Stormwater Pollution Control Plan, 2022.

## Exhibit 10-5 Stormwater System




**SOURCE:**
Port of Portland, August 2024 (geographic information system data).

### 10.6.2 Deicing Facilities and Fluid Collection System

PDX's deicing fluid collection system began in 2003. The system operates between October 1st and May 31st. Concentrated deicing discharges get pumped from pump station (PS)-A, PS-C, PS-D and PS-L to the concentrated storage tanks (CST-1, CST-2).[16] CST-1 is a two-million-gallon storage tank and CST-2 is a three-million-gallon storage tank for a total of five-million in storage capacity.[17] From the concentrated storage tanks, the concentrated deicing fluid is pumped through PS-J to the concentrated treatment plant before eventually out-falling to Portland's sanitary sewer at the Columbia Boulevard Wastewater Treatment Plant.[18] The deicing treatment facility was constructed in 2010 on the west side of the Airport, along NE 33rd Drive, off the end of Runway 10R. It uses anaerobic treatment technology to treat concentrated effluent prior to discharge to the City's sanitary system in compliance with permit requirements. The material can also be removed from the Airport by being offloaded to a tanker truck via the truck load-out facility near the concentrated storage tanks.[19] A summary of the Airport's concentrate system can be found in **Table 10-2** and the concentrated deicing infrastructure at PDX is illustrated on **Exhibit 10-6**.

Dilute deicing fluid is discharged from the airport to the Columbia Slough or the Columbia River. If the real-time total organic carbon (TOC) measurements exceed its threshold or the TOC discharge to the Columbia Slough exceeds cumulative daily, weekly or monthly flow-based limits, the pump stations diverts flow away from the Columbia Slough to the Columbia River.[20] Diverted dilute deicing fluid from PS-F, PS-G, PS-6 and PS-E enters the Dilute Detention Basins (DDB) and then is pumped to two dilute storage tanks (DST-1, DST-2) via PS-I. PS-N and PS-S also divert dilute deicing fluid to DST-1 and DST-2. PS-P pumps dilute deicing fluid from DST-1 and DST-2 to the Columbia River. A summary of the Airport's dilute system can be found in **Table 10-3** and the dilute deicing infrastructure at PDX is illustrated on **Exhibit 10-7**.

[16] Portland International Airport Deicing System Map, Port of Portland. 2023.
[17] Detailed Collection, Conveyance and Storage Training PowerPoint, Port of Portland. 2010.
[18] Detailed Collection, Conveyance and Storage Training PowerPoint, Port of Portland. 2010
[19] Portland International Airport Deicing System Map, Port of Portland. 2023.
[20] Portland International Airport Deicing System Map, Port of Portland. 2023.

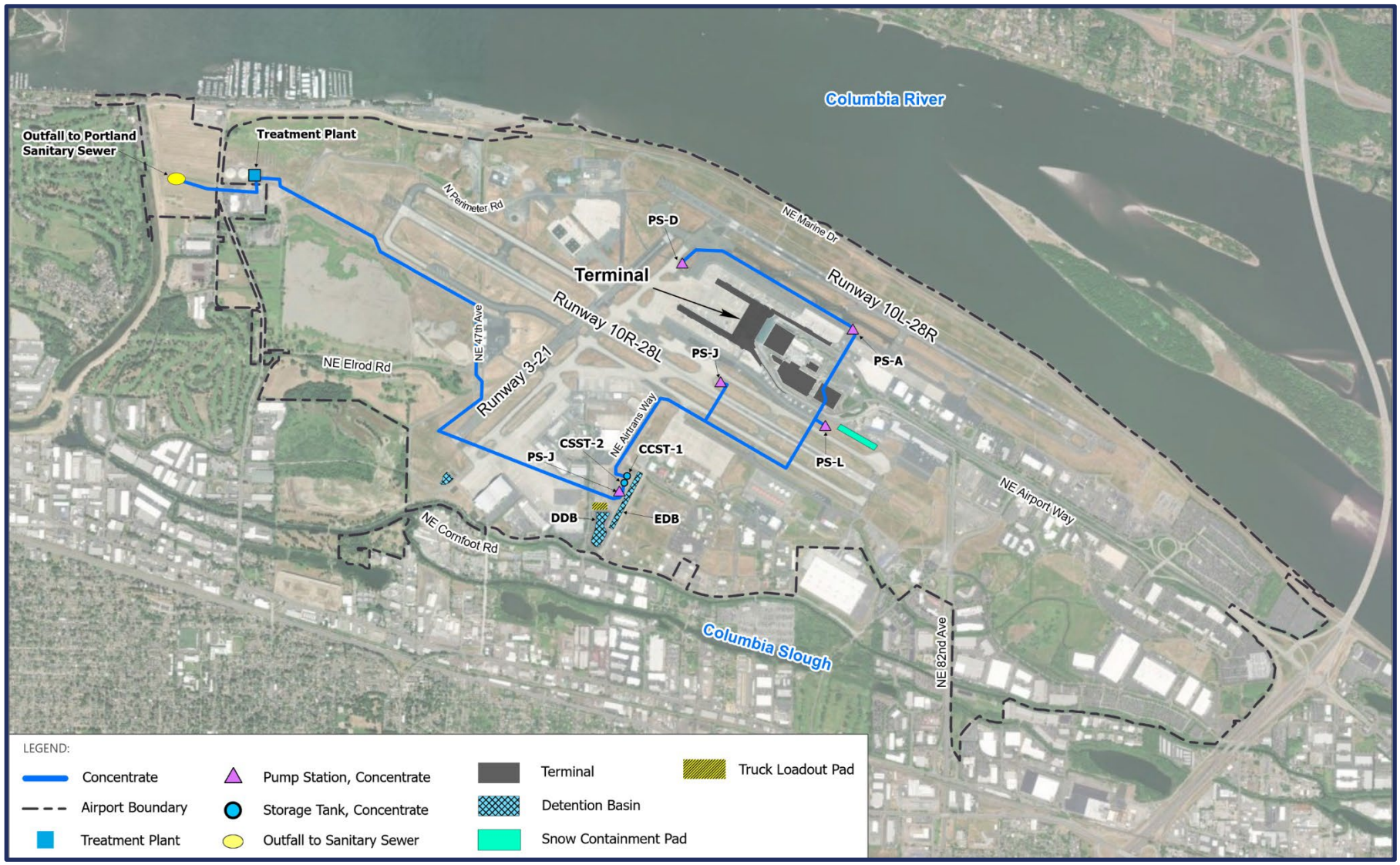
## Table 10-2 Deicing System Infrastructure – Concentrate System

| Description | Location | Purpose | Size |
|---|---|---|---|
| Pump Station A (PS-A) | Wet Well – Airside: east of Taxiways A and V intersection<br>Building – Airside: adjacent to perimeter Gate NA09 at the southwest corner of the north apron area | Collect and convey stormwater affected by aircraft deicing fluid to the CST. | 5.76 MGD design capacity |
| Pump Station C (PS-C) | Wet Well – Airside: between Taxiway B and Runway 10R-28L, east of Exit B5<br>Control Room – Airside: located beneath terminal in Room T-1783A<br>BIOX Enclosures – Airside:<br>– C-East apron level adjacent to Gate C3<br>– C-West apron level adjacent to Gate C19 | Collect and convey stormwater affected by aircraft deicing fluid to the CST. | 10.10 MGD design capacity |
| Pump Station L (PS-L) | Wet Well – Airside: east of Concourse B apron, north of Taxiway B, and south of Perimeter Road<br>Building – Airside: at east end of Concourse B apron | Collect and convey stormwater affected by aircraft deicing fluid to the CST. | 2.30 MGD design capacity |
| Pump Station J (PS-J) | Building – Landside: east of Taxiway J and west of ORANG | Discharge stormwater affected by aircraft deicing fluid to the sanitary sewer for treatment at the City's Columbia Boulevard Wastewater Treatment Plant.<br>Concentrate is pumped from the CST to the treatment plant through PS-J. | Up to 0.43 MGD discharge |
| Snow Containment Pad | Pad – Airside: east of PS-L, north of Taxiway B, and south of Perimeter Road | Provides location for snow affected by aircraft deicing chemicals to be deposited by the truck following collection from around terminal.<br>Drains into PS-L wet well. | 3 acres of asphalt pavement |
| CST-1; CST-2 | Tank – Landside: east of Taxiway J and west of ORANG | Provides storage of stormwater affected by aircraft deicing fluid prior to treatment at the deicing treatment facility and then discharge to the City of Portland's sanitary sewer for additional treatment. | 5-million-gallon capacity between two tanks (2-milion in CST-1, 3-million in CST-2) |
| Truck Load-Out Pad | Pad – Landside: southwest of the southern end of Taxiway J, east of NE Airtrans Way, and north of dilute detention basin | Provides infrastructure to facilitate off-site disposal of stormwater affected by aircraft deicing fluid from the CST. | 265-gallons-per-minute throughput capacity |

**NOTE:**
CST – Concentrated Storage Tank; MGD – Million Gallons per Day; ORANG – Oregon Air National Guard

**SOURCE:**
Port of Portland, Portland International Airport Master Plan Update, Inventory of Existing Conditions Technical Memo, 2010.

## Exhibit 10-6 Deicing Fluid Collection System - Concentrate




**SOURCE:**
Port of Portland, August 2024 (geographic information system data).

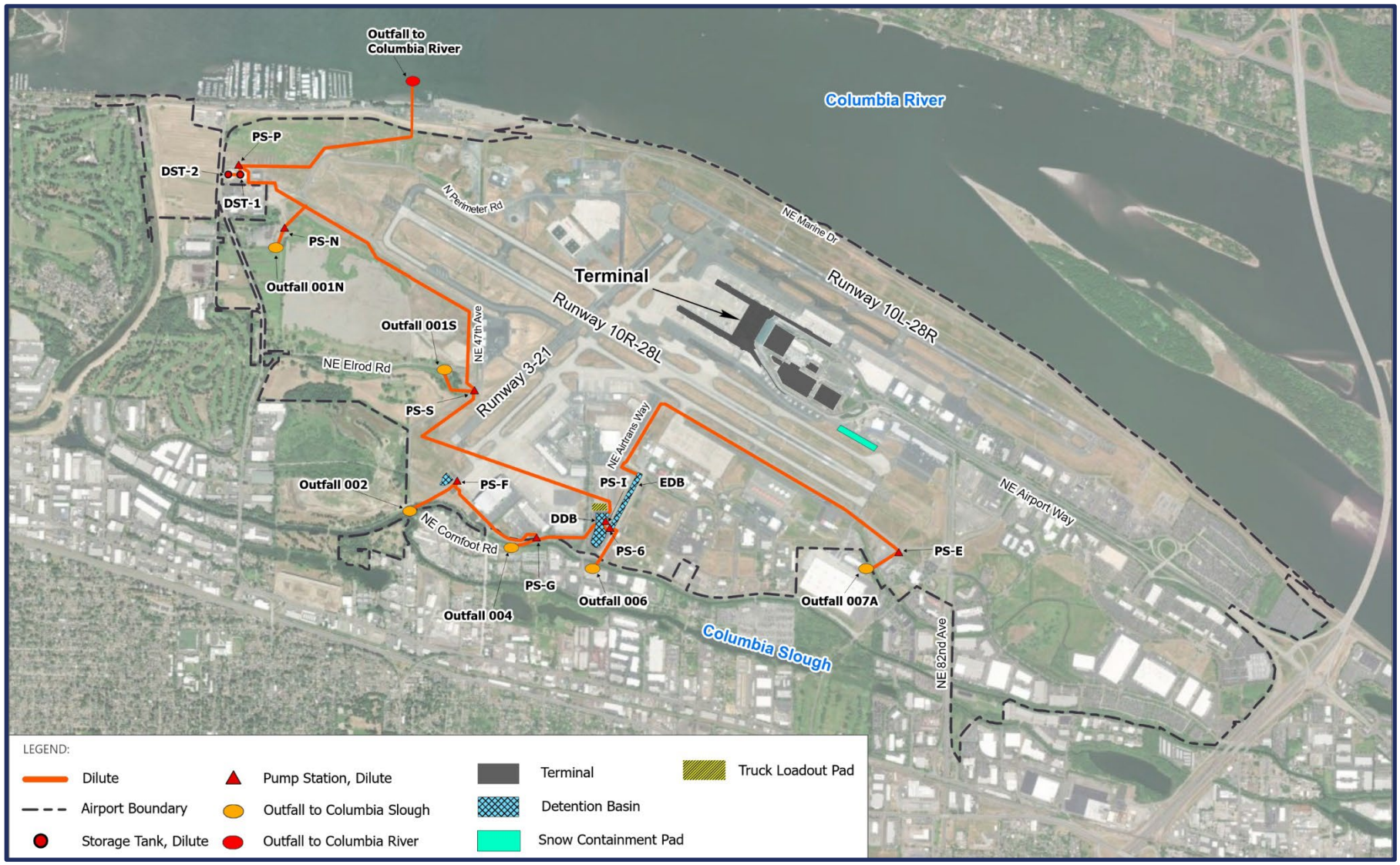
## Table 10-3 Deicing System Infrastructure – Dilute System

| Description | Location | Purpose |
|---|---|---|
| Pump Station P (PS-P) | Just north of the DST-1 and DST-2 and west of NE 33rd Dr. | Monitor TOC, pump dilute deicing fluid from the DSTs to the Columbia River Outfall. |
| Pump Station N (PS-N) | Just southeast of the Kliever Armory and southeast of the airfield perimeter road | Monitor TOC, pump dilute deicing fluid to the DSTs. |
| Pump Station S (PS-S) | Just south of the intersection of NE Alrod Rd and NE 47th Ave. | Monitor TOC, pump dilute deicing fluid to the DSTs. |
| Pump Station F (PS-F) | To the west of the Boeing Paint Hanger and south of the Runway 3 end of Runway 3-21 | Monitor TOC, pump dilute deicing fluid to the DDB. |
| Pump Station G (PS-G) | Just south of the FedEx Shipping Center and north of NE Cornfoot Rd. | Monitor TOC, pump dilute deicing fluid to the DDB. |
| Pump Station 6 (PS-6) | | Pump dilute deicing fluid to the DDB. |
| Pump Station E (PS-E) | North of the Port of Portland's Maintenance facility and south of the airfield perimeter road | Monitor TOC, pump dilute deicing fluid to PS-6. |
| Pump Station I (PS-I) | Directly east of the DDB and west of NE Mary Olson Way. | Monitor TOC, pump dilute deicing fluid to the DSTs. |
| Dilute Detention Basin (DDB) | Just north of NE Cornfoot Rd between NE Airtrans Way and NW Mary Olson Way. | Store dilute deicing fluid. |
| Dilute Storage Tanks (DST-1, DST-2) | Just east of NE 33rd Dr and north of the Klever Armory. | Store dilute deicing fluid. |

**NOTE:**
DST – Dilute Storage Tank; MG – Million Gallons; Dilute Detention Basin (DDB)

**SOURCE:**
Detailed Collection, Conveyance and Storage Training PowerPoint, Port of Portland. 2010; Portland International Airport Deicing System Map, Port of Portland. 2023

## Exhibit 10-7 Deicing Fluid Collection System – Dilute




**SOURCE:**
Port of Portland, August 2024 (geographic information system data).

# 11. Additional Planning Considerations

This section describes several other planning considerations that are unique to the Port and PDX that may potentially influence PDX 2045.

## 11.1 DEMOGRAPHIC AND SOCIO-ECONOMIC CONSIDERATIONS

Demographics and socio-economic factors play a critical role in shaping planning and development strategies that ensure airports effectively meet the needs of the communities and markets they serve. While the categories of demographic and socio-economic factors vary, common examples include population size and growth trends, employment levels, Gross Domestic Product or regional economic output, racial and ethnic compositions, languages spoken within the community, age distribution, levels of educational attainment, income brackets, people with disabilities, and internet accessibility. These considerations are essential for understanding the characteristics of the population an airport serves. For instance, areas with a more diverse population might require multilingual services to accommodate travelers from varied linguistic backgrounds.

PDX 2045 will rely heavily on specific demographic and socio-economic analyses. These analyses will be carried out on an as-needed basis, ensuring that each phase of the planning process is informed by up-to-date, relevant data. The results of these analyses will be documented in the accompanying narratives. For instance, detailed socio-economic factors that drive aviation demand, such as trends in business activity, tourism, and population growth, will be outlined in the Aviation Activity Forecasts report. This will help forecast future aircraft operations, passenger traffic, and cargo tonnage anticipated to move through PDX.

Additionally, demographic information will play a key role in shaping the Public Outreach and Communications Plan. By understanding the key characteristics of the local population, such as their preferred languages, age groups, and internet accessibility, the Port can design more inclusive and effective communication strategies to gather input and inform the public about development plans.

Incorporating diverse demographic and socio-economic data not only helps in anticipating the needs of different passenger segments but also ensures equitable access to airport facilities and services. For example, understanding the proportion of people with disabilities in the region will guide the design of accessible airport infrastructure and services. Similarly, assessing income levels can inform decisions on the availability of airport services, such as transportation to and from PDX.

## 11.2 PORTLAND INTERNATIONAL AIRPORT (PDX) PLAN DISTRICT

Importantly, on-Airport property and areas immediately adjacent to the Airport are subject to the PDX Plan District (Plan District), adopted by the City as part of its Planning and Zoning Code. The Plan District implements elements of the Airport Futures Land Use Plan by addressing the social, economic, and environmental aspects of growth and development at PDX. PDX is a unique land use within the City and requires tailored regulations to address wildlife hazards and impacts to transportation and natural resources. The Plan District provides flexibility to the Port to address a constantly changing aviation industry, while addressing the broader community impacts of operating an airport in an urban context.

Key aspects of the regulations include the following:

- Additional runways are prohibited. A legislative project to amend the Plan District would be required to construct new runways. The legislative project would require the City and Port to engage the regional community in a cooperative effort to create a development plan for PDX that addresses transportation and infrastructure needs, as well as community impacts, by exploring alternatives to

a potential third runway.[1]

- Extending, widening, or reconfiguring existing runways, taxiways, or airfield roadways is allowed.[2]
- New commercial passenger terminals with passenger processing facilities are allowed only if they have access directly from NE Airport Way; otherwise, they are prohibited.[3]
- An Airport Transportation Impact Analysis Review is required for any proposed development in the General Industrial (IG2) zone once PDX begins serving more than 21 million annual passengers.[4]
- A Southwest Quadrant Public Services Review is required when a proposal will increase development on the landside of the Southwest Quadrant by more than 40,000 square feet. [5]

Other requirements, such as landscaping, pedestrian movement areas, and development standards, also apply within the Plan District. [6] Additional information on the Airport setting can be found in section 1.4.

## 11.3 CULTURAL RESOURCES

Cultural resources are an important consideration for all Port planning efforts. The Portland-Vancouver region was inhabited for thousands of years prior to the arrival of European settlers in the late 1700s. The lower part of the Columbia River Basin was a natural gathering place for Indigenous tribes from across the northwestern US. The Columbia and Willamette Rivers provided a rich source of salmon, roots, and edible plants, which were traded widely among northwestern Indigenous peoples.

The south shore of the Columbia River, where the Airport is located, is significant to the Chinookan people. It is estimated that the Chinookan populations reached 17,840 in 1800, one of the highest Indigenous population densities in the Columbia River Basin. Of special importance is the Columbia Slough, located on the south side of PDX, which was a critical waterway used for trading, fishing, and travel. The State of Oregon protects areas of historical significance through State Land Use Goal 5, "Natural Resources, Scenic and Historic Areas, and Open Spaces." Goal 5 states that "cultural area refers to an area characterized by evidence of an ethnic, religious, or social group with distinctive traits, beliefs, and social forms."[7]

Cultural resources can be easily buried, disturbed, or destroyed by natural causes or through human activity. Low-lying areas have flooded frequently over time, sometimes destroying historic buildings and landscapes naturally. The exact location of remaining areas of significance (including ancestral burial grounds and village sites) are not published to protect them from disturbance and/or looting.

## 11.4 NOISE MANAGEMENT

A detailed environmental overview will be completed for PDX 2045, including development of new existing and future noise contours. Detailed environmental overviews are typically conducted while alternatives to accommodating aviation demand are being developed, so that relevant information can be gathered for the specific alternatives being addressed. However, as Airport noise extends beyond the Airport property boundary, a summary of noise management at PDX is required for context.

Efforts to reduce aircraft noise impacts related to operations at PDX are documented in the PDX CFR Part 150 Noise Compatibility Study Update[8]. The CFR Part 150 noise compatibility study is a voluntary noise exposure and land use study that airport operators use to assess aircraft noise and mitigate noise impacts and noncompatible land use around airports.

[1] City of Portland, Portland International Airport Plan District, Chapter 33.565, March 1, 2020.
[2] Ibid.
[3] Ibid.
[4] City of Portland, Portland International Airport Plan District, Chapter 33.565, March 1, 2020.
[5] Ibid.
[6] Ibid.
[7] Oregon Department of Land Conservation and Development, Goal 5 Rule for Cultural Areas, October 19, 2023.
[8] Barnard Dunkelberg & Company, Portland International Airport – Noise Compatibility Study, 2002.

As part of the CFR Part 150 process, which is similar to the master planning process, aircraft noise impacts on surrounding communities are quantified and evaluated. Noise exposure maps are developed for a baseline year, as well as five years into the future, to address projected noise impacts. Compatibility between aircraft operations and noise-sensitive land uses is addressed through recommendations that include operational measures (e.g., noise abatement procedures) and land use compatibility measures (e.g., noise mitigation procedures, such as soundproofing).

The most recent PDX CFR Part 150 study update was approved by the Port Commission in August 2005. It was then approved by the FAA in June 2007 and updated in July 2010[9]. Recommendations in the study included revising current aircraft departure and arrival procedures, working with the Cities of Portland and Vancouver to enhance local noise overlay ordinances, limiting the development of new noise-sensitive land uses within the noise impact overlay zones, and developing a FlyQuiet program, which is intended to encourage pilot participation in the PDX noise abatement program.

To implement the recommended measures from the CFR Part 150 study, the Port actively monitors aircraft noise exposure, educates stakeholders about aircraft noise, and responds to inquiries and complaints regarding aircraft noise. This education and outreach effort is conducted through collaboration with the local communities and industry stakeholders.

To assist the community in learning more about noise issues, the Port supports the Citizen Noise Advisory Committee (CNAC). The CNAC is the official forum to address the community's aircraft noise concerns. Local jurisdictions and the Port appoint the 15-member committee to represent residential and business concerns. CNAC was organized in 1998 as an official Port advisory committee on aircraft noise issues.

CNAC members review noise abatement projects, provide input for the implementation of the current Airport Noise Compatibility Plan, develop ideas and recommend proposals for consideration in future Airport noise plans, participate on advisory committees involved in long-range Airport facilities and capital improvement planning, and promote understanding of Airport noise issues.[10]

[9] Port of Portland, https://cdn.portofportland.com/pdfs/Prj_PDX_Prt_150_NEM_1-3.pdf (accessed November 2024).
[10] Port of Portland, https://www.portofportland.com/Committees/CNAC (accessed May 2024).