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CHAPTER A

Inventory of Existing Conditions

Introduction.

The City of Renton is located on the south shore of Lake Washington, in King County, Washington. It is the fifth largest city in King County, and the 11th largest city in the State of Washington. The City of Renton is centrally located in the greater Puget Sound Region, approximately 11 miles southeast of downtown Seattle.

In the 1920s, Renton Municipal Airport existed as a short turf runway called Bryn Mawr Airport. The first aircraft manufactured in Renton was the Boeing XPBB-1 Sea Ranger, built for the U.S. Navy, in 1941. By 1943 the U.S. Navy traded the Renton manufacturing site to the U.S. Army, where Boeing workers produced over 1,100 B-29 Superfortress aircraft. In 1947, through the Surplus Property Act of 1944, the United States of America deeded the rights and assets of the Defense Plant Corporation to the City of Renton. Renton Municipal Airport has since evolved into a busy General Aviation (GA) airport with seaplane facilities as well as Boeing 737 manufacturing facilities.

As the Airport was transferred to the City of Renton, The Boeing Company maintained the Airplane Programs manufacturing site adjacent to the Airport. In 1952, Boeing developed the Boeing 367-80 prototype, from which the Boeing 707 was developed. During the 1960s, Boeing developed the 727 and 737 with production occurring at Renton. In 2005, the Airport was renamed Clayton Scott Field to celebrate the 100th birthday of Clayton Scott, a local aviation pioneer whose flying career dates back to the Airport's very early days.

The purpose of this Airport Layout Plan (ALP) Update with Narrative Report is to provide a physical development plan for the next seven to ten years that will identify space for potentially needed facilities, provide an on-airport land use plan and be compatible with the environment, land uses adjacent to the Airport, other modes of transportation and other airports in the region. The focus will be on the total aviation facility and its environs, with the overall planning goal being the development of an aviation facility that can accommodate future demand, is not significantly constrained by its environs, and does not adversely impact its surroundings.

Airport Role and Facilities

Renton Municipal Airport (RNT) is owned by the City of Renton and managed by the City of Renton Public Works Department. The Airport consists of one single runway, a full-length parallel taxiway, a partial parallel taxiway, exit taxiways, aprons, hangars, and various aviation related facilities.

RNT is part of the National Plan of Integrated Airport Systems (NPIAS), a national airport system plan developed by the Federal Aviation Administration (FAA), which identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants from the Airport Improvement Program (AIP). The NPIAS also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring airports up to current design standards. The current NPIAS report, *National Plan of Integrated Airport Systems (NPIAS) 2021-2025*, identifies RNT as a reliever airport. Reliever airports must have 100 or more based aircraft or have 25,000 annual itinerant operations.

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RNT is also part of the Washington Aviation System and is classified as a Regional Service Airport. In the 2017 Washington Aviation System Plan, a Regional Service Airport is defined as an airport that serves large or multiple communities, defined as a Reliever Airport in NPIAS, has 40 or more based aircraft, and at least a 4,000-foot-long runway.

RNT's location and vicinity maps are shown in **Figure A1** and **Figure A2**.

Renton Airport Advisory Committee

In 2001, City of Renton Resolution 3495 established the 15-voting member and four non-voting member Renton Airport Advisory Committee (RAAC). As of September 2021, there are 16 RAAC members (both voting and non-voting), including Neighborhood Representatives, Airport Representatives, Pilot Association Representatives, and Tenant Representatives. The RAAC members are to be appointed by the Mayor and confirmed by a majority of the members of the City Council. The RAAC convenes on a quarterly basis and will serve as the Study Committee for this planning process.

SOURCE: Google Maps 2021.

FIGURE A1 **Airport Location Map**

Renton Municipal Airport/ Clayton Scott Field

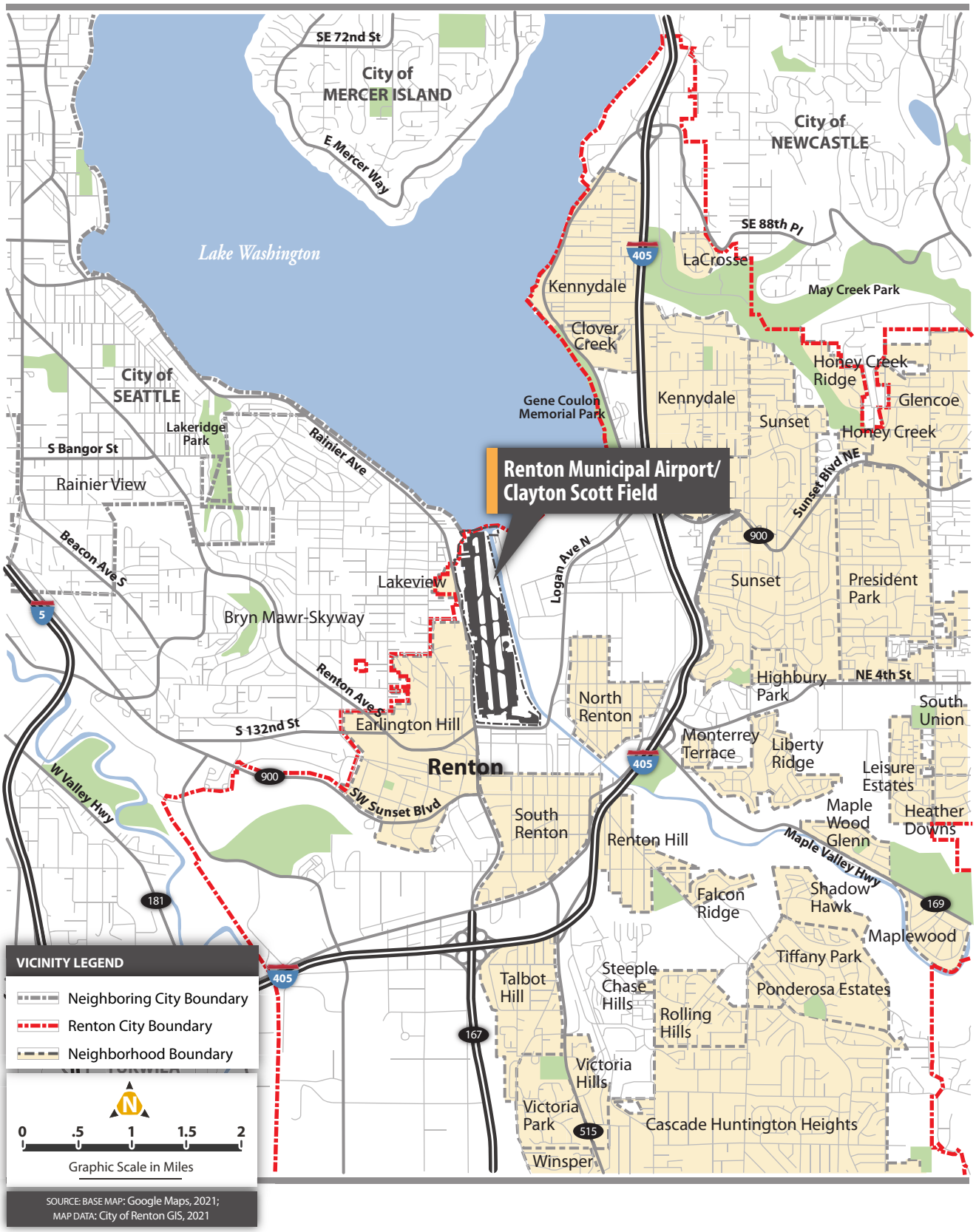

FIGURE A2 **Airport Vicinity Map**

Renton Municipal Airport/ Clayton Scott Field

Airfield

Table A1 defines the functional use and geometry of runways, taxiways, and aprons at RNT. **Figure A3** shows the existing airfield layout.

Table A1 **AIRPORT PAVEMENT INVENTORY SUMMARY**

Item	Description
Runway 16/34	▪ 5,382 feet x 200 feet ▪ Asphalt – Concrete – In good condition ▪ Published Strength: 100,000 pounds Single Wheel (SW), 130,000 pounds Dual Wheel Gear (DW), and 340,000 pounds Double Tandem Wheel
Taxiway A	▪ Full parallel Taxiway (west side of Runway 16/34) ▪ 50 feet wide ▪ Connector Taxiways A1 through A7
Taxiway B	▪ Partial parallel Taxiway (east side of Runway 16/34) ▪ 50 feet wide ▪ Connector Taxiways B3 through B7
APRONS	
Apron A	▪ East side of RNT near Taxiway B6 and the South Bridge ▪ 388,458 square feet ▪ Used by Boeing as a staging area during the manufacturing process and has sufficient parking space for seven 737s
Apron B	▪ West side of RNT near Taxiway A7 and Run Up Area ▪ 191,403 square feet ▪ Also used for manufacturing 737s and has hard stands for five 737s
Apron C	▪ West side of RNT between Taxiways A3 and A4 ▪ 319,680 square feet ▪ Used for General Aviation parking and storage
Transient Parking Apron	▪ West side of RNT adjacent to Boeing Employees Flying Association and Rainer Flight Service ▪ 97,290 square feet ▪ Provides overnight tiedown parking of up to five aircraft

SOURCE: **Mead & Hunt.**

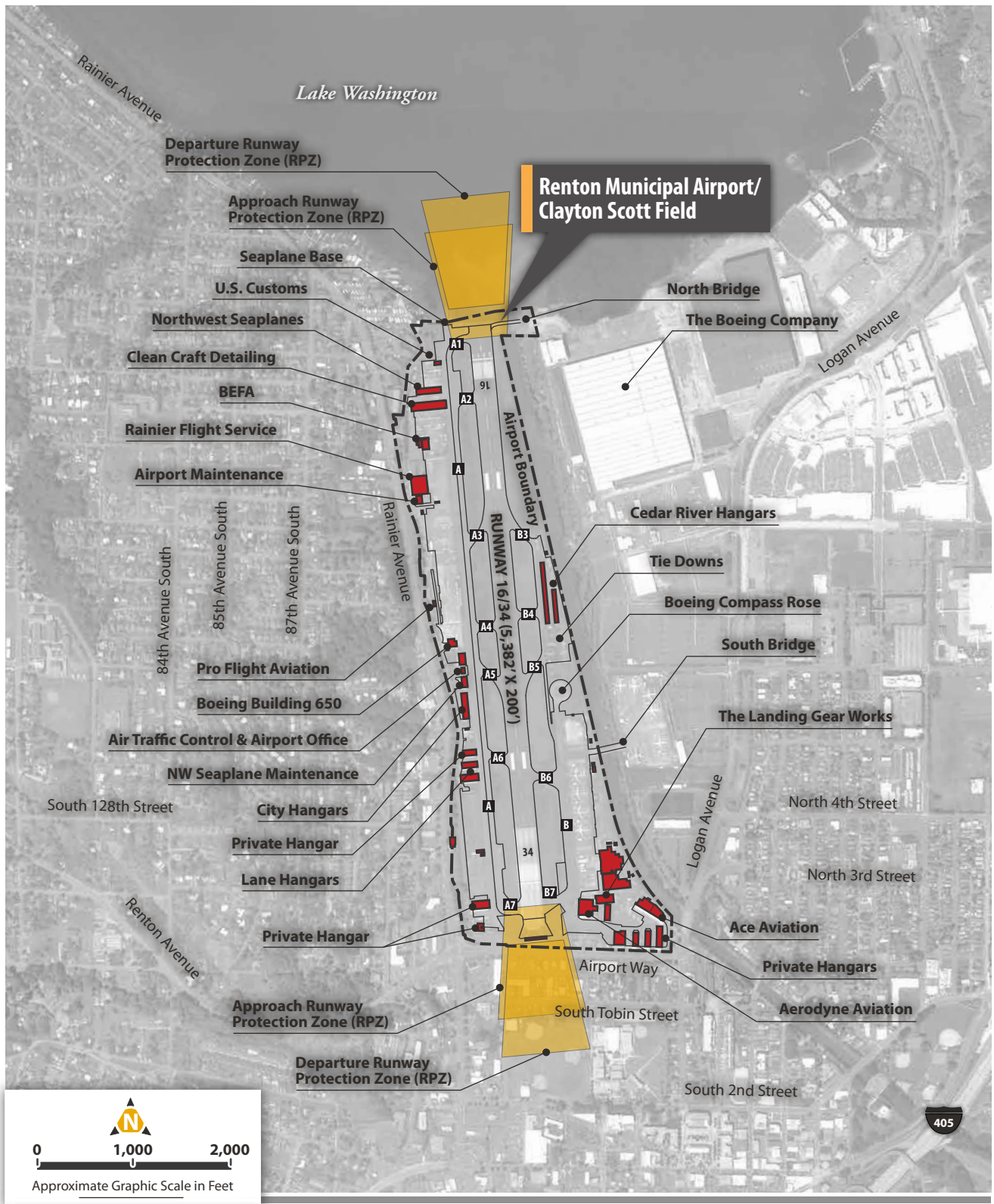

FIGURE A3 **Existing Airport Layout**

Airspace System and NAVAIDS

RNT, as with all airports, functions within a local, regional, and national system of airports and airspace. **Table A2** summarizes the airspace system facilities at RNT.

Table A2 **AIRSPACE FACILITIES INVENTORY SUMMARY**

Item		Description
Navigational Aids (NAVAIDS)	Non-Directional radio Beacon (NDB)	▪ Waton (AW) – 382.0 MHz, 35.1 nm at 184.1° ▪ Skagit/Bay View (BVS) – 240.0 MHz, 59.1 nm at 172.0°
	Tactical Aircraft Control Navigation (TACAN)	▪ McCord (TCM) – 109.6 MHz, 23.3 nm at 26.9° ▪ Whidbey Island (NUM) – 113.8 MHz, 54.8 nm at 160.7°
	Very-high frequency Omnidirectional Range (VOR)	▪ Seattle (BFI) – 180.6 MHz, 4.2 nm at 121.1° ▪ Seattle-Tacoma (SEA) – 117.5 MHz, 4.2 nm at 57.0° ▪ Seattle (BFI) – 116.8 MHz, 5.2 nm at 47.1° ▪ Paine (PAE) – 110.6 MHz, 25.7 nm at 174.4° ▪ Olympia (OLM) – 113.4 MHz, 42.0 nm at 41.5° ▪ Penn Cove (CVV) – 117.2 MHz, 49.6 nm at 155.4°
Facility Communications		▪ Flight Service Station (FSS) – Seattle (SEA) ▪ Universal Communications (UNICOM) – 122.95 MHz ▪ Common Traffic Advisory Frequency (CTAF) – 124.7 MHz ▪ Automated Terminal Information Service (ATIS) – 126.95 MHz ▪ Renton Ground – 121.6 and 256.9 MHz ▪ Renton Tower – 124.7 and 256.9 MHz
Visual Aids	Lighting	▪ Precision Approach Path Indicator (PAPI) – Runway 16/34 ▪ Runway End Identifier Lights (REILs) – Runway 16/34 ▪ Medium Intensity Runway Lights (MIRLs) – Runway 16/34 ▪ MIRL – Taxiway
	Markings	▪ Non-precision runway markings – Runway 16/34
	Misc. Aids	▪ Airport Rotating Beacon (clear and green) ▪ Wind Indicator (lighted)

SOURCE: Mead & Hunt and Airport Master Record 5010-1 (2021).

Presently, there are three straight-in instrument approach procedures published for RNT. These are listed in Table A3.

Table A3 **INSTRUMENT APPROACH PROCEDURES**

Approach	Designated Runway(s)	Ceiling Minimums (AGL)	Visibility Minimums
RNAV (GPS)	Runway 34	860’ AGL	1 mile[1], 1 ¼ miles[2], 2 ½ miles[4], N/A[5]
RNAV (GPS) – Y	Runway 16	780’ AGL	1 mile[1], 1 ¼ mile[2], 2 miles[6]
RNAV (GPS) – Z	Runway 16	526’ AGL	1 3/8 mile[3], N/A[6]

SOURCE: U.S. Terminal Procedures August 12, 2021 through September 9, 2021.

NOTE: [1] Authorized for use by Category A aircraft
[2] Authorized for use by Category B aircraft
[3] Authorized for use by Category A and B aircraft
[4] Authorized for use by Category C aircraft
[5] Authorized for use by Category D aircraft
[6] Authorized for use by Category C and D aircraft

Airspace. RNT is a controlled airport with an airport traffic control tower (ATCT). The immediate area surrounding the Airport is classified as Class D airspace. RNT airspace is unique in that it lies under the Terminal Control Area Class B Airspace of Sea-Tac International Airport (SEA). RNT Class D airspace has a ceiling of 2,500 feet Mean Sea Level (MSL) and is semi-circular in shape. The western boundary, as shown in the following illustration, is only a few hundred feet from the western airport property line to restrict operations into Sea-Tac airspace.

The airspace between 2,000 - 2,500 Feet is administered by Seattle Approach/Departure Control by a letter of agreement (LOA) with Renton Tower. An operation requesting permission to transit the Class D surface area of RNT could contact Seattle Approach/Departure Control on the appropriate frequency, and not ask Renton Control Tower for this permission.

Weather Monitoring Equipment. The RNT has an Automated Surface Observing System (ASOS), which can be monitored on the ATIS frequency of 126.95 MHz or by calling the station at (425) 255-6080. The ASOS tower is located on the east side of the Airport.

General Aviation and Seaplane Facilities

RNT not only supports aircraft manufacturing but primarily supports numerous general aviation related business and facilities. Airport tenants that offer Fixed Based Operator (FBO) services include, Ace Aviation, Aerodyne Aviation, Boeing Employee Flying Association, Clean Craft Detailing, Ellison Fluid Systems (Kaynan Inc.), Landing Gear Works, Northwest Seaplanes, Inc., Pro-Flight Aviation, and Rainier Flight Support.

Businesses currently located on the west side of the Airport include:

- **Northwest Seaplanes:** Provides scheduled and charter seaplane flights throughout the region.
- **Boeing Employee Flying Association (BEFA):** Provides use of small aircraft for personal flying and flight training to all current Boeing Employees and retirees.
- **Rainer Flight Service:** Provides flight training.
- **Pro-Flight Aviation:** Provides multiple services that include flight training and rental, Aviation Fuel (100LL and Jet A), aircraft maintenance, and car rental.
- **Puget Sound Energy:** Serves as energy provider for local area.
- **540 Renton Hangar LLC:** Provide private hangars offering storage of aircraft.
- **Lane Hangars Condo Association:** Provide private hangars offering storage of aircraft.

Businesses currently located on the east side of the Airport include:

- **Aerodyne Aviation:** Provides technical expertise in aeronautical engineering, aviation safety, unmanned aircraft systems, and flight operations.
- **The Landing Gear Works:** Provides manufacturing and improvement services of landing gear for general aviation aircraft.
- **Bosair (Ace Aviation):** Provides aircraft maintenance and repair.

Hangar Facilities. RNT has conventional and T-hangars on both the east and west sides of the field. In 2005, RNT created a policy for T-hangar leasing and a hangar waiting list, which sets guidelines for leasing T-hangars and guidance for the hangar waiting list. A one-time, non-refundable fee of $100 is collected by the Airport Office from individuals applying for the hangar waiting list. Private hangars are also located on RNT, offering private aircraft storage with direct access to the taxiways.

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Support Facilities

The quantity and type of support facilities at the RNT that encompass a broad set of functions that ensure smooth and efficient airport operation, include airport administrative offices, airport maintenance facilities, aircraft fuel storage, U.S. Customs, pilot control lighting, and the Airport Traffic Control Tower.

Airport Administration Office. The Airport Administration Office is located at 616 West Perimeter Rd in the ground floor of the control tower with an airside and landside door. Office hours are 8:00 am to 5:00 pm Monday through Friday.

Airport Maintenance Facility. The RNT Maintenance Facility is located on west side of the Airport, adjacent to Apron C and Rainier Flight Service. As the Maintenance Facility is a small building at approximately 550 square feet, the majority of the maintenance equipment is stored outside.

US Customs Service. Federal Inspection Service (FIS) is provided by the US Customs Service. U.S. Customs control the entry and clearance of aircraft arriving into the United States and inspect the crew, passengers, baggage, stores, and cargo carried. All inspections regardless of type of aircraft, must be conducted at the inspection facility, located in a portable building at the north end of the Airport. Aircraft inspections are to taxi to the inspection station and proceed inside the building. Commercial carriers must request landing rights in advance in writing, post an international carrier's bond in an amount established by Customs, and transmit the crew and passenger data electronically to Customs. As a Landing Rights Airport, Customs will respond within one hour with prior notification.

Pilot Controlled Lighting. RNT utilizes Pilot Controlled Lighting, which provides air-to-ground radio control of the airport lighting system. The pilot selects the intensity by selecting the proper frequency on the communication radio, then keying the microphone a prescribed number of times with a five second interval. The lights will remain at the selected intensity for 15 minutes if no subsequent pluses are received to change the intensity. The Pilot Controlled Lighting is available at RNT, when the ATCT is closed.

Airport Traffic Control Tower (ATCT). The FAA ATCT is located on the west side of Runway 16/34 at approximately mid-field, adjacent to Taxiway A5, and is 55 feet tall. The Control Tower is operated daily from October 1st through April 30th from 7:00 AM until 8:00 PM, and from May 1st through September 30th, from 7:00 AM until 9:00 PM.

Boeing Facilities

Aircraft Manufacturing Facilities. The *Boeing Commercial Airplane Group* assembles all lines of the Boeing 737 aircraft adjacent to RNT. Boeing is the major lease holder at the Airport. Boeing accesses the Airport through a through-the-fence agreement and two taxilane bridges over the Cedar River. The taxilane bridges are labeled as the North Bridge and the South Bridge. It is estimated that once a 737 departs the Boeing Renton manufacturing facility, it will remain on RNT property for seven days and then depart, via air, for additional manufacturing improvements.

Every Boeing 737, upon exiting the factory, is towed across the North Bridge to access the Airport. Towed aircraft cross the runway to Taxiway A1 and then proceed down Taxiway A to Boeing aircraft stalls on either the southwest or southeast side of the approach end of Runway 34. For aircraft parked on the east side of the runway, the aircraft tow will cross the runway again at Taxiway B7 and proceed via Taxiway B. Some aircraft are towed, in lieu of being parked on airport property, across the South Bridge to aircraft parking positions east of the Cedar River.

Boeing 737 aircraft ready for first flight will enter the runway at Taxiway B6 or Taxiway B7 if they originate from the east side of the runway, or Taxiway A7 if they originate from the west of the runway. Once on the runway, the aircraft crew will perform aircraft checks while taxiing to the runway end not in use (downwind taxi). At the runway end not in use, the crew apply full power, proceed down the runway a short distance, then perform a preplanned aborted takeoff. The aircraft decelerates to normal taxi speed at the conclusion of the aborted takeoff and continues to the runway end in use. Once reaching the end of the runway in use, the aircraft will turn 180 degrees on the runway, requiring full use of the 200-foot-wide runway width. The aircraft then await instructions from the ATCT for departure. Total time on the runway for each first flight is approximately 10 minutes.

Boeing 737 aircraft occasionally return to RNT, although these operations are infrequent. Usually, an aircraft will return for a mechanical issue that cannot be addressed at either Paine Field, Moses Lake, or Boeing Field. In the last five years RNT has averaged 10 annual landing operations by 737 aircraft, with the most retuning in 2020 with 44, and the least in 2019 with zero returning.

Boeing Compass Rose. The Boeing Compass Rose is located on the east side of RNT and is utilized just for the Boeing manufacturing process. The Compass Rose consists of approximately 3,332 square yards of pavement.

Access, Circulation and Parking

This section defines the quantity and type of ground access systems that serve RNT, or are served by it, such as on-airport access roads, circulation and service roads, and parking.

Vehicular Access and Parking. RNT has two main access points, one on the south side of the Airport from Airport Way, and one from the west side of the Airport from Rainer Avenue. Interior vehicular access of the Airport is conducted via Perimeter Road. Perimeter Road provides access to the aircraft manufacturing facilities as well as the general aviation facilities throughout the Airport. There are multiple vehicular parking areas spread throughout the Airport, providing parking for Boeing Employees as well as general aviation users. Prior to gaining access to RNT, a user must read the *Renton Airport Ground Vehicle Operations Rules* booklet, fill out forms, and complete the *Airport Ground Vehicle Test*. The purpose of the ground vehicle training program is to promote safe airfield driving through education. This program applies to Airport employees, tenants, and any other ground vehicle operators.

Zoning and Land Use

RNT is located less than a mile from downtown Renton and is surrounded on three sides by urban development. Planning for land use compatibility with airport development and operations requires knowledge of what land uses are proposed and what, if any, changes need to be made.

Existing Zoning. Airport property is zoned Medium Industrial in the September 2021 City of Renton GIS online database. Areas directly to the east are zoned Urban Center, a zoning type incorporating mixed use development, and Light Industrial. Additional higher-density Residential development is located adjacent to the Cedar River running parallel to Logan Avenue. To the south, Commercial Arterial, Residential, and Center Downtown are the primary zones. Zoning west of RNT includes additional Commercial Arterial, Residential, and Commercial Office. Lake Washington is located directly north of RNT.

Existing Land Use. Existing land use patterns in the area follow closely to what is portrayed on the zoning map. Land uses east of RNT include Urban Center, Industrial, and Residential uses. Urban Center land use continues to the south, as does Commercial development. Land uses to the west largely comprises of Residential, with some Commercial development along Reiner Avenue.

Future Land Use. Future land use patterns are illustrated in the 2018 Amendment to the City of Renton Comprehensive Plan, where future land uses are largely not expected to change. This map lists airport property as an Employment Area, which includes Light, Medium, and Heavy Industrial land developments. Areas east and south of RNT are to remain a combination of Commercial, Residential, and Mixed-Use designations, while areas to the west will remain mostly residential in nature. The density of zoning in each of these areas is expected to increase to accommodate increased growth and demand in the periphery of RNT.

Airport Environs Overlay Zoning

According to the Revised Code of Washington Title 36, Chapter 70, Section 547, entitled *General Aviation Airports – Siting of Incompatible Uses*, every county, city, and town in which there is located a general aviation airport that is operated for the benefit of the general public, whether publicly or privately owned, shall, through its comprehensive plan and development regulations discourage the siting of incompatible uses adjacent to such general aviation airports.

To meet this mandate the City of Renton has developed set of objectives and policies to address land use compatibility between RNT and an area of the City known as the Airport Influence Area. Under Title IV Development Regulations, Chapter 3 Environmental Regulations and Overlay Districts, Section 020 Airport Related Height and Use Regulations; the Renton Municipal Code states, in order to regulate the use of property in the vicinity of the airport, all of the land within Safety Zones 1 through 6 of shall be known as the Airport Influence Area.

Section 020 includes height restrictions and airport overlay zones based primarily on Federal Aviation Regulations (FAR) Part 77 imaginary surfaces. The overlay zones consist of Runway Protection Zone, Inner Approach/Departure Zone, Inner Turning Zone, Outer Approach/Departure Zone, Sideline Approach/Departure Zone, and Traffic Pattern Zone. As part of this ALP Update planning process, the FAR Part 77 map will be updated and consideration should be given by the City of Renton to adopting the update map for the purposed of airport height restriction and land use overlay zoning.

Environmental Overview

Environmental considerations and factors are important to review during the airport planning process when analyzing development alternatives and identifying preferred alternatives. The following sections provide brief descriptions of environmental impact categories that are pertinent to airport planning at RNT, as well as Airport-specific environmental information.

Air Quality. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), particulate matter (PM_{10}), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), and lead (Pb). According to the EPA, King County is currently designated as being "in attainment" for all criteria pollutants under the NAAQS. An attainment area is one in which air pollution levels do not exceed the NAAQS.

Future projects at airports in non-attainment areas may need to be accounted for in the State Implementation Plan and/or be shown not to exceed the applicable *de minimis* levels as defined by General Conformity. The Puget Sound Clean Air Agency has jurisdiction over the Puget Sound Basin and has established local ambient air quality standards to ensure compliance with the Clean Air Act.

Short-term air quality impacts may be expected from heavy equipment pollutant emissions, fugitive dust resulting from the movement of earth for cut and fill, any open burning that may occur on the Airport, and the operation of concrete batch plants. Contractors would be required to comply with all local, state, and federal air quality regulations, especially the procedures contained in the Federal Aviation Administration's Advisory Circular (AC) 150/5370-10A, *Standards for Specifying Construction of Airports*, which is the FAA guidance to airport sponsors concerning protection of the environment during construction projects.

Floodplains. Executive Order 11988 directs federal agencies to take action to reduce the risk of flood loss, minimize the impacts of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains.

According to Federal Emergency Management Association (FEMA) published floodplain maps, the majority of airport property is within a FEMA flood zone (either Zone X or Zone AE). Zone X indicates areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot and areas protected by levees from 100-year flood. Zone AE, which is primarily the southeast area of the Airport includes areas of 100-year flood that have base flood elevations determined. Also, the Cedar River is subject to frequent flooding and designated by FEMA as a regulatory floodway.

Historical, Architectural, Archeological, and Cultural. Section 106 of the National Historic Preservation Act requires federal agencies, or their designated representatives, to take into account the effects of their undertakings on historic properties, which include archeological sites, buildings, structures, objects, and districts. According to the Washington State Department of Archeology and Historic Preservation, Washington Information Systems for Architectural and Archaeological Records Data, there are no potentially eligible historic buildings on airport property.

It is not known whether archaeological sites are present on the airport property, as no surveys have been conducted. However, the area has high potential for such resources. The Black River once drained Lake Washington (just above the river's confluence with the Cedar River) in the Airport vicinity, prior to the Montlake Cut in 1916. There are at least five recorded Duwamish Place names in the area, including a reported village site possibly located to the northwest of the Airport property. Several sites are located just south of the airport property, including two pre-contact sites on the grounds of Renton High School, a pre-contact fishing station, and a homestead site. Despite historic and modern disturbance (including construction of the Cedar River channel, and the airport itself), archaeological materials may still be present. Given this history, an airport wide archeological survey should be considered.

The Native American Consultation Database (NACD), maintained by the National Park Service, lists three federally recognized tribes for King County including the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Colville Reservation, and the Muckleshoot Indian Tribe of the Muckleshoot Reservation. There are no known cultural resources on Airport property. However, it is important to note that the Muckleshoot Tribe has historical ties to the Lake Washington watershed. It is also important to note that Executive Order 13175 requires government to government consultation on potential cultural resource impacts.

Treaty Rights. The Muckleshoot Indian Tribe and Yakama Nation have adjudicated tribal treaty rights to usual and accustomed fishing areas in the vicinity of the Airport.

Noise. Noise is generally defined as unwanted sound and, as such, the determination of acceptable levels is subjective. The day-night sound level (DNL) methodology is used to determine both the noise levels resulting from existing conditions and the potential noise levels that could be expected to occur with proposed airport improvement projects. Very simply, a DNL level for a specified area over a given time is approximately equal to the average dB(A) level that has the same sound level as the intermittent noise events. Thus, a DNL 65 level describes an area as having an average noise level of 65 dB(A), which is the approximate average of single noise events.

RNT has implemented voluntary noise abatement procedures, a set of voluntary measures for use by pilots to "fly friendly" and be good neighbors to the citizens who live under aircraft flight paths. These procedures generally encourage pilots to fly over Lake Washington for approaches and departures, or to fly above the more commercial and industrial areas around RNT to the east and south. Pilots should deviate from these procedures only when necessary to comply with any Air Traffic Control requests or in the interest of safety. Pilots of large or turbine-powered aircraft must comply with the provisions of FAR 91.129(e), rather than these procedures.

Threatened and Endangered Species. The Endangered Species Act (ESA), as amended, requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. **Table A4** details ESA-listed species and or critical habitats identified by the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) as potentially occurring in the vicinity of the Airport.

Table A4 **SPECIES AND CRITICAL HABITAT WITH FEDERAL ESA STATUS**

Common Name (Scientific Name)	ESA Status	Critical Habitat
Gray Wolf (*Canis lupus)*	Proposed Endangered	None designated in project area
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	None designated in project area
Streaked Horned Lark (*Eremophila alpestris strigata*)	Threatened	None designated in project area
Yellow-billed Cuckoo (*Coccyzus americanus*)	Threatened	None designated in project area
Bull trout (*Salvelinus confluentus*)	Threatened	Designated – Final
Monarch Butterfly (*Danaus plexippus*)	Candidate	None designated in project area

SOURCE: **United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC).**

Suitable habitat for terrestrial species is not present within or within several miles of the Airport. Listed plant species identified by USFWS to be present in King County included the golden paintbrush (*Castilleja levisecta*).

Suitable habitat for this species is also not present within and adjacent to the Airport. NMFS identifies several aquatic species that occur in the marine environment of Puget Sound. Marine species are not applicable because the Airport is located adjacent to the freshwater environment of Lake Washington. Also, initial conversation with USFWS indicated that the Primary Constituent Elements are not present of the Streaked Horned Lark (SHL). However, further coordination may be required.

Review of the Washington State Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Database online identified the following priority species as occurring in the vicinity of the Airport. **Table A5** also identifies the state and federal status of the protected species and the occurrence and location of the species.

Table A5 **SPECIES DOCUMENTED ON THE WDFW PHS DATABASE**

Common Name (Scientific Name)	Federal Status	State Status	Occurrence and Location
Chinook salmon	NA	NA	Occurs in Lake Washington and Cedar River
Coho salmon (*Oncorhynchus kisutch*)	NA	NA	Occurs in Lake Washington and Cedar River
Coastal cutthroat trout (resident) (*Oncorhynchus clarki*)	NA	NA	Occurs in Lake Washington and Cedar River
Dolly varden trout (*Salvelinus malma*)	NA	NA	Occurs in Lake Washington and Cedar River
Bull trout (*Salvelinus confluentus*)	Threatened	Candidate	Occurs in Lake Washington and Cedar River
Kokanee (*Oncorhynchus nerka*)	NA	NA	Occurs in Lake Washington and Cedar River
Sockeye salmon (*Oncorhynchus nerka*)	Not Warranted	NA	Occurs in Lake Washington and Cedar River
Steelhead (*Oncorhynchus mykiss*)	Threatened	NA	Occurs in Lake Washington and Cedar River

SOURCE: **Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Database.**

Essential Fish Habitat. Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and the 1996 Sustainable Fisheries Act (SFA), an Essential Fish Habitat (EFH) evaluation of impacts is necessary for activities that may adversely affect EFH. EFH is defined by the MSFCMA in 50 CFR 600.905-930 as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Federal agencies are required to consult with NMFS on all activities, or proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. In the vicinity of the Airport, the Pacific Fishery Management Council (PFMC) has designated EFH for the EFH composite group of Pacific salmon. The Pacific salmon composite includes Chinook salmon, coho salmon, and pink salmon (*O. gorbuscha*). EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, other currently viable waterbodies, and most of the habitat historically accessible to salmon in Washington. The freshwater environment of Lake Washington does not include the two EFH composite groups of the marine species groundfish and coastal pelagic fish.

Other anadromous salmonids, such as chum salmon and steelhead trout, are rarely captured in the Pacific Fishery Management Council's ocean fisheries and are therefore not addressed with regard to EFH. However, the EFH evaluation for Pacific salmon species considers similar habitat needs and uses to those of additional anadromous salmonids.

DOT Section 4(f). According to Section 4(f) of the Department of Transportation Act (recodified as 49 USC, Subtitle I, Section 303), no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of historic site that is of national, state or local significance shall be used, acquired, or affected by programs or projects requiring federal assistance for implementation unless there is no feasible or prudent alternative.

Several recreational areas are located in the vicinity of the Airport. RNT property is bound on the north by Lake Washington and to the west by the Cedar River. Several parks and recreational facilities ae located adjacent to the Airport in association with these water bodies.

On Lake Washington adjacent to the Airport's northeast property corner, the City of Renton owns the Cedar River Boathouse, which is built on pilings over Lake Washington, located at the north end of the Cedar River Trail. The Cedar River Trail Park, owned by the City of Renton, is located adjacent to the Airport along the eastern boundary on the east side of the Cedar River, stretches for 4.5 miles within the city limits, and connects eastward to Maple Valley. The Cedar River Trail Park includes a bike path, picnic areas, play equipment, a non-motorized boar launch, and bird viewing opportunities, including blue herons and bald eagles. The City-owned Kiwanis Bicentennial Air Park is located along the Airport's western boundary, near the southwest corner of the site, and is largely open space with park benches providing a scenic view, as well as a location to view airplanes.

As development alternatives are considered in this planning process, consideration should be given to the potential for impacts to these recreational resources.

CHAPTER B

Facility Requirements

Introduction.

A key step in the master planning process is determining airport facilities required to accommodate airside and landside needs throughout the planning period. Facility requirements are developed to determine the facilities needed to meet existing and forecasted demand related to the existing and forecasted aircraft fleet. Evaluation procedures analyze runway length, dimensional criteria, aprons, hangars, and vehicular access.

Aviation Activity

The City of Renton recently analyzed data from Fiscal Year (FY)2015 to FY2020 and identified a declining trend of C/D business jet operations. When considering this declining trend and the decline in aircraft manufacturing-related operations from the Federal Aviation Administration (FAA) Traffic Flow Management System (TFMSC), it was decided that the need to upgrade the Runway Design Code (RDC) to C/D is not currently warranted, as Category C/D operations in CY2020 did not exceed the required 500 annual threshold. Consequently, the City and Federal Aviation Administration (FAA) Seattle Airports District Office (ADO) elected to undertake a simple ALP Update for the Airport with an RDC of B, without a change in RDC, and with the inclusion of operational restrictions for C/D aircraft expected to be implemented by the Airport Traffic Control Tower (ATCT). Data from the TFMSC database is shown in **Table B1**.

Table B1 **RNT HISTORIC TFMSC DATA ANALYSIS – LARGE C/D BUSINESS JET OPERATIONS AND BOEING OPERATIONS**

Fiscal Year	Large C/D Business Jet Operations	Boeing Operations	Total Large Aircraft Operations
2006	799	179	978
2007	465	211	676
2008	499	267	766
2009	316	300	616
2010	334	425	759
2011	358	474	832
2012	303	400	703
2013	281	433	714
2014	345	480	825
2015	248	501	749
2016	144	512	656
2017	144	513	657
2018	114	581	695
2019	140	574	714
2020	**131**	**251**	**382**

SOURCE: **FAA Traffic Flow Management System Counts (TFMSC).**

In contrast with trends from the previous 14 years, the total large aircraft operations for FY 2020 remained below 500. Whether this level of C/D aircraft operations will continue into the future is unknown. Boeing has publicly stated its plans for aircraft manufacturing rate increases, but it is uncertain when or if production will return to its pre-2019 levels. The data also shows that large C/D business jet operations have been in decline since 2006, with little to indicate a reverse in the trend. These two factors of reduced Boeing production and declining business jet operations indicate RNT could remain below 500 C/D operations for the foreseeable future.

Airfield Facility Requirements

To identify facility needs, it is necessary to translate the forecast aviation activity into specific types and quantities. This section addresses the actual physical facilities and/or improvements to existing facilities needed to safely and efficiently accommodate the projected demand that will be placed on the Airport. This section consists of two separate analyses: those requirements dealing with *airfield* facilities, and those dealing with *landside* facilities. The analysis of airfield requirements focuses on the determination of needed facilities and spatial considerations related to the actual operation of aircraft on the Airport. This evaluation includes the analysis of airfield dimensional criteria according to the updated FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design,* the establishment of design parameters for the runway and taxiway system, and an identification of airfield instrumentation and lighting needs.

Airfield Design Standards

The types of aircraft that currently operate at RNT, and those projected to utilize the facility in the future have an impact on the planning and design of airport facilities. This knowledge assists in the selection of FAA specified design standards for the Airport, which include runway and taxiway dimensional requirements, runway length, and pavement strength. These standards are based on the "design aircraft" that currently utilize the Airport, or that are projected to utilize the Airport in the future. According to the AC 150/5300-13A, Change 1, *Airport Design*; the first step in defining a runway's design geometry is to determine the Runway Design Code (RDC). The design aircraft can take the form of one particular aircraft, or a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG).

The critical aircraft for Runway 16/34 is the King Air 200 (Aircraft Approach Category B and Airplane Design Group II, based on approach speed and wingspan), along with approach visibility minimums of 1-mile, or a Runway Visual Range (RVR), of 5,000 feet. Therefore, the appropriate Runway Design Code (RDC) is B-II-5000.

The critical aircraft for the seaplane base is a combination of the de Havilland Canada DHC-2 Beaver and the DHC-6 Twin Otter/Viking. Both aircraft fall under Aircraft Approach Category A and Airplane Design Group I, based on approach speed and wingspan.

Runway 16/34 Design Standards. RNT meets most dimensional standards for classification under a B-II airport. Existing dimensions and the corresponding existing FAA design standards applicable to Runway 16/34 are presented in **Table B2** and **Figure B1** through **Figure B3**.

Table B2 **RUNWAY 16/34 DESIGN STANDARDS MATRIX – RDC B-II ≥ 1-MILE VISIBILITY MINIMUMS**

Item	Existing Dimension	FAA Criteria	Standard Met
RUNWAY DESIGN			
Runway Width	200 FT	75 FT	Yes (+125 FT)
Shoulder Width	**0 FT**	**10 FT**	**No (-10 FT)** [1]
Crosswind Component	13 Knots	13 Knots	Yes
RUNWAY PROTECTION			
Runway Safety Area (RSA) Runway 16			
Length beyond departure end	340 FT [2]	300 FT	Yes (+40 FT)
Length prior to threshold	300 FT [2]	300 FT	Yes
Width	150 FT	150 FT	Yes
Runway Safety Area (RSA) Runway 34			
Length beyond departure end	300 FT [2]	300 FT	Yes
Length prior to threshold	340 FT [2]	300 FT	Yes (+40 FT)
Width	150 FT	150 FT	Yes
Runway Object Free Area (ROFA) Runway 16			
Length beyond departure end	340 FT [2]	300 FT	Yes (+40 FT)
Length prior to threshold	300 FT [2]	300 FT	Yes
Width	**500 FT** [3]	**500 FT**	**No** [4]
Runway Object Free Area (ROFA) Runway 34			
Length beyond departure end	300 FT [2]	300 FT	Yes
Length prior to threshold	340 FT [2]	300 FT	Yes (+40 FT)
Width	500 FT	500 FT	Yes
Runway Obstacle Free Zone (ROFZ)			
Length beyond Runway 16 end	340 FT	200 FT	Yes (+140 FT)
Length beyond Runway 34 end	300 FT	200 FT	Yes (+100 FT)
Width	250 FT	250 FT	Yes
RUNWAY SEPARATION			
Runway centerline to:			
Holding position	200 FT	200 FT	Yes
Parallel taxiway/taxilane centerline	300/350 FT [5]	240 FT	Yes
Aircraft parking area	350 FT	250 FT	Yes

SOURCE: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design (February 2014).

NOTE: [1] Though non-standard, the much larger than standard runway width compensates for a lack of shoulder.
[2] Standards are met using the existing Runway 16/34 Declared Distances, including displaced thresholds. FAA criteria would not be met if they were not applied.
[3] The ROFA on Runway End 16 is not fully contained within the Airport property boundary.
[4] The ROFA is partially deficient due to the Cedar River running at an angle parallel to Runway 16/34 to the east.
[5] Varies.

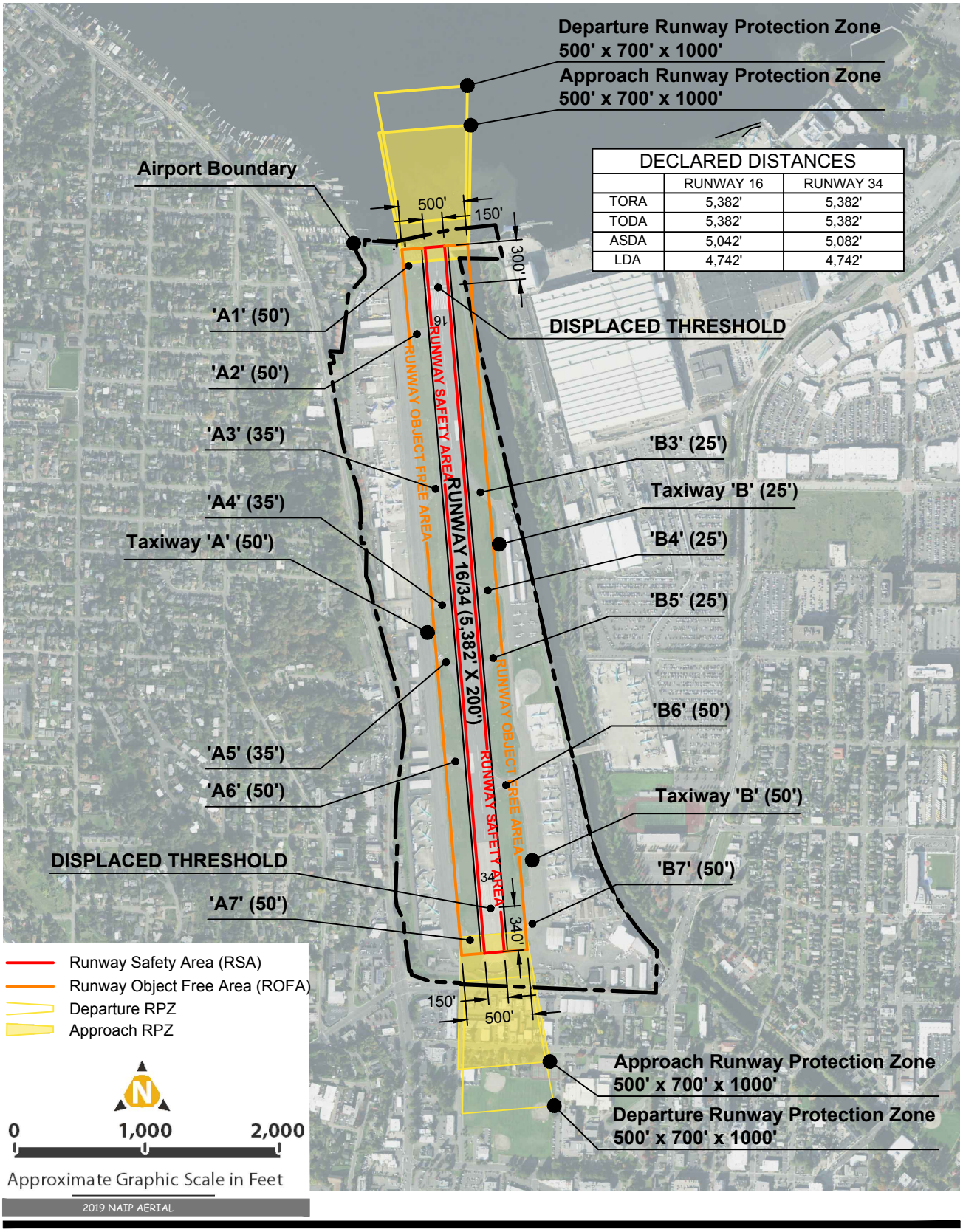


FIGURE B1 **Existing RDC B-II Design Standards**

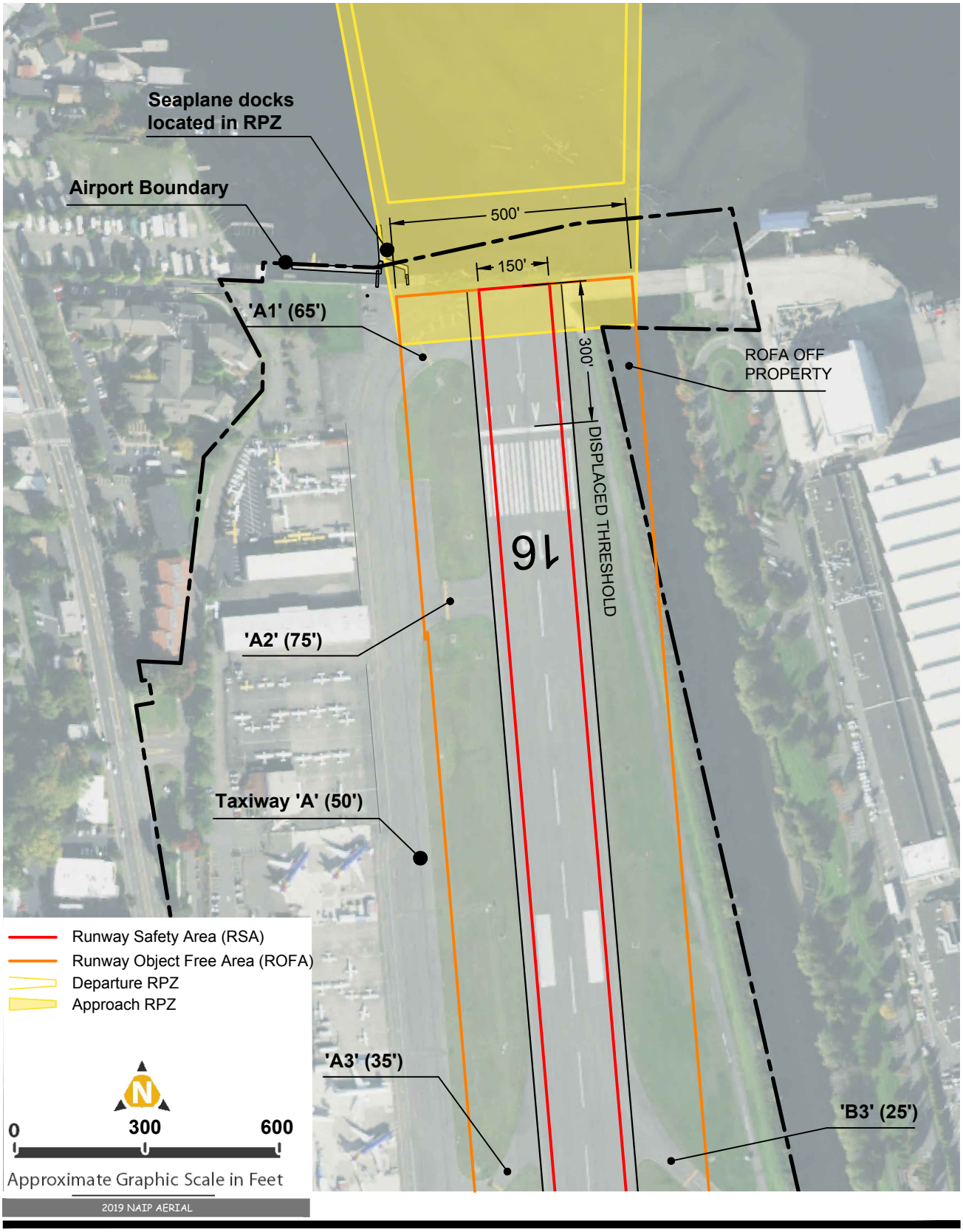


FIGURE B2 **Existing RDC B-II Design Standards (North)**

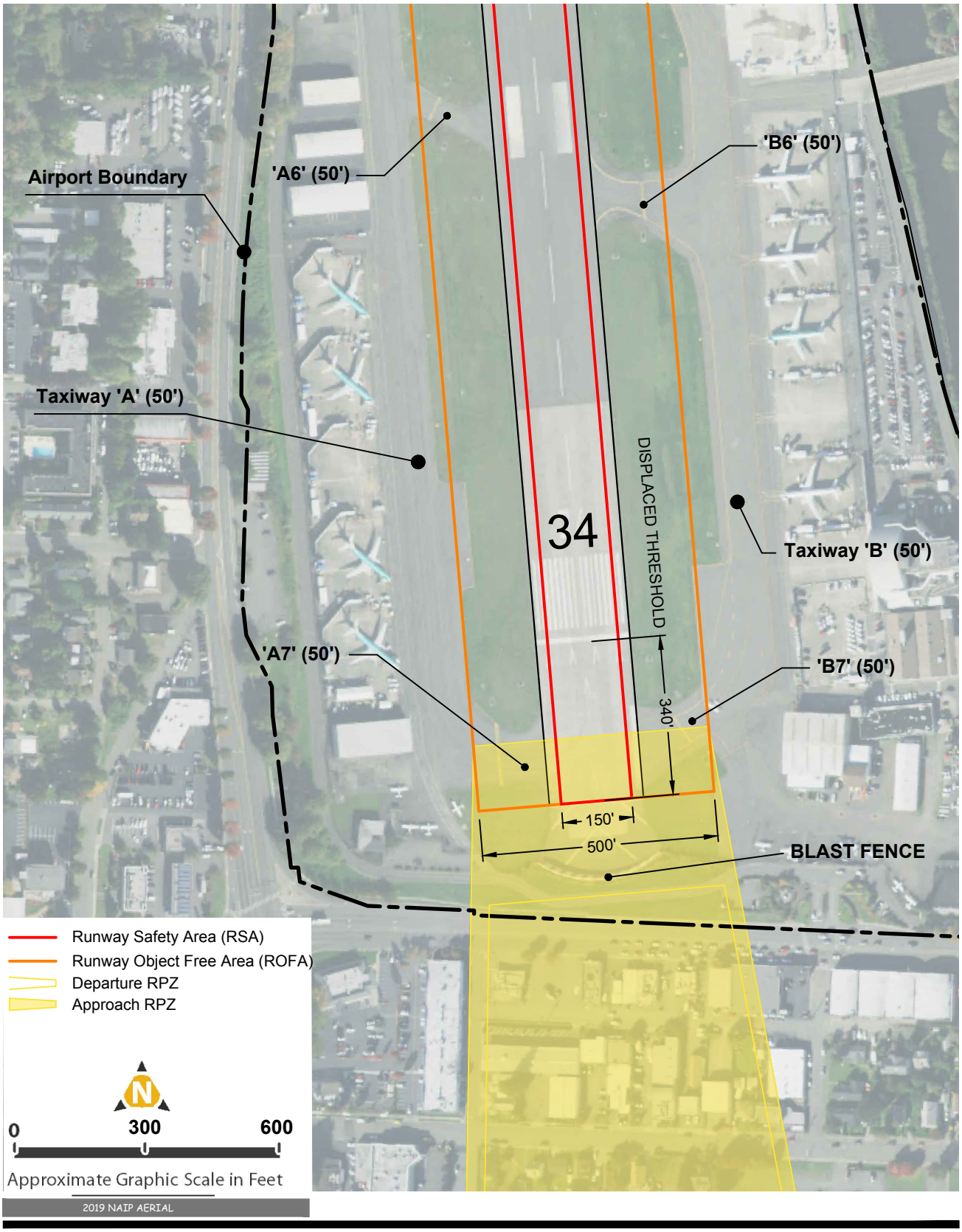


FIGURE B3 **Existing RDC B-II Design Standards (South)**

Runway Object Free Area (ROFA). The Runway Object Free Area (ROFA) is centered about the runway centerline and requires clearing the ROFA of above-ground objects protruding above the nearest point of the RSA. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA, including parked aircraft. On the east side of the runway, the ROFA is penetrated by the Cedar River. This penetration may require an FAA Modification of Standards, as the alternative would require either the infill of a portion of the river or the relocation of a portion of the river, both of which are not feasible or prudent alternatives.

Another ROFA consideration is the current configuration and location of the seaplane ramp, located roughly 185 feet west of runway centerline, seaplanes are towed through the ROFA to parking areas. While technically not a nonstandard condition, relocation of the ramp should be considered such that towing seaplanes through the ROFA is not required. Should this relocation require reconfiguration of the seaplane docks, consideration should be given to parcel, easement, and other property lines adjacent to and within the lake.

Runway Protection Zones. The function of a Runway Protection Zone (RPZ) is to enhance the protection of people and property on the ground beyond the runway ends. This is achieved through airport control of the RPZ areas, and control is preferably exercised through the acquisition of sufficient property interest within the RPZ. It is desirable to clear all about ground objects from with RPZs; where this is impractical, airport owners, at minimum, should maintain the RPZ clear of all facilities supporting non-compatible activities. RPZs are trapezoidal in shape, are centered about the runway centerline, and begin 200 feet beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the type of aircraft using the runway and the approach visibility minimums associated with each runway end. Of note, the current configuration of the seaplane base, both the ramp and one of the seaplane docks are located within the approach RPZ to Runway 16 and according to the FAA AC 150/5300-13A, Change 1, *Airport Design,* it is desirable to clear these seaplane facilities from the RPZ.

Declared Distance Application. FAA AC 150/5300-13A, Change 1, describes declared distances as the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distance performance requirements for turbine powered aircraft. The declared distances include Takeoff Run Available (TORA), Takeoff Distance Available (TODA) which apply to takeoff; Accelerate Stop Distance Available (ASDA), which applies to a rejected takeoff; and Landing Distance Available (LDA), which applies to landing. By treating these distances independently, declared distance is a design methodology that results in declaring and reporting the TORA, TODA, ASDA, and LDA for each operation direction. RNT's existing declared distances were shown previously in **Figure B1**. No changes to the existing declared distances are recommended.

Taxiway Design Standards. Similar to the runway design standards in the previous section, taxiway design standards are based on the most demanding aircraft (critical aircraft) operating on the taxiway on a regular basis (more than 500 annual operations). Taxiway and taxilane standards will be illustrated on the on the ALP as required by the FAA Standard Operating Procedure ALP checklist.

ALP Update

Summary

The information presented in this chapter provides the basis for understanding what facility improvements are necessary at RNT to meet current standards for Airport Reference Code B-II design standards. The following facility requirements were noted based upon existing conditions at RNT:

- **Runway Design Standards:** Runway 16/34 meets most dimensional standards for Airport Reference Code B-II.
- **ROFA:** East of Runway End 16, the ROFA is penetrated by a portion of the Cedar River. Either a design solution or a potential Modification of Standards (MOS) may be required to address this nonstandard condition.
- **RPZs:** The RPZs on either end of Runway 16/34 extend beyond the Airport property line. The RPZ's off the approach end of Runway 16 extend over Lake Washington which is technically compatible land use. The RPZ's at the approach end of Runway 34 extends over several noncompatible land uses to the south, and additional consideration should be given to obtaining City/Airport control over these RPZs.
- **Taxiway Design Standards:** RNT's taxiway appears sufficient to accommodate existing and future aviation activity and will be appropriately illustrated on the Airport Layout Plan.

The facility requirements identified in this chapter are used to direct the development of the alternatives presented in the following chapter which will consider alternatives related to seaplane base configuration and general aviation related development (aprons and hangars) primarily in the southwest corner of the Airport.

CHAPTER C

Landside Alternatives Analysis

Introduction.

This chapter presents and evaluates planning considerations, alternatives, and concepts associated with the future landside configuration of Renton Municipal Airport (RNT or Airport). The alternatives development process considers the facility requirements as determined in Chapter B, and input received from the Renton Airport Advisory Committee (RAAC), Airport staff, the Seaplane Pilots Association, the public, and the Federal Aviation Administration (FAA) throughout the planning process. The chapter concludes with preferred concepts illustrated on the conceptual development plan (CDP). The CDP will later be utilized in the development of the official Airport Layout Plan (ALP) set of drawings, which requires FAA approval. Given that the Runway Design Code (RDC) will remain B-II at RNT, no airfield alternatives will be developed because only minor changes to the airfield are warranted.

Assumptions

There are several fundamental reasoning assumptions that are driving this planning process and influence the basis for the recommended development program for the Airport. Consideration factors associated with these assumptions are the roles of RNT, the RAAC, and stakeholders providing input during the planning process. Development alternatives for the RNT seaplane base were a primary consideration in this ALP Update, as the ramp and docks need to be replaced or reconstructed in the near term. Seven assumptions have been established to direct the alternatives analysis the landside concepts.

Assumption One: The aircraft fleet mix is not expected to change. RNT will continue to serve as a reliever airport accommodating primarily general aviation (GA) activity, in addition to military activity, Boeing 737 manufacturing-related activity (primarily 737 departures) and seaplane aircraft operations.

Assumption Two: Recommended improvements must comply with local, state, and federal regulations. RNT will be developed and operated consistent with local ordinances and codes, federal and state statutes, federal grant assurances, and Federal Aviation Administration (FAA) regulations.

Assumption Three: The critical design aircraft for the airfield is the King Air 200. The King Air 200 is RNT's critical design aircraft for Runway 16/34. This aircraft is Aircraft Approach Category B and Airplane Design Group II, making B-II the RDC for Runway 16/34.

Assumption Four: The critical design aircraft for the seaplane base are the DHC-2 Beaver and DHC-6 Twin Otter/Viking. The de Havilland Canada DHC-2 Beaver and DHC-6 Twin Otter/Viking are seaplanes that are based at RNT and use the seaplane base on a regular basis. In considering improvements to the ramp and docks the DHC-2 and 6 requirements will be used.

Assumption Five: Runway 16/34 and its associated taxiway meet B-II standards and will remain classified as B-II. The King Air 200's B-II classification for Runway 16/34 applies to all airport facilities. As previously stated in **Chapter B – Facility Requirements**, RNT meets most dimensional standards for Airport Reference Code (ARC) B-II and the Airport will remain under B-II classification.

Assumption Six: Landside developable property is limited, and the Airport should make the highest and best use of existing and reconfigured landside developable property. RNT is land-constrained, so each alternative should focus on making the best use of existing landside developable property.

Assumption Seven: Any reconfigured facility will be replaced on a one for one basis. With any proposed landside reconfiguration, existing facilities will either be reconstructed in place or replaced on a one for one basis including vehicle access, hangars, aircraft parking space, vehicle parking spaces, etc.

Landside Development

RNT is located on the south shore of Lake Washington approximately 11 miles from downtown Seattle, and it serves an important role in the regional transportation system for ground, rail, and waterway access. This makes RNT a prime location for aviation industrial, GA, and seaplane facilities. The Airport is site-constrained, with much of its 168 acres currently reserved for airfield development such as runways, taxiways, aprons, and/or safety-object setbacks. Limited property is available for new or expanded landside development, and effective planning is crucial to optimize RNT's limited footprint.

The landside alternatives are divided into five development areas in this chapter as follows:

- **Area 1:** West of the runway
- **Area 2:** Southwest of the runway
- **Area 3:** Southeast of the runway
- **Area 4:** East of the runway
- **Area 5:** Seaplane development area north and west of the runway.

Existing landside development at RNT includes areas for GA facilities, aviation industrial (including aircraft manufacturing apron areas), aircraft parking aprons, Fixed Based Operator (FBO) facilities, fuel storage facilities, the seaplane base, park/open space, and access roadways.

Landside Area 1 Concept

As shown in **Figure C1**, the Area 1 Concept includes GA and seaplane uses. All facilities shown are compliant with B-II standards and setbacks, and no additional action is required to meet design standards. Existing structures and other facilities will be rebuilt in place on an as-needed basis based upon reaching the end of their useful life or at the end of the leases. A portion of this area, commonly referred to as Apron C, is subleased for aviation industrial use; however, the area will likely revert to GA use at the end of the sublease. The existing airport maintenance Quonset hut is to be removed and replaced by a new structure, and the northern airport entrance off Rainier Avenue will be rehabilitated to aesthetically match the south entrance.

Concept Features:

- Reconstructs existing facilities where necessary in their present location.
- Returns Apron C back to GA related use at the end of the aviation industrial sublease.
- Maintains apron vehicle service road in its existing location.
- Maintains Taxiway A in its existing location with a recommendation for reconstruction in the short-term planning period.

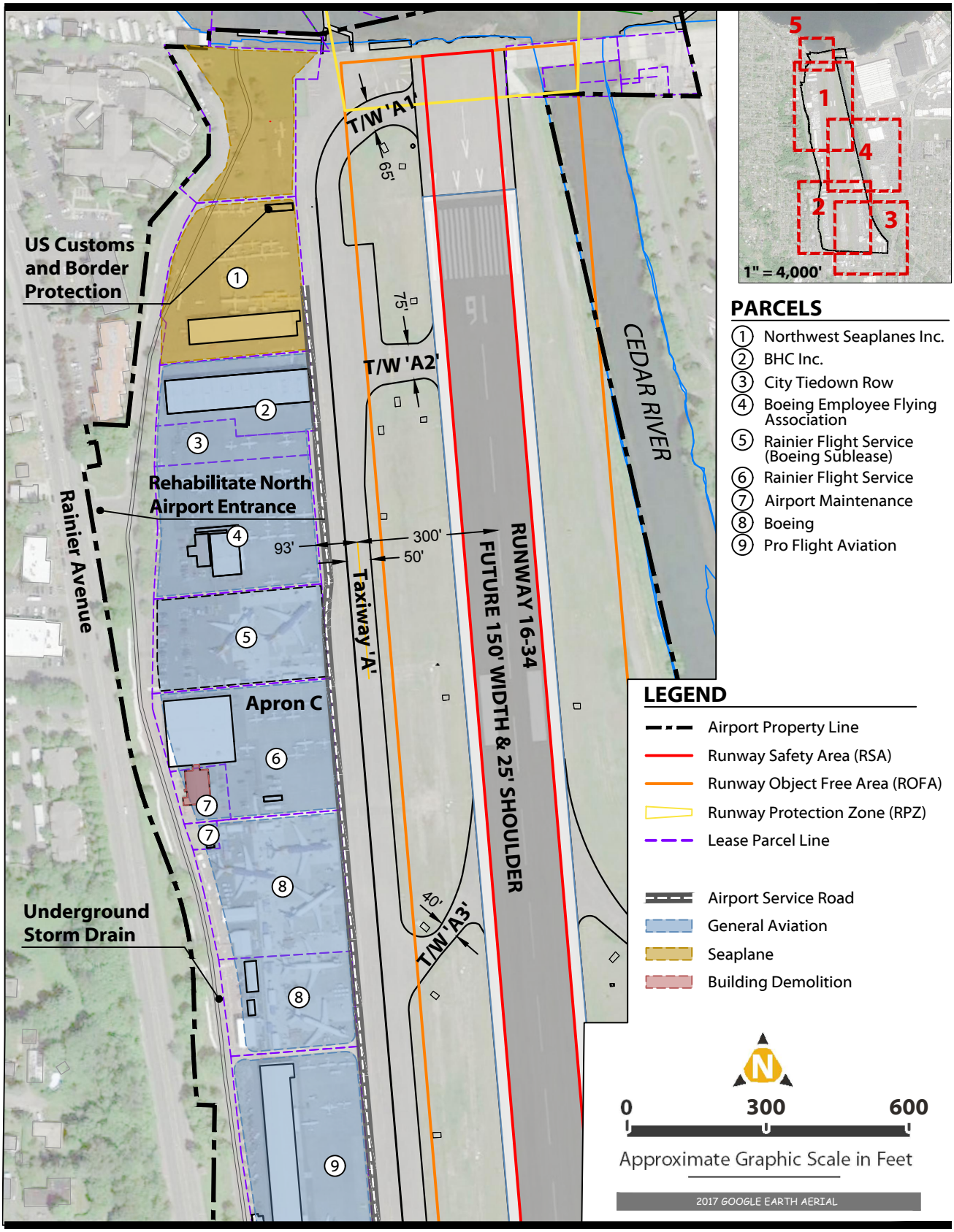


FIGURE C1 **Landside Area 1 Concept**

Landside Area 2 Concept

In this concept, the existing land uses primarily remain in their existing configuration. Parcels 1 and 2 are maintained for GA use while Parcel 3 is maintained as aviation industrial. Apron B is maintained as aviation industrial. The layout of Apron B would be able to accommodate the Boeing Max 10 aircraft, which at 116 feet 8 inches is the longest aircraft expected to be produced during the planning period. As with Landside Area 1, all B-II standards and setbacks are met. The existing chamber building will be demolished. Landside Area 2 Concept is illustrated in **Figure C2.**

Concept Features:

- Reconstructs existing facilities where necessary in their present location.
- Maintains Parcel 3/Apron B as aviation industrial use with two hard stands.
- Maintains Taxiway A in its existing location with a recommendation for reconstruction in the short-term planning period.

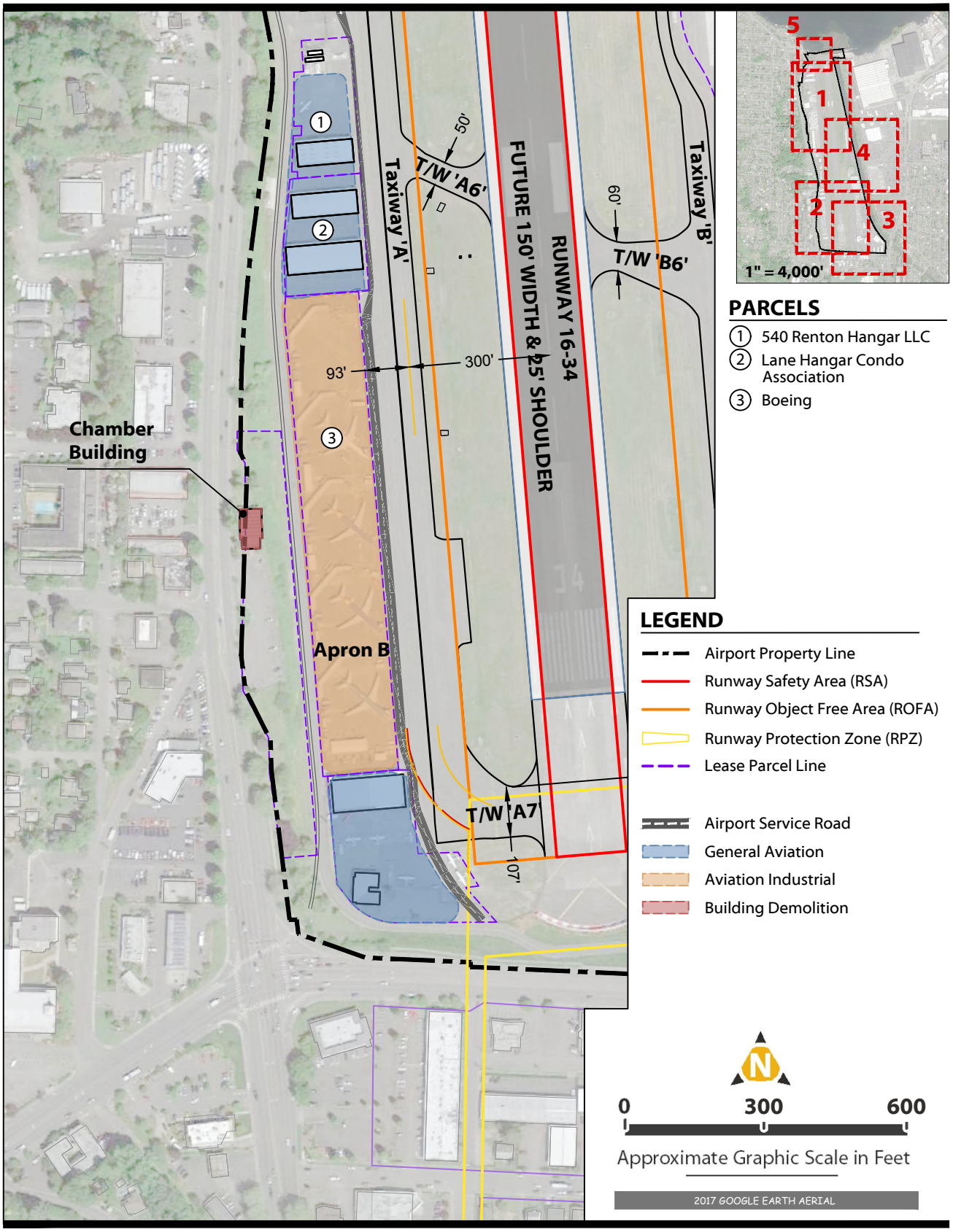


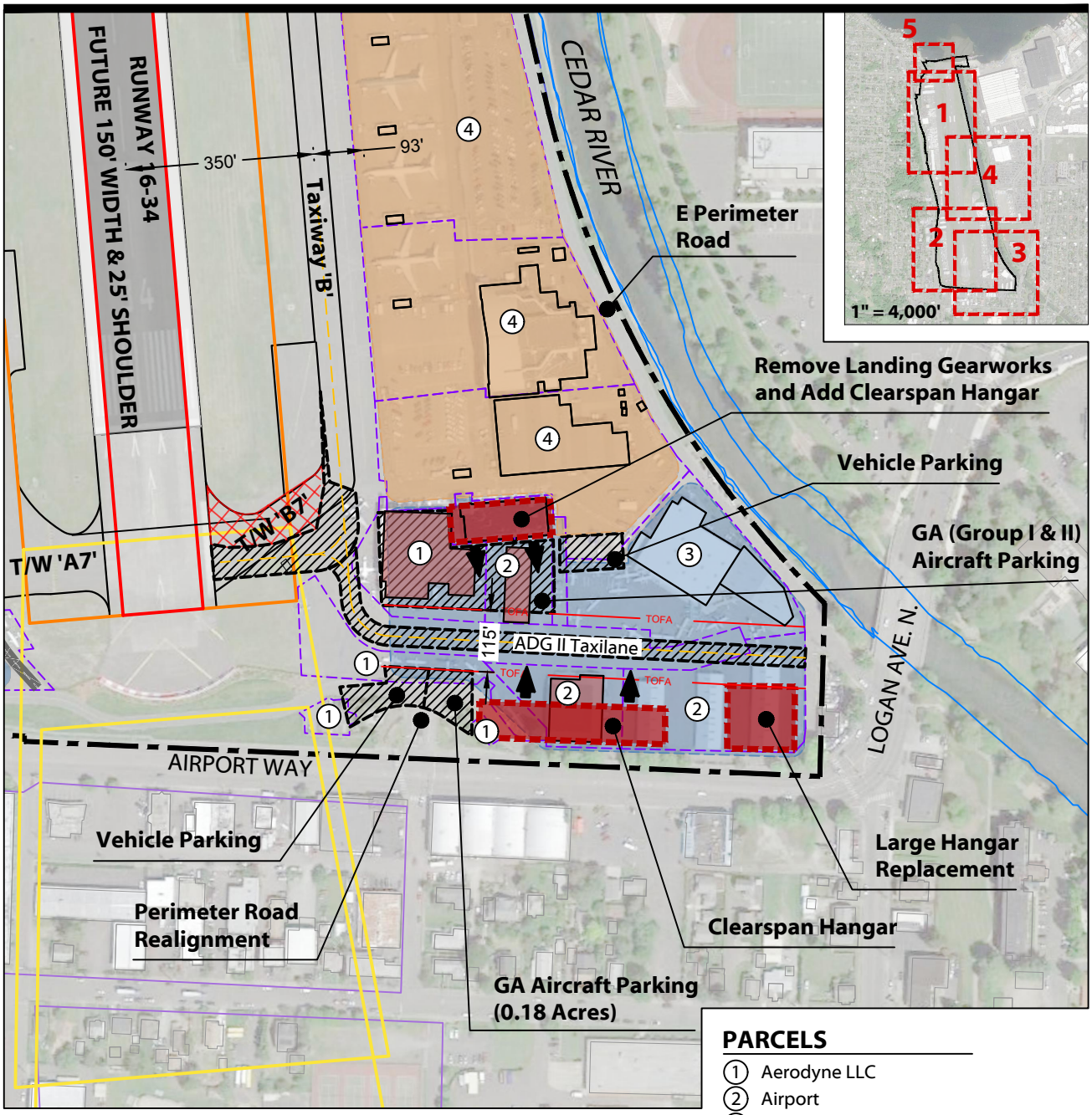
FIGURE C2 **Landside Area 2 Concept**

Landside Area 3 Concept

Landside Area 3 examines the southeast corner of the Airport. Many of the facilities in this area have reached the end of their useful life necessitating a reexamination of the layout and configuration of Landside Area 3. This conceptual layout recommends removal of older hangars and facilities and includes the conversion of much of the area for GA aircraft parking. The taxilane accessing this area has also historically not met Airport Design Group (ADG) II/Taxiway Design Group (TDG) 2, Taxilane Object Free Area (TOFA) clearance and this concept recommends a standard 115-foot wide TOFA be protected for the future layout. There is also a small amount of land acquisition recommended for the parcel located at the corner of Airport Way and Logan Avenue North. One additional component of this concept is the aviation industrial areas shown as Parcel 4 which are recommended to remain in their existing condition. The components of this concept are illustrated in **Figure C3**.

Concept Features:

- Replaces existing box hangars and T-hangars in this area and recommends replacement with Clearspan hangars that open in only one direction.
- Reserves adjacent areas for additional GA aircraft parking with a standard Group II taxilane to accommodate Group I and Group II aircraft.
- Extends The property boundary to include the 0.22-acre parcel at the southeast corner of the airport property line (at the intersection of Airport Way and Logan Ave North).



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- TOFA — Taxiway Object Free Area (TOFA)
- Lease Parcel Line
- Airport Service Road
- Future Pavement
- Pavement Demolition
- General Aviation
- Aviation Industrial
- Hangar Demolition
- Hangar Development

PARCELS

1. Aerodyne LLC
2. Airport
3. Bosair (Ace Aviation)
4. Boeing

0 300 600

Approximate Graphic Scale in Feet

2017 GOOGLE EARTH AERIAL

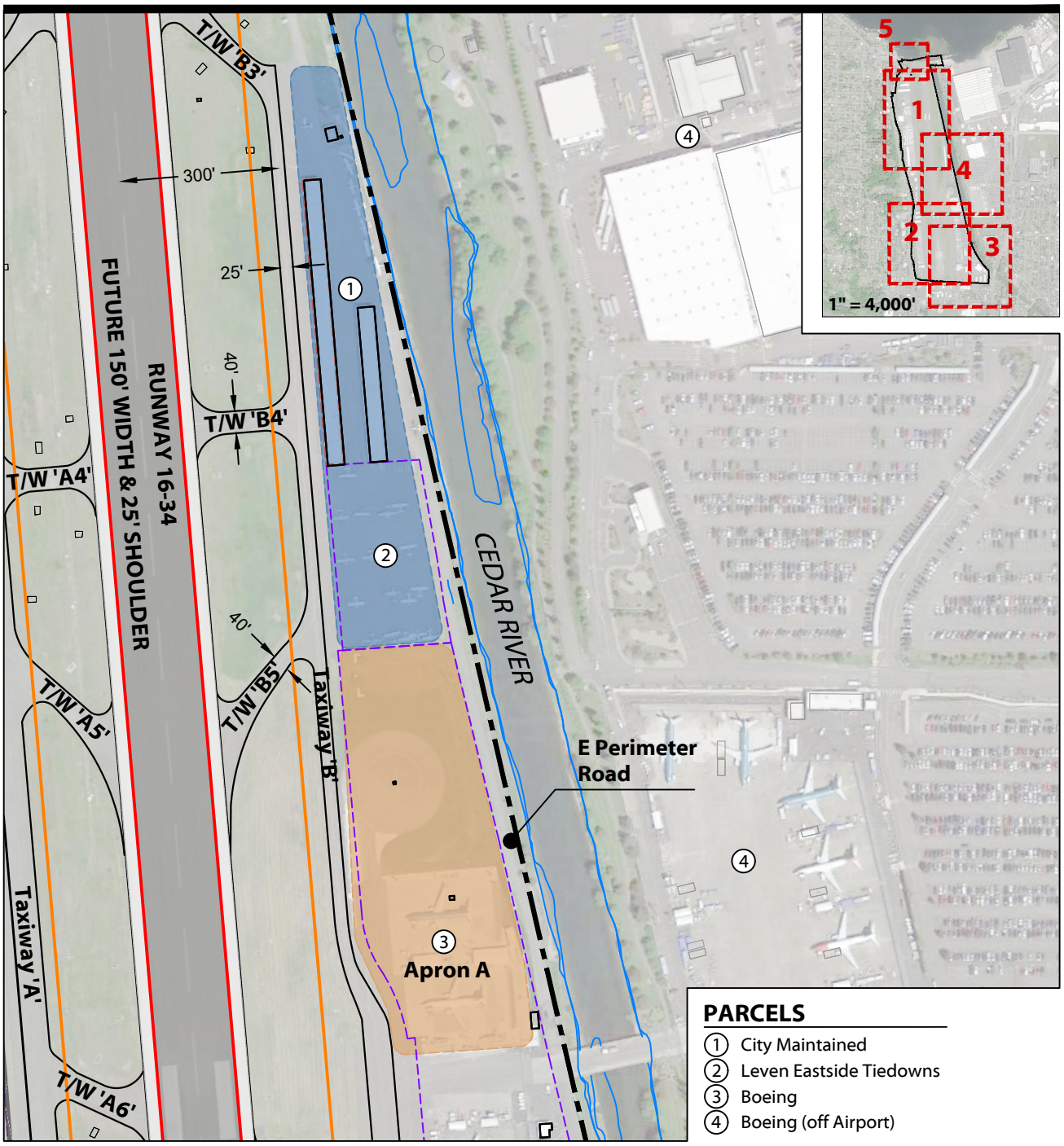
FIGURE C3 **Landside Area 3 Concept**

Landside Area 4 Concept

This concept recommends existing uses in Landside Area 4 be maintained in their current configuration. Parcel 3 will remain aviation industrial while Parcels 1 and 2 will remain GA. No reconfiguration is necessary to meet B-II standards or setbacks. The concept is illustrated in **Figure C4**.

Alternative Features:

- Retains Parcels 1 and 2 as GA.
- Reconstructs existing facilities where necessary in their present location.
- Maintains the RNT compass rose in its existing location for future use.
- Retains Parcel 3 as aviation industrial for use by Boeing and in support of Boeing's off airport through the fence access.



PARCELS

1. City Maintained
2. Leven Eastside Tiedowns
3. Boeing
4. Boeing (off Airport)

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Lease Parcel Line
- Airport Service Road
- General Aviation
- Aviation Industrial

N

0 300 600

Approximate Graphic Scale in Feet

2017 GOOGLE EARTH AERIAL

FIGURE C4 **Landside Area 4 Concept**

Landside Area 5 (Seaplane Base) Development Alternatives

Landside Area 5 development alternatives focus on the seaplane base in the northwest corner of the Airport. The key consideration in the seaplane base development alternatives is meeting FAA standards to the greatest extent practicable. Many options exist to meet these standards, several of which do not necessitate the relocation of the existing docks or pullout ramp. Each alternative introduces a new perimeter fence installation along the west side of Parcels 1 and 2, maintaining residential access from outside the perimeter fence and converting the existing Parcel 1 viewing area into future vehicle or aircraft parking. Existing GA uses in Area 5 would remain for use by the seaplane base.

Additional operational considerations relevant to the development of these alternatives include:

- Most seaplane operations at RNT occur during the summer when prevailing winds come from the north.
- Most seaplanes operating at RNT have a left pilot seat.
- Seaplane launch operations are primarily performed by a single pilot (without a line crew) and require direct left seat access or the ability to maneuver the seaplane to provide left seat access after launch.
- Seaplanes are launched tail first, after which the bow is held while the aircraft rotates counterclockwise into north prevailing winds. The plane is then walked forward with the left side against the dock.
- The existing box culvert, southwest of the east-west (E/W) dock along the seawall, has a utility easement and conveys stormwater from a large area outside of Airport property; therefore, it must remain in place.

Seaplane Base Alternative 1 – Reconstruct Facilities in Place. The first seaplane base alternative would reconstruct the existing facilities in their current location. Seaplane Base Alternative 1 is illustrated in **Figure C5**.

Alternative Features:

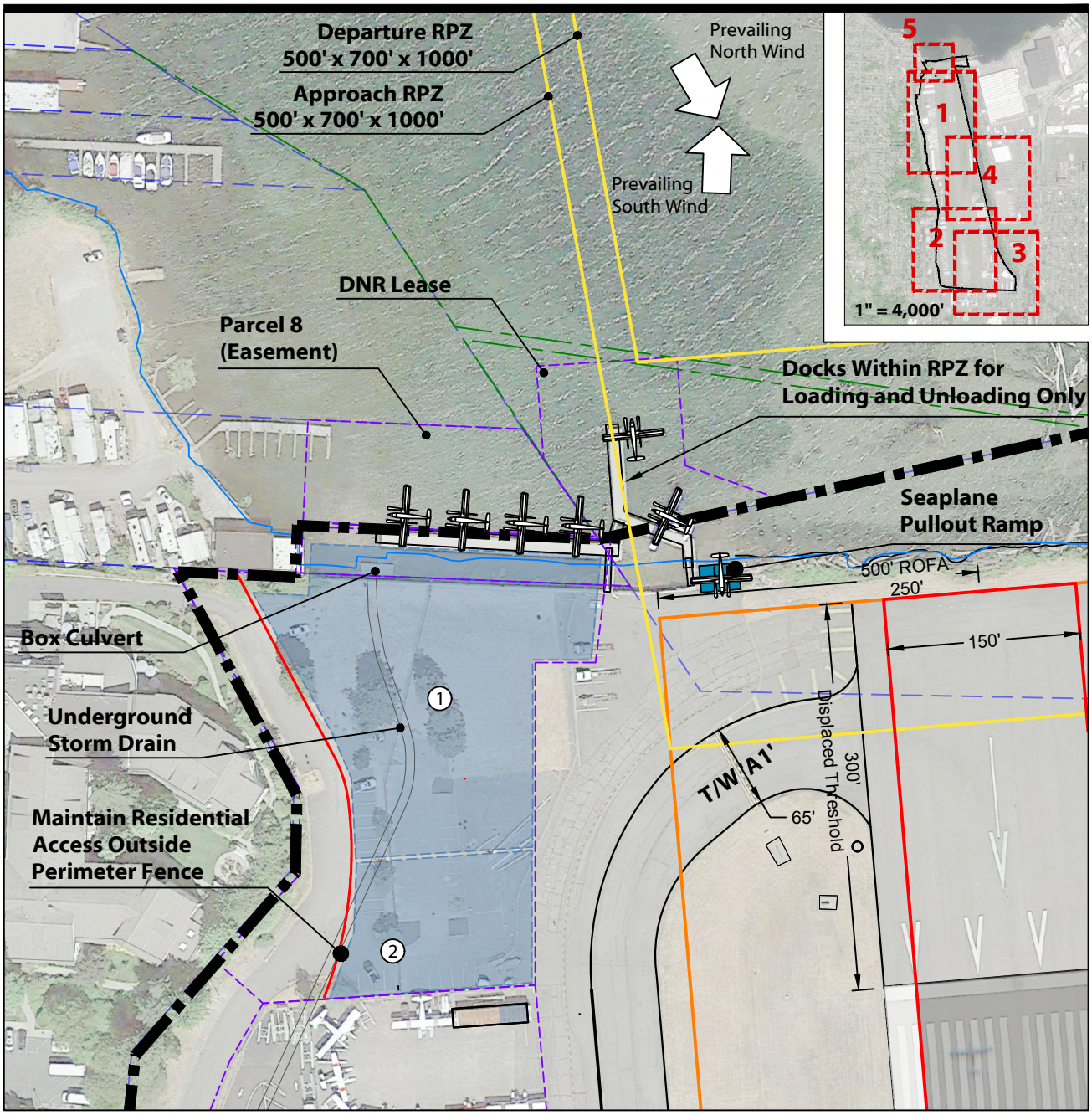
- Reconstructs existing facilities where necessary in their present location.
- Maintains the practice of towing seaplanes through the ROFA with Airport Traffic Control Tower (ATCT) clearance during launch and recovery.
- Reserves space to convert the existing vehicle parking and viewing area for aviation related development.

Advantages:

- Minimizes costs through reconstruction of facilities in place.
- Maintains existing configuration of seaplane docks and ramp, meeting the operational requirements of seaplane operators with prevailing winds from the north (summer operations).
- Allows for aviation related development in Parcels 1 and 2.

Disadvantages:

- Does not add additional width to the pull-out ramp, which is needed for the design aircraft.
- Does not add additional seaplane parking or access capacity.



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Lease Parcel Line
- Harbor Lines
- County/City Parcel Boundaries
- Future Dock and Ramp
- Airport Service Road
- General Aviation

PARCELS

(1) City Maintained
(2) City Tiedowns

N

0 125 250

Approximate Graphic Scale in Feet

2020 GOOGLE EARTH AERIAL

FIGURE C5 **Seaplane Base Alternative 1 - Reconstruct Facilities in Place**

Seaplane Base Alternative 2 – Relocate Ramp and Flip N/S Dock. Alternative 2 removes much of the existing dock in favor of repositioning the north-south (N/S) dock and relocating the ramp. Like Seaplane Base Alternative 1, this alternative reserves the N/S dock for loading and unloading only. The relocation of the ramp would allow seaplanes to be towed to and from the ramp without having to be towed through the ROFA and without having to request ATCT clearance. Seaplane Base Alternative 2 is illustrated in **Figure C6**.

Alternative Features:

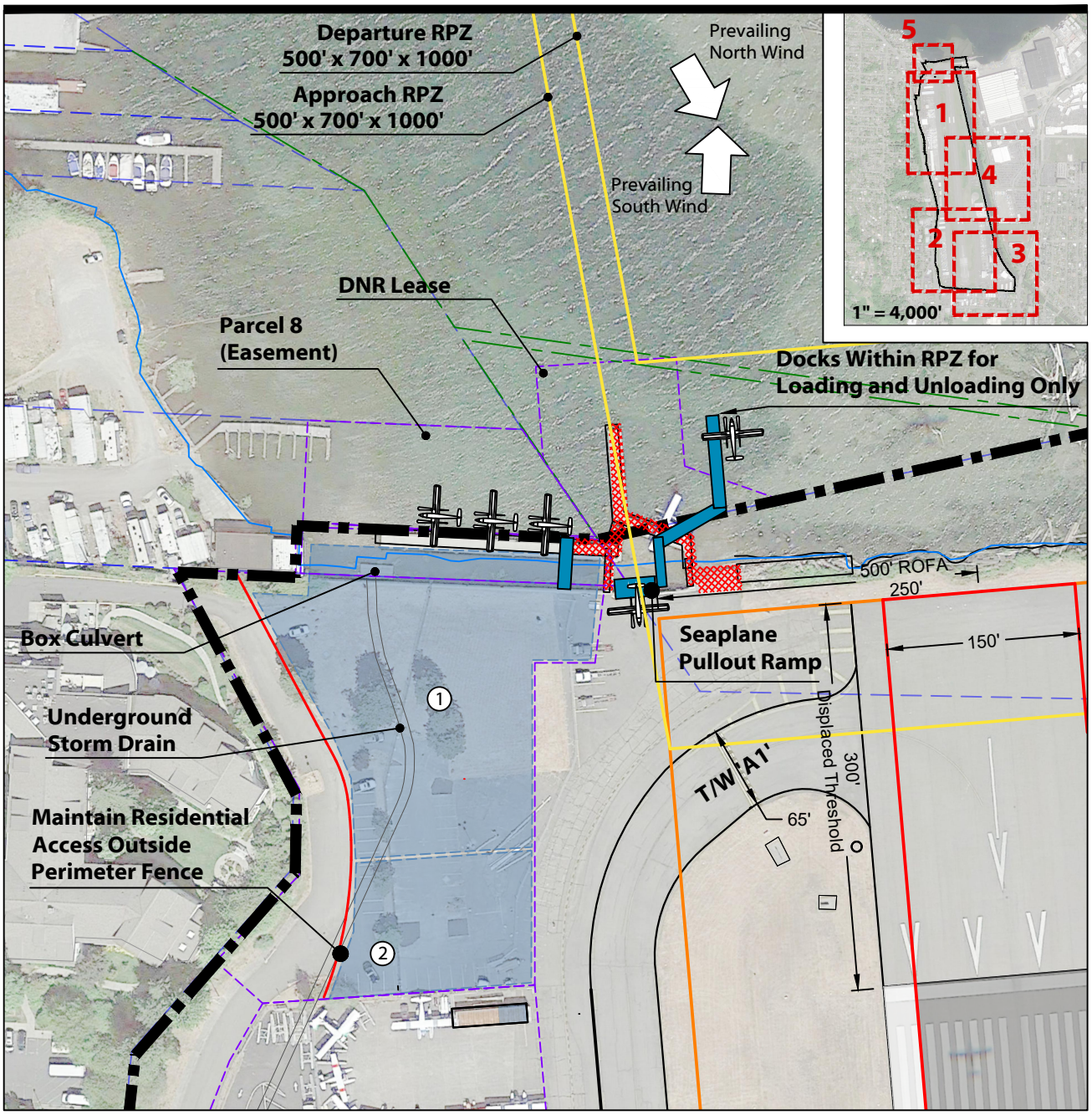
- Flips the N/S dock.
- Slightly reconfigures the E/W dock.
- Creates a new, physically separate N/S ramp clear of the ROFA.
- Reconstructs the walkway connecting the E/W dock to the shore in a new location further away from the new seaplane pullout ramp and N/S dock.
- Reconstructs the remaining existing facilities where necessary in their present location.

Advantages:

- Allows seaplanes to be towed clear of the ROFA.
- Provides a one for one replacement of the N/S dock.
- Allows for aviation related development in Parcels 1 and 2.

Disadvantages

- Dock configuration would not meet the left seat access requirements of seaplane operators with prevailing winds from the north (summer operations).
- Requires additional costs relative to Alternative 1 to reconfigure docks and widen the ramp.
- Potentially reduces the overall capacity for parked aircraft at the E/W dock.
- Locates the loading/unloading N/S dock closer to extended runway centerline.



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Lease Parcel Line
- Harbor Lines
- County/City Parcel Boundaries
- Future Dock and Ramp
- Future Demo
- Airport Service Road
- General Aviation

PARCELS

(1) City Maintained
(2) City Tiedowns

N

0 125 250

Approximate Graphic Scale in Feet

2020 GOOGLE EARTH AERIAL

FIGURE C6 **Relocate Ramp and Seaplane Base Alternative 2 - Flip N/S Dock**

Seaplane Base Alternative 3 – Reconstruct in Place and Improve Facilities. Alternative 3 reconstructs the docks and the pull-out ramp in their existing location, but also includes some additional improvements including an extension of the N/S dock and the provision of additional walkways to the E/W dock. Seaplane Base Alternative 3 is illustrated in **Figure C7**.

Alternative Features

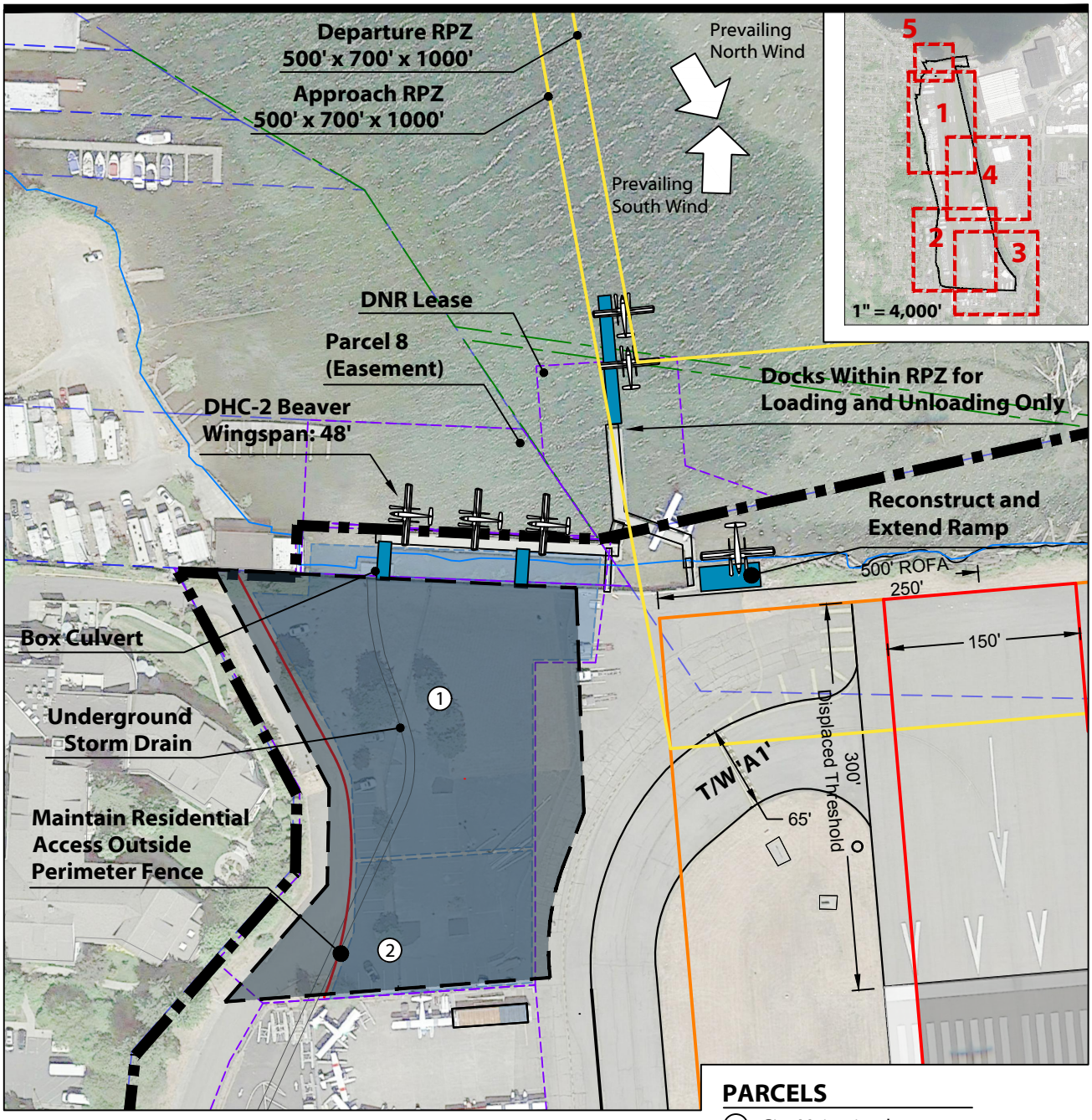
- Reconstructs existing facilities with some expanded facilities.
- Installs two additional walkways to the E/W ramp. The box culvert will not be affected.
- Extends the N/S ramp 100 feet.
- Reconstructs and widens the existing ramp for use in seaplane pullout operations.
- Converts Parcels 1 and 2 into a future aeronautical development area.

Advantages:

- Provides adequate ramp width for design aircraft.
- Maintains the existing configuration of seaplane docks and ramp, meeting the operational requirements of seaplane operators with prevailing winds from the north (summer operations).
- Allows for aviation-related development in Parcels 1 and 2.
- Enhances existing seaplane facilities.

Disadvantages:

- Requires extension of DNR lease boundary to accommodate dock extension.
- Additional improvements require third-party funding.
- Requires continuation of the practice of towing seaplanes through the ROFA with Airport Traffic Control Tower (ATCT) clearance during launch and recovery.



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Lease Parcel Line
- Harbor Lines
- County/City Parcel Boundaries
- Future Dock and Ramp
- Future Aeronautical Development Area
- Airport Service Road
- General Aviation

PARCELS

1. City Maintained
2. City Tiedowns

N

0 125 250

Approximate Graphic Scale in Feet

2020 GOOGLE EARTH AERIAL

FIGURE C7 **Reconstruct in Place and Seaplane Base Alternative 3 - Improve Facilities**

Seaplane Base Alternative 4 – Reconstruct Seaplane Base for RDC C/D-III. Should a change in aircraft operational activity in the future occur that necessitates a change in RDC to C/D-III, the seaplane base facilities would have to be significantly reconfigured. Alternative 4 illustrates the limited space available for relocating facilities outside the ROFA in this scenario. There is simply not enough space available to replace the ramp and docks on a one-for-one basis. Consequently, unless land acquisition were contemplated, the change in RDC would be devastating to the Renton Seaplane Base. Base Alternative 4 is illustrated in **Figure C8**.

Alternative Features:

- Completely removes all existing docks and reconstructs them outside of the C/D-III ROFA.
- Removes the seaplane pullout ramp and reconstructs it outside of the ROFA.

Advantages:

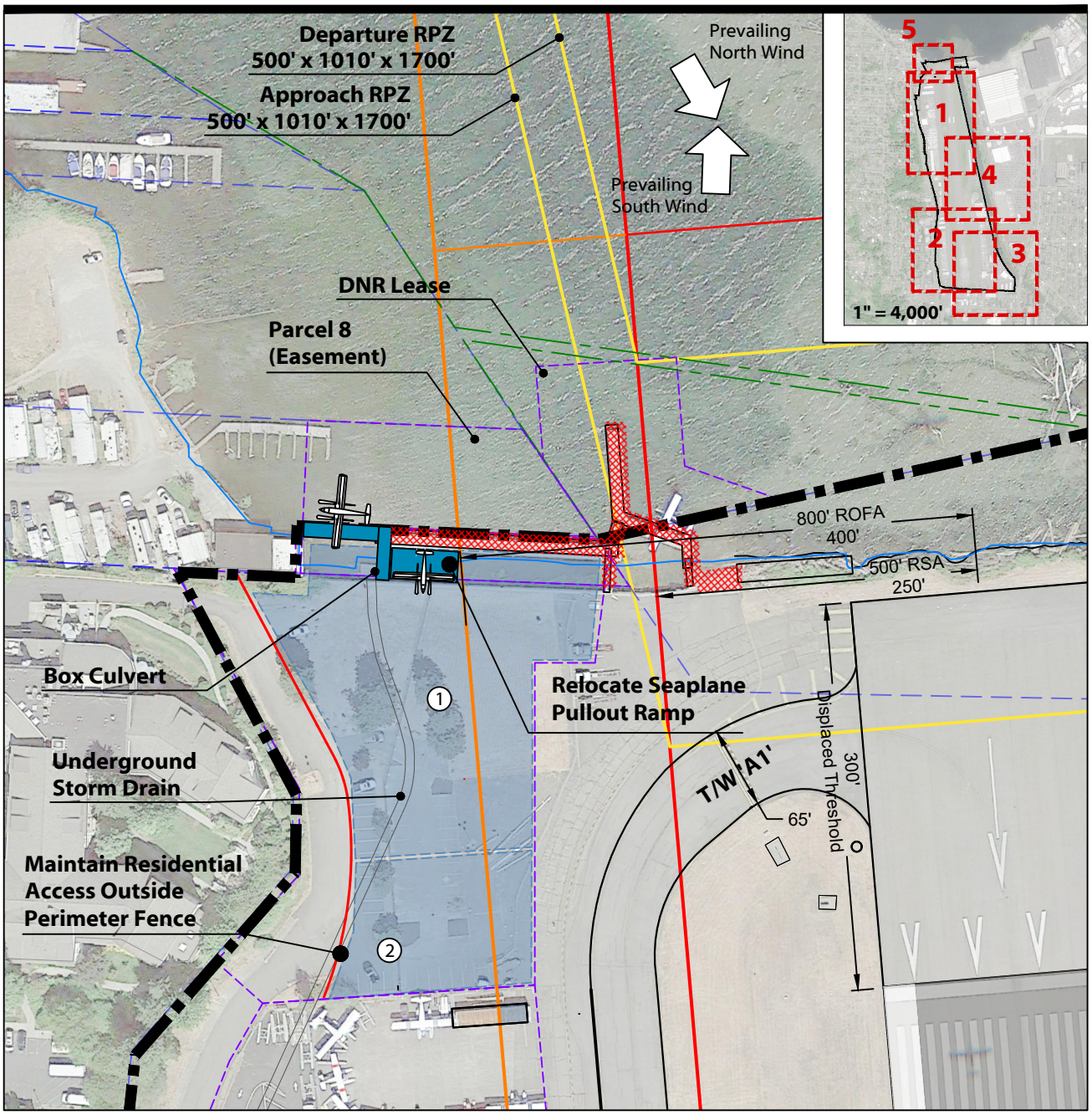
- Relocates the docks and ramp outside of the C/D-III ROFA.
- Allows for aviation related development in Parcels 1 and 2.

Disadvantages:

- Does not meet the requirements of the seaplane base due to the reduction in dock space.
- Requires reconfiguration of the underground storm drain and culvert outlet to accommodate the relocated ramp.
- Requires the complete demolition and reconstruction of all seaplane base facilities.

Recommended Seaplane Base Alternative. Alternative 3, Reconstruct in Place and Improve Facilities, is recommended as the preferred alternative for the seaplane base and Landside Area 5 for several reasons. This concept best meets the needs and requirements of the seaplane users and minimizes changes to the facility. Alternative 3 also provides the following benefits:

- Preserves the entirety of the existing seaplane base, reconstructing in place as necessary.
- Reserves space for a N/S dock extension in the future; however, this extension would require revisions to the DNR lease.
- Reconstructs and widens the seaplane pullout ramp to meet design aircraft requirements.
- Reserves space for Parcels 1 and 2 to be redeveloped for aeronautical use that could include additional seaplane facilities.



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Lease Parcel Line
- Harbor Lines
- County/City Parcel Boundaries
- Future Dock and Ramp
- Future Demo
- Airport Service Road
- General Aviation

PARCELS

1. City Maintained
2. City Tiedowns

N

0 125 250

Approximate Graphic Scale in Feet

2020 GOOGLE EARTH AERIAL

FIGURE C8 **Reconstruct Seaplane Base**
Seaplane Base Alternative 4 - for RDC C/D-III

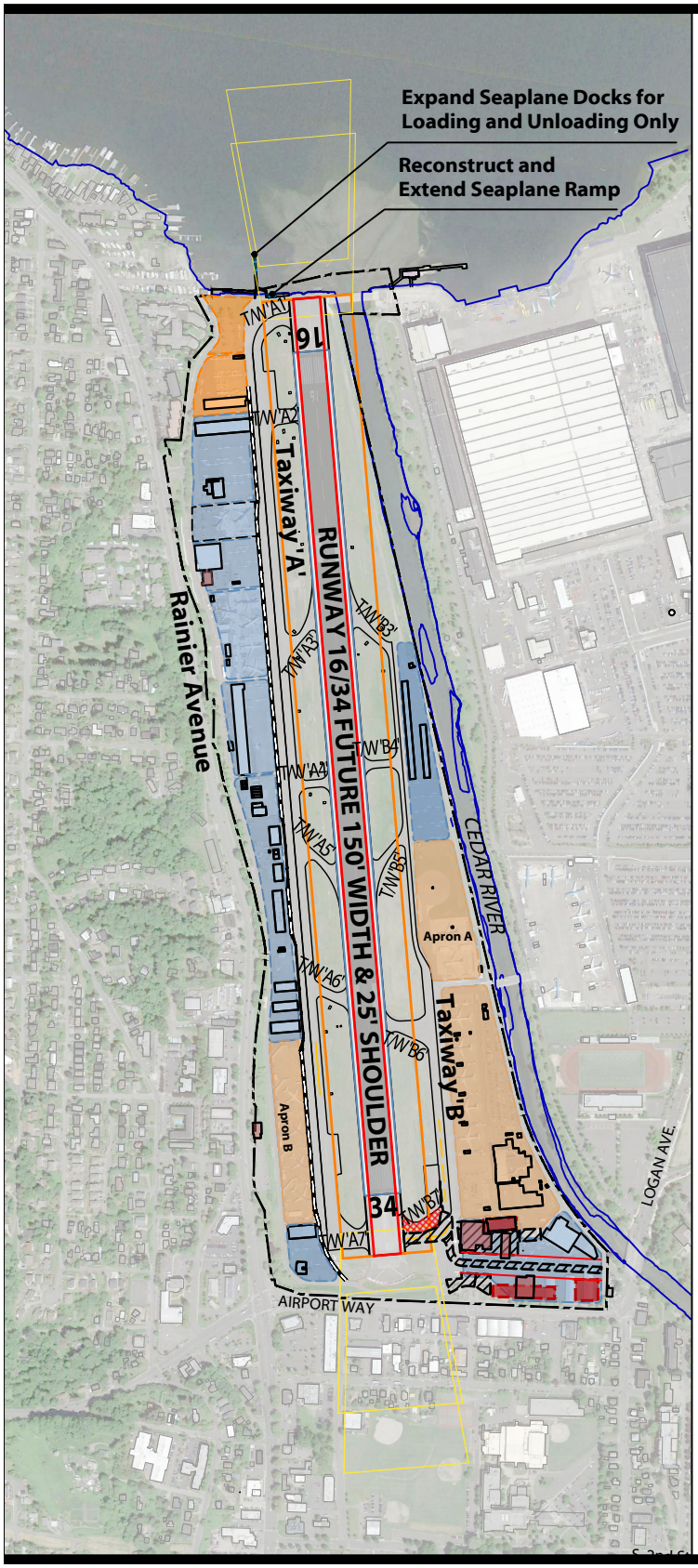
Conceptual Development Plan

Utilizing the recommended components of RNT's landside development areas presented in this chapter, and following input from Airport Staff and the RAAC, a CDP for RNT was developed and is presented in **Figure C9**. The CDP incorporates the alternatives and development proposals best suited to accommodating the needs of RNT's users.

Landside Areas 1 through 4 primarily preserve existing airport parcels for continued development of existing designated land uses. Landside Areas 1, 2, and 4 remain largely unchanged, preserving all existing facilities and rebuilding facilities like hangars and aprons in place, as needed. Building demolition will occur in Areas 1 and 2, where the existing airport maintenance Quonset hut and chamber buildings will be demolished. Significant redevelopment is planned in the southeast corner of the Airport designated as Landside Area 3, where the general aviation facilities will be reconfigured. Existing hangars that have reached the end of their useful life have been and will continue to be demolished in this area. This will free up space for the construction of a more standard, Design Group II taxilane connecting to Taxiway B. This plan corrects the existing historically non-standard taxilane layout while providing a standard object free area for the taxilane. New Clearspan hangars will be constructed as replacements for the existing box and T-hangars, as well as a combination of general aviation and vehicular parking areas throughout the southeast development area.

Seaplane Base Alternative 3, the preferred seaplane base alternative for Landside Area 5 to the northwest, best meets the needs of RNT's based and transient seaplane users while providing the fewest disadvantages. The seaplane base is to be expanded as illustrated, including rebuilding and widening the seaplane pullout ramp in place and extending the north/south dock in future. The remaining area adjacent to the seaplane ramp and docks will be redeveloped for future seaplane related uses including additional seaplane parking.

As with any airport planning decision, the ultimate build-out of the various aviation and aviation-compatible development areas will be demand driven, and the depicted development far exceeds that which is projected during the planning period. The CDP will ultimately be used to develop the official set of ALP drawings representing the ultimate long-term airport configuration, which will be sent for submission and approval by the FAA.



- **Runway 16/34 to be narrowed to 150' width with 25' shoulders. Runway edge lights to be relocated.**
- **Taxiway B7 to be realigned to 90 degree exit from Runway 16/34.**

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Airport Service Road
- Future Pavement
- Pavement Demolition
- General Aviation
- Seaplane Redevelopment Area
- Aviation Industrial
- Building/Hangar Demolition
- Hangar Development

N

0 1000 2000

Approximate Graphic Scale in Feet

2017 GOOGLE EARTH AERIAL

FIGURE C9 **Conceptual Development Plan (CDP)**

CHAPTER D

Airport Development Program

Introduction.

The Development Program chapter focuses on funding available for projects at Renton Municipal Airport (RNT or the Airport), so the City of Renton may continue to plan for development needed to accommodate future demand, meet Federal Aviation Administration (FAA) B-II design standards, and receive FAA and state financial support for improvements. Like most airports, the primary source of funding is the Airport Improvement Program (AIP) by the FAA. As part of the AIP, the FAA asks airports to annually submit a Capital Improvement Program (CIP), which lists short- and medium-term development projects by priority need. It is important to understand that the FAA is not obligated to allocate funding simply because an airport's projects are listed in the CIP.

Implementation Schedule and Project List

A list of capital improvement projects has been assembled from the documentation previously presented, utilizing the Airport's existing CIP as a starting point. The improvements necessary to accommodate the current and future needs of RNT have been placed into two phases: Phase I and Phase II. The projects for Phase I (years 0-5) are listed in priority order by year. In Phase II (years 6-10), the projects are listed without year designators, as priorities may change. RNT's proposed phased CIP is presented in **Table D1** and **Table D2** in this chapter. It is anticipated that the project phasing will invariably be altered as local and federal priorities evolve over the coming years.

Cost Estimates

Planning level cost estimates have been prepared for the proposed projects in Phase I and Phase II. These estimates should only be used as a planning tool due to costs reflecting 2022 dollars. Additionally, they should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering design documents.

Financial Plan and Implementation Strategy

Like most airports, there are three main funding sources for airports: the FAA AIP, the state's department of transportation aeronautics division, and lastly the airport sponsor. Funding depends on availability of funds, project eligibility, and the priority of the project within the CIP. Its authority encompasses programming, planning, design, and construction of all airport development projects. For planning purposes, assumptions were made related to the funding source of each proposed capital improvement project. The estimated project costs and likely funding sources are provided in **Table D1** through **Table D3**.

Table D1 **PHASE I (0-5 Years) DEVELOPMENT PLAN PROJECT COSTS**

Project #	Project Description	Total Costs	Recommended Financing Method		
			Local	State	Federal
YEAR 1 (2022)					
I.1	Reconstruct exterior fence line for improved security standards; install security cameras and key card gate locks (Design - Construction)	$140,700	$12,800	-	$127,900
	Year 1 Totals	***$140,700***	***$12,800***	***-***	***$127,900***
YEAR 2 (2023)					
I.2	Reconstruct and widen seaplane pullout ramp	$417,200	$20,900	$20,900	$375,400
I.3	Reconstruct Taxiway A (Design)	$2,548,300	$127,400	$127,400	$2,293,500
	Year 2 Totals	***$2,965,500***	***$148,300***	***$148,300***	***$2,668,900***
YEAR 3 (2024)					
I.4	Demolish large hangars in the southeast development area (Phase I)	$2,170,100	$108,505	$108,505	$1,953,090
I.5	Reconstruct Taxiway A and narrow runway to 150', including runway edge lights (Construction Phase I)	$11,467,600	$573,400	$573,400	$10,320,800
	Year 3 Totals	***$13,637,700***	***$681,905***	***$681,905***	***$12,273,890***
YEAR 4 (2025)					
I.6	Construct two additional walkways on the east-west seaplane ramp	$17,100	$4,500	$4,500	$8,100
I.7	Extend North/South seaplane dock 50 feet to the north	$28,100	$7,400	$7,400	$13,300
I.8	Reconstruct Taxiway A and narrow runway to 150', including runway edge lights (Construction Phase II)	$11,467,600	$573,400	$573,400	$10,320,800
	Year 4 Totals	***$11,512,800***	***$585,300***	***$585,300***	***$10,342,200***
YEAR 5 (2026)					
I.9	ATCT Renovation (Construction)	$5,000,000	$500,000	-	$4,500,000
I.10	Design/Construct seaplane aircraft parking	$1,129,964	$56,498	$56,498	$1,016,968
	Year 5 Totals	***$6,129,964***	***$556,498***	***-***	***$5,516,968***
SUB-TOTAL PHASE I		**$34,386,664**	**$1,984,803**	**$1,415,505**	**$30,929,858**

Table D2 **PHASE II (6-10 Years) DEVELOPMENT PLAN PROJECT COSTS**

PROJECT #	PROJECT DESCRIPTION	TOTAL COSTS	RECOMMENDED FINANCING METHOD			
			LOCAL	STATE	FEDERAL	OTHER
YEARS 6-10 (2027-2032)						
II.1	Rehabilitate aprons, including windsock and tiedown apron	$4,598,700	$229,935	$229,935	$4,138,830	-
II.2	Construct additional clearspan hangars in the southeast development area (Phase II)	$4,433,800	-	-	-	$4,433,800
II.3	Realign and rehabilitate southeast development area taxilane and apron; reconfigure Exit Taxiway B7	$3,076,500	$153,825	$153,825	$2,768,850	-
II.4	Rehabilitate Runway 16/34	$21,775,800	$1,088,790	$1,088,790	$19,598,220	-
II.5	Demolish existing Chamber Building	$313,800	$313,800			-
II.6	Acquire Property Easements for Parcels Intersecting the Runway 16/34 Runway Protection Zone (Phase I)	$4,470,700	$223,535	$223,535	$4,023,630	-
II.7	Construct two new vehicle parking lots in the southeast development area	$1,185,800	$59,290	$59,290	$1,067,220	-
II.8	Construct reconfigured GA aircraft parking apron in the southeast development area	$3,434,400	$171,720	$171,720	$3,090,960	-
II.9	Rehabilitate North Entrance to Airport off Rainier Ave	$310,800	$310,800	-	-	-
II.10	Demolish existing maintenance facility and reconstruct new facility	$596,800	$596,800	-	-	-
II.11	Airport Master Plan Update	$750,000	$37,500	$37,500	$675,000	-
II.12	Acquire Property Easements for Parcels Intersecting the Runway 16/34 Runway Protection Zone (Phase II)	$4,470,700	$223,535	$223,535	$4,023,630	-
	Year 6-10 Totals	***$49,417,800***	***$3,409,530***	***$2,188,130***	***$39,386,340***	***$4,433,800***
SUB-TOTAL PHASE II		**$49,417,800**	**$3,409,530**	**$2,188,130**	**$39,386,340**	**$4,433,800**

Airport Grant-In-Aid Funding Programs

The following section describes the traditional federal and state airport-in-aid funding programs administered by the FAA and Washington State Department of Transportation (WSDOT). **Table D3** lists the funding categories and typical participation available to the Airport as a FAA Non-Hub Primary airport funding classification. Most projects in the previous tables are FAA-eligible and will be funded from federal grant-in-aid programs (FAA entitlement and discretionary), with the airport matching participation typically at five to 10 percent.

Table D3 **AIRPORT FUNDING PROGRAMS AND PARTICIPATION**

Grant Program/Funding Category	Federal (FAA) Participation	State (WSDOT) Participation	Airport (RNT) Participation
Federal Funding Programs (FAA)			
FAA Cargo Entitlement	$475K (FY 2020)	-	-
FAA 'Pure' Discretionary	90%	5% (See Note)	5% to 10%
FAA State Apportionment	90%	5% (See Note)	5% to 10%
FAA Small Airport Fund	90%	5% (See Note)	5% to 10%
State of Washington Airport Funding Programs (WSDOT)			
WSDOT Airport Aid Program (Pavement Projects)	-	95%	5%
WSDOT Airport Aid Grant Program (Safety Projects)	-	95%	5%
WSDOT Airport Aid Program (Security and Planning Projects)	-	95%	5%
WSDOT Airport Aid Program	100% Airport Low Interest Loan Through State of WA		

SOURCE: **FAA and WSDOT program analysis.**

NOTES: **Funding programs and participation levels subject to FAA/WSDOT budget reauthorization.**
WSDOT funding participation and levels per SWDOT program and project discretion.

FAA Funding Programs and Guidance

The federal government has funded civilian airport development since 1946. The FAA currently funds airport improvements through a dedicated Aviation Trust Fund, collected from user-generated fees and taxes (airline passenger tax, aircraft parts, and fuel). The Trust funds are reinvested at FAA-eligible airports through the Airport Improvement Program (AIP); the current FAA Airport Improvement Program is authorized under the Airport and Airway Improvement Act of 1982, administered in accordance with FAA Order 5100.38, "Airport Improvement Program Handbook". Although subject to congressional authorizations, the FAA AIP program and funding levels are not anticipated to change significantly throughout the 10-year RNT CIP period.

The FAA funding sources available to support airport capital improvements are:

FAA Entitlement. Commercial service airports enplaning more than 10,000 annual passengers are classified as primary and receive FAA entitlement funds. Per FAA formula, the Airport is allocated $1.0 million annually in passenger entitlement funds. These funds can be committed to AIP-eligible projects with FAA approval and can be accumulated up to four years. Projects funded with entitlement grants typically receive 90 percent FAA participation and 10 percent Airport (local) participation.

FAA Discretionary. FAA discretionary dollars are the remaining funds not assigned to FAA entitlements or mandated by FAA set-asides. Typical projects funded with discretionary money are:

- Airport capacity
- Safety and security
- Noise related
- Those identified as FAA national priority projects.

Subject to FAA formula, discretionary balances and available funds are uncertain from year-to-year. Discretionary funds commonly provide grants for large capital projects (airfield pavement rehabilitation and land acquisition), and support 80 to 95 percent of the total eligible project cost. Discretionary funding levels are typically identified in the FAA ACIP three to five years in advance of the project, in which the Airport must commence the project within six months of the fiscal-year grant agreement.

FAA Apportionment. FAA apportionment funds are distributed amongst individual states based on an area/population formula and national funding considerations. The use of apportionments for funding individual airport project grants is at the discretion of the FAA and varies based on funding formula and balances.

State of Washington (WSDOT) Funding Programs and Guidance

The WSDOT administers an Airport Aid Grant Program for airports within the State of Washington. The program is funded by a per-gallon aviation fuel fee and aircraft registrations. Projects are required to be identified in the WSDOT Aviation's five-year Statewide Capital Improvement Program (SCIP), including projects not funded or eligible under the FAA.

The program distributes funds to three major project categories:

1. Pavement projects
2. Safety projects
3. Maintenance, security, and planning projects, in which projects must be accessible by the public and depicted on the Airport Layout Plan (ALP).

The maximum WSDOT grant amount is $750,000 per project, in which WSDOT may fund up to 95 percent, with a minimum of five percent local Airport participation. In addition, WSDOT may participate in matching the local share of FAA AIP projects, where WSDOT contributes up to half of the 10 percent match of the total FAA funded project.

Private-Third Party Funding

Many airports use private third-party financing when the planned improvements will be primarily used by a private business or for other “non-public” uses. Such projects are typically not eligible for federal funding. Projects of this kind typically include corporate hangars, FBO facilities, cargo facilities, exclusive aircraft parking aprons, and various other projects that are private use facilities.

ALP Update

Capital Improvement Program

The Airport Capital Improvement Program (ACIP) is a document prepared by the FAA under the AIP. This document serves as the primary planning tool for identifying and prioritizing critical airport development for airports within the National Plan of Integrated Airport Systems (NPIAS). The CIP is also the basis for distribution of grant funds to airports. For smaller airports, grant funds from the FAA range from 90-95 percent per project.

Phasing Plan

To supplement the information provided by the project list and project cost estimates, a phasing illustration was prepared. **Figure D1** indicates the suggested phasing for the proposed improvement projects throughout the 10-year planning period.

The plans represent a suggested schedule, but variance from it may be necessary, especially during the latter time periods. Attention has been given to the first five years because the projects outlined in this time frame include many critical improvements including the reconstruction of Taxiway A. The demand for certain facilities, especially in the latter time frame, and the economic feasibility of their development, are to be the prime factors influencing the timing of individual project construction. Care must be taken to provide for adequate lead-time for detailed planning and construction of facilities to meet aviation demands. It is also important to minimize disruptive scheduling, where a portion of the facility may become inoperative due to construction, and to prevent extra costs resulting from improper project scheduling.

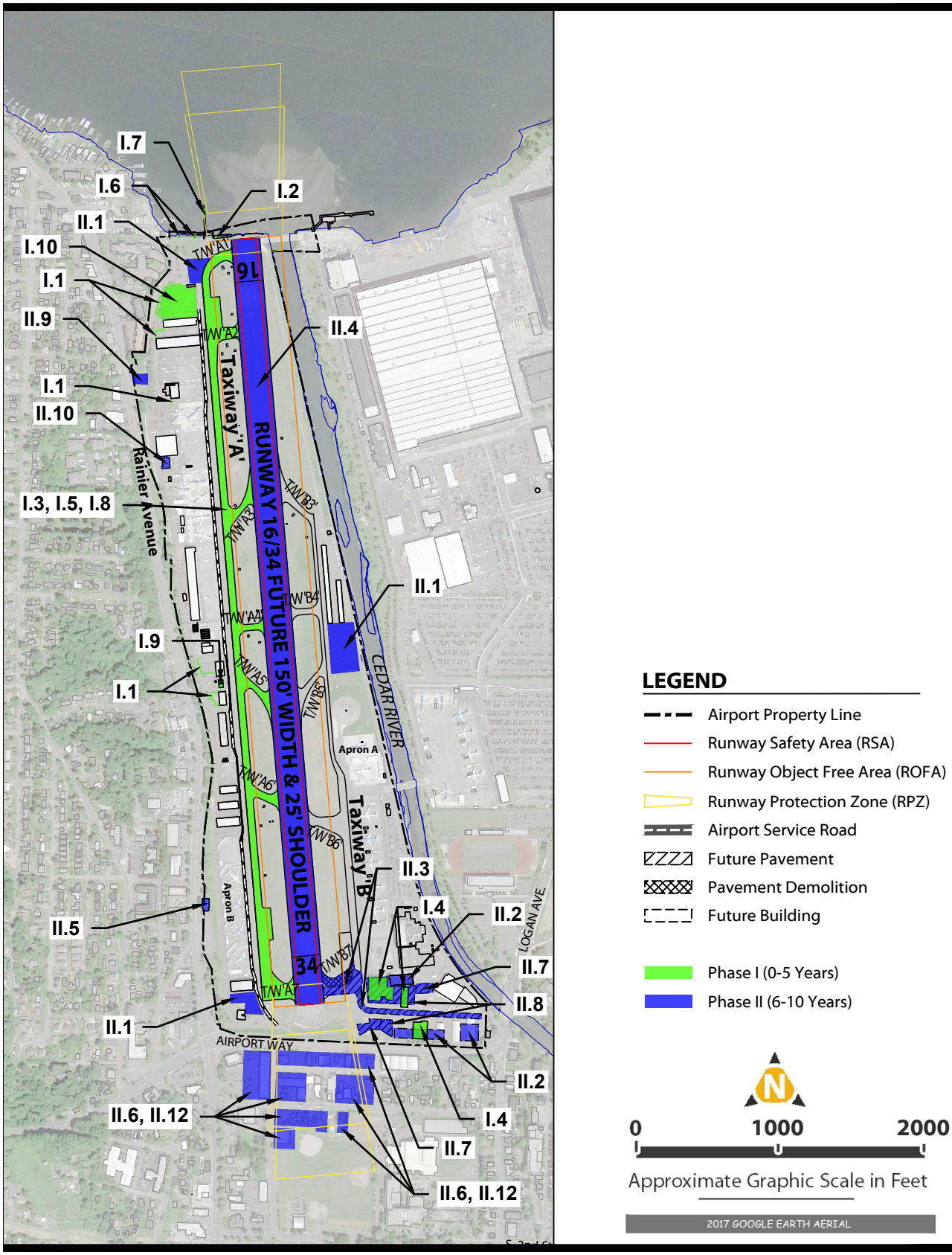


FIGURE D1 **Phasing Plan**