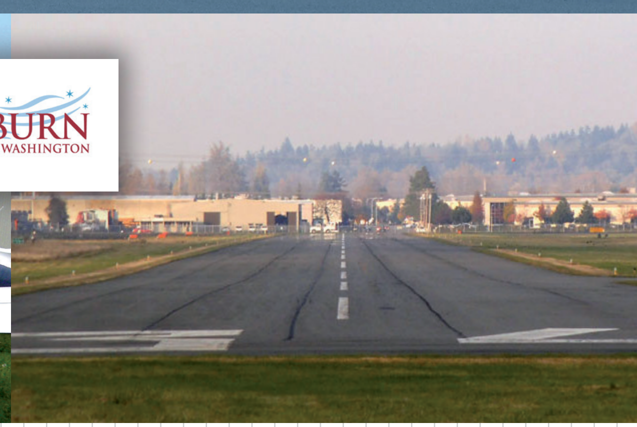
AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON



CENTURY WEST
ENGINEERING CORPORATION

Parametrix

CITY OF AUBURN

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN REPORT

FINAL REPORT, MAY 2015

PREPARED FOR

CITY OF AUBURN WASHINGTON

PREPARED BY

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IN ASSOCIATION WITH

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Chapter 1 – Introduction & Project Overview

Chapter 1 – Introduction and Project Overview

The City of Auburn is updating the Airport Master Plan for Auburn Municipal Airport (S50) in cooperation with the Federal Aviation Administration (FAA) to address the airport's needs for the next twenty years. The Airport Master Plan will provide specific guidance in making the improvements necessary to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable.

Study Purpose

The purpose of the Airport Master Plan is to define the current, short-term and long-term needs of the Airport through a comprehensive evaluation of facilities, conditions and FAA airport planning and design standards. The study will also address elements of local planning (land use, transportation, environmental, economic development, etc.) that have the potential of affecting the planning, development and operation of the airport. FAA Advisory Circular 150/5070-6B Airport Master Plans defines the specific requirements and evaluation methods established by FAA for the study.

Project Need

Auburn Municipal Airport is included in the federal airport system—the National Plan of Integrated Airport Systems (NPIAS). Participation in the NPIAS is limited to public use airports that meet specific FAA activity criteria. The FAA recognizes NPIAS airports as being vital to serving the public needs of air transportation. In doing so, the FAA recognizes that access to the nation's air transportation system is not limited to commercial air service. There are more than 3,300 NPIAS airports, of which more than 75 percent are general aviation airports similar to Auburn Municipal. Auburn Municipal is one of five

NPIAS airports in King County (Auburn, SEATAC, King County International/Boeing Field, Renton Municipal, and Vashon). Other nearby NPIAS airports are located in Puyallup (Pierce County/Thun Field) and Tacoma (Tacoma Narrows). The nearest scheduled commercial air service is available at Seattle-Tacoma International Airport (SEATAC), less than 10 miles northwest of Auburn.

NPIAS airports are eligible for federal funding of improvements through FAA programs such as the Airport Improvement Program (AIP). However, to maintain eligibility for funding, the FAA requires airports to periodically update their master plans as conditions change in order to maintain current planning.

This project updates the 2002 Airport Master Plan (W&H Pacific), which has provided the primary airport planning guidance for the Airport over the last ten years. As many of the previous airport master plan recommendations have been implemented, the need now exists to update the long-term planning for the Airport. In addition to addressing changing local conditions, recently updated FAA standards and current trends within the aviation industry also need to be reflected in updated airport planning. When completed, the 2012-2032 Airport Master Plan and Airport Layout Plan (ALP) will replace the previous master plan and will meet the FAA's requirement to maintain current planning.

Project Funding

Funding for the Airport Master Plan Update is being provided through an FAA Airport Improvement Program (AIP) grant (90%) with a local match (10%) provided by the City of Auburn. The AIP is a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public use airports. The AIP is funded exclusively through fees paid by users of general aviation and commercial aviation and the funds can only be for eligible aviation related projects.

Airport History

According to local records[1], the City of Auburn began investigating the feasibility of building an airport in 1962. Then Mayor Shaughnessey appointed a committee to investigate potential locations for the airport and potential funding options. Eleven different sites were evaluated over the next four years (1962-1965). Eventually, the City authorized a full feasibility study for the airport to be located adjacent to the City's sewer treatment plant. The study concluded that "an airport in Auburn would contribute significantly to the local economy if it had modern facilities, such as a well lit paved runway, covered hangars, and paved tie-down areas that would attract pilots to the airport." The Auburn City Council passed an ordinance in 1968 to raise $450,000 through bonds, for site acquisition and development. Auburn Municipal Airport opened in 1969 with a 2,900' asphalt runway and adjacent paved taxiway. The Airport was renamed Auburn Municipal Airport – Dick Scobee Field in 1986 in honor of Dick Scobee, former Auburn resident

[1] White River Museum – History of the Auburn Municipal Airport

and NASA Space Shuttle Commander. As the airport owner (sponsor) of record, the City of Auburn is responsible for conforming to all applicable FAA regulations, design standards and grant assurances.

History of Airport Planning and Development

As noted earlier, major components of Auburn Municipal Airport were constructed in 1969. Since its original construction, the City has continued to modernize every part of the Airport including the runway-taxiway system; aircraft parking aprons; airfield lighting; fixed base operator (FBO) facilities; aviation fuel storage and dispensing; security fencing; stormwater drainage; utilities; and aircraft hangars. Private investment on the Airport has also been substantial, in particular with hangar construction.

Planning for Auburn Municipal Airport has been updated on a regular basis since the Airport's initial construction in 1969. The last two FAA-funded airport master plan updates were completed in 2002 and 1993. The City's commitment to long-term planning is reflected in the condition, configuration, and functional capabilities of the Airport. Improvements completed since the last master plan include parallel taxiway and aircraft hold area upgrades, property acquisition and hangar construction on the east side of the runway. The primary areas of recent hangar development are north of the aircraft fueling area and tiedown area (between 23^{rd} and 26^{th} Streets NE), in the northeast corner of the airport, and near the southeast corner of the airport.

Auburn Municipal Airport is included in the City of Auburn's Innovation Partnership Zone (IPZ), created in 2012. The IPZ is a defined geographic area that will support sustainable development of business and industrial clusters with research components to support new products, markets, workforce development and employment. The IPZ designation also provides significant benefits in competing for public development funds and private investment. In Auburn, IPZ partners include private sector businesses serving diverse industrial segments, research and education institutions, and the City of Auburn. A complete description of the City of Auburn IPZ designation is provided in **Appendix A.**

The previous planning studies, the 2002 ALP drawings, subsequent airfield design drawings, recent aerial photography, available mapping and survey data, and local planning studies will be used as primary information sources for preparing the updated Airport Master Plan and ALP.

Study Organization

Work in progress on the Airport Master Plan Update will be documented in a series of technical memoranda (presented as draft chapters). The chapters are prepared to document progress in the study, facilitate the review of preliminary results, and to obtain input early and throughout the master planning process. The draft chapters are not finished products. Inevitably, certain information compiled in the chapters becomes obsolete during the planning process as conditions change or new information becomes available. In these instances it is not intended to revise and re-issue the chapters, but rather, to reflect new information in subsequent chapters or in the draft and final Airport Master Plan reports.

The draft chapters and supporting documents were prepared over a period of approximately 18 months. Each draft chapter was reviewed locally and also by the FAA and Washington Department of Transportation - Aviation Division (WSDOT) for consistency with federal and state regulations, policies and standards.

The 2012-2032 Auburn Municipal Airport Master Plan includes the following chapters:

- *Chapter 1 – Introduction and Project Overview*
- *Chapter 2 – Inventory of Existing Conditions*
- *Chapter 3 – Aviation Activity Forecasts*
- *Chapter 4 – Airport Facility Requirements*
- *Chapter 5 – Airport Development Alternatives*
- *Chapter 6 – Environmental Review*
- *Chapter 7 – Financial and Development Program*
- *Chapter 8 – Airport Layout Plan*
- *Chapter 9 – Airport Land Use Compatability*
- *Chapter 10 – FAA Compliance Review*

Local Citizen Participation

The City of Auburn is committed to an inclusive, transparent planning process and has made all project work products available for public review. The public involvement element of the Airport Master Plan Update provided several ways for all interested individuals, organizations, or groups to participate in the project.

First, all draft work products developed during the project were made available for public review and comment. Links to the documents were posted on the City's webpage to allow for convenient access, review and comment. Copies of the draft work products were available for public review and comment at the airport manager's office and City Hall throughout the project. Comment forms were also available for both electronic and printed versions of the draft work products.

Second, a series of public meetings were held during the project to facilitate public participation. The public meetings included periodic study sessions and briefings with the Auburn Airport Board and City Councilmembers. The project team presented information, provided updates on study progress and identified upcoming decision points during these meetings. The project team utilized a variety of tools to encourage citizen participation, including surveys, and project updates posted on the City's webpage.

Third, a local planning advisory committee (PAC) was formed to assist the project team in reviewing draft technical working papers and to provide input into the planning process. The composition of the PAC provided an effective blend of airport users, neighbors, local business, local government representation, and other interests. Representatives from the FAA Seattle Airports District Office and the Washington Department of Transportation - Aviation Division (WSDOT) served as *ex officio* members of the PAC. The PAC met throughout the project, reviewed and commented on draft work products, discussed key project issues and provided local knowledge and expertise to the planning process.

The PAC meetings were open to public and public comment was encouraged. Public input was integral to the planning process, ensuring that all interested stakeholders had an opportunity to participate in the project.

Summary

The FAA-defined airport master planning process requires a sequential, systematic approach which leads to selection of a preferred development option for the airport that is integrated into the Airport Layout Plan (ALP) and Airport Capital Improvement Program (ACIP). To meet this goal, the Airport Master Plan Update will:

- *Provide an updated assessment of existing facilities and activity;*
- *Forecast airport activity measures (design aircraft, based aircraft, aircraft operations, etc.) for the current 20-year planning period;*
- *Examine previous planning recommendations (2004 Airport Master Plan) as appropriate, to meet the current and projected airport facility needs, consistent with FAA airport design standards;*
- *Determine current and future facility requirements for both demand-driven development and conformance with FAA design standards;*
- *Provide consistency between airport planning and land use planning to promote maximum compatibility between the airport and surrounding areas;*
- *Prepare an updated Airport Layout Plan (ALP) drawing set to accurately reflect current conditions and master plan facility recommendations; and*

- *Develop an Airport Capital Improvement Program (ACIP) that prioritizes improvements and estimates project development costs and funding eligibility for the 20-year planning period.*
- *Evaluate airport sponsor compliance with FAA Airport Improvement Program (AIP) grant assurances.*

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49, United States Code, section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable with appropriate public laws.

Chapter 2 – Inventory of Existing Conditions

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Chapter 2 – Inventory of Existing Conditions

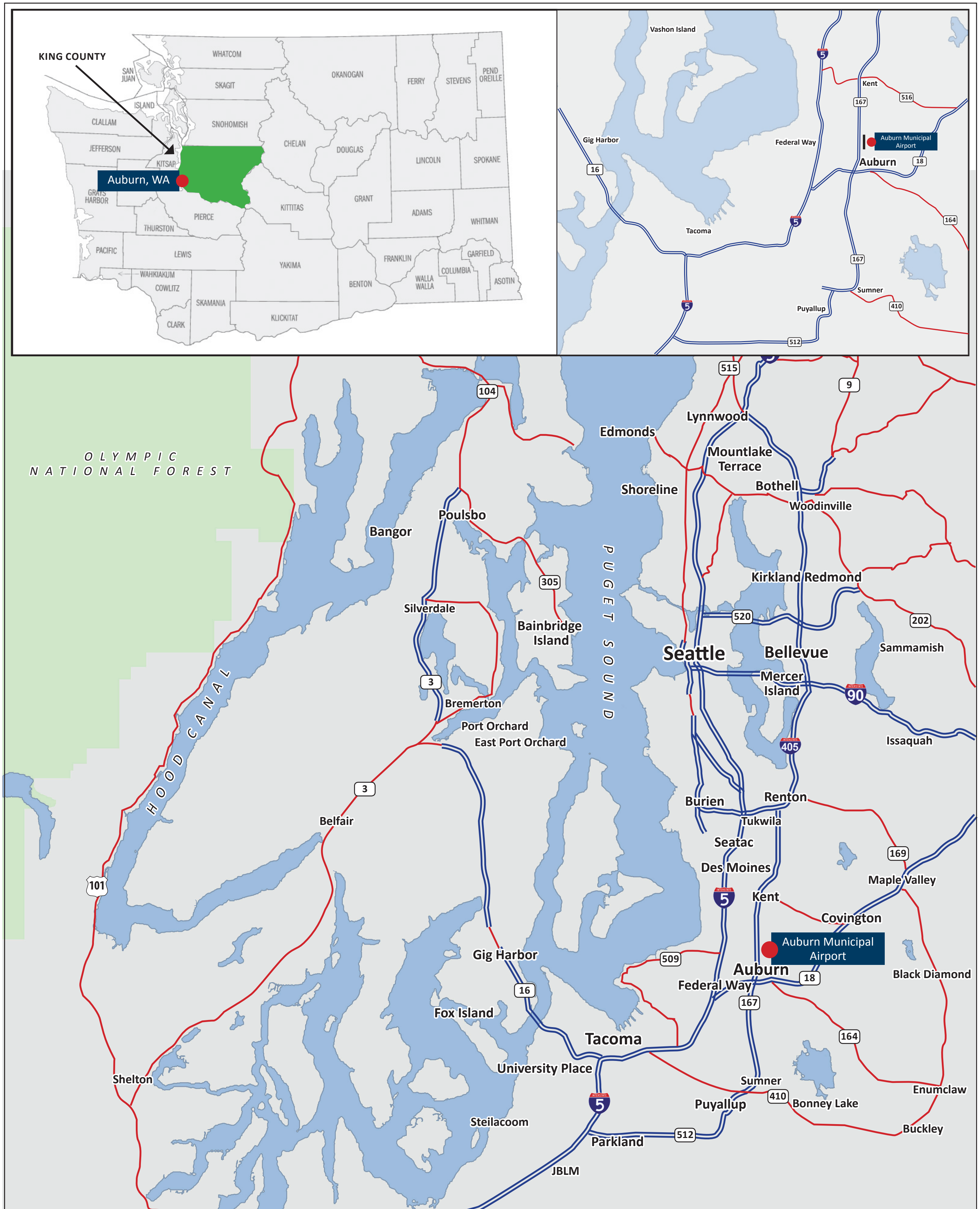
The purpose of this chapter is to document the existing facilities and conditions at Auburn Municipal Airport (Airport Identifier Code: S50). The airport is owned and operated by the City of Auburn, Washington.

This project replaces the airport's 2002-2022 master plan update[1] which will serve as a primary source for inventory data. However, where available, more current or comprehensive data have been included in the chapter to illustrate current conditions. Existing airfield facilities were examined during on-site inspections to update facility inventory data and recent aerial photography was used to provide a current view of existing facilities. The consultants also worked closely with airport management staff to review the current facility and operational data maintained by the City.

Airport Locale

Auburn is an incorporated city located in southwest King County and a small area of northeastern Pierce County, approximately 26 miles south of Seattle and 13 miles northeast of Tacoma. Auburn is bordered by the cities of Kent, Federal Way, Pacific, Sumner and Algona, and unincorporated King and Pierce County. The Muckleshoot Indian Reservation is located near the southeastern corner of the Auburn city limits. Within the Puget Sound region, King County is bordered by Snohomish County (north) and Pierce County (south). Kitsap, Kittitas, and Chelan counties also border King County to the west and east. A location and vicinity map for Auburn Municipal Airport is provided in **Figure 2-1**.

[1] Auburn Municipal Airport Master Plan Update 2001-2020 (W&H Pacific, December 2002)



AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

LOCATION MAP | **FIG. 2-1**

Auburn Municipal Airport is located in North Auburn, about 1 mile north of downtown Auburn, east of Highway 167 and U.S. Interstate 5, and north of Highway 18. Surface access to the airport is provided by local surface streets and Highway 167 and 18, which connect to U.S. Interstate 5 (I-5) and 405 (I-405). The airport is bordered by major arterial roadways on its south and north ends (15th Street N.E. and 30th Street N.E.). Access to the developed east side of the airport is provided via D Street and E Street N.E., which connect to Auburn Way North via 22nd and 26th Street N.E. and to 15th Street N.E. The north hangar area is accessed directly from 30th Street N.E.

As noted in the Introduction chapter, Auburn Municipal Airport has been in continuous aviation use since its initial construction as a small airstrip in 1969-70. The airport serves Auburn, Federal Way, Kent and greater King County. There are ten (10) publicly-owned, public use airports located within 35 nautical miles of Auburn. The majority of the airports are general aviation, although SEATAC, King County International (Boeing Field), Snohomish County (Paine Field), and Renton also accommodate transport aircraft, either in commercial service or related to aircraft manufacturing. There are numerous privately-owned airports in the vicinity of Auburn, including nearby Crest Airpark, which is public use. The significance of the airport service area will be discussed in detail in the aviation activity forecasts (Chapter 3).

Physical Geography

Auburn is located south of Seattle on the east side of the Puget Sound. The low areas surrounding Puget Sound are characterized by coastal forest lands, rolling hills and plentiful water sources. Auburn is located in the Green River Valley, bordered by the foothills of the Cascade Range to the east and the West Hills areas of Des Moines, Kent and Federal Way to the west. Two major water sources in the local area include the White River and Green River. The White River borders the southern edge of the City of Auburn and winds east to connect to the Green River. The Green River begins near South Seattle and winds south-south east through the northeast portion of Auburn and east into the Cascades. Lake Tapps Reservoir is located south of downtown Auburn and was originally created by Puget Sound Energy (PSE) for power generation. Hydropower operations stopped in 2004 and the area is now used for many different recreational activities.

Auburn Municipal Airport is located in a low-lying valley floor, 63 feet above mean sea level (MSL). Nearby Seattle-Tacoma International Airport (8.1 miles northwest) sits on an elevated plain at 433 feet MSL. Moderate mountainous terrain along the east side of the Green River Valley begins about 15 miles from the airport and extends into the Cascade Range. Maximum elevation figures (MEF) depicted on the Seattle VFR Terminal Area Chart (TAC) indicates the highest terrain elevations are found within 25 miles at 6,500 feet MSL, to the south and east (north of Mt. Rainer). Areas to the immediate south, north and west have low-lying terrain surrounding Puget Sound ranging from 2,400 to 4,500 feet MSL.

Climate

Auburn has a temperate maritime-influenced climate with mild winter and warm summer temperatures that are characteristic of the east side of Puget Sound. The region produces moderate rain and occasional snow during the winter months, usually in conjunction with periodic storm events, but does not normally experience extended periods of freezing temperatures.

Historic climatic data (1948-2005) for the local area is available from the National Weather Service observation site in Kent (station number 454169), located approximately 4 miles north of the airport.2 The data indicate that July and August are typically the warmest months; December and January are the coldest. On a monthly basis, the average maximum temperature is 78.0 degrees Fahrenheit (July) and the average minimum temperature is 46.2 degrees (December and January). Annual precipitation averages 39.13 inches, with approximately 45 percent occurring in the three-month period from November to January, where monthly totals normally approach 6 inches. Precipitation during the summer months averages about 1.2 inches per month.

Historical Aviation Activity

Auburn Municipal Airport accommodates a wide variety of aeronautical activity, including small single- and multi-engine aircraft, civilian helicopters, and occasional business class turbine aircraft. The current runway length of 3,400 feet is the primary determinant in fixed-wing aircraft usage, particularly limiting multi-engine turboprop and business jet aircraft. Auburn Municipal Airport is classified as a Reliever airport in the National Plan of Integrated Airport Systems (NPIAS) defined by the Federal Aviation Administration (FAA). Reliever airports are intended to provide additional general aviation capacity to nearby commercial service airports. Four of the five Reliever airports in Washington are located in the Puget Sound region (Auburn, Renton, Paine Field, and Harvey Field); Felts Field in Spokane is also designated a Reliever airport by FAA.

Auburn Municipal Airport currently has several commercial tenants providing aircraft maintenance or other services. Northwest Aviation College (NAC), a private flight training school located on the airport, closed in 2012. In recent years, NAC operated a fleet of 10 fixed wing aircraft generating approximately 40,000 annual operations at Auburn Municipal Airport. Airport Management Group (AMG), the City of Auburn's contract airport manager, provides on-site airport management and aircraft fueling.

According to airport management records, Auburn Municipal Airport currently has 274 based aircraft (February 2013). As an airport without an air traffic control tower, actual counts of aircraft takeoffs and landings (operations) are not regularly maintained. The 2002 airport master plan estimated 141,000 operations and 276 based aircraft in 2000. This estimate reflected significant flight school air traffic associated with Northwest Aviation College, which ended operations at the airport in early 2012. A detailed analysis of aviation activity data will be presented in the updated Aviation Activity Forecasts (Chapter 3). Current airport activity is summarized in **Table 2-1**.

[2] The Weather Channel

TABLE 2-1: AUBURN MUNICIPAL AIRPORT (S50) BASED AIRCRAFT AND OPERATIONS

AIRCRAFT TYPE	NUMBER AT AIRPORT
Based Aircraft *February 2013 Airport Management Count*	
Single-Engine Piston	262
Multi-Engine Piston	8
Turboprop	0
Turbojet	0
Rotorcraft	4
Other	0
Total Based Aircraft	**274**
Annual Aircraft Operations ➢ 2002 Airport Master Plan Estimate (2000) ➢ 2012 Estimate (see Forecast chapter)	96,136 --

Airfield Facilities

Auburn Municipal Airport has one runway (16/34) that is oriented in a north/south direction (160-340 degree magnetic heading). The runway is equipped with lighting and visual guidance indicators (VGI) and has a full length parallel taxiway on its east side. All existing landside development (hangars, aircraft parking, etc.) is located on the east side of the airport. An undeveloped area (approximately 23 acres) is located near the southwest corner of the airport.

Auburn Municipal Airport does not have an air traffic control tower and is classified as a non-towered airport. At non-towered airports, pilots are responsible for proper communication and aircraft operation, including maintaining adequate separation from other aircraft in flight or on the runway-taxiway system. The airport has common traffic advisory frequency (CTAF)/Unicom for communications on the ground and in the vicinity of the airport. **Table 2-2** summarizes airport data. **Figure 2-2** depicts existing airfield facilities.

TABLE 2-2: AIRPORT DATA

AIRPORT NAME / DESIGNATION	AUBURN MUNICIPAL AIRPORT (S50)
Airport Owner	City of Auburn
Date Established	1970
Airport Category	National Plan of Integrated Airport Systems (NPIAS): Reliever (General Aviation) FAA Airport Reference Code: B-I (small) (per the 2002 ALP) Washington State Aviation System Plan: Regional Service
Airport Acreage	Approximately 110 Acres as indicated on current FAA Airport Master Record Form 5010-1
Airport Reference Point (ARP) Coordinates	N 47º 19.66’ W 122º 13.60’
Airport Elevation	63 feet Mean Sea Level (MSL)
Airport Traffic Pattern Configuration/Altitude	Right Traffic (Rwy 16)/Left Traffic (Rwy 34) • Fixed wing pattern 1,063 feet above mean sea level (MSL) / 1,000 feet above ground level (AGL) • Helicopter pattern: 563 feet above mean sea level (MSL) / 500 feet above ground level (AGL)

The published airfield elevation is 63 feet above mean sea level (MSL).[3] The traffic patterns for both runway ends are located on the west side of the runway and pilots are advised to avoid noise sensitive areas east of the airport and hospital facilities located 1 mile south of the runway. The traffic pattern for Runway 34 is standard left traffic (left hand turns within the pattern), while Runway 16 has a right traffic pattern (right turns within the pattern). Wind conditions typically dictate which runway end is in use and the direction of flight in the traffic pattern. The traffic pattern altitude for fixed wing aircraft is 1,000 feet above ground level (1,063 feet MSL); the traffic pattern altitude for helicopters is 500 feet above ground level (563 feet MSL). **Figure 2-3** depicts the traffic patterns for Auburn Municipal Airport.

[3] Surveyed by the National Geodetic Survey. Datums: National Geodetic Vertical Datum of 1988 (NGVD 88); North American Datum of 1983 (NAD 83)

AIRPORT BUILDINGS	
	AIRCRAFT FUEL
	COMMERCIAL/FIXED BASED OPERATOR (FBO)
	AIRPORT MGR. OFFICE
	T HANGAR
	CONVENTIONAL/EXECUTIVE HANGAR
RUNWAY 16/34	
3400' x 75'	

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EXISTING CONDITIONS | **FIG. 2-2**

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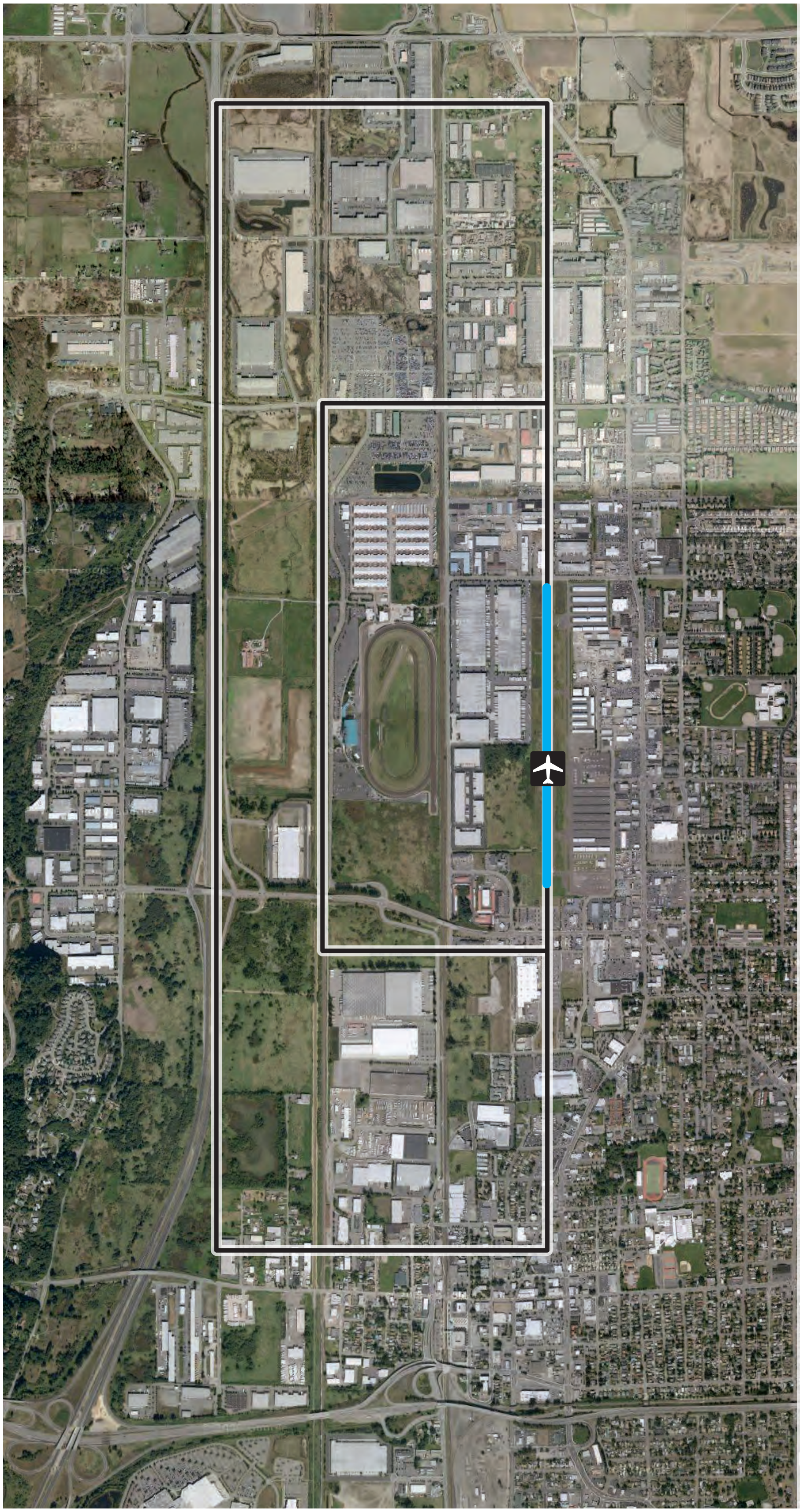


Noise sensitive areas run south to north on both the east and west side of the airport

Fixed wing fly westside pattern 1,000′ MSL over highway

Rotorcraft fly westside pattern 500′ MSL over RR tracks

Rotorcraft must remain clear of fixed wing aircraft

All aircraft shall avoid making turn prior to reaching 500′ MSL while departing

LHT for RWY 34 and RHT for RWY 16

Fixed wing aircraft entering pattern from the east are expected to over flight the airport east to west at 1,500′ MSL and enter on the downwind on 45

Over flight of Emerald Downs and their stables is prohibited

CITY OF AUBURN WASHINGTON

Runway

RUNWAY 16/34

Runway 16/34 is 3,400 feet long and 75 feet wide with an asphalt surface. The original runway pavement was constructed in 1969 (2,900' x 75') and a south extension (500' x 75') was added in 1983. The entire runway was rehabilitated in 2004 with a 2" asphalt overlay.[4] The runway is equipped with edge lighting and visual approach aids. The effective gradient of the runway is approximately 0.19 percent, with the high point (63 feet MSL) located at its south end (Runway 34 threshold). The runway is served by a full length parallel taxiway (Taxiway A) on its east side with 5 exit taxiways (Taxiways C-G).

The runway has basic (visual) markings on both ends, consistent with current visual and nonprecision instrument (circling) approach capabilities. The runway markings (white paint) include runway designation numbers, and centerline stripe. Yellow taxiway lead-in lines are painted on the runway at each of the five exit taxiways. All runway markings are consistent with FAA standards for configuration, color, and approach type (basic visual approach/non-precision instrument). The markings were observed to be in good condition during a recent site visit.

TABLE 2-3: RUNWAY 16/34 DATA

Dimensions	3,400 x 75 feet
Bearing	S 00º52'25" W (True)
Effective Gradient	0.19%
Surface/Condition	Asphalt/Good
Markings	Basic/Visual: Runway Landing Designation Numbers, Centerline Stripes, Taxiway Lead-In Lines (good condition)
Lighting	Runway Edge, Threshold, Vertical Guidance Indicators, Runway End Identifiers (See Table 2-6)
Signage	Mandatory, Location, and Directional (internally illuminated)

Airfield Pavement Strength

Runway 16/34 has a published weight bearing capacity of 12,500 pounds for aircraft equipped with single wheel landing gear.[5] A single wheel 12,500 pound rating is the FAA standard for runways designed to serve single-engine and multi-engine piston, single-engine and multi-engine turboprops, small business jets and very light jets (VLJ) with operating weights at or below 12,500 pounds. The airport's taxiways, aprons, and hangar taxilanes also have pavement designs that are consistent for use by small aircraft.

[4] 2005 Pavement Management Report – Auburn Municipal Airport

[5] FAA 5010-1 Airport Record Form; FAA Airport/Facility Directory (A/FD) Northwest U.S.

During a recent site inventory, runway and main taxiway pavements were observed to be in good or very good condition, consistent with age. Some apron and taxilane pavements are showing wear with isolated areas of distress.

Runway Wind Coverage

It is generally preferable for aircraft to land and takeoff directly into the wind, although varying wind conditions often require crosswind operations at airports. When wind conditions exceed the capabilities of a specific aircraft, use of a crosswind runway (when available) may occur. At airports with single runways, occasional periods of strong crosswinds often limit operations until conditions improve.

The FAA-recommended planning standard is that primary runways should be capable of accommodating at least 95 percent of wind conditions within the prescribed crosswind component. This component is based on a direct crosswind (90 degrees to the direction of flight) of 10.5 knots (12 miles per hour) for small aircraft and 13 knots (15 miles per hour) for larger general aviation aircraft. Transport and larger military aircraft are typically designed to accommodate higher crosswind components. Aircraft are able to tolerate increasingly higher wind speeds as the crosswind angle is reduced and moves closer to the direction of flight.

The wind roses depicted on the 2002 Airport Layout Plan graphically illustrate the favorable relationship between the runway alignment, local wind conditions and terrain. It is assumed that SEATAC airport wind data was used to develop the wind rose based on the close proximity of the airport (8 miles northwest) and the same 160-340 degree runway alignments. The wind roses indicate 98.9 percent coverage in all-weather conditions and 99.2 percent coverage during instrument weather conditions, both of which exceed the FAA crosswind coverage standard for small aircraft.

Taxiways

Auburn Municipal Airport has a full length parallel taxiway on the east side of Runway 16/34 that provides access to the entire runway and adjacent aprons and landside facilities. A system of taxilanes provides access to aircraft parking aprons and hangar development areas on the east side of the airport. It is noted that the taxiway designations on the airport have changed slightly since the 2002 airport master plan. The five exit taxiways that were previously designated Taxiways A-E are now designated Taxiways C-G and the parallel taxiway is designated Taxiway A. **Table 2-4** summarizes existing taxiway facilities. **Figures 2-2 and 2-3**, presented earlier in the chapter, depict the major taxiways on the airfield.

TAXIWAY A

Taxiway A is the east parallel taxiway for Runway 16/34. Taxiway A is 25 feet wide and has a runway separation of 240 feet. Taxiway A has five exit taxiway connections to the runway. The number and location of the exit taxiways promotes efficient aircraft movement in the runway-taxiway system.

The parallel taxiway and exit taxiways were reconstructed (widened and/or reconfigured) in 2009 and are in very good to excellent condition. The previous configuration included closely-spaced dual taxiways (20 feet wide) on the northern half of the parallel taxiway which have been replaced with a single 25-foot wide taxiway.

Taxiway A has a centerline stripe with striping connecting to each runway exit taxiway and adjacent hangar or apron taxilanes. The east edge of Taxiway A is marked with a dashed yellow stripe where it abuts adjacent apron or taxilane paved areas. The striping and markings on the parallel taxiway are in very good condition. Taxiway A is equipped with medium intensity taxiway lighting (MITL) and has extensive lighted airport directional and informational signage.

Taxiway A has four aircraft hold areas (varying sizes) located adjacent to the taxiway on its west (interior) side. The hold areas are at both ends of the runway (adjacent to Taxiways C and G) and adjacent to two interior exit taxiways (Taxiways D and F). The hold areas are marked with centerline stripes along their inner edges, but do not have markings indicating the edge of parallel taxiway object free area (OFA), which is used to define wingtip clearance to a fixed or moveable object for taxiing aircraft.

TAXIWAYS C-G (RUNWAY 16/34 EXITS)

Runway 16/34 has five 90-degree exit taxiways (C-G) that connect the runway and the east parallel taxiway (Taxiway A). The exit taxiways vary in width from 30 to 40 feet and are approximately 190 feet long. The exit taxiways are equipped with blue medium intensity taxiway edge lighting (MITL) and are marked with aircraft hold lines located 125 feet from runway centerline. The aircraft hold lines (and accompanying signage) are located at the edge of the runway obstacle free zone (OFZ), a protected area surrounding the runway that is kept free of taxiing or holding aircraft, except when accessing or exiting the runway. As noted earlier, taxiway lead-in lines are located on the runway and connect with the exit taxiway centerlines. The striping and markings on the major taxiways are in good condition.

ACCESS TAXILANES AND TAXIWAYS

Auburn Municipal Airport has several access taxilanes serving aircraft hangar areas on the east side of the runway. The three paved aircraft aprons on the airport also have defined taxilanes to provide access to aircraft parking and fueling. The condition of the taxilanes range from fair to good, although some sections were rated "poor" in the most recent pavement inspection in 2012. Most of the taxilanes are marked with yellow centerline stripes that vary in condition from poor (faded or worn) to good.

<u>North Hangar Access Taxiway</u>

The north hangar area is served by a taxiway that extends beyond the north end of Taxiway A. The taxiway is approximately 35 feet wide and is semi-parallel to the extended runway centerline (approximately 245 to 250 feet east of runway centerline). The access taxiway connects to five east-west stub taxilanes located between five rows of hangars.

North Hangar Area Taxilanes

The north hangar area has five east-west stub taxilanes located between rows of multiple-unit hangars (City of Auburn, Auburn Hangar Owners Association – AHOA, Auburn Flyers Condo, Jim Jacobson). All of the hangars are oriented in rows perpendicular to the runway and use the stub taxilanes to connect to the north access taxilane and Taxiway A, which provides direct access to all other areas of the airfield. The spacing between hangar rows (taxilane object free area) varies from approximately 70 to 80 feet.

Auburn Condo Hangar Association (ACHA) Taxilanes

The ACHA hangar area located near mid-runway is served by four east-west taxilanes that connect to a north-south taxilane located near the east end of the area to form a taxilane loop. The taxilanes provide access to seven multi-unit hangars. Four hangars are dual-sided and one hangar is one-sided, oriented in rows perpendicular to the runway and use the stub taxilanes to connect to Taxiway A. Two hangars located along the west edge of the development are oriented north-south with west-facing doors. The spacing between hangar rows (taxilane object free area) varies greatly from approximately 40 to 60 feet. The narrowest taxilane clearance (<40 feet) is on the north-south taxilane that fronts the hangars located at the rear (east end) of the development. The clearance between buildings in this area is reduced by electrical panels and protective bollards installed on the east ends of the east-west oriented hangars and by vehicles parked in the taxilane. Non-movement areas are marked (yellow cross hatching) at the west end of four hangars located directly adjacent to Taxiway A.

South Hangar Area Taxilanes

The south hangar area consists of eight rows of multi-unit hangars (City of Auburn and Auburn Flyers Condo) and eight stub taxilanes located between the south and central aircraft parking aprons. The hangar rows are oriented perpendicular to the runway and the stub taxilanes connect directly to Taxiway A. A narrow paved vehicle access lane extends along the eastern end of the development, between the hangar ends and the adjacent security fence. Except for the southern-most hangar row which has north-facing units, the other hangars in this area are dual-sided T-hangars. The spacing between hangar rows (taxilane object free area) varies from approximately 75 to 80 feet, although vehicles parked on adjacent taxilanes reduce actual wingtip clearance for taxiing aircraft.

The northern-most taxilane in this area provides access to the north units in Hangar Row 2 (including the aircraft wash rack located near the east end of the hangar) and to 7 aircraft tiedowns located on the south side of Building "506" which currently accommodates airport management offices and commercial lease space.

South Access Taxiway

The south access taxiway extends from the intersection of Taxiway A and Taxiway C to the southwest corner of the south tiedown apron. The taxiway is 20 feet wide and extends approximately 300 feet, parallel to the extended runway centerline (approximately 210 feet east of runway centerline).

Auburn Flight Service (FBO Access Taxilanes)

Two paved access taxilanes extend from Taxiway A to a small apron adjacent to the Auburn Flight Service hangar. The taxilanes are approximately 20 feet wide and 325 feet long and provide access to 8 adjacent paved aircraft parking pads and the northern row of grass tiedowns. A grass-surfaced aircraft parking area located adjacent the hangar has an unpaved taxilane located between the tiedown rows that also connects to Taxiway A. The taxilanes are located within the lease area and are privately funded and maintained.

TABLE 2-4: TAXIWAY DATA (AUBURN MUNICIPAL AIRPORT)

TAXIWAY	DESCRIPTION	DIMENSIONS/CONFIGURATION
Taxiway A	East Parallel Taxiway	3,400 x 25' with five exit taxiways Asphalt surface w/ yellow centerline stripe and outer edge stripe; MITL (Blue)
Taxiways C, D, E, F, G	90-degree Exit Taxiways for Runway 16/34 and Parallel Taxiway (A)	190' (Length of section between runway edge and parallel taxiway edge) Widths Vary: 30 to 40 feet Asphalt surface w/ centerline stripe; taxiway lead-in lines from runway; aircraft hold lines at each runway connection (125' from runway centerline); MITL (Blue) Exit Locations (distance from runway ends 34/16): C – Rwy 34 threshold (0'/3,400') D – (525'/2,875') E – (1,425'/1,975') F – (2,425'/975') G – Rwy 16 threshold (3,400'/0')
North Hangar Area Access Taxiway	Taxiway extending beyond north end of Taxiway A	Approximately 500 x 30' Asphalt surface w/ centerline stripe and connections with stub taxilane centerline stripes
North Hangar Taxilanes	Taxilanes within hangar area (continuous pavement between all hangars)	Widths of useable pavement between hangars vary from 70 to 80' Asphalt surface w/ centerline stripes
ACHA Hangar Taxilanes	Taxilanes within hangar area (continuous pavement between all hangars)	Widths of useable pavement between hangars vary from 40 to 60' Asphalt surface w/ centerline stripes; non-movement areas marked at west end of hangars directly adjacent to Taxiway A
South Hangar Taxilanes	Taxilanes within hangar area (continuous pavement between all hangars)	Widths of useable pavement between hangars vary from 75 to 80' Asphalt surface w/ centerline stripes
Auburn Flight Service FBO Taxilanes	2 paved and 1 grass taxilanes within FBO lease area serving aircraft parking and hangar	Paved Taxilanes: 325 x 20' Asphalt surface w/ centerline stripes Grass Taxilane: 285 x 18'
Apron Taxilanes *(north, central and south aprons)*	Apron/ Tie Down Taxilanes	Taxilanes between or adjacent to tiedown rows and aircraft fueling area; Asphalt surface w/ centerline stripes Taxilane clearances (to adjacent tiedowns) vary from 62 to 80 feet (less clearance when tiedowns are occupied)

Aircraft Apron

Auburn Municipal Airport has three paved apron areas located on the east side of Runway 16/34 that accommodate local and visitor aircraft tiedowns, airport management offices, and aircraft fueling. The airport also has a grass tiedown apron and eight paved parking positions located at the south end of the airport leased to Auburn Flight Service. The aprons are currently configured with a total of 169 small airplane tiedowns, although not all tiedowns are marked or actively used. **Table 2-5** summarizes the existing apron facilities at the airport.

NORTH TIEDOWN APRON

The north tiedown apron is located near mid-field, north of exit taxiway E and the aircraft fueling area, and immediately south of the ACHA hangar area. The apron accommodates small airplane parking and is configured with two east-west tiedown rows served by two adjacent taxilanes that connect directly to Taxiway A. The center row is double-sided with 13 tail-in tiedowns (designated N 01-13). The southern row originally included 7 north-facing tail-in tiedown positions, although three tiedowns at the west end of the row are not currently available. The tiedowns in the south row are not numbered. The apron originally included a northern row of 7 tiedowns that were eliminated to provide access to 5 south-facing units in an adjacent T-hangar that was constructed since the last master plan was completed. In its current configuration, the north tiedown apron has **17 useable tiedowns**. Vehicle access to the north tiedown apron is provided through the automated gate located adjacent to the airport management office.

CENTER TIEDOWN APRON

The center tiedown apron is located near mid-field, directly in line with exit taxiway E and immediately north of the south hangar area. The apron accommodates aircraft loading/unloading and parking for transient aircraft, based aircraft parking, and aircraft fueling. The airport management office is located in Building "506," formerly used by Auburn Flight Service/Northwest Aviation College located adjacent to the apron. Vehicle access to the center tiedown apron is provided through the automated gate located adjacent to the airport management office.

The center apron has four taxilane connections (striped) to Taxiway A. The outer section of the apron directly abuts Taxiway A and includes the aircraft fueling area and 10 visitor aircraft tiedowns (marked inside a 200 x 52' rectangle). The fuel island is oriented east-west with two pumps located at the east end. Taxilane centerline striping extends from Taxiway A to aircraft fueling positions on the north and south sides of the tank. A small office is located near the fuel tanks at the northwest corner of the center apron.

The main tiedown area is configured with four east-west tiedown rows served by three adjacent taxilanes. The two center rows are double-sided with 16 and 17 tail-in tiedowns (designated C07-39). The outer (western most) tiedown position in the northern double-sided row is not currently used (not marked or numbered) due to its proximity to the fueling island and taxilanes. The north row has 6 south-facing tiedowns (designated C 01-06) and the south row has 5 north-facing tiedowns (designated C40-44). There are 11 tiedowns located adjacent to Building "506" which was formerly used as a flight school; 4 tiedowns are located in front of the building (west/northwest frontage) and 7 tiedowns are located on a small section of apron south of the building. In its current configuration, the center tiedown apron and south extension has **65 useable tiedowns**.

SOUTH TIEDOWN APRON

The south tiedown apron is located at the southeast corner of the airport, adjacent to Taxiway C and the south end of the runway. The apron accommodates parking for transient and based aircraft. A section of the apron is leased to a local line controlled model aircraft club (NW Skyraiders). A combination lock pedestrian gate is located on the south side of the apron adjacent to a motel. Vehicle access to the apron is provided through two automated gates located on the south and east sides of the apron.

The south apron has two taxilane connections to Taxiway A. The primary taxilane connection is located at the northwest corner of the apron where Taxiway A and C meet at the Runway 34 end. A bypass taxiway extends south of Taxiway C to an aircraft hold area and connects at the southwest corner of the apron.

The south apron is configured with four east-west tiedown rows served by three adjacent taxilanes. The two center rows are double-sided with 21 tail-in tiedowns each (42 total); the north row has 11 tiedowns and the south row has 10 tiedowns. It is noted that the northern two rows of tiedowns are numbered (S01-11 and S12-32) and the southern two rows are not numbered. In its current configuration, the south tiedown apron has **63 useable tiedowns**.

AUBURN FLIGHT SERVICE APRON (FBO LEASE)

Auburn Flight Service, a local fixed base operator (FBO) providing aircraft maintenance services, leases the area immediately north of the south tiedown apron. The leased area includes aircraft parking (a grass surfaced apron with 16 tiedowns and 8 paved tiedown pads), a commercial hangar, vehicle parking, a small apron, and dual access taxilanes that connect to Taxiway A. In its current configuration, the south FBO lease area has **24 designated tiedowns** with additional paved apron space to accommodate 4 to 6 more aircraft.

TABLE 2-5: AIRCRAFT APRONS (AUBURN MUNICIPAL AIRPORT)

APRON	DESCRIPTION
North Tiedown Apron	Approximately 350 x 230’ (8,940 square yards) Asphalt Concrete Current Use: Small airplane tiedowns located north of the fueling area and hangar frontage (north edge) Tiedowns: 17 small airplanes
Center Apron	Approximately 498 x 330’ (18,260 square yards) Asphalt Concrete Current Use: Small airplane tiedowns (local and transient), aircraft fueling, access to adjacent commercial buildings Tiedowns: 65 small airplanes
South Tiedown Apron	Approximately 498 x 330’ (18,260 square yards) Asphalt Concrete Current Use: Small airplane tiedowns (transient and based aircraft parking) Tiedowns: 63 small airplanes
Auburn Flight Service FBO Lease Apron (south)	Approximately 285 x 115’ (3,600 square yards) Grass surface; 8 Asphalt parking pads (325 x 55’ - 1,990 square yards) and adjacent paved taxilane. Current Use: Small airplane tiedowns, FBO services (aircraft maintenance) Tiedowns: 24 small airplanes
Total Number of Designated Aircraft Parking Positions	**169 small airplane tiedowns**

Airport Lighting and Signage

Auburn Municipal Airport accommodates day and night operations in visual weather conditions and day operations in instrument meteorological conditions (IMC). The airport’s published instrument approach indicates that night procedures are not authorized.

The runway is equipped with lighting systems that are consistent with current approach requirements and runway use. The runway-taxiway system has extensive illuminated signage that provides directional, location, and runway clearance information to pilots. **Table 2-6** summarizes the categories of airport lighting currently used at the airport. All airfield lighting observed during recent site visits appeared to be in fair condition or better and fully operational.

TABLE 2-6: TYPES OF AIRPORT LIGHTING USED AT AUBURN MUNICIPAL AIRPORT

CATEGORY	TYPE	CONDITION
Airport Lighting	Airport Rotating Beacon (white/green dual lens) Operates on dusk-dawn photocell switch	Good/Fair
Runway Lighting	Medium Intensity Runway Lighting (MIRL) (white lenses) Threshold Lighting (red/green lenses) Runway End Identifier Lights (REIL) (white strobes) Pilot-Activated (via CTAF radio frequency)	Good
Visual Guidance Indicators	4-Light VASI (red/white lenses) • Rwy 16: (V4R) 4.5 degree glide path • Rwy 34: (V4L) 4.0 degree glide path Operate Continuously	Good
Taxiway Lighting	Medium Intensity Taxiway Lighting (blue) on Taxiway A and runway exits (Taxiways C-G) Pilot-Activated (via CTAF radio frequency)	Excellent
Airfield Signage	Mandatory, Location, and Directional	Fair
Other Lighting	Obstruction lights, lighted wind cone/segmented circle, flood lighting in hangar, fuel areas.	Good

AIRPORT LIGHTING

The airport has a rotating beacon mounted on the roof (west end) of the T-hangar located immediately south of the center tiedown apron on the east side of the airport. The beacon was relocated since the last master plan from an off-airport site on "B" Street NW, approximately ¼ mile west of the runway. Rotating beacons are used to indicate the location of an airport to pilots at night or during reduced visibility. The beacon provides sequenced white and green flashing lights (representing a lighted land airport) that rotate 360 degrees to allow pilots to identify the airport from all directions from several miles.

An illuminated wind cone is located on the west side of the runway and is located in the segmented circle. A second unlighted wind cone is located near the end of Runway 34 (@ Taxiway D) on the west side of the runway.

The rotating beacon and lighted wind cone operates on an automatic dusk-dawn photocell switch. The runway lighting and taxiway lighting are pilot-activated using the common traffic advisory frequency (CTAF) 122.8 MHz. The visual guidance indicators operate continuously. All airfield lighting reportedly functions normally.

RUNWAY LIGHTING

Runway 16/34 has medium intensity runway edge lighting (MIRL) and runway end identifier lights (REIL).

- **MIRL:** The MIRL system includes white edge lights and runway threshold lights. The threshold light fixtures have split lenses (green/red) indicating the beginning and end of the runway.

- **REIL:** Runway 16/34 is equipped with runway end identifier lights (REIL), which consist of two high-intensity sequenced strobe lights that mark the end of the runway to assist pilots in establishing visual contact with the runway environment during periods of darkness or reduced visibility.

Visual Guidance Indicators: Runways 16 and 34 are equipped with a 4-light Visual Approach Slope Indicators (VASI). The VASI projects light along an established glide path to a runway end, with red and white colored lights indicating the aircraft's vertical position (above, below, or on glide path) relative to the defined glide path. The VASI at both runway ends have slightly steeper glide path angles (4 and 4.5 degrees to address close in obstruction clearance) compared to the standard 3-degree glide path.

Taxiway Lighting: The runway exit taxiways and the parallel taxiway at Auburn Municipal Airport are equipped with blue medium intensity taxiway edge lighting (MITL). The MITL system was installed new in 2009 as part of the parallel taxiway reconstruction/reconfiguration. The MITL fixtures are mounted on individual concrete foundation pads and are in excellent condition.

Airfield Signage: The runway-taxiway system has internally illuminated mandatory instruction signs (red background with white letters/numbers) marking the aircraft holding positions at each of the taxiway connections with the runway [34-16, etc.]; the signs also include taxiway direction/designations [B, C, D, → etc.] with yellow background and black numbers/letters. The signs are located to coincide with the painted aircraft hold lines on each taxiway that connects to the runway.

Other Lighting: Overhead lighting is available in the terminal area and main aircraft parking aprons, the aircraft fueling area, and in various hangar areas. Some hangars also have exterior wall-mounted flood lights. Red obstruction lights are mounted on the tops of several structures, antennae, and other items on, and in the vicinity of the airfield.

Agricultural Aircraft Facilities

Auburn Municipal Airport does not accommodate locally based aerial applicators and there are no designated agricultural aircraft loading areas on the airport.

Helicopter Facilities

Auburn Municipal Airport accommodates regular helicopter activity from both locally-based and transient aircraft. All helicopter operations (takeoffs and landings) at the airport currently utilize the runway-taxiway system. The airport currently has four based helicopters, two of which are used in flight training. The airport also accommodates regular helicopter activity from area flight schools located at Boeing Field and other nearby airports. Most of the helicopter flight training activity involves work within the traffic pattern since the airport does not have a designated practice area outside the runway environment. A small gravel pad used for helicopter training is located on the west side of the runway, approximately 180 feet west of the runway centerline and 400 feet north of the Runway 34 end. The airport does not currently have designated parking areas for helicopters, although airport management is currently considering adding helicopter parking on the south aircraft tiedown apron.

Airfield Pavement Condition

The Washington State Department of Transportation (WSDOT) Aviation Division maintains the Airport Pavement Management System (APMS) for Washington airports in the Washington State Aviation System Plan (WSASP) and the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS). The APMS is a tool to identify pavement system needs, make programming decisions for funding, provide information for legislative decision making, and assist local jurisdictions with planning decisions with the goal of maximizing the useful life of pavements and reducing long-term pavement costs throughout the system.

Through visual inspections and use of MicroPAVER computer software, existing pavement conditions are determined and future conditions are predicted for each airfield pavement section being evaluated (runway, parallel taxiway, apron, etc.). Large sections of pavement are generally divided into small units to provide multiple inspection points that can capture isolated areas of distress in addition to providing an overall indication of condition. For example, Runway 16/34 consists of two primary sections originally constructed 14 years apart; within these two sections, the APMS defines 45 individual 75 x 75' square units. The pavements are rated using a Pavement Condition Index (PCI), which has a scale of 0 (failed) to 100 (excellent). The PCI quantifies the types, severities, and amounts of distress present in the pavement visual inspections then predicts future condition based on pavement type, design, wear, climate, etc. The program also identifies the preventive maintenance or rehabilitative measures needed to extend the useful life of the pavement.

On-site pavement inspections and management reports are periodically updated to assist airports in the ongoing maintenance of airfield pavements. The most recent APMS inspection conducted at Auburn Municipal Airport was in September 2012. Preliminary data was provided by WSDOT Aviation for this study, although the complete report will not be available until later in 2013. **Table 2-7** summarizes airfield pavement conditions for Auburn Municipal Airport based on the 2012 and the previous (2005) inspections. The following distress categories are noted in various 2012 pavement inspections sheets: "*longitudinal and transverse cracking, alligator cracking, patching, rutting, weathering/raveling, depression, and swelling.*" Pavements reconstructed in 2009 (parallel taxiway, portions of the exit taxiways, new aircraft hold areas) had no distresses observed in the 2012 inspection.

Updated 2012 report data will be added to this chapter and used elsewhere in the master plan when it is available. Based on the 2012 inspection, the major airfield pavements are rated 70 or above, although some apron and hangar taxilane pavements are in the 45-70 range, and some isolated areas are rated below 45. The lower rated pavements will require rehabilitation or reconstruction early in the planning period while the useful lives of other pavement sections can be extended well into the planning period through regular pavement maintenance.

The branch report contained in the 2005 pavement study indicated that the airport had 1.284 million square feet (SF) of active airfield pavement, which equals approximately 29.5 acres of surface area, not including the two leased areas on the airport with tenant constructed pavement.

TABLE 2-7: SUMMARY OF AIRFIELD PAVEMENT CONDITION (S50)

PAVEMENT	SECTION DESIGN/AGE	2012 PCI RATING[1,2]	2005 PCI RATING[2]
Runway 16/34	**Full Runway: 2" Asphalt Overlay 2004** North Section (from Rwy 16 end to Txy D): 2" AC, 18" Aggregate Base (1969) South Section (From Rwy 34 end to Txy D) 2" AC; 3" Aggregate Base, 11" Aggregate. Subbase (1983)	81 76	100 100
Taxiway A (East Parallel Taxiway)	**New Construction (Reconfigured) 2009** 2.5" AC, 3" Base Course, 9" Aggregate Base (2009)	100	N/A
Exit Taxiways C, D, E, F	East 2/3: Reconstructed (2009) 2" AC, 3" Aggregate Base, 11" Aggregate Subbase West 1/3: (1969): 2" AC, 18" Aggregate Subbase	100 61	69-96
Exit Taxiway G	2" AC, 18" Aggregate Base (1969)	60	73
North Hangar Access Taxiway	3" AC, 2" Crushed Aggregate Base, 13" Aggregate Subbase (1999)	75	96
South Apron Access Taxiway (south of Rwy 34)	2" AC, 3" Aggregate Base, 11" Aggregate Subbase (1986)	71	68
North Tiedown Apron (north of fuel)	Unknown AC, Unknown Base (1986)	65	79
Center Apron/Main Apron	Front Section (fuel area, visitor parking, south section) Unknown AC, Unknown Base (1972) Main Section (tiedowns) Unknown AC, Unknown Base (1989) Outer Strip (adjacent to Taxiway A) 2" AC, 18" Aggregate Base (1969)	45 76 29	61 91 56
South Tiedown Apron	2" AC, 3" Aggregate Base, 11" Aggregate Subbase (1982)	71	88
North Hangar Taxilanes	3" AC, 2" Crushed Aggregate Base, 13" Aggregate Subbase (1999)	75	96
ACHA Hangar Taxilanes	**Not rated (lease area)**	--	--
South Hangar Taxilanes	Unknown AC, Unknown Base, Unknown Subbase (1972)	45	55-74
Auburn Flight Service South FBO Taxilanes	**Not rated (lease area)**	--	--

1. *WSDOT Airport Pavement Management System, Applied Pavement Technology, 2012*
2. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from "failed" to "excellent." For additional details, see *AUBURN MUNICIPAL AIRPORT 2012 PAVEMENT MANAGEMENT REPORT.*

The condition of the airfield pavements observed during site visits performed as part of the master plan update (Fall 2012) were generally consistent with the APMS pavement evaluations. The most common pavement wear appears to be drainage related (depressions, etc.), minor fuel/oil damage in tiedown positions, and where different pavement sections meet (parallel taxiway and adjacent aprons, etc.). Surface cracking is minor to moderate ranging from <.25 inches to approximately 1.5 to 2 inches. The airfield pavements appear to be well maintained with regular crackfilling and vegetation control.

Note: A pavement rehabilitation project was conducted in the summer 2014 that included crackfill, isolated repair, slurry seal, and repainting markings. The work will be reflected in the next scheduled PCI inspection in 2015 or 2016.

Landside Facilities

HANGARS AND AIRPORT BUILDINGS

Auburn Municipal Airport accommodates a variety of aviation-related buildings including aircraft storage hangars, commercial and mixed-use hangars and office/classroom space. All existing structures are located on the east side of the airport. The west side of the airport has 23 acres (currently undeveloped) that was planned for future aviation-related development in the last master plan. **Figure 2-2**, presented earlier in this chapter**,** depicts the existing buildings on the airport. **Table 2-8** summarizes existing aviation use buildings located at the airport.

North Hangar Area

The north hangar area is located adjacent to the north access taxiway that extends beyond Taxiway A. The north hangar area accommodates 5 rows of multi-unit hangars including two City-owned T-hangars (40 units) located at the north end of the development (Hangar Rows 9 and 10); four T-hangars and two conventional hangars (34 units) owned by Auburn Hangars Owners Association (AHOH); two multi-unit hangars (7 units – AFC2) owned by Auburn Flyers Condos; and one conventional hangar owned by Jim Jacobson. The north hangar area has a total of 82 units (hangar doors), although some hangars are capable of accommodating multiple aircraft. Vehicle access to the north hangar area is provided from 30th Street NE through an automated (key card) gate located at the northeast corner of the airport. A second vehicle gate on 30th street (in line with the north hangar access taxiway) is padlocked and provides emergency or other supervised access only. The north hangar area has no designated vehicle parking spaces; vehicles are observed parking inside hangars and on the taxilanes between hangars.

Auburn Condo Hangar Association (ACHA) Hangar Area

The ACHA hangar area is located near mid-runway with seven multi-unit hangars, including 4 T-hangars (35 units) and three executive hangars (11 units). The ACHA area has a total of 46 units (hangar doors). Vehicle access to the north hangar area is provided from E Street NE through an automated (key card) gate located on the east side of the hangar area. The ACHA hangar area has no designated vehicle parking spaces; vehicles are observed parking inside hangars and on the taxilanes between hangars.

South Hangar Area

The south hangar area is located between the center and south tiedown aprons. The south hangar area accommodates 8 rows of multi-unit hangars including seven City-owned T-hangars (105 units) located in Hangar Rows 2 through 8. The city-owned hangars include 6 twin-engine units and 99 single-engine units. The east end of the northern-most T-hangar (Hangar Row 2) has been modified to include commercial space (Air Tech Instruments) and an enclosed aircraft wash rack. The units in Hangar Row 2 have hangar doors. All of the other city-owned hangars in Rows 3-8 are open front units that are designed to accommodate doors. Auburn Flyers Condos owns five multi-unit hangars (19 units – AFC1 and AFC3) located on the west end of Hangar Row 8 and in another row immediately north of Auburn Flight Service.

The south hangar area has a total of 124 units (hangar doors), although some hangars are capable of accommodating multiple aircraft. Vehicle access to the south hangar area is provided from E Street NE through two automated (key card) gates located near the north and south ends of the development. A narrow vehicle lane extends along the eastern edge of the hangar development between the ends of the hangars and the airport perimeter fence. The south hangar area has no designated vehicle parking spaces; vehicles are observed parking inside hangars and on the taxilanes between hangars.

Auburn Flight Service Hangar

Auburn Flight Service owns a mixed use hangar located between the south hangar area and the south tiedown apron. The building includes office space, hangar space and restrooms. The building has dedicated vehicle access from E Street NE with 35 vehicle parking spaces.

Building "506"

Building "506," is located on the south end of the center tiedown apron. The city-owned building includes airport management office space, restrooms and other leaseable space. The building has 11 adjacent aircraft tiedowns with additional tiedowns located on the center apron. The building has dedicated vehicle access from E Street NE with 33 vehicle parking spaces.

Office

A small office building (formerly airport management office) is located adjacent to the center tiedown apron and includes offices, and restrooms. The building has 7 vehicle parking spaces located on the north side of the center tiedown apron. The building is located adjacent to controlled access vehicle gate which is used to access adjacent aprons and hangars.

TABLE 2-8: AVIATION USE BUILDINGS AT AUBURN MUNICIPAL AIRPORT (SOUTH TO NORTH)

	BUILDING	USE/CONFIGURATION	LOCATION
1	Auburn Flight Service	Operations, Office, Hangar	North of South Tiedown Apron
2	Conventional Hangar (Auburn Flyers Condo Association)	Aircraft Storage (3 units)	North of Auburn Flight Service; South of Hangar Row 8
3	Conventional Hangar (Auburn Flyers Condo Association)	Aircraft Storage (3 units)	North of Auburn Flight Service; South of Hangar Row 8
4	Conventional Hangar (Auburn Flyers Condo Association)	Aircraft Storage (3 units)	North of Auburn Flight Service; South of Hangar Row 8
5	T-Hangar (Auburn Flyers Condo Association)	Aircraft Storage (2 units)	West end of Hangar Row 8

6	T-Hangar (Auburn Flyers Condo Association)	Aircraft Storage (8 units)	Middle of Hangar Row 8
7	T-Hangar (City Owned)	Aircraft Storage (6 units) twin-engine open front	East end of Hangar Row 8
8	T-Hangar (City Owned)	Aircraft Storage (17 units) open front	Hangar Row 7
9	T-Hangar (City Owned)	Aircraft Storage (17 units) open front	Hangar Row 6
10	T-Hangar (City Owned)	Aircraft Storage (17 units) open front	Hangar Row 5
11	T-Hangar (City Owned)	Aircraft Storage (17 units) open front	Hangar Row 4
12	T-Hangar (City Owned)	Aircraft Storage (17 units) open front	Hangar Row 3
13	T-Hangar (City Owned)	Aircraft Storage (14 units), Aircraft Wash Rack, Commercial Tenant	Hangar Row 2
14	Building "506" (City Owned)	Airport Management Offices, restrooms	South side of Center Apron
15	Office (City Owned)	Office, restroom	North side of Center Apron
16	Fuel Building	Fuel system controls	North of Center Apron
17	T-Hangar (Auburn Condo Hangars Association)	Aircraft Storage (9 units)	ACHA Hangar Area; North of N. Tiedown Apron
18	T-Hangar (Auburn Condo Hangars Association)	Aircraft Storage (9 units)	ACHA Hangar Area; North of N. Tiedown Apron
19	T-Hangar (Auburn Condo Hangars Association)	Aircraft Storage (9 units)	ACHA Hangar Area; North of N. Tiedown Apron
20	T-Hangar (Auburn Condo Hangars Association)	Aircraft Storage (9 units)	ACHA Hangar Area; North of N. Tiedown Apron
21	Executive Hangar (Auburn Condo Hangars Association)	Aircraft Storage (4 units)	ACHA Hangar Area; North of N. Tiedown Apron
22	Executive Hangar (Auburn Condo Hangars Association)	Aircraft Storage (4 units)	ACHA Hangar Area; North of N. Tiedown Apron
23	Executive Hangar (Auburn Condo Hangars Association)	Aircraft Storage (3 units)	ACHA Hangar Area; North of N. Tiedown Apron
24	Conventional Hangar (Jim Jacobson)	Aircraft Storage (1 unit)	North Hangar Area
25	Executive Hangar (Auburn Flyers Condo Association)	Aircraft Storage (3 units)	North Hangar Area
26	Executive Hangar (Auburn Flyers Condo Association)	Aircraft Storage (4 units), Commercial Tenant	North Hangar Area
27	T-Hangar (Auburn Hangars Owners Association)	Aircraft Storage (9 units)	North Hangar Area
28	T-Hangar (Auburn Hangars Owners Association)	Aircraft Storage (7 units)	North Hangar Area
29	Conventional Hangar (Auburn Hangars Owners Association)	Aircraft Storage (1 unit)	North Hangar Area
30	T-Hangar (Auburn Hangars Owners Association)	Aircraft Storage (8 units)	North Hangar Area
31	T-Hangar (Auburn Hangars Owners Association)	Aircraft Storage (8 units)	North Hangar Area
32	Conventional Hangar (Auburn Hangars Owners Association)	Aircraft Storage (1 unit)	North Hangar Area
33	T-Hangar (City Owned)	Aircraft Storage (20 units)	Hangar Row 10
34	T-Hangar (City Owned)	Aircraft Storage (20 units)	Hangar Row 9

Vehicle Access and Parking

Surface access to Auburn Municipal Airport is provided via State Highway 167, 15th Street NW, Auburn Way North and other surface streets. The airport has several different entrances including 26th Street and 22nd Street off of Auburn Way North and D Street NE off of 15th Street. E Street NE acts as a frontage road and provides access to the main office, all hangars and tiedown parking areas. The east landside area of the airport has several automated controlled access vehicle gates located adjacent to aircraft parking aprons and hangar areas.

Auburn Municipal Airport has approximately 75 designated automobile parking spaces located adjacent to commercial use buildings including 35 spaces at Auburn Flight Service, 33 spaces at Building "506," 7 spaces at the airport office and a small parking area located at the east end of Hangar Row 2, south of the center apron. There are no designated auto parking spaces adjacent to aircraft parking aprons or hangar areas. Vehicles are observed parked in the taxilanes between hangar rows or inside hangars.

Airspace and Navigational Aids

AIRSPACE CLASSIFICATIONS

Airspace within the United States is classified by the FAA as "controlled" or "uncontrolled" with altitudes extending from the surface upward to 60,000 feet above mean sea level (MSL). Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled.

Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot AGL layer above the surface and below controlled airspace. **Figure 2-4** illustrates and describes the characteristics of the airspace classifications defined by the FAA.

LOCAL AREA AIRSPACE STRUCTURE

Figure 2-5 depicts nearby airports, notable obstructions, special airspace designations and instrument flight rules (IFR) routes in the vicinity of Auburn Municipal Airport, as identified on the Seattle Terminal Area Chart (TAC) and the IFR Enroute Low Altitude Chart (L-1/L-2).

Auburn Municipal Airport is located in an area of Class G airspace that begins at the ground surface and extends to 700 feet MSL. Between 700 feet and 3,000 feet above Auburn Municipal is Class E airspace. At 3,000 ft MSL the second layer of Seattle Tacoma International Airport (SEATAC) Class B airspace begins and extends upward to 10,000 feet MSL.

Class G airspace is designated "uncontrolled" and is airspace that was not otherwise designated at Class A, B, C, D or E. Radio communication is not required for visual flight rules (VFR) operations in Class E or G airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at the airport. Pilots are required to contact air traffic control (ATC) prior to operating within

Class B airspace. Aircraft are required to obtain an ATC clearance prior to operating in Class E airspace during instrument flight rules (IFR).

East-West Visual Flight Rules (VFR) Flyways over SEATAC are located approximately 3 to 4 nautical miles north of Auburn Municipal Airport. The “Mariner” and “Seahawk” transitions allow aircraft to cross the SEATAC runways (requires air traffic control clearance) at an altitude of 1,500 to 2,000 feet MSL.

Auburn Municipal Airport is located within the 30-nautical mile veil of Mode C transponder airspace that surrounds Seattle-Tacoma International Airport. The Mode C airspace extends from the surface upward to 10,000 feet above mean sea level (MSL). Aircraft operating in the airspace are required to be equipped with a Mode C Transponder, with only a few exceptions. A transponder is an electronic device that produces a response that enables aircraft to be identified on radar and aircraft collision avoidance systems.

Large areas of Class E airspace associated with enroute instrument airways and transition to terminal airspace extend in all directions beyond the Class E airspace associated with local area airports. This category of Class E airspace has a floor established at 700 feet MSL.

The local fixed wing airport traffic pattern altitude is 1,000 feet above ground level (AGL) (1,063’ MSL) with right traffic on Runway 16 and standard left traffic on Runway 34. The helicopter traffic pattern altitude is 500 feet AGL. The traffic patterns for both runway ends are located on the west side of the runway, as depicted previously in **Figure 2-3.**

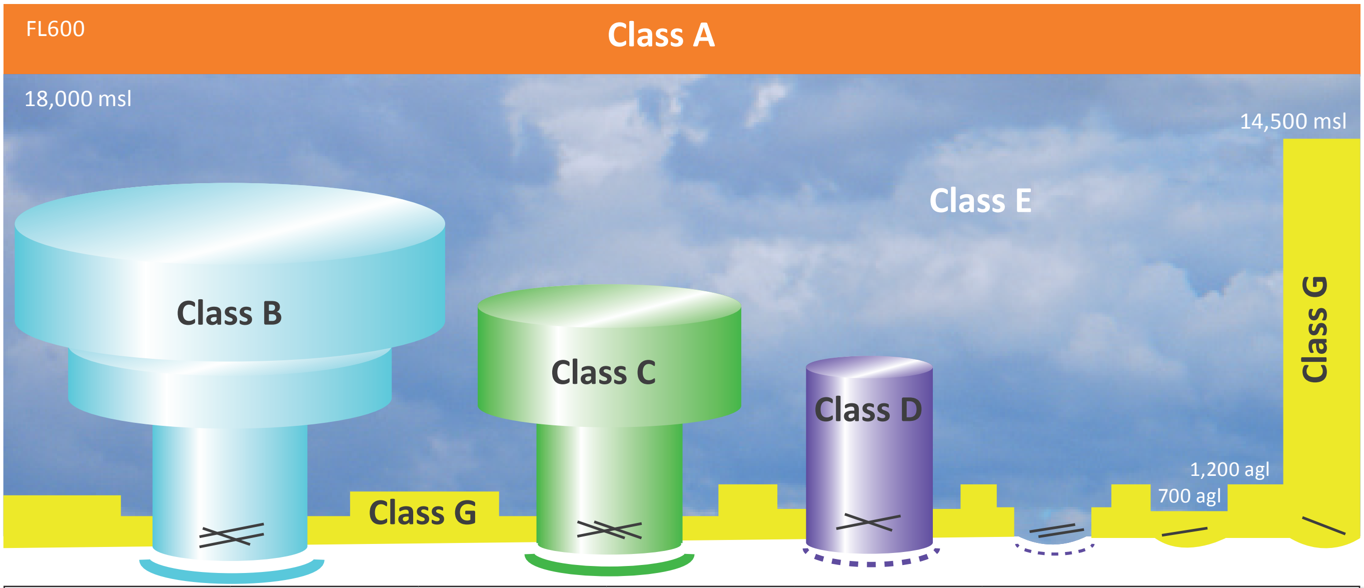
The Seattle VORTAC[6], located 7.3 miles northwest of the airport supports nearby enroute air navigational routes and instrument approach procedures to several area airports. Eight separate enroute airways converge in this area. Local airport operations and flight activity is not directly affected by the enroute airspace due to the minimum enroute altitudes that are well above the local airport traffic pattern altitude.

SPECIAL USE AIRSPACE

Areas of special use airspace (SUA) in the vicinity of Auburn Municipal Airport include the Restricted Airspace R-6703A, 6703B, 6703C, and 6703D, located approximately 26 nautical miles southwest, between Joint-Base Lewis McChord (JBLM) and Olympia. For national security reasons aircraft are not allowed to fly through restricted airspace without permission from the controlling agency or facility.

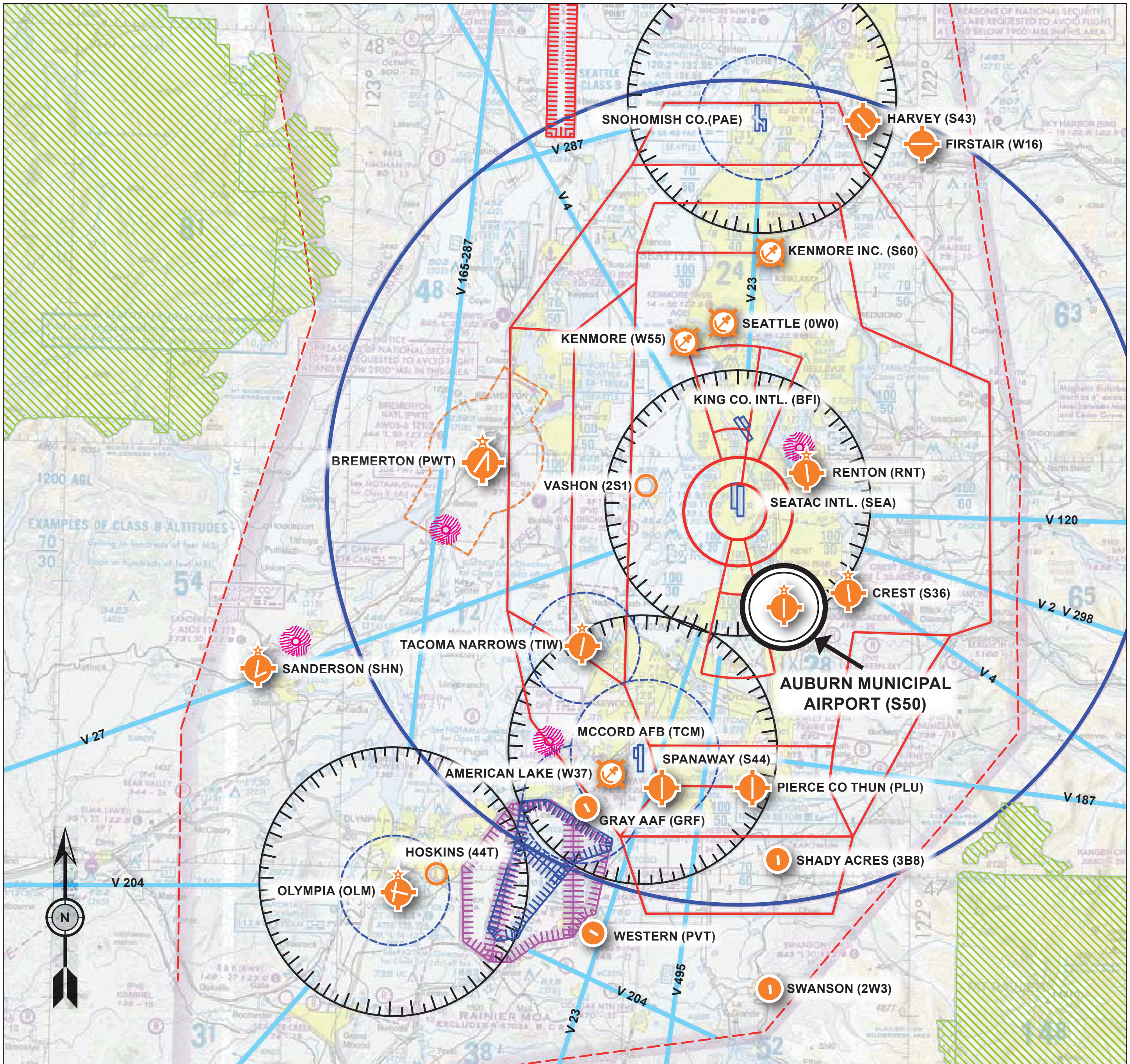
The nearest Military Operations Area (MOA) is the Rainer 1/2/3 MOA (26 miles southwest). MOAs are designated to segregate VFR and IFR traffic from military operations. The restrictions associated with Rainier MOA 1, 2 and 3 begin at 2,000 and extend upward to 9,000 feet MSL. When a MOA is active, IFR traffic may be cleared through the area when air traffic control can ensure IFR separation; otherwise traffic will be rerouted. Although VFR operations are not restricted in an MOA, pilots are advised to exercise extreme caution while flying within, near, or below an active MOA. Prior to entering an active MOA, pilots are encouraged to contact the controlling agency for traffic advisories due to the frequently changing status of these areas.

[6] Very high frequency Omnidirectional Radio range (VOR) combined with UHF frequencies (Tactical Air Navigation – TACAN)



COMMUNICATION REQUIREMENTS AND WEATHER MINIMUMS						
	Class A	**Class B**	**Class C**	**Class D**	**Class E**	**Class G**
Airspace Class Definition	Generally airspace above 18,000 feet MSL up to and including FL 600.	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports	Generally controlled airspace that is not Class A, Class B, Class C, or Class D	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E
Minimum Pilot Qualifications	Instrument Rating	Student*	Student*	Student*	Student*	Student*
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 msl**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 msl***	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal***
VFR Visibility 10,000 msl and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 msl and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

*Prior to operating within Class B, C or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, appendix D, section 4.
**Student pilot operations require at least 3 statue miles visibility during the day and 5 statute miles visibility at night.
***Class G VFR cloud clearance at 1,200 agl and below (day); clear of clouds.



LEGEND			
	Airport with other than hard-surfaced runways		Class B Airspace
	Seaport		Class D Airspace
	Airports with hard-surfaced runways 1,500 ft. to 8,069 ft.		Class E Airspace
	Airports with hard-surfaced runways greater than 8,069 ft.		Mode C Veil
	Non-Directional Radiobeacon (NDB)		Class E Airspace with floor 700' above surface
	Compass Rose		Military Operations Area (MOA)
	Victor Airways		Prohibited, Restricted, Warning, and Alert Areas

Navigational Aids and Weather

There are no ground based navigational aids located on the airport. However, numerous ground based navigation aids are located within 30 nm of the airport. The nearest facilities include the Seattle VORTAC[7] located 8 miles northwest of the airport and the Renton nondirectional beacon (NDB), located 10 nautical miles north.

Auburn Municipal Airport does not have an automated weather observation system located on the airport. The nearest weather observations are located at SEATAC (8 miles northwest), Renton Municipal Airport (10 miles north), Pierce County Airport – Thun Field (14 miles south), and Tacoma Narrows Airport (15 miles west). The RNAV GPS-A instrument approach for Auburn utilizes the SEATAC altimeter setting. The SEATAC Automatic Terminal Information Service (ATIS) provides altimeter setting, wind data, temperature, dewpoint, density altitude, visibility, precipitation and cloud/ceiling data. **Table 2-9** summarizes existing navigational aids and related items.

TABLE 2-9: NAVIGATIONAL AIDS AND RELATED ITEMS

TYPE	FACILITIES
Electronic Navigational Aids	None on Field Renton Non-directional Beacon (NDB) (10 nm N) 353 LHz Seattle/Metro VORTAC (8 nm NW) 116.8 MHz
Weather Observation	Seattle ASOS /ATIS (118.0 MHz) Renton ASOS (132.675 MHz) Thun Field AWOS-3 (128.575 MHz) Tacoma Narrows ASOS / ATIS (118.5 MHz)
Communication	Unicom/Common Traffic Advisory Frequency (CTAF)(122.8 MHz) Seattle App/Dep Control (123.85 MHz)

Instrument Procedures

Instrument approach and departure procedures are developed by the FAA using electronic navigational aids to guide aircraft through a series of prescribed maneuvers in and out of an airport's terminal airspace. The procedures are designed to enable continued airport operation during instrument meteorological conditions (IMC), but are also used during visual conditions, particularly in conjunction with an instrument flight plan. The capabilities of each instrument approach are defined by the technical performance of the procedure platform (ground based navigational aids or satellite navigational aids) and the presence of nearby obstructions, which may affect the cloud ceiling and visibility minimums for the approach, and the routing for both the approach and missed approach procedure segments. The aircraft approach speed and corresponding descent rate may also affect approach minimums for different types of aircraft.

[7] Very high frequency Omnidirectional Radio range (VOR) combined with UHF frequencies (Tactical Air Navigation – TACAN)

Auburn Municipal Airport has one published non-precision instrument approach, the RNAV-GPS (A). The current procedure provides electronic course guidance from the south with a final approach course of 331 degrees. The approach is classified as a "circling" procedure with a minimum descent altitude of 1,320 feet MSL (1,257 feet AGL) and a minimum visibility requirement of 1¼ miles. The instrument approach is authorized for small aircraft only (Approach Category A and B) with approach speeds of less than 121 knots (nautical miles per hour). The procedure is not authorized at night. Airport management indicates that the night restriction is due to an FAA requirement that an updated obstruction survey be completed to evaluate existing obstacles within the defined approach and missed approach airspace. The airport has a standard instrument departure (Auburn One Departure (Obstacle)) designed for obstacle clearance for both runway ends. The existing instrument approach capabilities for Auburn Municipal Airport are summarized in **Table 2-10.**

The Airport also utilizes a departure procedure, Auburn One Departure, for departing aircraft that uses the Seattle NDB and McChord NDB. Pilots are provided with specific departure procedures for obstacle clearance when departing either Runway 16 or 34. Copies of the instrument approach and departure procedure charts are included in **Appendix B**.

TABLE 2-10: INSTRUMENT PROCEDURES (AUBURN MUNICIPAL AIRPORT)

APPROACH	APPROACH CATEGORY A		APPROACH CATEGORY B		APPROACH CATEGORY C		APPROACH CATEGORY D	
	Ceiling	**Vis.**	**Ceiling**	**Vis.**	**Ceiling**	**Vis.**	**Ceiling**	**Vis.**
RNAV/GPS-A								
Circling	1,320	1¼	1,320	1½	n/a		n/a	

Approach Categories are based on the approach speed of an aircraft in the landing configuration (typically 1.3 times the stall speed Vso).
Approach Categories:
Category A*: 0-90 knots (Cessna 172, Beechcraft Bonanza, Piper Seneca, Cessna Caravan, Pilatus PC-12)*
Category B*: 91-120 knots (Beechcraft Baron 58, King Air 200, Cessna 310-441, Citation Bravo)*
Category C*: 121-140 knots (Learjet 45, Canadair Challenger, Boeing 737, MD80)*
Category D*: 141-165 knots (Gulfstream 550)*
Ceiling: Lowest permitted height of clouds in feet above ground level (AGL)
Vis: Minimum visibility required in statute miles
Source: National Ocean Service Instrument Approach Plates

Airport Support Facilities/Services

AIRCRAFT FUEL

Auburn Municipal Airport has 100-octane low lead (100LL) aviation gasoline (AVGAS) available for sale through Airport Management Group (AMG). The airport's fueling island is located on the western section of the center apron. The City of Auburn owns the fuel storage and dispensing system that includes one above ground double-wall 12,000 gallon tank and 2 pumps. 24 hour self-fueling (credit card payment) is available. Jet fuel is not currently available at the airport. **Table 2-11** summarizes existing aviation fueling facilities on the airport.

TABLE 2-11: AVIATION FUEL STORAGE (AUBURN MUNICIPAL AIRPORT)

STORAGE TYPE	LOCATION/FACILITIES
Fixed Point Fuel Storage Tank and Dispensing Facilities	1 – Aboveground 12,000 gallon tank (AVGAS) (City owned) Fueling Island 24-hour Card Lock System – 2 AVGAS pumps (City owned)
Jet Fuel	None
Automobile Gasoline	None

FIXED BASE OPERATORS (FBO)

Auburn Municipal Airport has several commercial tenants providing a variety of aviation services including Cornerstone Aviation (leasing space from Auburn Flight Service), Airtech Instruments (instrument sales, repair), Atomic Helicopters (flight training), BNC Maintenance (aircraft maintenance), Galvin Aviation (flight training) and Fair Aircraft Appraisal (aircraft maintenance and services). Airport Management Group (AMG) manages aircraft fueling operations at the airport in addition to providing airport management services to the City of Auburn.

PUBLIC RESTROOMS

Public restrooms are located in the airport operations building. Several portable chemical toilets are located on the airfield and several private T-hangars have indoor restrooms. The commercial buildings on the airport have restrooms for their employees and customers.

Fencing & Security

The airport has an extensive fencing and gate system that covers the entire airfield. The fencing is standard 7-foot chain link with numerous swing gates (locked) located around the perimeter. There are several electronic controlled (key card) sliding vehicle gates and some combination lock pedestrian gates located along the perimeter of the east landside area, providing controlled access to apron and hangar areas.

Utilities

The developed areas of Auburn Municipal Airport have water, natural gas, sanitary sewer, electrical, and telephone/internet service. **Figure 2-6** depicts the locations of the major utilities serving Auburn Municipal Airport.

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

EXISTING UTILITIES | **FIG. 2-6**

CITY OF AUBURN WASHINGTON

CENTURY WEST ENGINEERING CORPORATION

WATER

Water service for the airport property is provided by the City of Auburn. The water system enters the property in several locations providing service to the north hangar area, the central hangar area, the airport office, and south hangar area.

The north hangar area is served with an 8” looped water main connected in two locations on 30th Street NE. Two hydrants are located along 30th Street NE, and three hydrants are located on the east side of the east drive aisle.

The central hangar area is served with an 8” water main connected through 26th Street NE and then extending south along the east taxiway to the hangar area. The main loops through the hangars providing water services. There are two fire hydrants located in front of the hangar area along the east taxiway.

The airport office is served with an 8” main extending from 23rd Street NE. There are two fire hydrants along the entrance road to the office and just north of the central tie down area.

An 8” water main parallels the southern hangar area in the E Street NE right of way. There are service lines for Building “506” (formerly Northwest Aviation College) and the wash rack. Fire hydrants are evenly spaced in the E St. NE. right of way.

The southern tiedown area and FBO is served from the 8” main in E Street NE where it transitions onto the airport property just south of the southern hangar where there is a fire hydrant. The main then extends south to 16th Street NE. There is one fire hydrant located just west of the FBO providing service to the tie down area.

Water mains of various sizes (8”, 12”, and 16”) have been extended just outside the western perimeter of the airport property and currently serve the warehouses and business to the west.

Fire protection is provided by the Valley Regional Fire Authority.

SANITARY SEWER

The City of Auburn owns and operates the sanitary sewer system serving the airport property and serves the same buildings that have water service.

The northern hangar area is served by a sewer main that is extended from 30th Street NE along the eastern hangar access road.

The central east side of the airport property is served by a sewer main the parallels the north section of the east parallel taxiway along the frontage of the central hangar area, to the airport office. This main serves the central hangars and the office. The sewer main crosses RWY 16/34 in two locations between Exits E and F at approximately the midpoint of the runway. The sewer then extends to the north along the western airport boundary and connects to the sewer main in 30th Street NE.

The FBO in the south tiedown area and the wash rack located in the NE corner of the south hangar area are both served by the sewer main in E Street NE. This main flows north and connects to the main crossing RWY 16/34 at midfield.

STORMWATER

The airport has a storm water drainage system that utilizes a series of building roof drains, catch basins, swales and culverts. Three detention points are located on the airport property in the northwest corner. The City of Auburn maintains a Stormwater Pollution Prevention Plan (SWPPP) for Auburn Municipal Airport that complies with the Industrial Stormwater General Permit (ISWGP) Condition S3.A.1 through 3. The "Best Management Practices" or BMP's outlined in these sections provide adequate methods to control and treat stormwater pollution. They are also consistent with the 2005 Stormwater Management Manual for Western Washington (SWMM.) Examples of the BMP's include providing proper disposal of waste oil and fuel, having an emergency spill response and cleanup plan, and adequate monitoring of the aircraft fuel tanks to ensure no leakage is unnoticed.

The airport property contains two drainage basins. Basin 0 is located at the south end of the airport and includes the south aircraft tie down apron, the FBO office and parking lot, the southernmost row of hangars in the south hangar area, the adjacent portion of Taxiway A, and approximately 250' of Runway 34. Stormwater runoff from Basin 0 is collected in a series of catch basins, pipes, swales, and ponds that ultimately join together to flow west approximately 200' north of the end of Runway 34. The stormwater then enters a swale that continues west, off the airport property, and joins the City stormwater system along B Street NW. There is a small area along the southern fence line that routinely floods and encroaches on the southernmost Taxiway and run up area. It should also be noted that D Street NE and the southern end of E Street NE are also connected to the storm system as it passes through the airport.

Basin 1 contains the entire airport area north of Basin 0. This basin also is a series of catch basins, pipes, swales, and ponds. The entire basin flows to the north. The runoff from the hangar areas, aprons, and taxiways are collected in a pipe that runs along the east side of parallel Taxiway A and discharges to the City stormwater system in 30th Street NE. The runoff from RWY 16/34 is collected in underdrains that parallel both sides if the runway. These underdrains are routed to the swales between the runway and parallel Taxiway. The swales ultimately flow to the north and also discharge to the City stormwater system in 30th Street NE.

The three large ponds along the northwest property line primarily collect and treat stormwater from the large warehouse area west of the airport. The ponds are connected with culverts and drain to the City stormwater system in 30th Street NE. The three ponds are covered with netting so they do not attract birds.

The swale between the 30th Street NE and the northernmost hangar experiences flooding that encroaches on the hangar taxiway. Also the small grassy area at the west end of the northernmost hangar experiences flooding that encroaches on Taxiway A.

POWER

Electrical service is provided by Puget Sound Energy and enters the airport on the east side. Most electrical service lines located on the airport are underground with some overhead lines serving buildings along the east side of the airport.

GAS

Natural gas service is provided by Puget Sound Energy and enters the airport on the east side.

Land Use Planning and Zoning

Land use planning and zoning for the Airport and in the immediate vicinity are administered by the City of Auburn. Areas north, south, west and east of the Auburn city limits are under the jurisdiction of King County or adjacent municipalities of Kent, Algona, Pacific, and Federal Way. Municipal zoning for the airport and its surrounding area is depicted in **Figure 2-7**. Additional detail on airport land use, noise and land use compatibility will be provided in the Environmental and Land Use Compatibility chapters later in the master plan.

COMPREHENSIVE PLAN LAND USE DESIGNATION

The Comprehensive Plan is a guidance document which expresses the way in which the city seeks to grow and develop. The City of Auburn Comprehensive Plan land use designation for Auburn Municipal Airport is "**Public and Quasi-Public**". The stated purpose of this land use designation is to reflect the coordinated effort of local officials to designate an area of significant size needed to provide public or quasi-public services to the community, and which are not more appropriate for inclusion in another designation. The "Public and Quasi-Public" designation of the Airport is consistent with the community-serving transportation and economic development function of the Airport. Examples of other uses also encompassed by the "Public and Quasi-Public" designation elsewhere in the City includes large churches, large private schools and similar uses. Industrial and commercial uses affiliated with or managed by educational institutions may also be classified as a public use and permitted on a conditional basis.

COMPREHENSIVE PLAN LAND USE DESIGNATIONS IN THE VICINITY

The land use designations in the vicinity of the Auburn Municipal Airport include: "Light Industrial", "Heavy Industrial", and "Heavy Commercial". Properties to the west of the Airport are designated "Light industrial" and the purpose of this designation is specifically to reserve quality lands for the City's economic development goals while providing a location attractive for manufacturing, processing and assembling land use activities that benefit from quality surroundings and appropriate commercial retail uses that benefit from the location, access, physical configuration, building types of these properties. Lighter Industrial and heavy commercial uses may be permitted in this land use designation. By contrast, the "Heavy Industrial" land use designation of properties located to the north and east provides for a wide range of heavier commercial uses involving extensive storage or heavy vehicular movement meeting both a local and regional need for such services.

AIRPORT ZONING

Auburn Municipal Airport is zoned "**Airport Landing Field District (LF)**". The LF district zoning is intended to accommodate the operation and management of the Auburn Municipal Airport. Inherent in the operation and management of the Airport is avoiding actions that endanger the lives and property of users of the Auburn Municipal Airport and of occupants of land or property in the vicinity of the airport. This zoning classification establishes certain zones which include all of the land lying beneath the approach, transitional, horizontal, and conical surfaces consistent with Federal Air Regulations (FAR) Part 77 as amended. The LF District accounts for approximately 110 acres in the City of Auburn, or 0.57% of the total city area. This LF District exists at only one location within the City and only implements the "Public and Quasi-Public" Land Use Designation of the City's Comprehensive Plan. Zoning for the Airport and its surrounding area is depicted in **Figure 2-7**. The City of Auburn LF District zoning ordinance (Auburn City Code Chapter 18.38) is included in **Appendix C**.

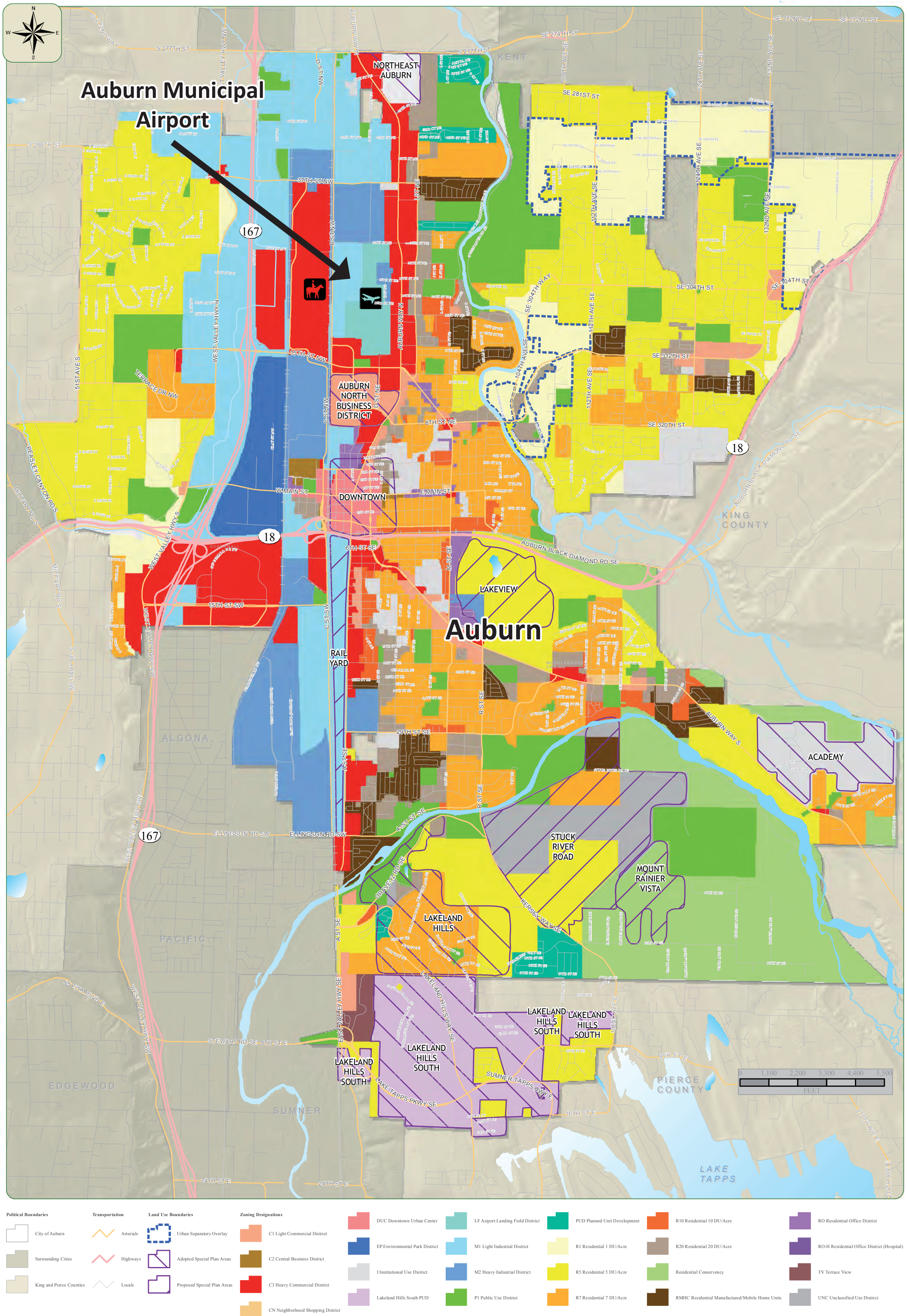
AIRPORT VICINITY ZONING

The zoning classification of properties in the vicinity of the Airport includes Light Industrial (M1), Heavy Industrial (M2) and Heavy Commercial (C3) districts.

AIRPORT OVERLAY ZONE

The City of Auburn LF District zone includes elements of airport overlay zoning, including height restrictions within the runway FAR Part 77 imaginary surfaces. Specific protective elements within the basic zoning designations in the vicinity of the airport will be described in the land use compatibility section of the master plan.

Airport overlay zoning is intended to prevent airspace obstructions around airports by establishing height limitations based on an airport's FAR Part 77 airspace surfaces. Airport overlay zoning may also limit land use and densities, as outlined in airport land use compatibility guidelines created by WSDOT Aviation Division.


Auburn Municipal Airport
Auburn
NORTHEAST AUBURN
AUBURN NORTH BUSINESS DISTRICT
DOWNTOWN
LAKEVIEW
RAIL YARD
ACADEMY
STUCK RIVER ROAD
MOUNT RAINIER VISTA
LAKELAND HILLS
LAKELAND HILLS SOUTH
KENT
ALGONA
PACIFIC
EDGEWOOD
SUMNER
KING COUNTY
PIERCE COUNTY
LAKE TAPPS
Political Boundaries
City of Auburn
Surrounding Cities
King and Pierce Counties
Transportation
Arterials
Highways
Locals
Land Use Boundaries
Urban Separators Overlay
Adopted Special Plan Areas
Proposed Special Plan Areas
Zoning Designations
C1 Light Commercial District
C2 Central Business District
C3 Heavy Commercial District
CN Neighborhood Shopping District
DUC Downtown Urban Center
EP Environmental Park District
I Institutional Use District
Lakeland Hills South PUD
LF Airport Landing Field District
M1 Light Industrial District
M2 Heavy Industrial District
P1 Public Use District
PUD Planned Unit Development
R1 Residential 1 DU/Acre
R5 Residential 5 DU/Acre
R7 Residential 7 DU/Acre
R10 Residential 10 DU/Acre
R20 Residential 20 DU/Acre
Residential Conservency
RMHC Residential Manufactured/Mobile Home Units
RO Residential Office District
RO-H Residential Office District (Hospital)
TV Terrace View
UNC Unclassified Use District

Data Sources:

- City of Auburn airport records
- **Auburn Municipal Airport – Airport Layout Plan** (W&H Pacific, December 2002)
- **Auburn Municipal Airport - 2012 Preliminary Pavement Data** (Applied Pavement Technology, Inc., September 2012)
- **Auburn Municipal Airport - 2012 Pavement Management Report** (Applied Pavement Technology, Inc., February 2013)
- **FAA Airport Master Record Form (5010-1)**
- **Airport/Facility Directory (AFD) –Northwest U.S.** (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office)
- **Seattle Sectional Aeronautical Chart and Terminal Area Chart; IFR Enroute Low Altitude (L-1/L-2) Chart** (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office)
- **Instrument Approach Procedure Charts (FAA NACO**) RNAV (GPS) A approach
- **City of Auburn Development Code and Zoning Mapping**
- **City of Auburn Comprehensive Plan**
- Puget Sound Regional Council **"Preparing Busy General Aviation Airports for Next Generation Technologies"** (May 2013)
- WSDOT Aviation - **Long Term Air Transportation Study (LATS)** (2007)

A glossary of aviation terminology and a list of acronyms have also been provided to describe technical items and aviation jargon commonly in use.

Chapter 3 – Aviation Activity Forecasts

Chapter 3 – Aviation Activity Forecasts

The overall goal of aviation activity forecasting is to prepare forecasts that accurately reflect current conditions, relevant historic trends, and provide reasonable projections of future activity, which can be translated into specific airport facility needs anticipated during the next twenty years and beyond.

Introduction

This chapter provides updated forecasts of aviation activity for Auburn Municipal Airport (S50) for the twenty-year master plan horizon (2012-2032). The forecasts presented in this chapter are consistent with Auburn Municipal Airport's current and historic role as a general aviation reliever airport.

Unless specifically noted, the forecasts of activity are unconstrained and assume that the City of Auburn will be able to make the facility improvements necessary to accommodate anticipated demand. Through the evaluation of airport development alternatives later in the master plan, the City of Auburn will consider if any unconstrained demand will not or cannot be reasonably met.

The FAA-defined airport master plan forecasting process for general aviation airports is designed to address elements critical to airport planning by focusing on two key activity segments: based aircraft and aircraft operations (takeoffs and landings). Detailed breakdowns of these are also provided including aircraft fleet mix, activity peaking, distribution of local and itinerant operations, and the determination of the critical aircraft, also referred to as the design aircraft.

The design aircraft represents the most demanding aircraft type or family of aircraft that uses an airport on a regular basis (a minimum of 500 annual takeoffs & landings). The existing and future design aircraft are used to define the airport reference codes (ARC) to be used in airfield planning. FAA airport design standards are organized into several different ARC groupings, each reflecting the physical requirements of that aircraft type. The activity forecasts also provide consistency in evaluating future demand-based facility requirements such as runway and taxiway capacity, aircraft parking and hangar capacity, and other planning evaluations such as airport noise.

FORECAST PROCESS

The Federal Aviation Administration (FAA) provides guidance on forecasting aviation activity in airport master planning projects. **FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans**, outlines seven standard steps involved in the forecast process:

1) **Identify Aviation Activity Measures**: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.
2) **Review Previous Airport Forecasts**: May include the FAA Terminal Area Forecast (TAF), state or regional system plans, and previous master plans.
3) **Gather Data**: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.
4) **Select Forecast Methods**: There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.
5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.
6) **Summarize and Document Results**: Provide supporting text and tables as necessary.
7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA. The aviation demand forecasts are then submitted to the FAA for their approval.

   Master Plan forecasts for operations and based aircraft for general aviation airports are considered to be consistent with the TAF if they meet the following criteria: Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft:

   a. Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or
   b. Forecasts do not affect the timing or scale of an airport project, or
   c. Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3C.

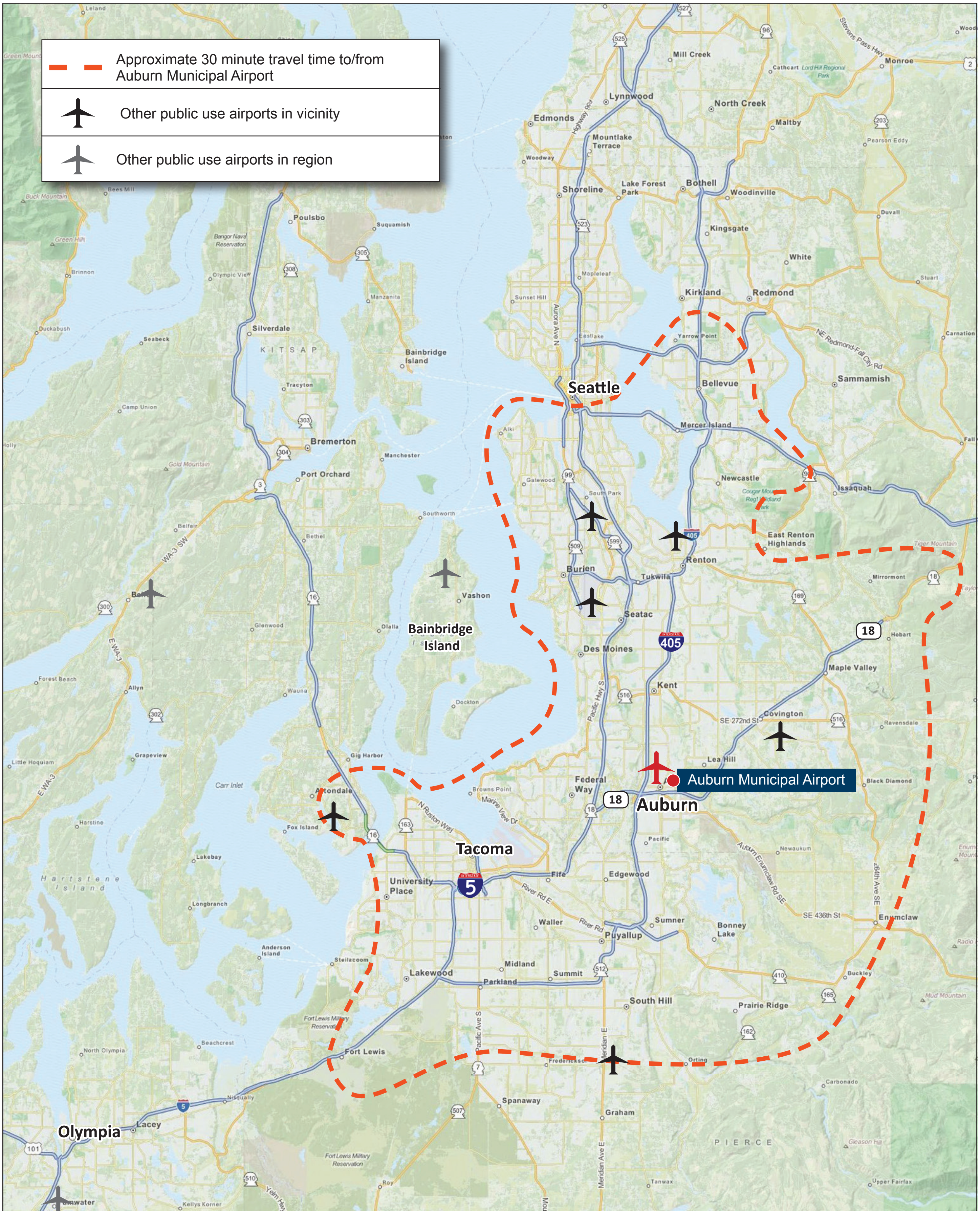
Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over twenty years with any certainty. In addition, major unexpected events such as the terrorist attacks of 9/11 2001 or the recent economic recession have the potential to render any forecast obsolete when the effects of these events are deep or prolonged. Therefore, it is important to remember that aviation activity forecasts are to serve only as guidelines. Planning must be flexible enough to respond to a range of unforeseen developments -- either positive or negative. The use of development reserves for demand-driven facility needs such as hangar space or aircraft parking provides airport management with the ability to respond to unanticipated demand and preserve long-term aviation use areas on the airport.

The following forecast analysis for Auburn Municipal Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for Auburn Municipal Airport that will permit airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility that meets the area's air transportation needs.

Airport Service Area

The airport service area refers to the geographic area surrounding an airport that generates most "local" activity. The population, economic characteristics and number of competing airports within an airport's service area are important factors in defining locally-generated demand for aviation facilities and services. With numerous airports nearby, service areas often overlap, creating competition between airports for items such as hangar space, fuel and aviation services. Demand generated by transient users can also be influenced by competition from nearby airports. In both cases, demand factors usually include cost, convenience and the quality of facilities or services available.

A 30-minute surface travel time is often used to approximate the boundaries of a service area for a typical general aviation airport in an urban area. In addition to Auburn Municipal Airport, there are four publicly-owned airports and several privately owned airports that accommodate general aviation activity within 30 minutes of Auburn, which creates significant competition among airports and eliminates the need to travel long distances to access desired airport facilities or services. **Figure 3-1** illustrates the approximate boundary of an approximate 30-minute drive from the local area, which encompasses large areas of King County and areas of adjacent Pierce County.



Approximate 30 minute travel time to/from Auburn Municipal Airport
Other public use airports in vicinity
Other public use airports in region
Auburn Municipal Airport
Seattle
Tacoma
Auburn
Olympia
Bainbridge Island

Table 3-1 lists the publicly-owned, public use airports within a 30 nautical mile radius of Auburn Municipal Airport. It is noted that most of the public use airports listed provide competitive facilities and services with master plans that provide for future facility expansion. Competing airports located beyond a 30-minute travel time typically have less impact on local airport activity due to the redundancy provided by closer facilities. In contrast, the service area for a commercial airport often extends beyond two hours due the relatively small number of airports with scheduled airline service.

TABLE 3-1: PUBLIC AIRPORTS IN VICINITY OF AUBURN MUNI. AIRPORT *(WITHIN 30 NAUTICAL MILES)*

AIRPORT	LOCATION	RUNWAY DIMENSION (FEET)	SURFACE	LIGHTED RUNWAY?	FUEL AVAILABLE?
Renton Municipal	10 NM N	5,382 x 200	Asphalt	Yes	Yes
Boeing Field – King County Int'l.	13 NM N	10,000 x 200 (primary runway)	Asphalt	Yes	Yes
Seattle Tacoma Int'l.	8 NM NW	11,901 x 150 (primary runway)	Asphalt	Yes	No GA services
Pierce County - Thun Field (Puyallup)	14 NM S	3,650 x 60	Asphalt	Yes	Yes
Tacoma Narrows	15 NM W	5,002 x 150	Asphalt	Yes	Yes
Vashon Airport	13 NM NW	2,001 x 60	Turf	Yes	No
Bremerton National Airport	24 NM W	6,000 x 150	Asphalt	Yes	Yes

Significant Market Factors Related to Auburn Municipal Airport:

- Auburn Municipal Airport has historically been among the most active general aviation airports in the Puget Sound Region.
- The Airport has historically been prominent in local flight training activities.
- The Airport's geographic location and quality of facilities provide competitive advantages/development opportunities needed to retain existing aircraft and attract new aircraft from within the local area and for aircraft relocating to the area in the future.
- The Airport has land available to accommodate aviation facility reconfiguration and expansion for general aviation needs.
- As a non-towered airport, Auburn Municipal Airport provides relative simplicity and convenience of operations.

- The Airport's proximity to several major state and interstate highways provides efficient surface access within the local area and overall region.
- Commercial and industrial development in the Puyallup-Auburn-Kent corridor combined with efficient surface access to the airport is also complimentary to local airport activity.

Regional Factors:

- The Puget Sound region will continue to be Washington's largest population and economic center and among Washington's most active general aviation markets.
- Several airports in the Puget Sound region are facing development constraints that may limit future expansion or significantly increase the cost of new development for tenants.
- Increased surface travel times in the I-5 and I-405 corridors are anticipated as the region continues to grow, making proximity and overall accessibility more valuable.

These factors suggest that Auburn Municipal Airport will continue to be among the area's most active airports and has the potential to expand on its historic base to become an increasingly viable alternative for a wide range of general aviation users. Looking forward, the ability to offer competitive land lease rates, ready-to-build hangar sites, and building rental space that is in demand (mixed use hangars, storage hangars, etc.) will be significant competitive factors. The availability of services that cater to business and general aviation aircraft owners/operators such as aircraft servicing is also important for attracting both locally based and transient aircraft.

Socioeconomic Trends and Forecasts

AREA ECONOMY

Historically, downturns in general aviation activity often occur during periods of weak economic conditions and growth typically coincides with favorable economic conditions. It is evident that the recent economic recession and the slow recovery that followed, has constrained general aviation activity locally, statewide and throughout the national airport system. However, as indicated in the FAA's national long term aviation forecasts, the overall strength of the U.S. economy is expected to sustain economic growth over the long-term, which will translate into modest to moderate growth in aviation activity.

In December 2012, King County's unemployment rate was 6.1 percent, more than 2 percentage points below the statewide unemployment rate (8.2%). Pierce County's unemployment rate in December 2012 was 8.5 percent, slightly higher than the statewide rate. The median household income in King County in 2010 was $65,383, nearly 20 percent above Washington's median household income level of $54,888. Pierce County's median household income in 2010 was $55,531, slightly higher than the statewide average. Pierce County has a relatively high percentage of government employment compared to King County (22 % compared to 14%), mostly due to Joint Base Lewis-McChord.

The 2011 Washington State Data Book identified the leading employment sectors in King and Pierce Counties (in 2010):

King County

1) Wholesale/Retail Trade (15%)
2) Government (14%)
3) Health Care & Social Assistance (10%)
4) Manufacturing (9%)
5) Professional/Technical Services (8%)

Pierce County

1) Government (22%)
2) Wholesale/Retail Trade (16%)
3) Health Care & Social Assistance (14%)
4) Accommodation/Food Services (8%)
5) Manufacturing (6%)
6) Construction (6%)

The Auburn-Kent Valley is a prime industrial and commercial area that accommodates a wide range of businesses and industry including high tech and aerospace. The Auburn Boeing plant is among the largest local employers. The Auburn plant is part of Boeing's Fabrication Division and includes machining, tooling, equipment services, tube and duct, and other specialty production lines.

The planned completion of upgrades to State Route 167 at the south connection between Puyallup and Tacoma will improve accessibility and transportation of goods within the corridor, which will in turn allow the area to accommodate future economic growth.

POPULATION

In broad terms the population within an airport's service area affects the type and scale of aviation facilities and services that can be supported. Although a large number of airport-specific factors can affect activities at an airport, changes in population often reflect other broader economic conditions which may also affect airport activity. Since it is difficult to identify specific connections between general aviation airport activity and individual economic indicators such as growth in personal income, unemployment rates, or business spending, population trends generally provide a broad measure of an area's economic health. Regions with flat or declining populations often have weak underlying economic conditions. In contrast, higher rates of population growth often characterize a growing economy that can stimulate individual and business use of general aviation.

HISTORIC POPULATION

As noted earlier, the airport service area for Auburn Municipal Airport extends beyond the local community and includes large areas of King and Pierce Counties. An examination of local and two-county historic population provides a basis for comparing the area's growth with historic activity at the airport.

Annual estimates of population for Washington cities and counties are developed by the Washington Office of Financial Management (OFM) to support local planning. The annual OFM estimates, coupled with the U.S. Census, conducted every ten years, provide an indication of local area population trends over an extended period. Population growth in King/Pierce Counties has been moderate (averaging 1.36 percent annual growth rate) over the last forty years, typically growing at a rate slightly higher than Washington's statewide population, which has averaged about 1.66 percent annually since 1980. Population growth within the City of Auburn (incorporated area) has outpaced county and statewide growth over the 30-year period, although annexation, particularly the Lea Hill area in 2008, has significantly expanded city population. As a result of the local expansion, Auburn's share (in percentage) of county and statewide population has nearly doubled. Historic population data for Pierce County, King County, City of Auburn, and Washington are summarized in **Table 3-2.**

TABLE 3-2: HISTORIC POPULATION

	1980	1990	2000	2010	2012	*AVERAGE ANNUAL GROWTH RATE (AAGR) 1980-2012*
King County	1,269,898	1,507,319	1,737,034	1,931,249	1,957,000	*1.26%*
Pierce County	485,643	586,203	700,820	795,225	808,200	*1.62%*
Combined 2-County Population	1,755,541	2,093,237	2,437,854	2,726,474	2,765,200	*1.36%*
Washington	4,132,156	4,866,692	5,894,121	6,724,540	6,817,770	*1.66%*
2-County % of WA Population	42.3%	43.0%	41.4%	40.6%	40.6%	
Auburn (incorporated area)	26,417	33,650	40,314	70,180	71,240	*3.15%*
Auburn % of 2-County Area	1.5%	1.6%	1.7%	2.6%	2.6%	
Auburn % of WA Population	0.6%	0.7%	0.7%	1.0%	1.1%	

Source: U.S. Census data; Washington Office of Financial Management annual estimate (April, 2012).

POPULATION FORECASTS

Washington Office of Financial Management (OFM)

Long-term county population forecasts are prepared by the Washington Office of Financial Management (OFM) to support local and statewide planning. The OFM forecasts are developed through three growth scenarios (Low, Intermediate, High) reflecting a range of growth assumptions ranging from very conservative to very optimistic. The Intermediate projections are routinely used by local governments for comprehensive planning due to their balanced, mid-range outlook. The OFM forecasts are summarized in **Table 3-3**.

TABLE 3-3: KING COUNTY, PIERCE COUNTY & WASHINGTON POPULATION FORECASTS

YEAR	KING COUNTY	PIERCE COUNTY	COMBINED 2-COUNTY AREA	WASHINGTON
2010[1]	1,931,249	795,225	2,726,474	6,724.540
2012[2]	1,957,000	808,200	2,765,200	6,817,770
2015	2,012,782[3]	831,944[3]	2,844,726[3]	7,029,758[4]
2020	2,108,814[3]	876,565[3]	2,985,379[3]	7,182,231[4]
2025	2,196,202[3]	923,912[3]	3,120,114[3]	7,570,617[4]
2030	2,277,160[3]	967,601[3]	3,244,761[3]	7,951,595[4]
2035	2,350,576[3]	1,006,614[3]	3,357,190[3]	8,301,547[4]
Avg. Annual Growth Rate (AAGR)2010-2035	*0.79%*	*0.95%*	*0.84%*	*0.85%*

1. 2010 U.S. Census Data
2. Washington Office of Financial Management (OFM) Annual Estimate (April 1)
3. OFM Forecast Population 2000-2040 (Intermediate Projection)
4. OFM Forecast of State Population (November 2012)

The 2010-2040 OFM Intermediate forecasts for King County and Pierce County project sustained modest growth through 2040 (0.79 and 0.95 percent average annual rate of growth, respectively). The OFM 2012 Forecast of The State Population[1] projects Washington's annual statewide growth to average 0.85 percent through 2040. A comparison of the OFM Intermediate forecast and the recently updated statewide population forecast shows that the combined King County and Pierce County population is expected to account for about 40.4 percent of Washington population in 2035, down slightly from 40.6 percent in 2010.

[1] Forecast of The State Population (Washington Office of Financial Management, November 2012)

The 2012 OFM estimates for King County and Pierce County combined (2,765,200) falls between the 2010 and 2015 Intermediate projections for each county, indicating that forecast is currently providing an effective projection of growth. Anticipated growth within two-county area is considered to be an indicator of future economic strength that will affect activity at Auburn Municipal Airport.

National General Aviation Activity Trends

The first decade of the 21st Century was tumultuous for General Aviation. The industry was battered by poor economic conditions and steadily rising fuel prices that slowed growth and negatively impacted elements such as aircraft manufacturing, on-demand air travel, aircraft ownership, and aircraft utilization levels. Ongoing concerns over the potential replacement and future availability of aviation gasoline (AVGAS) have also created uncertainty within general aviation. On a national level, most measures of General Aviation activity declined sharply through the second half of the decade and have only recently started to show modest signs of improvement.

Data maintained by the FAA show significant system-wide declines of several key general aviation activity indicators between 2000 and 2011 (AVGAS consumption -36%; piston aircraft hours flown -36%; active piston aircraft -9%; active GA pilots -2%). The FAA's updated long term forecasts are significantly tempered to reflect current and recent historic conditions. Although the FAA maintains a favorable long-term outlook, many of the activity segments associated with piston engine aircraft and AVGAS consumption are not projected to return to "pre-recession" levels until the 2020 to 2030 timeframe.

These expectations reflect a variety of industry specific factors and broad-based measures and forecasts of economic health such as gross domestic product (GDP), consumer price index, oil prices and interest rates. The FAA acknowledges several risks to its forecast assumptions related to rising oil prices, public perceptions of business and corporate aviation, broad national and international governmental fiscal policy concerns, and environmental concerns. The FAA notes that improvement for business and corporate aviation is largely based upon the future prospects of economic growth and corporate profits.

The FAA indicates that the 2012 general aviation forecasts have been updated to rely heavily on discussions with industry experts conducted at a workshop co-hosted by FAA and the Transportation Research Board (TRB) in July 2011 along with the results of the 2010 General Aviation and Part 135 Activity Survey. The forecast assumptions have been updated by FAA analysts to reflect more recent data and developing trends, as well as further information from industry experts. Although some segments of general aviation are expected to grow at moderately high rates, most measures of the general aviation industry suggest modest, sustained growth in the range of 1 to 2 percent annually is expected over the next 20 years. The FAA's annual growth assumptions for individual general aviation activity segments are summarized in **Table 3-4.**

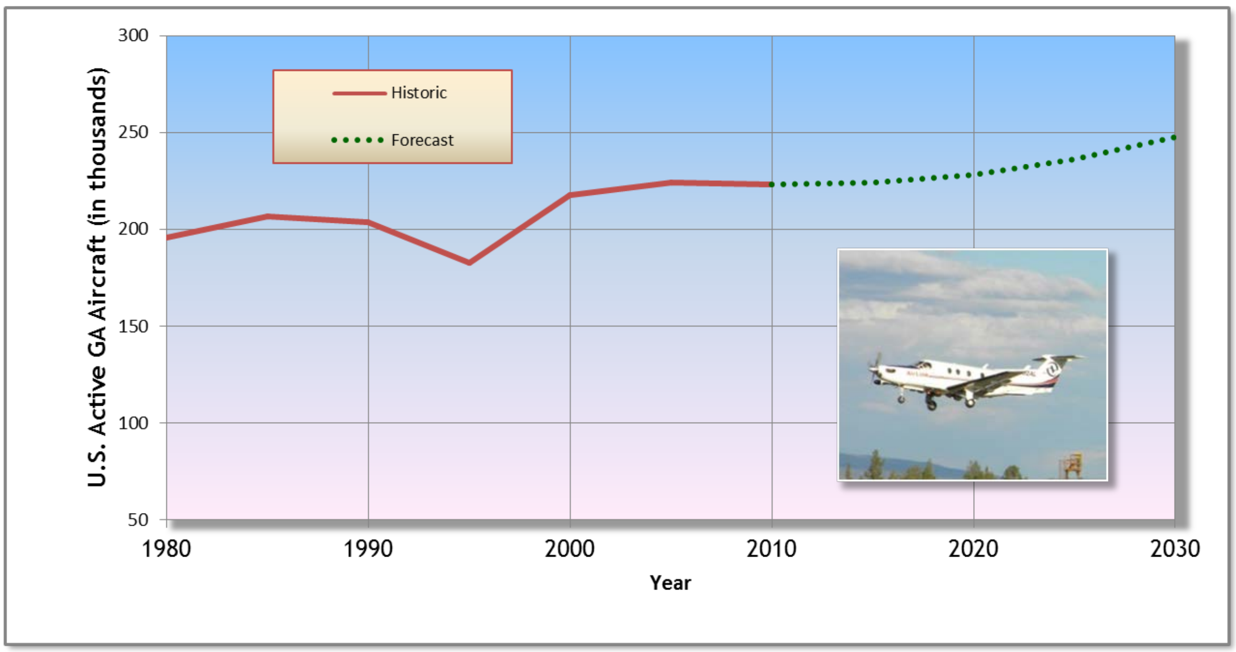
TABLE 3-4: FAA LONG RANGE FORECAST ASSUMPTIONS (U.S. GENERAL AVIATION)

ACTIVITY COMPONENT	FORECAST ANNUAL AVERAGE GROWTH RATE (2012-2032)
Components with Annual Growth Forecast < 0%	
Single-Engine Piston Aircraft in U.S. Fleet	-0.2%
Multi-Engine Piston Aircraft in U.S. Fleet	-0.5%
Hours Flown - GA Fleet (Piston AC)	-0.1%
Student Pilots (Indicator of flight training activity)	-0.1%
Components with Annual Growth Forecast < 1%	
Private Pilots	0.1%
Commercial Pilots	0.4%
Airline Transport Pilots	0.6%
Instrument Rated Pilots	0.4%
Active Pilots (All Ratings, excluding Airline Transport)	0.3%
GA Operations at Towered Airports (all AC types)	0.3%
AVGAS (Gallons consumed - GA only)	0.2%
Active GA Fleet (# of Aircraft)	0.6%
Turboprop Aircraft in U.S. Fleet	0.9%
Components with Annual Growth Forecast 1%-2%	
Experimental Aircraft in U.S. Fleet	1.2%
Components with Annual Growth Forecast >2%	
Sport Pilots	6.0%
Helicopter Pilots	3.0%
Turbine Helicopters in U.S. Fleet	3.0%
Piston Helicopters in U.S. Fleet	2.7%
Light Sport Aircraft in U.S. Fleet	2.1%
Turbojet Aircraft in U.S. Fleet	4.0%
Hours Flown - GA Fleet (Turbine AC)	4.0%
Hours Flown – Experimental AC/Light Sport AC	2.6%/3.5%
Jet Fuel (Gallons consumed – GA only)	3.9%

Source: FAA Long Range Aerospace Forecasts (FY 2012-2032)

The FAA's long term forecasts predict that the U.S. active general aviation aircraft fleet will grow modestly at an average annual rate of 0.6 percent between 2012 and 2032. The active fleet is expected to increase from 222,520 aircraft in 2011 to 253,205 in 2032 (+30,685) which is an overall increase of approximately 14 percent. However, within that overall growth is a projected decline in active single engine piston aircraft (-2.3%) and multi-engine piston aircraft (-9.2%). These declines reflect attrition of an aging fleet which is not fully offset by new aircraft production. Encouraging areas within the general aviation fleet are found in experimental aircraft (+29%), sport aircraft (+53%), and business jet (+129%) growth through 2032. The very light jet (VLJ) [2] portion of the business jet segment is expected to overcome several early setbacks and depressed market demand to become a growing percentage of the business jet fleet. **Figure 3-2** depicts the FAA forecast for active general aviation aircraft in the United States between 2012 and 2032.

FIGURE 3-2: US ACTIVE GENERAL AVIATION AIRCRAFT FORECAST



The industry segments with potential for affecting future activity at Auburn Municipal Airport include changes in the single-engine piston fleet, which is tempered somewhat by growth in light sport aircraft and experimental aircraft. Continued strength in turbine aircraft manufacturing, particularly for single-engine turboprops and very light jets/small business jets that are capable of operating on runway lengths comparable to Auburn's, and for turbine helicopters is another significant trend within general aviation. Student pilot numbers, while not projected to grow dramatically, are expected to remain relatively steady

[2] Very Light Jets (VLJ) are small jet-powered aircraft (weighing less than 12,500 pounds) with airport-related performance characteristics (takeoff weight, approach speed, runway length requirements, physical dimensions, passenger load, etc.) comparable to a high-performance light twin-engine aircraft.

at approximately 115,000 through 2032. The FAA expects the number of active private pilots to increase slightly, although the number of sport pilots is expected to more than triple over the next twenty years. The number of helicopter pilots is projected to nearly double over the next twenty years.

Overview of Recent Local Events

Auburn Municipal Airport was affected by the same conditions that affected airports across the country during the recent economic recession and sluggish recovery. As noted above, moderate unemployment continues to be a drag on the local economy. A review of events at the airport over the last ten years underscores the impact of the economic recession that effectively created a "pre-recession" period that included hangar construction and growth in aircraft activity followed by a recession and post-recession period that is marked with a decline in aircraft utilization (hours flown, fuel used, etc.) and slower hangar construction. Several significant events have occurred at the airport since the last master plan was completed in 2002. These events are summarized below.

NORTHWEST AVIATION COLLEGE

The closure of a local flight school in April 2012 affected several activity measures at the airport—most very recently, although some activity appears to have begun to slow during the recent economic recession, several years ahead of the closure. Between 2000 and 2012, the number of based aircraft at Auburn Municipal Airport decreased by less than 1 percent (276 to 274), although the number of aircraft associated with the flight school went from 20 to 0. In 2000, the flight school's fleet of 20 aircraft accounted for 7 percent of the airport's 276 based aircraft. Over the next several years, the aging flight training fleet was replaced with 10 newer, more reliable aircraft. Following the closure of the flight school, the aircraft were sold (8 aircraft left the airport and 2 remain on the airport). Accounting for the loss of flight school aircraft, the number of based aircraft not associated with the flight school increased by 18 during this period. In recent years it is estimated that the flight school generated approximately 8,000 flight hours annually (approximately 40,000 operations), down from 12,000 hours (60,000 operations) at its peak. The 2002 airport master plan estimated 141,000 annual operations in 2000. It is estimated that Northwest Aviation College operations accounted for 28 percent of total airport operations in 2000. The flight school accounted for less than 5 percent of airport operations in 2012 as business operations were winding down. According to airport management, Northwest Aviation College accounted for roughly 60 percent of the airport's annual aviation gasoline (AVGAS) volume until recently. The airport's 2012 AVGAS volume declined by 43 percent over the previous year, which coincided with the flight school closure. The reductions in aviation activity associated with the closure of Northwest Aviation College are not expected to be replaced without an equivalent flight school being located at the airport.

HANGAR CONSTRUCTION

Closely following completion of the last airport master plan in 2002, several privately-funded hangars were constructed at the airport, increasing hangar capacity by approximately 127 units. However, according to airport management, the majority of aircraft currently residing in the new hangars relocated from open-front city hangars and aircraft tiedown aprons, with a smaller number of aircraft relocating from other airports. The impact on the airport's based aircraft fleet was not as dramatic as anticipated in the 2002 master plan based aircraft forecast, but contributed to the net increase in non-flight training aircraft (+18) between 2000 and 2012.

AVIATION FUELING

A review of aviation fuel delivery volumes at Auburn Municipal Airport was conducted to help evaluate the impact of activity trends on airport operations. While overall economic conditions since 2007 have been generally weak, the impact of Northwest Aviation College flight operations on fuel activity is evident, particularly the sharp decline between 2011 and 2012. Airport management estimates that the flight school accounted for up to 60 percent of airport fuel volumes in recent years. It appears that during this period, non-flight school AVGAS volumes remained relatively stable with a slight increase that could be partly attributed to a small increase in non-flight school based aircraft. **Table 3-5** summarizes AVGAS deliveries at the airport during the last six years (2007-2012).

TABLE 3-5: AUBURN MUNICIPAL AIRPORT - AVIATION FUEL (ANNUAL GALLONS DELIVERED)

	2007	2008	2009	2010	2011	2012
AVGAS (100LL)	102,957	107,316	72,059	92,867	82,799	46,825
NET CHANGE FROM PREVIOUS YEAR	--	+4.2%	-32.9%	+28.9%	-10.8%	-43.5%

Source: Airport fuel records

Local/National Trend Comparison: The fueling trends at Auburn Municipal Airport are generally consistent with general aviation fuel consumption trends documented by the FAA throughout the U.S. during the same period. **Figure 3-3** illustrates the recent historic aviation fuel trends for Auburn Municipal Airport (left axis) and the U.S. (right axis).

Nationally, AVGAS consumption levels dropped every year between 2000 and 2011, ending 35 percent below 2000 levels. Contributing factors include economic recession, rising fuel prices, the ever-increasing cost of aircraft operation, use of alternative fuels (auto gas), and a shrinking piston-engine fleet (-9% between 2000 and 2011). The latter factor does not appear to have influenced AVGAS fueling trends at Auburn Municipal, although the economic factors have broad impacts that are evident at virtually every general aviation airport. A review of the statewide aircraft taxable fuel distribution data provided by WSDOT Aviation for the period 2007 through 2012 shows a 22 percent overall decline in AVGAS volumes with minor year-to-year fluctuations. This trend is generally consistent with national fueling activity and it generally signals a decline in aircraft utilization (hours flown, gallons of fuel consumed, etc.).

FIGURE 3-3: AUBURN (S50) AND US AVIATION GASOLINE (AVGAS) CONSUMPTION TRENDS

Historic Aviation Activity

For Auburn Municipal Airport, aircraft operational data (takeoffs and landings, touch and go landings, etc.) are limited to estimates. As a non-towered airport, no record of activity is regularly maintained. However, a review of estimates contained in state aviation system plans, previous airport master plans, and FAA Terminal Area Forecast (TAF) data provides a general indication of activity at the airport over time. Based aircraft counts are updated periodically either as part of a master plan or by airport management for other purposes.

FAA TERMINAL AREA FORECAST (TAF) DATA

The Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) is maintained for airports that are included in the National Plan of Integrated Airport System (NPIAS). **Table 3-6** summarizes recent historic based aircraft and aircraft operations estimates for the airport from the TAF. The TAF is periodically updated and adjusted as more specific airport activity data are available. When reviewing FAA TAF data, it is important to note that when there is no change from year to year it often indicates a lack of data, rather than no change in activity. Similarly, a large change in data in a single year may follow updated reporting that captures changes that occurred over several years. Small changes in year-to-year activity that extend through the forecast typically reflect assumed growth rates that are not frequently updated. TAF aircraft operations estimates in the ten years prior to 2000 ranged from 143, 000 to 165,908. The TAF data in 2000 was revised to reflect the base year (2000) documented in the 2002 Airport Master Plan forecasts. The consistent year-to-year growth reflected in the operations data since 2000 appears to follow an assumed pre-defined annual growth rate which does not reflect specific local events or fluctuating economic conditions. It is noted that the TAF based aircraft estimate for 2012 (343) is 69 higher (+25%) than the 2012 airport management count (274). Based on recent fuel delivery records and the closure of the local flight school, the recent TAF estimates of aircraft operations also appear to be well above current activity levels.

TABLE 3-6: FAA TAF DATA – AUBURN MUNICIPAL AIRPORT

YEAR	GA AIRCRAFT OPERATIONS	BASED AIRCRAFT	RATIO: GA OPERATIONS PER BASED AIRCRAFT
2002	145,636	277	526
2003	148,272	284	522
2004	150,882	277	545
2005	153,518	277	554
2006	155,862	305	511
2007	158,242	305	519
2008[1]	160,657	312	515
2009[1]	163,110	319	511
2010[1]	165,600	326	508
2011[1]	168,129	335	502
2012[1]	170,695	343	498

1. FAA Terminal Area Projected (Forecast) Activity; previous years are presented as historical (all data based on estimates)

CURRENT ESTIMATE OF ACTIVITY

The 2002 airport master plan estimated 276 based aircraft and 141,000 annual aircraft operations for 2000. The estimates were relatively consistent with other FAA activity estimates at the time and are believed to have been reasonably accurate.

Based Aircraft

The airport's current based aircraft count of 274 (late 2012) is slightly lower than the 276 based aircraft estimated in 2000 (-0.7%) for the Master Plan. However, as noted earlier, the 2000 based aircraft count included 20 aircraft in the Northwest Aviation College fleet and 256 other aircraft. The events associated with the flight school closure were noted above. With this accounted for, non-flight school aircraft at the airport increased from 256 to 274 (+7.0%), which reflects an average annual growth rate (AAGR) of **0.57 percent**.

Auburn Municipal Airport has traditionally accommodated primarily single- and multi-engine piston aircraft and small helicopters. All current fixed-wing based aircraft are included in Airplane Design Group I (ADG I), although the airport accommodates transient ADG II aircraft that are capable of operating on the existing 3,400-foot runway. ADG I includes aircraft with wingspans less than 49 feet; ADG II includes aircraft with wingspans from 49 to 79 feet. A description of aircraft classifications is provided later in the chapter.

Aircraft Operations

The 2002 Airport Master Plan developed an estimate of aircraft operations (takeoffs and landings) based on a seasonal assessment of activity. Aircraft operations for 2000 were estimated at 140,976, which was rounded to 141,000. With a based aircraft fleet of 276 aircraft, the ratio of operations per based aircraft was 511 (141,000/276 = 511). The master plan operations estimate was approximately 15 percent lower than the FAA's TAF estimate for 1999 and it appeared to be consistent with activity ratios generated by general aviation reliever airports during the period. The activity ratio was also consistent with airports having significant flight training activity. In 2000, the ratio of operations per based aircraft (not including local flight training aircraft) was 395 (101,000/256 = 395), which is consistent with medium size general aviation airports with significant transient activity, including flight training from nearby airports.

FAA GUIDANCE FOR ESTIMATING AIR TRAFFIC AT NON-TOWERED AIRPORTS

The FAA provides planning guidance for estimating activity at general aviation airports without control towers, including the use of activity ratios to project aircraft operations from the number of based aircraft at the airport. In the absence of actual aircraft operations counts, the ratios of activity are generally adequate for airport planning purposes. The FAA developed "typical" operations ratios for general aviation airports based on recent observations at airports throughout the United States. The suggested range is 250 to 450 operations per based aircraft (for small airports with low activity to high activity airports in urban areas). The ratios are intended to reflect operations from both locally-based and transient aircraft and they have been tempered slightly from previous recommended ratios developed for FAA NPIAS general aviation airports to reflect industry and economic trends experienced over the last decade.

The 2002 Airport Master Plan estimate of general aviation operations (141,000) with 276 based aircraft reflect an operations to based aircraft ratio of 511, which is slightly above the high end of the typical range but provides a reasonable "pre-recession" estimate of activity. The closure of the local flight school and the significant decline in AVGAS fueling volumes experienced at Auburn Municipal Airport in recent years, coupled with nearly level based aircraft totals suggests a decline in overall aircraft activity and average aircraft utilization has occurred.

In order to develop updated forecasts of aircraft operations, an estimate of current activity is needed. Using the 2002 airport master plan's activity measures as a baseline, several adjustments were made to reflect specific events.

- Three months of Northwest Aviation College activity in 2012 was estimated at 3,000 operations.
- A 15 percent reduction in non-flight training aircraft utilization was assumed (compared to 2000) to reflect national and statewide aviation trends and the portion of reduced on-airport AVGAS volumes not attributed to the closure of Northwest Aviation College. The 2000 ratio of 395 operations per (non-flight training) based aircraft was reduced to approximately 336 (395 x .85 = 335.75) for 2012.
- An area helicopter flight school (Atomic Helicopters) bases two aircraft at Auburn Municipal Airport, although most flight training activity is conducted at Boeing Field. According to airport management, the aircraft are repositioned to Boeing Field as needed. For planning purposes, it is estimated that the two aircraft currently generate approximately 1,700 annual operations, most of which is related to repositioning the aircraft between the two airports, with some flight training conducted on the airport. The estimated annual activity translates into an average of about 5 operations per day.

Based on the factors noted above, an estimate of aircraft operations for 2012 was developed as follows:

A. Northwest Aviation College Aircraft Operations (Jan-Mar): 3,000

B. Non Flight Training Based Aircraft (272) x 336 operations per based aircraft ratio (captures local and transient aircraft activity, including transient flight training)

C. Locally-Based Flight Training Helicopters (2) x 856 operations

2012 General Aviation Operations (Auburn Municipal Airport)

A. = 3,000 Operations

B. 272 x 335.75(≈336) = 91,324 Operations

C. 2 x 856 = 1,712 Operations

A+B+C = 96,036 General Aviation Operations

96,036/274 (Based Aircraft) = 351 GA Operations per Based Aircraft

The 2012 estimate of general aviation operations (96,036) is approximately 32 percent lower than the 2000 estimate of activity (141,000). A detailed distribution of current traffic is provided in the forecast of aircraft operations later in the chapter.

Aviation Activity Forecasting

EXISTING FORECASTS

Several existing aviation activity forecasts are available for comparison with current activity, recent historic trends, and the updated forecast scenarios prepared for the master plan. However, it is noted that all of the existing aviation activity forecasts for Auburn Municipal Airport were completed before the start of the recent economic recession that began in the 4th quarter of 2007. Five years after the beginning of recession, many segments of general aviation activity have not returned to pre-recession levels. As an example, the precipitous declines in piston aircraft hours flown and AVGAS consumption documented by FAA throughout the national aviation system during the last decade were not anticipated in forecasts commonly produced between 2000 and 2007.

The existing forecasts are presented unmodified and therefore do not reflect recent events and may be obsolete (in actual numbers). However, the long-term growth rates reflected in the existing forecasts are typically within the range found at many general aviation airports and provide a useful basis of comparison. The existing forecasts and their respective average annual growth rates are summarized below and later in **Table 3-7 and depicted in Figure 3-4**. For the purposes of comparison, the existing forecasts have been interpolated or extrapolated to correspond to the nearest master plan forecast years.

2002 AIRPORT MASTER PLAN

The 2002 Airport Master Plan forecasts projected based aircraft at Auburn Municipal Airport to increase from 276 to 377 between 2000 and 2022, which reflects an average annual growth rate of **1.57 percent**. Operations were projected to increase from 141,000 to 193,189 during the same period, reflecting an average annual growth rate of **1.59 percent**.

The airport's 2012 based aircraft count (274) is 67 aircraft below (-19.7%) the 2010 forecast of 341 based aircraft. The 2012 operations estimate of 96,036 is 45 percent below the 2010 forecast of 174,891 operations. The master plan forecasts did not anticipate the significant local and national events that negatively affected air traffic at the airport and do not reflect current conditions or recent activity trends.

FAA TERMINAL AREA FORECAST (TAF)

The FAA's 2008 TAF forecast update projects based aircraft at Auburn Municipal Airport to increase from 305 to 463 (+52%) between 2007 and 2025, which represents average annual growth of **2.35 percent**. The 2012 TAF forecast for based aircraft (343) is 69 aircraft (20%) above the 2012 based aircraft count for the airport. General aviation aircraft operations are projected to increase from 158,342 to 207,962 between 2007 and 2025, which represents average annual growth of **1.53 percent**. The 2012 operations forecast of 158,342 is approximately 65 percent higher than the 2012 operations estimate (96,036) prepared for the master plan update. As noted earlier, the TAF forecasts have not been adjusted to reflect a variety of airport-specific and national factors and do not appear to reflect current conditions or recent activity trends at the airport.

2007 WSDOT AVIATION LONG TERM AIR TRANSPORATION STUDY (LATS)

The 2007 WSDOT Aviation Long Term Air Transportation Study (LATS) contains based aircraft and operations forecasts for Washington's public use airports for the 2007-2030 timeframe. Based aircraft are projected to increase from 305 to 353 (+16%) between 2002 and 2030, which represents average annual growth of **0.59 percent**. General aviation aircraft operations are projected to increase from 137,250 to 158,850 during the same period, reflecting an average annual growth rate of **0.59 percent**. Annual air taxi operations were estimated at 6,100 and military operations were estimated at 100 in the base year of the forecasts (2005) and were then maintained unchanged through the 25-year forecast period.

Updated Forecasts

BASED AIRCRAFT

Several updated projections of based aircraft at Auburn Municipal Airport have been prepared based on a review of recent socioeconomic data, existing aviation activity forecasts and current conditions. The existing and updated forecasts are summarized in **Table 3-7** and depicted in **Figure 3-4**. Note that the previously prepared forecasts are not adjusted to reflect the 2012 based aircraft count (274).

ADJUSTED FAA TERMINAL AREA FORECAST (TAF) (2.35% ANNUAL GROWTH)

The existing FAA TAF based aircraft forecast for Auburn Municipal Airport was updated by applying the growth rate to the updated 2012 based aircraft count of 274 aircraft. With this one-time adjustment, based aircraft are projected to increase from 274 to 388 (+42%) between 2012 and 2027, which represents average annual growth of **2.35 percent**.

U.S. ACTIVE GENERAL AVIATION FLEET MARKET SHARE (0.64% AND 0.92% ANNUAL GROWTH)

Auburn Municipal Airport accounted for approximately 0.123 percent of the U.S. active general aviation fleet in 2012, down from 0.127 percent in 2000. This trend is reflective of the nominal decline in based aircraft at the airport, but it does not provide a complete picture of the flight school/non-flight school shifts in based aircraft numbers. The underlying theme in U.S. general aviation activity forecasts is very modest growth. Since expectations are low system-wide, it is very feasible for individual airports to outpace national growth with events such as new hangar construction or attracting new tenants to the airport.

Two market share projections were developed using the U.S. general aviation fleet forecast model. The first projection assumes that current market share of 0.123 percent is maintained through the planning period. Based aircraft are projected to increase from 274 in 2012 to 311 in 2032, which represents an average annual growth rate of **0.64 percent.** The second projection assumes that Auburn's market share will gradually increase from 0.123 to 0.130 percent by the end of the planning period. This upward movement assumes that the airport will marginally increase market share in part based on its ability to grow an established large based aircraft population due to availability of services and other favorable market factors. In this projection, based aircraft increase from 274 in 2012 to 329 in 2032, which represents an average annual growth rate of **0.92 percent.**

PUGET SOUND REGIONAL TRANSPORTATION ORGANIZATION (RTPO) MARKET SHARE (0.57% TO 1.65% ANNUAL GROWTH)

The Washington Long Term Air Transportation Study (LATS) long-term aviation activity forecasts, prepared in 2007, provides based aircraft forecasts for the state's RTPOs. For the Puget Sound RTPO, which includes King, Pierce, Kitsap and Snohomish Counties, there were 3,798 general aviation aircraft based at public airports in 2005. Auburn Municipal Airport accounted for approximately 6.47 percent of Puget Sound RTPO based aircraft in 2005. The LATS forecast projects Puget Sound RTPO based aircraft to increase from 3,798 to 5,434 by 2030, which reflects a 43 percent overall increase and an average annual growth rate of 1.44 percent.

Three market share projections were developed using the LATS Puget Sound RTPO forecasts. For each, the LATS Puget Sound RTPO forecast for 2030 was extrapolated to 2032 by using the average annual growth rate (1.34%) from the 2025 to 2030 forecast period. The first projection assumes that Auburn's current market share of 6.47 percent is maintained through the planning period. Based aircraft are projected to increase from 274 in 2012 to 361 in 2032, which represents an average annual growth rate of **1.39 percent.**

The second projection assumes that Auburn's market share will gradually increase from 6.47 to 6.8 percent by the end of the planning period. In this projection, based aircraft increase from 276 in 2012 to 380 in 2032, which represents an average annual growth rate of **1.65 percent.**

The third projection assumes that Auburn's market share will decrease from 6.47 to 5.5 percent by the end of the planning period. This does not indicate a decline in based aircraft for the airport, just a slower rate of growth than is projected within the entire Puget Sound RTPO. In this projection, based aircraft increase from 276 in 2012 to 307 in 2032, which represents an average annual growth rate of **0.57 percent.**

POPULATION/ BASED AIRCRAFT RATIO (0.84% ANNUAL GROWTH)

The combined population of King and Pierce County in 2012 was 2,765,200.[3] Auburn's 2012 based aircraft count of 274 yields a ratio of approximately 0.991 based aircraft per 10,000 residents. A projection was developed using the current Washington Office Financial Management Intermediate population forecast for the two counties and maintaining population to based aircraft ratios. In this projection, based

[3] Washington OFM Annual Estimate of Population, April 1, 2012.

aircraft increase from 276 in 2012 to 330 in 2032, which represents an average annual growth rate of **0.84 percent.**

This projection assumes that the current relationship between regional population and based aircraft will remain constant over the next twenty years. Although there is no strong correlation between historic population and based aircraft growth at the airport, this projection provides an indication of airport growth that would essentially mirror overall anticipated growth within the region.

Summary

The preferred forecast noted above from the draft aviation activity forecast working paper was the **Puget Sound RTPO Maintain Market Share** projection. The projection was based on the airport's strategic location within the region, historic activity levels and site specific development potential which provide sufficient basis to grow in line with the overall Puget Sound region. Based aircraft were projected to increase from 274 in 2012 to 361 in 2032, which represents a net increase of 87 aircraft and an average annual growth rate of 1.39 percent. Although the preferred based aircraft forecast was revised per FAA review (see below), it is recommended that the long-term development reserves be based on the higher projection.

Following review of the master plan draft forecast working paper, the FAA Seattle Airports District Office provided the following direction: "- Pg. 23, Based Aircraft Forecasts: The preferred is very optimistic for what we are seeing with national trends. Given the regional trends and the activity that Auburn is able to accommodate, I believe that the US GA Fleet (Increase Share) is very reasonable and fitting for Auburn."[4] Based on this input, the U.S. GA Fleet Increased Market Share projection will be used as the selected based aircraft forecast for the master plan. In this forecast, based aircraft increase from 274 in 2012 to 329 in 2032, which represents a net increase of 55 aircraft and an average annual growth rate of 0.92 percent. The use of long term development reserves is recommended to address potential growth beyond forecast levels.

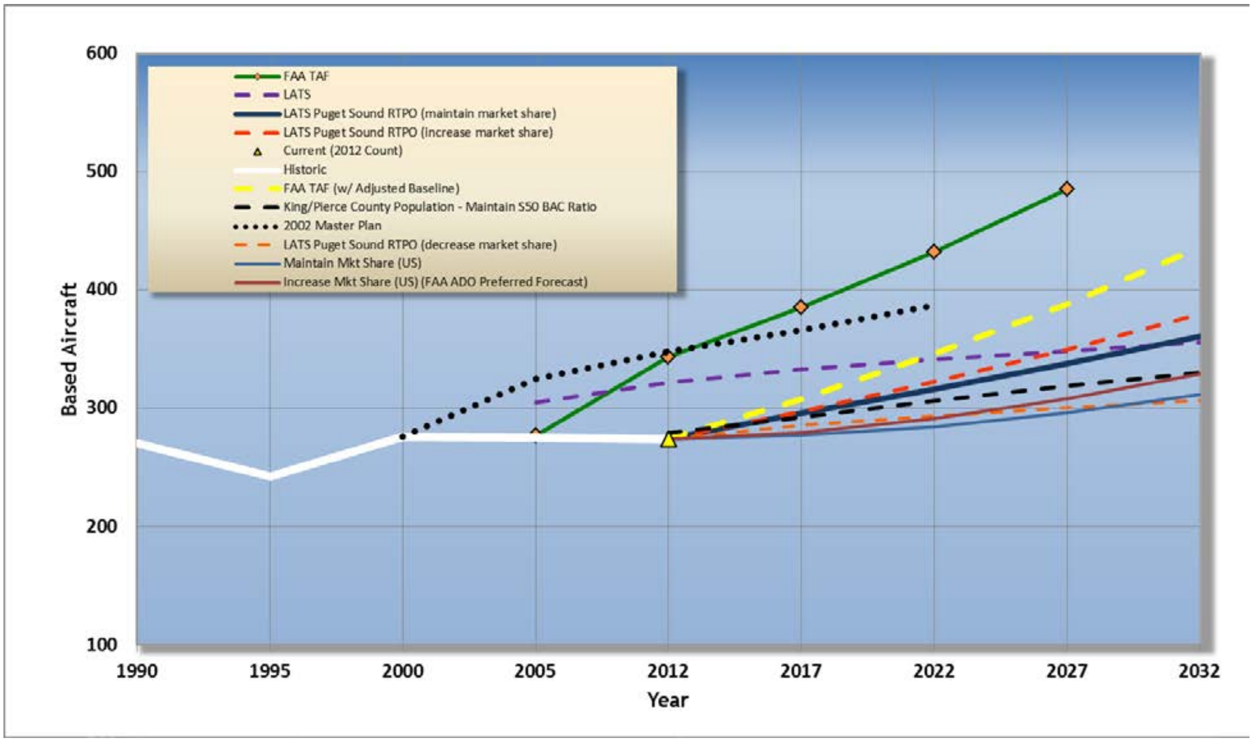
[4] Email correspondence (4/16/13) from Deepeka.Parashar@faa.gov, FAA Seattle ADO

TABLE 3-7: SUMMARY OF BASED AIRCRAFT FORECASTS (AUBURN MUNICIPAL AIRPORT)

EXISTING FORECASTS	2012	2017	2022	2027	2032	AAGR[2]
2002 Airport Master Plan	348[1]	366[1]	387[1]	--	--	1.56%
WSDOT LATS	322[1]	333[1]	341[1]	348[1]	356[1]	0.59%
FAA Terminal Area Forecast	343	385	432	485[1]	--	2.35%
UPDATED FORECASTS	**2012**	**2017**	**2022**	**2027**	**2032**	**AAGR[2]**
FAA TAF% with Adjusted Baseline	274	308	346	388[1]	--	2.35%
US GA Fleet (Maintain Current Share)	274	277	284	296	311	0.64%
US GA Fleet (Increase Share) ***(FAA Recommended Forecast)***	**274**	**280**	**291**	**308**	**329**	**0.92%**
Puget Sound RTPO Market Share (Maintain Current Share) [3]	274	296	316	338	361	1.39%
Puget Sound RTPO Market Share (Increase Share) [3]	274	297	322	350	380	1.65%
Puget Sound RTPO Market Share (Decrease Share) [3]	274	286	293	300	307	0.57%
King/Pierce County Population Ratio (Maintain Current Ratio of S50 BAC to Population)	279	292	306	319	330	0.84%

1. Interpolated/Extrapolated to fit forecast year
2. Average Annual Growth Rate (over defined forecast period)
3. Utilizes 2007 WSDOT LATS Based Aircraft Forecast for Puget Sound Regional Transportation Planning Organization (RTPO)

FIGURE 3-4: AUBURN MUNICIPAL AIRPORT - BASED AIRCRAFT FORECASTS



AIRCRAFT OPERATIONS

Updated aircraft operations projections have been developed for comparison with existing forecasts in order to identify a selected forecast for the master plan. The updated operations forecasts utilize the 2012 estimate (96,036) as the base for new projections. Several forecasting methods were used to reflect specific conditions.

CONSTANT AND INCREASING OPERATIONS RATIO PROJECTIONS (1.38% AND 1.93% ANNUAL GROWTH)

These projections were developed using an FAA-recommended methodology for estimating airport operations at non-towered general aviation airports. This method was also selected as the preferred forecast in the 2002 Airport Master Plan that utilized a static ratio of approximately 512 general aviation operations per based aircraft through the planning period. For the updated projection, the 2012 estimate of 96,036 general aviation operations and 274 based aircraft provides a ratio of approximately 350 operations per based aircraft that is used as a benchmark from which to move forward. The current ratio reflects recent fuel trends and current flight training activity at the airport.

The **constant ratio projection** maintains the 350 operations per based aircraft ratio through the twenty-year planning period. The projection assumes that current aircraft utilization will remain at current levels and growth in aircraft operations will be driven primarily by a net increase in based aircraft. The **increasing ratio projection** assumes a gradual increase from 350 to 390 operations per based aircraft through the planning period. The ratio of 390 operations per based aircraft is comparable to the levels of non-flight school activity at the airport in 2000. This projection reflects the assumption that as the recent economic downturns ease, the airport will be capable of sustaining significantly stronger growth in activity both in terms of growth in based aircraft and increased utilization per aircraft, although equivalent replacement of Northwest Aviation College flight training activity is not assumed.

The range of operations ratios presented in these projections are consistent with the FAA's current guidance on estimating activity at medium size general aviation airports and are tempered to reflect the FAA's modest long term growth expectations for general aviation activity.

The constant ratio projection results in general aviation aircraft operations increasing from 96,036 to 126,382 by 2032, which represents an average annual growth rate of **1.38 percent.** The increasing ratio projection results in general aviation aircraft operations increasing from 96,036 to 140,825 by 2032, which represents an average annual growth rate of **1.93 percent.**

MARKET SHARE U.S. TOWERED AIRPORTS (0.45% AND 0.98% ANNUAL GROWTH)

These projections were developed as a market share projection (general aviation operations) for airports with FAA and contract air traffic control towers. The basis for this projection is that the characteristics of Auburn Municipal Airport are similar to several towered northwest airports with predominantly general aviation activity such as Tacoma Narrows Airport, or Felts Field in Spokane. Two market share projections were developed based on the FAA forecast of general aviation operations at towered airports. This activity segment is forecast to increase from 25.96 to 27.76 million operations between 2011 and 2032.

The **maintain market share projection** assumes that Auburn Municipal Airport's 2012 market share (0.038%) will continue through 2032. The **increasing market share projection** assumes that the current market share will gradually increase from 0.038 to 0.042 percent by 2032.

The maintain ratio projection results in general aviation aircraft operations increasing from 96,036 to 105,016 by 2032, which represents an average annual growth rate of **0.45 percent.** The increase market share projection results in general aviation aircraft operations increasing from 96,036 to 116,615 by 2032, which represents an average annual growth rate of **0.98 percent.**

PUGET SOUND REGIONAL TRANSPORTATION ORGANIZATION (RTPO) MARKET SHARE (0.72% TO 2.08% ANNUAL GROWTH)

The Washington Long Term Air Transportation Study (LATS) long-term aviation activity forecasts, prepared in 2007, includes general aviation operations forecasts for the Puget Sound RTPO. The LATS forecast projects Puget Sound RTPO general aviation operations to increase from 1,358,117 in 2005, to 2,068,251 in 2030, which reflects a 52 percent overall increase and an average annual growth rate of 1.70

percent. Auburn Municipal Airport accounted for approximately 6.2 percent of Puget Sound RTPO general aviation operations in 2012.

Three market share projections were developed using the LATS Puget Sound RTPO forecasts. For each, the LATS Puget Sound RTPO forecast for 2030 was extrapolated to 2032 by using the average annual growth rate (1.57%) from the 2025 to 2030 forecast period. The first projection assumes that Auburn's current market share of 6.2 percent is maintained through the planning period. Aircraft operations are projected to increase from 96,036 in 2012 to 132,290 in 2032, which represents an average annual growth rate of **1.61 percent.**

The second projection assumes that Auburn's market share will gradually increase from 6.2 to 6.8 percent by the end of the planning period. In this projection, aircraft operations increase from 96,036 to 145,092 in 2032, which represents an average annual growth rate of **2.08 percent.**

The third projection assumes that Auburn's market share will decrease from 6.2 to 5.2 percent by the end of the planning period. This does not indicate a decline in aircraft operations for the airport, just a slower rate of growth than is projected within the entire Puget Sound RTPO. In this projection, aircraft operations increase from 96,036 to 110,953 in 2032, which represents an average annual growth rate of **0.72 percent.**

FLIGHT SCHOOL SCENARIO (3.25% ANNUAL GROWTH)

This projection is based on a scenario where large scale flight training activity returns to Auburn Municipal Airport early in the planning period. The airport's historic role in area flight training may be attributed at least in part to the airport's geographic location, facilities and mix of traffic. The primary assumption in this scenario is that activity comparable to that generated by Northwest Aviation College until 2012 could be replaced with an independent flight program or a program affiliated with an established education institution. In this scenario, flight training levels would begin lower (assume 5 flight training aircraft) and gradually increase to recent levels (10 flight training aircraft) by the end of the planning period. The overall impact of this scenario would be an additional 20,000 to 40,000 operations in addition to activity generated by other users. This scenario assumes that the ratio of operations per based aircraft for non-flight school aircraft would gradually increase from approximately 350 to 390 due to the increase in transient flight activity associated with an active flight training airport. Since this scenario cannot be predicted with any certainty, it is recommended as the upper end of the forecast envelope that can be used to define long-term development reserves.

Summary

The **Increasing Operations Per Based Aircraft** projection is recommended as the preferred aircraft operations forecast for the Auburn Municipal Airport Master Plan. This projection is driven in part by the airport's strategic location within the region, historic aviation activity levels and types, access to a large user base, and growing levels of fixed wing and helicopter flight training in the Puget Sound region. The close proximity to other airports in the area allows for convenient access by flight schools for primary training, pattern work and other activities that can be accommodated at a less congested airport.

Note: Based on a change in the preferred based aircraft forecast noted earlier, the preferred aircraft operations forecast was adjusted. The rising aircraft activity ratios were unchanged and were applied to revised based aircraft totals for each forecast year. Aircraft operations are projected to increase from 96,036 in 2012 to 128,375 in 2032, which represents an average annual growth rate of **1.46 percent.**

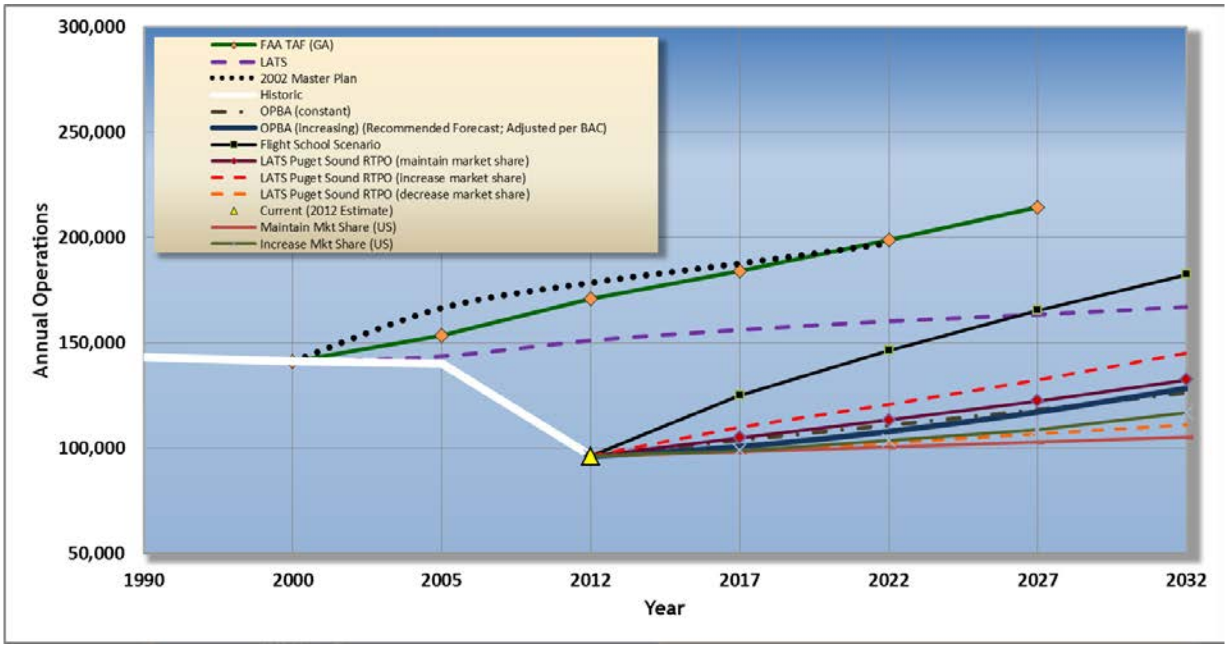
The existing and updated aircraft operations forecasts are summarized in **Table 3-8** and depicted in **Figure 3-5**. It is recognized that the range of updated operations forecasts for the airport are lower than the previous master plan forecasts. This is due in large part to weak economic conditions which have affected activity locally and throughout the national general aviation system. The FAA's current long-term general aviation activity forecasts have been tempered significantly compared to the agency's "pre-recession" forecasts.

TABLE 3-8: SUMMARY OF GENERAL AVIATION OPERATIONS FORECASTS (AUBURN MUNICIPAL AIRPORT)

EXISTING FORECASTS	2012	2017	2022	2027	2032	AAGR[2]
2002 Airport Master Plan	178,406[1]	187,507[1]	197,072[1]	--	--	1.59%
WSDOT LATS	150,986[1]	155,992[1]	160,087[1]	163,273[1]	166,914[1]	0.56%
FAA Terminal Area Forecast	170,695	184,129	198,623	214,374[1]	--	1.53%
UPDATED FORECASTS	**2012**	**2017**	**2022**	**2027**	**2032**	**AAGR[2]**
US GA Fleet (Maintain Current Share)	96,036	98,129	100,316	102,609	105,016	0.45%
US GA Fleet (Increase Share)	96,036	98,589	103,439	108,516	116,615	0.98%
Operations Per Based Aircraft Ratio Constant	96,036	103,601	110,643	118,207	126,382	1.38%
Operations Per Based Aircraft Ratio Increasing *(Recommended Forecast, Adjusted Per Based Aircraft Rev.)*	**96,036**	**100,659**	**107,760**	**117,013**	**128,375**	**1.46%**
Puget Sound RTPO Market Share (Increase Current Share) [3]	96,036	104,870	113,232	122,351	132,290	1.61%
Puget Sound RTPO Market Share (Increase Current Share) [3]	96,036	109,944	120,537	132,218	145,092	2.08%
Puget Sound RTPO Market Share (Increase Current Share) [3]	96,036	98,104	102,274	106,544	110,953	0.72%
Flight School Scenario	96,036	124,962	146,279	165,172	182,234	3.25%

1. Interpolated/Extrapolated to fit forecast year
2. Average Annual Growth Rate (over defined forecast period)
3. Utilizes 2007 WSDOT LATS Based Aircraft Forecast for Puget Sound Regional Transportation Planning Organization (RTPO)

FIGURE 3-5: AUBURN MUNICIPAL AIRPORT GENERAL AVIATION OPERATIONS FORECAST



Local and Itinerant Operations

The FAA TAF and the 2002 master plan forecasts reflect a 38 to 40 percent local and 60 to 62 percent itinerant traffic distribution for forecast operations. Local operations are conducted in the vicinity of an airport and include flights that begin and end at the airport. These include local area flight training, touch and go landings, flightseeing, and other flights that do not involve a landing at another airport. Itinerant operations include flights between airports, including cross country flights.

For forecasting purposes, maintaining a 40%/60% split between local and itinerant operations at Auburn Municipal Airport appears to be reasonable. Local and itinerant data for each forecast year are summarized in **Table 3-14**.

Design Aircraft

As noted earlier, the selection of design standards for airfield facilities is based upon the characteristics of the aircraft that are expected to use the airport. The **design aircraft** is defined as the most demanding aircraft type operating at the airport with a minimum of 500 annual itinerant operations, as described by the Federal Aviation Administration (FAA):

“**Substantial Use Threshold.** Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs."

The FAA groups aircraft into five categories (A-E) based upon their approach speeds. Aircraft Approach Categories A and B include small propeller aircraft, many small or medium business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots (nautical miles per hour). Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use with approach speeds of 121 knots or more. The FAA also establishes six airplane design groups (I-VI), based on the wingspan and tail height of the aircraft. The categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft.

The combination of airplane design group and aircraft approach speed for the design aircraft creates the Airport Reference Code (ARC), which is used to define applicable airfield design standards. Aircraft with a maximum gross takeoff weight greater than 12,500 pounds are classified as "large aircraft" by the FAA; aircraft 12,500 pounds and less are classified as "small aircraft."

A list of typical general aviation and business aviation aircraft and their respective design categories is presented in **Table 3-9. Figure 3-6** illustrates representative aircraft in various design groups.

TABLE 3-9: GENERAL AVIATION AIRCRAFT & DESIGN CATEGORIES

AIRCRAFT	AIRCRAFT APPROACH CATEGORY	AIRPLANE DESIGN GROUP	MAXIMUM GROSS TAKEOFF WEIGHT (LBS)
Grumman American Tiger	A	I	2,400
Cessna 182 (Skylane)	A	I	3,100
Cirrus Design SR22	A	I	3,400
Cessna Corvallis TT	A	I	3,600
Cessna 206 (Stationair)	A	I	3,614
Beechcraft Bonanza A36	A	I	3,650
Socata/Aerospatiale TBM 850	A	I	7,394
Beechcraft Baron 58	B	I	5,500
Cessna 340	B	I	5,990
Cessna Citation Mustang	B	I	8,645
Embraer Phenom 100	B	I	10,472
Cessna Citation CJ1+	B	I	10,700
Beech King Air B200	B	I	11,800
Piper Malibu (PA-46)	A	II	4,340
Cessna Caravan 675	A	II	8,000
Pilatus PC-12	A	II	10,450
Cessna Citation CJ2+	B	II	12,500
Cessna Citation II	B	II	13,300
Cessna Citation CJ3	B	II	13,870
Beech King Air 350	B	II	15,000
Cessna Citation Bravo	B	II	15,000
Embraer Phenom 300	B	II	17,968
Dassault Falcon 20	B	II	28,660
Bombardier Learjet 55	C	I	21,500
Beechcraft Hawker 800XP	C	II	28,000
Gulfstream 200	C	II	34,450
Gulfstream III	C	II	69,700
Learjet 35A/36A	D	I	18,300

Source: AC 150/5300-13, as amended; aircraft manufacturer data.

A-I

12,500 lbs. or less (small)

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer
Piper Seneca

B-I

12,500 lbs. or less (small)

Beech Baron 58
Beech King Air 100
Cessna 402
Cessna 421
Piper Navajo
Piper Cheyenne
Cessna Citation I

A-II, B-II

12,500 lbs. or less (small)

Super King Air 200
Cessna 441
DHC Twin Otter
Cessna Caravan
King Air C90

B-II

Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Jetstream 31
Falcon 20, 50
Falcon 200, 900
Citation II, Bravo XLS+
Citation CJ3

A-III, B-III

Greater than 12,500 lbs.

DHC Dash 7
DHC Dash 8
Q-300, Q-400
DC-3
Convair 580
Fairchild F-27
ATR 72
ATP

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

C-II, D-II

Gulfstream II, III, IV
Canadair 600
Canadair Regional Jet
Lockheed JetStar
Citation X
Citation Sovereign
Hawker 800 XP

C-III, D-III

Boeing Business Jet
B 727-200
B 737-300 Series
MD-80, DC-9
Fokker 70, 100
A319, A320
Gulfstream V
Global Express

C-IV, D-IV

B-757
B-767
DC - 8-70
DC - 10
MD - 11
L 1011

D-V

B - 747 Series
B - 777

Current and Future Design Aircraft

Based on existing and forecast activity levels, the existing and future design aircraft for Runway 16/34 is a piston multi-engine aircraft included in Aircraft Approach Category B and Airplane Design Group I (Airport Reference Code: B-I). These aircraft typically weigh less than 12,500 pounds and are categorized as "small" airplanes.

Based on the practical limits on runway length (4,000 feet or less, defined by existing roadways), it appears that the reasonable upper limit of capabilities at Auburn Municipal Airport is associated with turboprops, very light jets, and small business jets that do not require longer runway lengths. The growing number of single-engine turboprops (Cessna Caravan, Pilatus PC12, Piper Meridian, TBM700/850, etc.), many of which are included in ARC A-II, are ideally suited for the airport. Single engine turboprops can operate from shorter runways and are often alternatives to more expensive or older multi-engine turboprops and older high performance piston aircraft. Similarly, very light jets or smaller conventional business jets, such as the Cessna Mustang routinely operate on runways that can accommodate multi-engine piston aircraft. General aviation aircraft manufacturing trends clearly indicate a shift toward turbine aircraft for business aircraft and the development of more aircraft capable of operating on shorter runways will significantly increase the airport's access to business aviation activity.

Based on these factors, the updated aviation activity forecasts reflect growth in turbine aircraft activity during the current planning period, with ADG II (A/B) operations nearing the FAA's substantial use threshold by the end of the planning period. Due to the potential for the number of ADG II aircraft operations to increase beyond current expectations, it is recommended that development reserves and setbacks consistent with Airport Reference Code A/B-II be maintained for the runway–taxiway system. The existing runway width (75 feet) and runway-parallel taxiway separation (240 feet) already meet ADG II standards for this type of aircraft. The reserves would effectively maintain current airfield capabilities and do not represent an upgrade or expansion in facilities. A detailed discussion of design aircraft considerations will be provided in the Facility Requirements chapter.

Air Taxi and Military Operations

Air taxi activity includes operations regulated by the FAA under FAR Part 135, including on-demand passenger service (charter and fractional), small parcel transport (cargo), and air ambulance activity. Auburn Municipal Airport has not historically accommodated significant levels of air taxi activity. The FAA TAF historical activity and forecast does not include any air taxi operations. However, based on the potential for new on-demand air taxi service using a variety of general aviation aircraft, charter and fractional aircraft ownership, it is reasonable to assume that Auburn could accommodate limited (50 to 150 annual operations) activity during the twenty year planning period.

Historically, military operations at Auburn Municipal Airport have been very limited and they are not expected to increase during the current planning period. The FAA TAF historical activity and forecast does not include any military operations. 50 annual military operations are projected through the planning period to account for occasional activity, primarily helicopters used by National Guard or other military/government agencies for search and rescue, emergency response or law enforcement.

Operational Peaks

It is estimated that peak month activity at Auburn Municipal Airport occurs during the summer (typically July or August) and accounts for approximately 12 percent of annual aircraft operations. This level of peaking is consistent with the mix of airport traffic and is expected to remain relatively unchanged during the planning period. Peak day operations are defined by the average day in the peak month (design day) and the busy day in the typical week during peak month (busy day); the peak hour within the design day represents the design hour. The design day is calculated by dividing peak month operations by 30. The busy day is estimated to be 25 percent higher than the average day in the peak month (design day x 1.25). The design hour operations are estimated to equal 15 percent of design day operations. Operational peaks for each of the forecast years are summarized in **Table 3-10**.

TABLE 3-10: PEAK GENERAL AVIATION OPERATIONS FORECAST

ACTIVITY	2012	2017	2022	2027	2032
Annual Operations	96,036	100,659	107,760	117,013	128,375
Peak Month Operations (12%)	11,524	12,079	12,931	14,042	15,405
Design Day (average day in peak month)	372	390	417	453	497
Busy Day	465	487	521	566	621
Design Hour Operations (assumed 15% of design day)	56	58	63	68	75

Instrument Flight Activity

Flight activity data for aircraft operating under instrument flight rules in the national airspace system is tracked by FlightAware, a company that developed live flight tracking services for commercial and general aviation. Instrument flight plan data for calendar years 2006 and 2012 (see **Table 3-11**) were acquired to help gauge instrument activity at Auburn Municipal Airport. The data captures all civil aircraft filing instrument flight plans listing Auburn Municipal Airport either as the originating airport or the destination airport. Military aircraft are not included in the FAA instrument flight plan data. The 2006 data was selected to represent a typical “pre-recession” level of activity and the 2012 data represents current activity, which was approximately 34 percent below 2006 levels. It appears that the 2012 activity reflects the lingering impacts of weak economic conditions and the slow recovery. It is also noted that the instrument approach serving the airport is currently restricted and is not authorized for night use. Airport management indicates that the FAA restricted night instrument procedures until an obstruction survey can be completed to verify location and elevations of potential airspace penetrators in the vicinity of the airport. It is reasonable to assume that instrument activity at the airport will increase as economic conditions improve, the nighttime restriction is removed, or if the current approach minimums were improved. Based on current traffic estimates, instrument operations currently appear to account for about 1 percent of overall operations. The level of instrument approaches (in actual instrument weather conditions) appears to be approximately 1 percent of total itinerant landings.

TABLE 3-11: INSTRUMENT OPERATIONS - AUBURN MUNICIPAL AIRPORT (2006/2012)

ARC	REPRESENTATIVE AIRCRAFT	2006	2012
A-I	Cessna 182/Beechcraft Baron 55/TBM700	1,165	780
B-I	Beechcraft Baron 58/Beechcraft King Air 90/Cessna Citation CJ1	50	24
A-II	Cessna Caravan/Pilatus PC12	14	7
B-II	Cessna Citation Bravo/Beechcraft King Air 200/Falcon 50	0	0
--	Blocked (aircraft type and N number withheld at request of owner)	3	1
--	Helicopter	0	0
	Total Instrument Operations	**1,232**	**812**

Source: FlightAware

Aircraft Fleet Mix

BASED AIRCRAFT

The airport's current mix of based aircraft is projected to become more diverse during the current planning period reflecting growth in turbine aircraft (turboprop, very light jet, business jet), helicopters and light sport aircraft. Single engine turboprops and very light jets/small business jets are capable of operating on runways less than 4,000 feet under most common weather conditions experienced in Auburn. The projected changes in the based aircraft fleet mix at Auburn Municipal Airport are generally consistent with broader trends identified by FAA regarding the composition of the general aviation fleet as a whole. The forecast based aircraft fleet mix is summarized in **Table 3-12**.

Figures 3-7 and 3-8 depict the current (2012) and long term (2032) distribution of based aircraft by type, which is predominantly single-engine piston, followed by multi-engine piston, helicopter, light sport aircraft and business jet.

FIGURE 3-7: AUBURN MUNICIPAL AIRPORT - BASED AIRCRAFT FLEET MIX (2012)

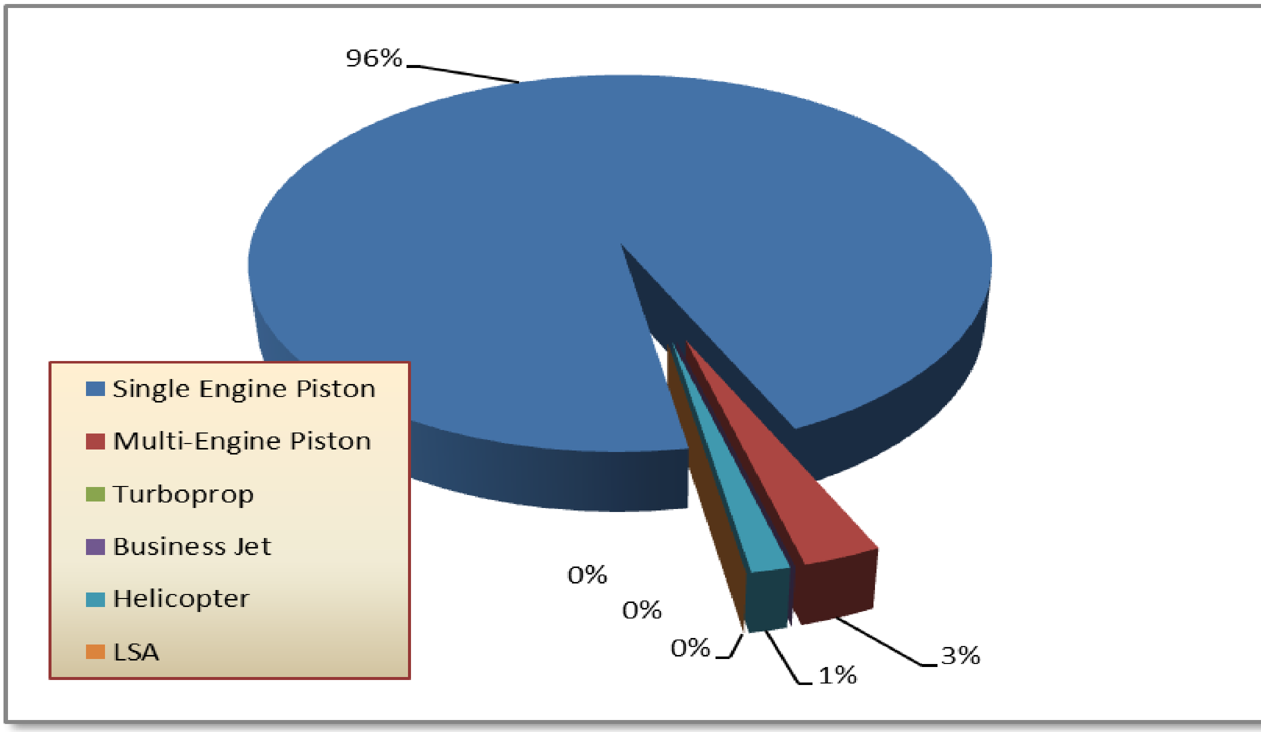


FIGURE 3-8: AUBURN MUNICIPAL AIRPORT – FORECAST BASED AIRCRAFT FLEET MIX (2032)

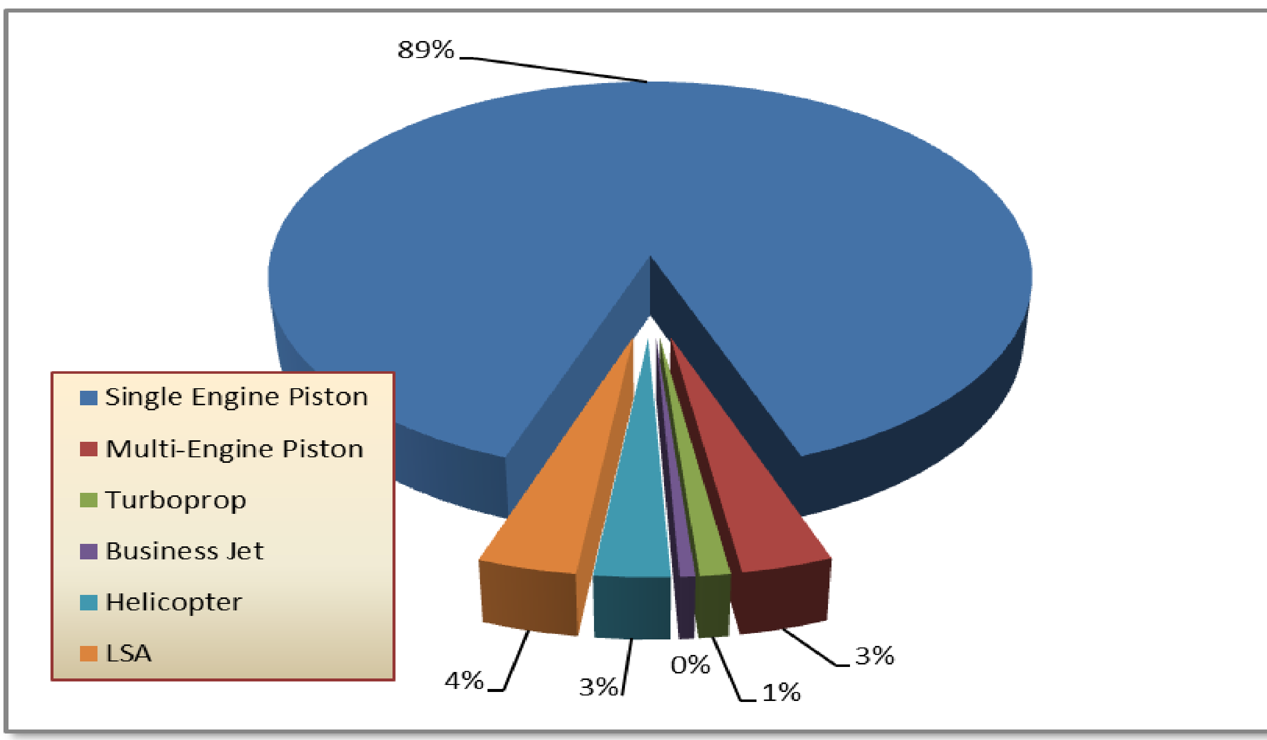


TABLE 3-12: FORECAST BASED AIRCRAFT FLEET MIX

ACTIVITY	2012	2017	2022	2027	2032
Single Engine Piston	262 (96%)	264 (94%)	268 (92%)	278 (90%)	292 (89%)
Multi-Engine Piston	8 (3%)	8 (3%)	10 (3%)	11 (3%)	11 (3%)
Turboprop	0 (0%)	1 (<1%)	2 (<1%)	3 (1%)	3 (1%)
Business Jet/VLJ	0 (0%)	0 (0%)	1 (<1%)	2 (<1%)	2 (<1%)
Light Sport Aircraft	0 (0%)	2 (1%)	5 (<2%)	8 (3%)	12 (4%)
Helicopter	4 (1%)	5 (<2%)	5 (<2%)	6 (2%)	9 (3%)
Total Based Aircraft (100%)	**274**	**280**	**291**	**308**	**329**

Note: Percentages may not sum due to independent rounding

AIRCRAFT OPERATIONS

The current aircraft operations fleet mix is estimated to closely follow the airport's based aircraft composition, with new turbine aircraft and helicopter operations that will complement the airport's established base of single-engine and multi-engine piston aircraft. Currently, single and multi-engine piston aircraft account for approximately 96 percent of airport operations followed by helicopter and multi-engine piston operations. Although single engine piston aircraft will continue to generate the majority of aircraft operations at Auburn Municipal Airport through the planning period, their portion of overall traffic is expected to gradually decline as other aircraft types become more common. The forecast aircraft operations fleet mix is summarized in **Table 3-13**.

TABLE 3-13: GA FORECAST AIRCRAFT OPERATIONS FLEET MIX (NO MILTARY OR AIR TAXI)

AIRCRAFT TYPE	2012	%	2017	%	2022	%	2027	%	2032	%
Single Engine Piston/LSA	92,214	96.0	96,519	95.9	101,920	94.6	109,403	93.5	119,955	93.4
Multi Engine Piston	800	<1.0	1,000	<1.0	1,200	1.1	1,240	1.0	1,400	1.1
Turboprop	20	<0.1	100	0.1	240	0.2	380	0.3	420	0.3
Jet	2	<0.1	20	<0.1	100	<0.1	190	0.2	200	0.2
Helicopter	3,000	3.0	3,020	3.0	4,300	4.0	5,800	5.0	6,400	5.0
Total Operations (100%)	**96,036**	**100**	**100,659**	**100**	**107,760**	**100**	**117,013**	**100**	**128,375**	**100**

Note: Percentages may not sum due to independent rounding

Forecast Summary

The recommended based aircraft and operations forecasts for Auburn Municipal Airport reflect the capabilities of the airport and the dynamics within its airport service area. Growth is projected to be modest, well within the airport's current development and functional capacity. The long term forecasts also reflect the broad national expectation of improving economic conditions and demand for aviation services over the next twenty years and beyond. A coming shortage of qualified pilots faces the airline industry as current pilots reach mandatory retirement. Other growing activity segments will require qualified pilots for both fixed wing aircraft and helicopters. The use of general aviation aircraft for business travel will continue to reflect commercial air service options and limits, particularly for travel to/from smaller cities and sparsely populated areas. The preferred forecasts are summarized in additional detail in **Table 3-14.**

As with any long term facility demand forecast, it is recommended that long term development reserves be protected to accommodate demand that may exceed current projections. For planning purposes, a reserve capable of accommodating a doubling of the 20-year preferred forecast demand should be adequate to accommodate unforeseen facility needs during the current planning period. However, should demand significantly deviate from the airport's recent historical trend, updated forecasts should be prepared to ensure that adequate facility planning is maintained. In particular, the potential for the airport to accommodate a large scale flight training operation could quickly push aircraft operations levels back to pre-recession activity levels.

TABLE 3-14: FORECAST SUMMARY

ACTIVITY	2012	2017	2022	2027	2032
Itinerant Operations					
General Aviation	57,622	60,395	64,656	70,208	77,025
Air Taxi	50	80	120	130	140
Military	50	50	50	50	50
Total Itinerant Operations	**57,722**	**60,525**	**64,826**	**70,388**	**77,215**
Local Operations (all GA)	38,414	40,263	43,104	46,805	51,350
Total Local & Itinerant Operations	**96,136**	**100,788**	**107,930**	**117,193**	**128,565**
Based Aircraft	**274**	**280**	**291**	**308**	**329**
Operations Per Based Aircraft (GA)	351	360	370	380	390
Aircraft Operations By Type (ARC)					
Single Engine Piston (A-I)	92,248	96,539	101,970	109,473	120,025
Multi-Engine Piston (B-I)	810	1,040	1,220	1,240	1,400
Single Engine Turboprop (A-II)	10	70	200	340	360
Multi-Engine Turboprop (B-I)	16	40	50	60	90
Multi-Engine Turboprop (B-II)	0	10	30	30	30
Business Jet (B-I)	0	16	102	190	200
Business Jet (B-II)	2	4	8	10	10
Helicopter Operations	3,000	3,020	4,300	5,800	6,400
Military	50	50	50	50	50
Total – All Operations	**96,136**	**100,789**	**107,930**	**117,193**	**128,565**
Subtotal - Turboprop Operations	26	120	280	430	480
Subtotal - Jet Operations	2	20	110	200	210
Total Turbine Fixed Wing Operations	28	140	390	630	690
Subtotal - ARC I Turbine Operations (A/B)	**16**	**56**	**158**	**250**	**290**
Subtotal - ADG II Turbine Operations (A/B)	**12**	**84**	**238**	**380**	**400**

Fifty-Year Forecast

Per the airport master plan project scope of work, fifty-year demand forecasts were prepared by extrapolating the average annual growth rates (AAGR) for the recommended 20-year based aircraft and aircraft operations forecasts. The purpose of the 50-year projection is to provide an estimate of demand that can be used to approximate long-term aviation use land requirements for the airport. **Table 3-15** summarizes the 50-year, and intermediate 30- and 40-year based aircraft and aircraft operations projections.

TABLE 3-15: 50-YEAR FORECAST

ACTIVITY	2012	2032	AAGR 2012-2032	2042	2052	2062
Total Local & Itinerant Operations	96,136	128,565	1.46%	148,676	171,933	198,828
Based Aircraft	274	329	0.92%	361	395	433
Operations Per Based Aircraft (GA)	351	390	--	412	435	459

Chapter 4 – Airport Facility Requirements

Chapter 4 – Airport Facility Requirements

The airport facility requirements analysis uses the results of the inventory and forecasts contained in Chapters Two and Three, as well as established planning criteria to determine the future facility needs for Auburn Municipal Airport for the current twenty year planning period.

Introduction

The evaluation of airport facility requirements can be divided into two broad primary categories: airside and landside. **Airside** facilities include runways, taxiways, navigational aids and lighting systems. **Landside** facilities include hangars, fixed base operator (FBO) facilities, aircraft parking apron, helicopter parking, aircraft fueling, surface access and automobile parking, utilities, and other related items. All airfield items are evaluated based on established standards from the Federal Aviation Administration (FAA).

The facility requirements evaluation is used to identify the adequacy or inadequacy of existing airport facilities and identify what new facilities may be needed during the planning period based on forecast demand. Potential options and preliminary costs for providing these facilities will be evaluated in the Airport Development Alternatives (Chapter Five), to determine the most cost effective and efficient means for meeting projected facility needs.

Organization of Materials

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

The evaluation of current and future conformance with FAA airport design standards and airspace planning criteria will be reflected on the updated FAA approved Airport Layout Plan. The evaluation of demand driven items will reflect in gross numbers, new facility needs such as runway length requirements, hangar spaces and aircraft parking positions based on forecast demand and the needs of the design aircraft. Items such as lighting and navigational aids are evaluated based on the type of airport activity, airport classification and capabilities.

The updated inventory of existing facilities presented in Chapter Two, is used to evaluate conformance with FAA standards. **Figures 4-1, 4-2, and 4-3** illustrate the location of the non-conforming items identified for the airport design standards described in this chapter. **Figure 4-1** depicts the runway-taxiway system and the north hangar area. **Figure 4-2** depicts the east landside area (south section). **Figure 4-3** depicts the east landside area (mid-runway section).

The most common nonstandard items identified in this evaluation are aircraft (wingtip) obstruction clearances for taxilanes located in hangar areas, apron tiedowns and adjacent to the aircraft fueling area. Although the clearances vary, most aircraft movements occur without incident. However, as facilities are updated or replaced (aircraft parking or hangars), new facilities should be designed to conform with appropriate design standards. It is also observed that vehicles are routinely parked adjacent to taxilanes, within object free areas (OFA), which is not consistent with FAA wingtip clearance standards for taxiing aircraft. Restricting vehicle parking adjacent to defined taxilanes should be considered to address this non-conforming item. The runway and west parallel taxiway meet all applicable FAA design standards.

Detailed definitions of the standards and their application at the airport are provided throughout the chapter. The reader is encouraged to consult the Glossary of Aviation Terms provided previously to clarify technical information.

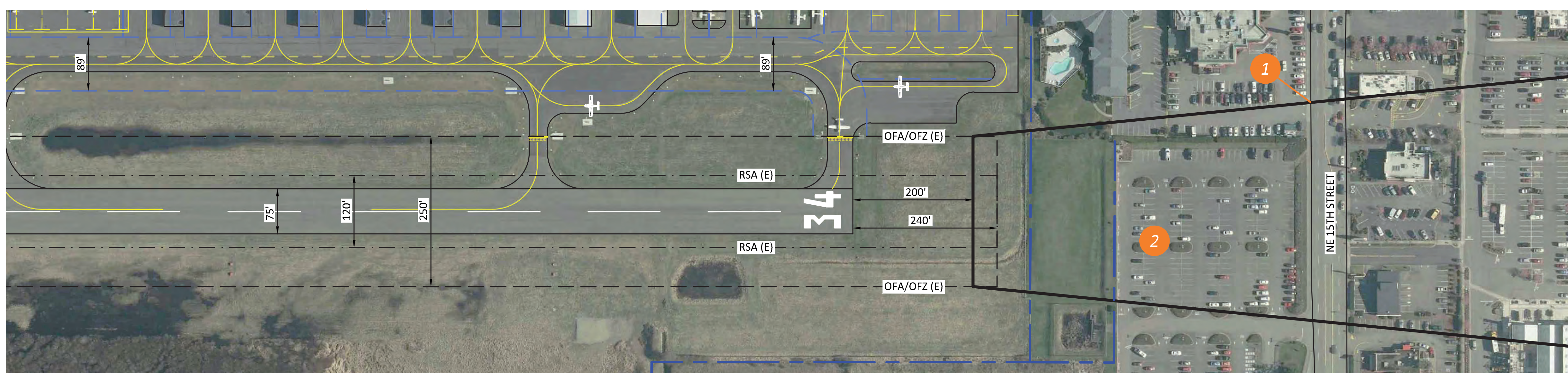
1 RPZ - ROAD

2 RPZ - NON-AIRPORT PROPERTY OWNERSHIP

3 TAXILANE OFA (PARKED VEHICLES) *

TAXILANE/TAXIWAY OBJECT FREE AREA

* PARKED VEHICLES OBSERVED IN VARIOUS HANGAR ROWS.



AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

AIRFIELD CONFORMANCE | **FIG. 4-1**

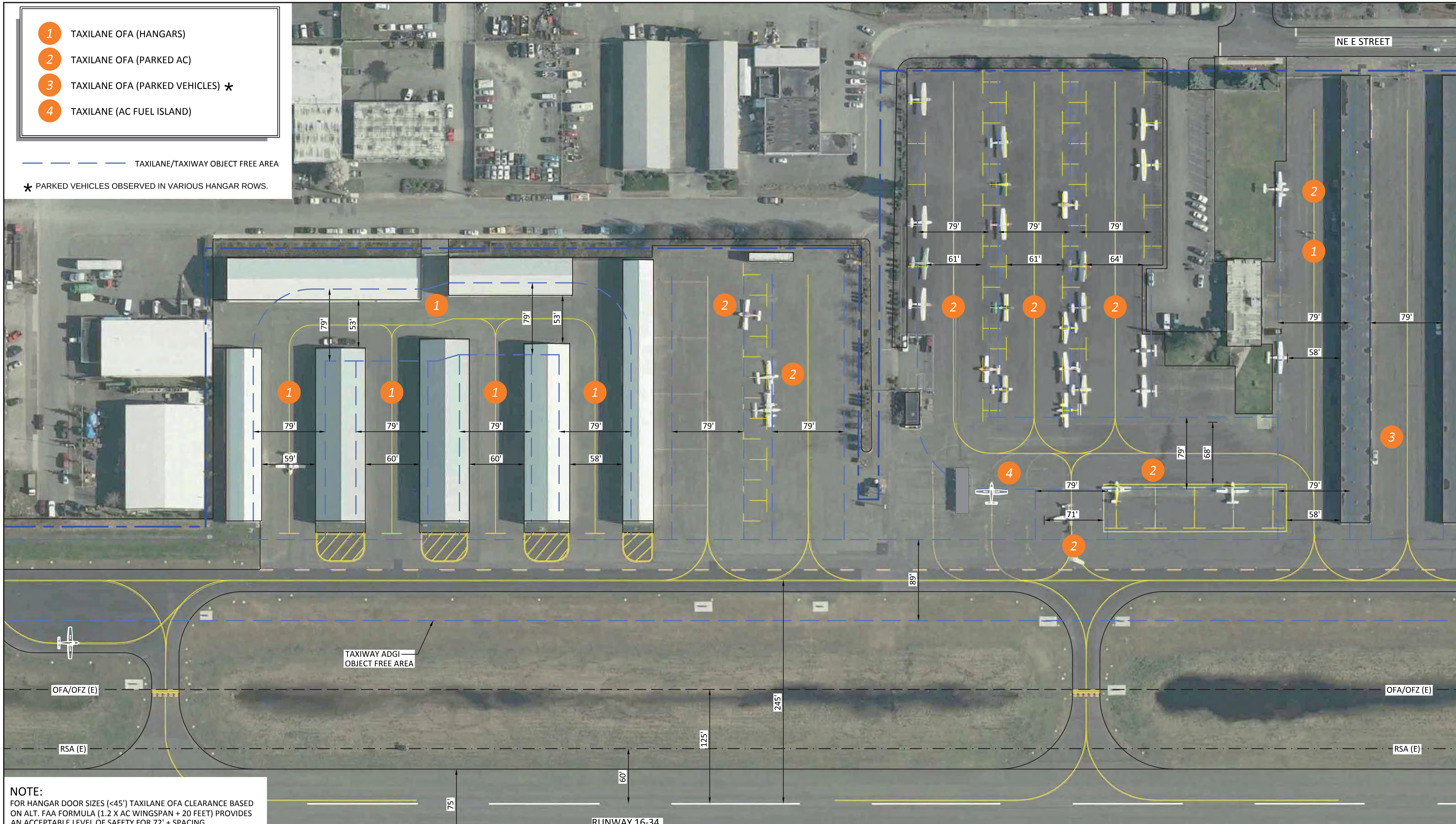
CENTURY WEST ENGINEERING CORPORATION

NOTE:
FOR HANGAR DOOR SIZES (<45') TAXILANE OFA CLEARANCE BASED ON ALT. FAA FORMULA (1.2 X AC WINGSPAN + 20 FEET) PROVIDES AN ACCEPTABLE LEVEL OF SAFETY FOR 72' + SPACING.

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

EAST LANDSIDE (SOUTH AREA) CONFORMANCE | FIG. 4-2

CENTURY WEST ENGINEERING CORPORATION



NOTE:
FOR HANGAR DOOR SIZES (<45') TAXILANE OFA CLEARANCE BASED ON ALT. FAA FORMULA (1.2 X AC WINGSPAN + 20 FEET) PROVIDES AN ACCEPTABLE LEVEL OF SAFETY FOR 72' + SPACING.

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

EAST LANDSIDE (NORTH AREA) CONFORMANCE | FIG. 4-3

CENTURY WEST ENGINEERING CORPORATION

2001-2020 Airport Master Plan Update Overview

The 2001-2020 Auburn Municipal Airport Master Plan Update[1] provided recommendations for airport facility improvements for the twenty year planning period that extended to 2020. The projects summarized in **Table 4-1** were included in the twenty year capital improvement program (CIP) for the master plan. The projects were reviewed to identify those which have been completed (noted in the table). The previously recommended improvements which have not been implemented will be revalidated, modified or eliminated based on the updated assessment of facility needs, current FAA guidelines and the elements of the Airport Master Plan preferred development alternative.

Note: several pavement sections were included in a 2014 rehabilitation (slurry seal, repair, crackfill, etc.) project that was completed after the original facility requirements assessment in Table 4-1. These projects are identified (2014 project).

TABLE 4-1: SUMMARY OF 2001-2020 AIRPORT MASTER PLAN UPDATE RECOMMENDED PROJECTS AND CURRENT STATUS

COMPLETED? YES/NO	PROJECTS
	Phase I (2001-2005)
No	Property Acquisition (Park & Ride Grass, Pacific Concrete, and west side)
No	Property Acquisition (southwest vacant parcel)
Yes	Noise Abatement Sign Replacement
No	Displace Runway 16 Threshold
No	Adjust/Relocate VASIs
Yes	Hangars Unlimited Hangar Construction (2 Hangars – North Hangar Area)
No	Airport Security Fencing and Grading
No	Parallel Taxiway Slurry Seal (*Parallel Taxiway was reconfigured/reconstructed in 2009 and rehabilitated in 2014*)
No	Phase I Development of 3.5 acre site
Yes	Hangar Construction (southernmost hangar pad - North Hangar Area)
Yes	Runway Rehabilitation and Airfield Overlay (2014 Rehab Project)
Yes	Runway and Connector Taxiway Lighting Replacement (2014 Rehab Project)
Yes	Connector Taxiway and Hold Apron Overlay (2004 and 2014 Rehab Project)
No	Hangar Taxilane and Apron Overlay (2014 Rehab Project)
No	Transient and Northern Based Aircraft Apron Slurry Seal (2014 Rehab Project)
No	Phase II Development of 3.5 acre site
No	Airport Access Signing and Parking Improvements
No	Property Acquisition and Airport Security Fencing (Park & Ride)

[1] Auburn Municipal Airport Master Plan Update 2001-2020 (W&H Pacific, December 2002)

Yes	North Taxilane Fog Seal (2014 Rehab Project)
Yes	South Apron Slurry Seal (2014 Rehab Project)
No	Wetland Mitigation (west side property)
	Phase II (2006-2010)
Yes	ALP Update *(2012-2032 Master Plan & ALP Update)*
Yes	Parallel Taxiway and Apron Construction *(relocated/reconfigured parallel taxiway)*
Yes	Taxiway Lighting and Airport Signing Reconstruction
Yes	Hold Apron Construction
No	West Side Development – Parallel Taxiway and Taxilane Construction
No	West Side Development – Hangar Construction (4 buildings)
No	West Side Development – Access Road and Utilities Construction
	Phase III (2011-2020)
Yes	ALP Update *(2012-2032 Master Plan & ALP Update)*
Yes	Airport Office Relocation (2014 Project)
No	Transient Apron Reconfiguration
No	Property Acquisition and Airport Security Fencing (Hotel property)
No	Additional Runway Pavement Construction
No	Connector Taxiway and Hold Apron Construction & Parallel Taxiway Extension
No	Reconstruct Hangars – Phase I
No	Reconstruct Hangars – Phase II

Source: 2001-2020 Airport Master Plan Update (Chapter 7, Proposed Capital Improvement Projects)

In addition to the master plan recommended items noted above, the airport had a considerable amount of privately-funded hangar construction near mid-runway and in the south hangar area.

Design Aircraft

As indicated in Chapter 3 (Aviation Activity Forecasts), the current and future design aircraft identified for Auburn Municipal Airport is a light twin-engine (piston) aircraft, included in **Aircraft Approach Category B** and **Airplane Design Group I (Airport Reference Code (ARC): B-I).** This aircraft weighs less than 12,500 pounds, which places it in the "small" airplane category.

The design aircraft represents the most demanding aircraft using the airport on a regular basis (minimum of 500 annual operations) and determines the appropriate airport design standards for the current twenty year planning period. The continued use of standards consistent with "small aircraft" and "utility" runways, as defined in FAR Part 77, is appropriate for Runway 16/34 for both the ADG I standards and the ADG II reserve option described below.

OPTION: ADG II DEVELOPMENT RESERVE

As noted in the forecast chapter, Auburn Municipal Airport accommodates limited Airplane Design Group II (ADG II) activity and this activity is expected to grow during the current planning period. It is recognized that runway length limits the type of ADG II aircraft that can be accommodated at the Airport on a regular basis. Based on the previous master plan's recommended runway length (3,953 feet) or the practical limits on runway length defined by existing roadways (approximately 4,000 feet), it appears that turboprops and other turbine aircraft capable of operating on these runway lengths are a realistic market segment for Auburn Municipal Airport.

Single engine turboprops in particular represent a potential growth market for the Airport based on aircraft manufacturing trends and practical airfield capabilities. According to manufacturer data, single-engine models accounted for 63 percent of worldwide turboprop deliveries since 2001 and have averaged nearly 70 percent of deliveries over the last five years. Single-engine turboprops including the Cessna Caravan, Pilatus PC12, Piper Meridian, and TBM700/850 are ideally suited to operate at Auburn Municipal Airport. Although the forecast levels of ADG II activity are expected to remain below 500 annual operations during the current planning period, activity is expected to grow steadily. Based on these factors, it is suggested that the City consider defining ADG II development reserves and setbacks for the runway–taxiway system to preserve long term capabilities. The existing runway width (75 feet) and runway-parallel taxiway separation (240 feet) already meet basic ADG II standards. The ADG II reserves would effectively maintain current airfield capabilities and do not represent a significant upgrade or expansion in facilities.

The evaluation of design standards presented later in the Facility Requirements chapter will be based on the current and future design aircraft and corresponding Airport Reference Code (ARC): B-I (small) for the current instrument approach capabilities. The equivalent standards for ADG II (ARC A/B-II) will be noted where applicable to assist the City in determining whether defining development reserves for Runway 16/34 and the parallel taxiway is beneficial.

Figures 4-5 and 4-6, presented later in the chapter, depict specific items defined by the ADG II development reserve and the equivalent ADG I standard. In general, the required setbacks for the runway or parallel taxiway will be greater for the ADG II reserve compared to the ADG I standard. Increased separation setbacks may require relocation of existing items (aircraft parking positions, etc.) and affect the location of new structures (hangars, etc.). The information is intended to provide the City with sufficient understanding of potential advantages and disadvantages in their long-term planning decisions.

Airport Design Standards

Federal Aviation Administration (FAA) **Advisory Circular (AC) 150/5300-13A, <u>Airport Design</u>**, serves as the primary reference in planning airfield facilities. **Federal Air Regulation (FAR) Part 77.25, <u>Objects Affecting Navigable Airspace</u>**, defines airport imaginary surfaces which are established to protect the airspace immediately surrounding a runway. The airspace and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, trees, etc.) to the greatest extent possible to provide a safe operating environment for aircraft. **<u>FAA Order 8260.3B - United States Standard for Terminal Instrument Procedures (TERPS)</u>** defines protected airspace surfaces associated with instrument approaches and departures.

Table 4-2 summarizes existing facility dimensions and dimensional standards based on small airplanes included in ADG I (Airport Reference Code: B-I (small) and the equivalent standards for ADG II (ARC: A/B-II). It is noted that there is no "small airplane" equivalent currently defined for ADG II. However, the popularity of single engine turboprops weighing less than 12,500 pounds creates significant activity generated by "small" ADG II aircraft.Both standards assume the “utility” runway designation will be maintained.

Figures 4-1, 4-2, and 4-3 presented earlier in the chapter illustrate nonstandard runway or taxiway conditions noted in the sections below**. Figure 4-1** also depicts the footprint of the runway safety area, object free area, obstacle free zone, and runway protection zones that are associated with the current runway based on 1-mile approach visibility minimums and ARC B-I, small.

TABLE 4-2: AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA STANDARD	RUNWAY 16/34 *EXISTING CONDITIONS*[1]	AIRPLANE DESIGN GROUP I *A&B AIRCRAFT (SMALL AIRCRAFT) APPROACH VISIBILITY ≥ 1- MILE*	(RESERVE) AIRPLANE DESIGN GROUP II *A&B AIRCRAFT (SMALL AIRCRAFT) APPROACH VISIBILITY ≥ 1- MILE*
Runway Length	3,400	2,950/3,500 [6]	4,060 [9]
Runway Width	75	60	75
Runway Shoulder Width	10	10	10
Blast Pad Width	-	80	95
Blast Pad Length	-	60	150
Runway Safety Area (RSA) • Width • Length Beyond Departure End • Length Prior to Landing Threshold	 120 240 240	 120 240 240	 150 300 300
Runway Obstacle Free Zone (ROFZ) • Width • Length Beyond Runway End • Length Prior to Landing Threshold	 250 200 200	 250 200 200	 250 200 200
Runway Object Free Area (ROFA) • Width • Length Beyond Runway End • Length Prior to Landing Threshold	 250 240 240	 250 240 240	 500 300 300
Approach/Departure Runway Protection Zone (RPZ) • Length • Inner Width • Outer Width	 1,000 250 450	 1,000 250 450	 1,000 250 450
Runway Centerline to: • Parallel Taxiway/Taxilane Centerline • Aircraft Parking Line • Building Restriction Line	 240 [2] 295 [3] 307/251 (east/west) [4]	 150 125/284.5 [7] 307/376 [8]	 240 305.5 [10] 307/376[8]
Taxiway Width	25	25	35
Taxiway Shoulder Width	10	10	10
Taxiway Safety Area Width	49	49	79
Taxiway Object Free Area Width	89	89	131
Taxiway Centerline to Fixed/Movable Object	44.5	44.5	65.5
Taxilane Object Free Area Width	<79 [5]	79	115
Taxilane Centerline to Fixed/Movable Object	<39.5 [5]	39.5	57.5

Table 4-2 Notes:

1. Existing published airfield dimensions effective March 2013 (FAA Airport/Facility Directory).
2. Taxiway reconstructed/reconfigured in 2009.
3. Nearest aircraft parking (transient tiedowns, south of fuel island) is located approximately 295 feet east of runway centerline.
4. The nearest structures (hangars) on the east side of the runway are approximately 307 feet from runway centerline. No on-airport structures located on west side of runway. 2002 ALP depicts 251-foot west BRL and 307-foot east BRL.
5. Main apron clearances from taxilane centerlines to aircraft fueling position, aircraft tiedowns, and hangars vary (less than ADG I standard).
6. Per FAA Runway Length Model: Runway lengths required to accommodate 95 and 100 percent of the small airplane fleet (12,500 pounds or less) at Auburn Municipal Airport. 78 degrees F, 7-foot change in runway centerline elevation.
7. 284.5 feet is required to clear the ADG I taxiway object free area for the existing 240-foot runway-east parallel taxiway separation. The nearest aircraft parking position are located 295 feet from runway centerline, which will accommodate an aircraft tail height of approximately 24.2 feet without penetrating the 7:1 transitional surface that extends from the existing visual (250 feet wide) primary surface; the clearance would be reduced to approximately 6.4 feet of tail height if the primary surface was widened (500 feet wide) for straight-in nonprecision instrument approaches. The ADG I (small) standard of 125 feet applies to runway without a parallel taxiway.
8. The east BRL (307 feet from runway centerline) can accommodate a 26-foot tall structure (typical medium/large hangar roof heights) without penetrating the 7:1 transitional surface that extends from the existing visual (250 feet wide) primary surface. The clearance at the existing BRL would be reduced to approximately 8 feet if the primary surface was widened (500 feet wide) for straight-in nonprecision instrument approaches and a BRL of 376 feet would be required to accommodate hangars with 18-foot roof elevations.
9. Per FAA Runway Length Model: Runway lengths required to accommodate small airplanes with more than 10 seats at Auburn Municipal Airport. 78 degrees F, 7-foot change in runway centerline elevation.
10. Distance required to clear ADG II taxilane OFA for existing east parallel taxiway.

INSTRUMENT APPROACH NOTE:

As noted in the Inventory chapter, the existing instrument approach for Auburn Municipal Airport is a nonprecision approach with a visual final approach segment. The approach is classified as a "circling" or "circle to land" procedure since it requires pilots to establish visual contact with the airport environment at or before a fixed "missed approach point" and land while maintaining visual contact with the runway. The approach descent minimums are relatively high (1,257 feet AGL) and appear to reflect the effect of numerous obstructions (towers, power lines, etc.) and local airspace structure in the vicinity of the Airport.

The potential may exist to improve existing approach minimums—either through development of a straight-in nonprecision approach to a particular runway end or development of a new "circling" procedure. Preliminary coordination with the FAA Flight Procedures Office is being conducted during the master plan update with the goal of defining basic feasibility and the amount of improvement that may be possible. It is anticipated that the FAA will provide a general indication of feasibility in time for consideration in the master plan.

For the purposes of the facility requirements analysis, a preliminary assessment of the impacts on existing aircraft parking and building setbacks has been conducted to assist in the City's evaluation of potential options. If development of a straight-in procedure is feasible, it can be compared with the existing or a new "circling" procedure and the City can weigh the relative advantages and disadvantages of each option in order to determine the best path forward.

For any approach, the degree of improvement is dependent on the number, elevation and location of nearby obstructions within the protected TERPS[2] airspace for both the approach and missed approach paths and the compatibility with other defined airspace in the local area. Development of a new approach will require an updated obstruction survey and a formal process for procedure development, flight check, and publishing.

Table 4-3 summarizes the changes in airport development setbacks/clearances that would be associated with a change in instrument approach type for Runway 16/34. **Figure 4-4** depicts the primary surfaces and transitional surface setbacks (shown in 10-foot intervals) for both the existing "circling" instrument approach and a potential straight-in approach.

[2] TERPS: Terminal Instrument Procedures, as defined in FAA Order 8260.3B

TABLE 4-3: COMPARISON OF KEY DEVELOPMENT SETBACKS/CLEARANCES FOR CIRCLING AND STRAIGHT-IN INSTRUMENT APPROACHES FOR RUNWAY 16/34

ITEM	RUNWAY 16/34 *Circling Approach Procedure* *(Utility – Visual, Current Standard, as depicted on 2002 Airspace Plan)*	RUNWAY 16/34 *Straight-In Approach Procedure* *(Utility Non-Precision Instrument)* *(Optional Future Standard)*
Width of Primary Surface	250 feet	**500 feet**
Approach Surface Length/Slope	5,000 feet / 20:1	5,000 feet / 20:1
Runway Setback Required to Clear 8-foot aircraft tail height	181 feet (284.5 feet required to clear existing east parallel taxiway OFA)	**306 feet**
Maximum Building Height at Existing East BRL (307 feet from runway centerline)	26 feet	**8.1 feet**
Maximum Building Height at Existing West BRL (251 feet from runway centerline)	18 feet	**0.1 feet**
Runway Setback Required to Clear 15-foot structure	230 feet (284.5 feet required clear existing east taxiway OFA)	**355 feet**
Runway Setback Required to Clear 25-foot structure	300 feet	**425 feet**
Runway Setback Required to Clear 35-foot structure	370 feet	**495 feet**

The primary change for Runway 16/34 associated with a straight-in instrument approach would be an increase in the width of the protected area surrounding the runway (primary surface) from the existing 250 feet to 500 feet and a 125-foot shift of the 7:1 transitional surface on each side of the runway. The transitional surface is a sloping airspace surface that extends outward and upward from the sides of the primary surface to an elevation 150 feet above the runway. Items such as parked aircraft, fueling facilities, hangars, buildings, etc., are sited to avoid penetrating the protected airspace surfaces. It appears that numerous existing hangars and parked aircraft on the east side of the runway would penetrate the shifted transitional surface.

The primary result of upgrading the airspace surfaces would be a need to eliminate/relocate existing aircraft parking positions that penetrate the reconfigured airspace and adjust setbacks for new buildings to avoid transitional surface penetrations. Existing structures/objects that penetrate the reconfigured airspace would typically be surveyed and lighted (red obstruction light). The approach surface slope for nonprecision instrument approaches on utility runways is 20:1, the same as required for visual approaches. Please see the FAR Part 77 Airspace section later in the chapter for a description of the primary and transitional surfaces.

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SETBACKS BASED ON INSTRUMENT APPROACH TYPE | FIG. 4-4

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Runway Safety Area (RSA)

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

By FAA design standard, the runway safety area *"shall be:*

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

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

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

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

The recommended transverse grade for the RSA located along the sides of a runway ranges between 1½ and 5 percent from runway shoulder edges. The recommended longitudinal grade for the first 200 feet of RSA beyond the runway end is 0 to 3 percent. The remainder of the RSA must remain below the runway approach surface slope. The maximum negative grade is 5 percent. Limits on longitudinal grade changes are plus or minus 2 percent per 100 feet within the RSA.

The RSA for Runway 16/34 appears to meet FAA dimensional and surface condition standards along the sides and at both ends of the runway. The RSA appears be free of physical obstructions, except items permitted by FAA that are installed on frangible (break away) supports (runway lights, information/directional signs, runway end identifier lights and VASI). The storm water detention ponds located near the north end of the runway are located beyond the RSA for both ADG I and II (reserve).

The grass surfaced area at the south end of the runway extends approximately 285 feet to the adjacent parcel (grass area on the north side of the Metro Park & Ride lot). The parcel and the adjacent developed parking lot area are identified for future airport acquisition on the 2002 ALP as part of a south runway extension. This recommendation will be reevaluated as part of the alternatives analysis. The grass surfaced area beyond the north end the runway extends approximately 530 feet to the airport perimeter fence. The runway extensions depicted on the 2002 ALP were configured with displaced thresholds and 240-foot RSAs extending at both ends of the future 3,953-foot runway.

Runway pavement edges should be periodically inspected to ensure that grass, dirt or gravel build ups do not exceed 3 inches. The RSA should be regularly cleared of brush or other debris and periodically graded and/or compacted to maintain FAA standards, as needed.

Any future runway extensions will require corresponding RSA improvements based on the applicable design standard. A summary of the RSA requirements based on the existing/future B-I (small) ARC and the reserve A-II ARC is presented below:

Existing/Future Standard	***Reserve***
ARC B-I Small	***ARC A/B -II***
Runway Safety Area (RSA) 120 feet wide and extends 240 feet beyond each departure end of runway.	150 feet wide and extends 300 feet beyond each departure end of runway.
The RSA appears to be free of built items except those with locations fixed by function on break-away mounts. The RSA surface appears to meet gradient and compaction standards. Periodic inspection/verification maintenance and clearing is required.	The majority of the RSA reserve for the existing runway can be accommodated within existing airport property, although the south end is limited by property ownership. Future runway extensions may require use of declared distances (reduced useable runway length available) for some operations. The same surface gradient and surface standards apply.

Runway Object Free Area (ROFA)

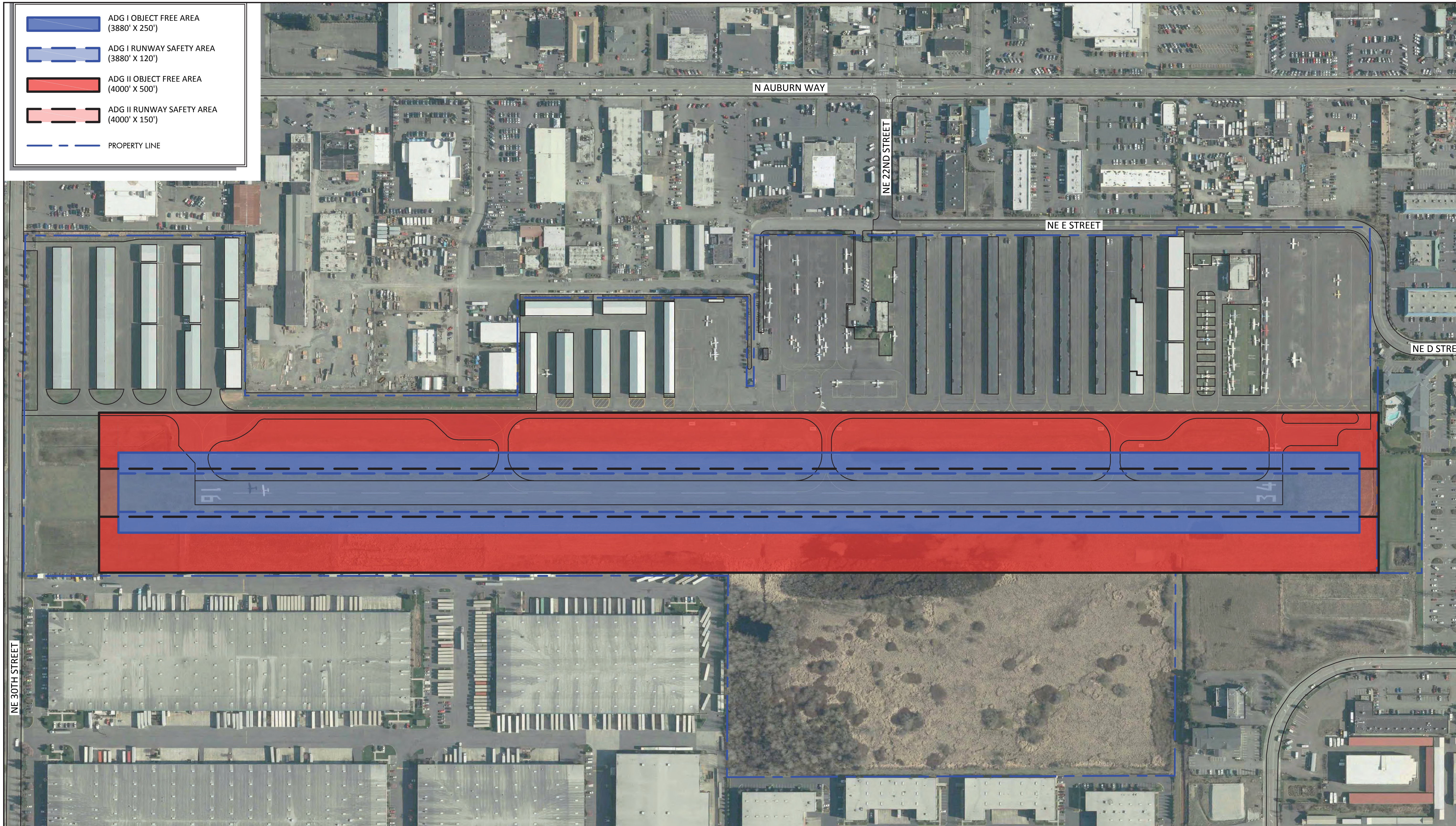
Runway object free areas (ROFA) are two dimensional surfaces intended to be clear of ground objects that protrude above the runway safety area edge elevation. Obstructions within the object free area may interfere with aircraft flight in the immediate vicinity of the runway. The FAA defines the object free area clearing standard:

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

The ROFA for Runway 16/34 appears to be free of physical obstructions (excluding navigational aids, lighting, airfield signs, etc.) and meets FAA dimensional standards. The ROFA should be periodically inspected to remove any protruding objects and clear vegetation. However, unlike runway safety areas, the OFA does not require a prepared surface capable of supporting an aircraft. Any future runway extensions will require corresponding object free area improvements based on the applicable design standard. A summary of the ROFA requirements based on the existing/future B-I (small) ARC and the reserve A-II ARC is presented below:

Existing/Future Standard	***Reserve***
ARC B-I Small	***ARC A/B -II***
Runway Object Free Area (ROFA) 120 feet wide and extends 240 feet beyond each departure end of runway.	 500 feet wide and extends 300 feet beyond each departure end of runway.
The ROFA appears to be free of built items except those with locations fixed by function on break-away mounts. The ROFA surface appears to meet gradient and standards. Periodic maintenance and clearing is required.	The majority of the OFA reserve for the existing runway can be accommodated within existing airport property, although the south end is limited by property ownership. Future runway extensions may require use of declared distances (reduced useable runway length available) for some operations. The protective netting and support structures for the storm water detention ponds adjacent to the runway would need to remain at or below runway elevation (≤3 inches) to avoid penetrating the ROFA. The same surface gradient and clearing standards apply.

Figure 4-5 depicts the runway safety area and runway object free area for the existing Runway 16/34 for both the ARC B-I (Small) and ARC A-II (reserve).



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RUNWAY SAFETY AREA & OBJECT FREE AREA (ADG I & ADG II RESERVE) | FIG. 4-5

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Obstacle Free Zone (OFZ)

Obstacle free zones (OFZ) are planes of clear airspace extending upward above runways that are intended to protect close-in obstructions that may create hazards for aircraft. The FAA defines the following clearing standard for the OFZ:

"The obstacle free zone clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs [navigational aids] *that need to be located in the obstacle free zone because of their function."*

The FAA defines four types of obstacle free zones based on approach capabilities, runway configuration and type of aircraft use. For Runway 16/34 only the *Runway* OFZ is required. Other OFZ types designed for runway ends with approach lights, significantly lower approach visibility minimums, or precision instrument approaches are not applicable to Runway 16/34.

The FAA defines the Runway Obstacle Free Zone as:

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

The FAA recommended ROFZ width for Runway 16/34 is 250 feet, based on the design aircraft (B-I small). This dimension also applies to a typical "small" ADG II airplane that is capable of operating on the existing or previously planned runway lengths.

Based on a recent visual inspection conducted during the master plan inventory, no penetrations to the existing runway OFZ were observed, other than the runway lights, VASI units, runway end identifier lights, directional signage, and distance remaining signs which have locations fixed by function. All items currently located within the runway OFZ meet the FAA frangibility (break away) standard. Aircraft hold lines are located 125 feet from runway centerline on each of the exit taxiways connecting to the runway, which keeps holding aircraft entirely outside the runway OFZ.

Taxiway Safety Area

Taxiway safety areas (TSA) serve a similar function as runway safety areas and use the same design criteria for surface condition (see description of runway safety area provided earlier in this chapter), with varying dimensions based on airplane design group. The main taxiways on the airfield are designed to accommodate the same design aircraft as the runway (Airplane Design Group I). The ADG I standard TSA dimension is 49 feet, centered on the taxiway, extending 24.5 feet each side of centerline. Based on the existing 25-foot width on the parallel taxiway, the outer edge of the TSA extends 12 feet beyond the taxiway pavement edge (for sections bordered by grass). The ADG II taxiway safety area standard width is 79 feet (39.5 feet from centerline), which is approximately 27 feet from the edge of the parallel taxiway.

Items within TSAs that have locations fixed by function (taxiway edge lights, reflectors, signs, etc.) must be mounted on frangible (break away) mounts. Based on a recent visual inspection conducted during the master plan inventory, the parallel taxiway and exit taxiways appear to meet the surface condition and obstruction clearing standards required for taxiway safety areas.

As with runway safety areas, the ground surface located immediately adjacent to the taxiways periodically requires inspection/verification maintenance or improvement to adequately support the weight of an aircraft or an airport vehicle. Grading and/or soil compaction within taxiway safety areas should be completed as needed, and grass, brush or other debris should be regularly cleared to maintain FAA standards. Taxiway pavement edges should be periodically inspected to ensure that grass, dirt or gravel build ups do not exceed 3 inches.

It is noted that safety area standards do not apply to *taxilanes* typically located within hangar developments or aircraft parking aprons. Taxilanes provide aircraft access within a parking or hangar area; taxiways provide aircraft access between points on the airfield and serve runways (e.g. parallel taxiways and exit taxiways).

Taxiway/Taxilane Object Free Area

Taxiway and taxilane object free areas (OFA) are intended to provide unobstructed taxi routes (adequate wingtip clearance) for aircraft. The outer edge of the OFA defines the recommended distance from taxiway or taxilane centerline to a fixed or moveable object. The FAA clearing standard prohibits service vehicle roads, holding or parked aircraft, and above ground objects (hangars, parked vehicles, other built items, etc.), except for objects with locations that are fixed by function (navigational aids, airfield signs, etc.).

All taxiways and taxilanes at Auburn Municipal Airport are designed to meet ADG I standards, or the corresponding Taxiway Design Group I (TDG I) standards (new in 2012). The FAA added taxiway design groups in the last major update (9/28/12) of its Airport Design advisory circular (AC 150/5300-13A). The standards are based on the outer main gear width and cockpit to main gear distance. Some design elements associated with taxiways remain under airplane design group, while others are included under taxiway design group. Most aircraft that are included in ADG I will also be included in TDG I. For the purposes of this discussion, the standards will be combined (ADG/TDG I).

TAXIWAYS

The standard ADG/TDG I taxiway OFA width dimension is 89 feet, which extends outward 44.5 feet from centerline in both directions. As with the taxiway safety area, any items within the taxiway OFA that have locations fixed by function, must be frangible (break away mount) to meet the FAA clearing standard.

Parallel Taxiway and Exit Taxiways

The parallel taxiway (Taxiway A) was reconfigured/reconstructed in 2009 and the runway separation was increased to 240 feet (ADG II standard), although the width (25 feet) is based on ADG I standards. The five exit taxiways (Taxiways C-G) were modified to connect with the reconfigured Taxiway A. The ADG I OFA for the parallel taxiway and exit taxiways appear to be free of obstructions. **Figure 4-6** depicts the ADG I and ADG II (reserve) object free areas for the existing Taxiway A; the larger ADG II OFA impacts several existing parking positions.

Aircraft hold areas on Taxiway A (adjacent to Taxiways D, F, and G) are located on the interior (runway) side of the parallel taxiway. Taxi striping directs aircraft to the western side of the hold area (located approximately 68 feet from the centerline of Taxiway A). This portion of the hold area keeps aircraft clear of the adjacent taxiway OFA. However, the remainder of the hold area is unmarked and does not identify the setback required for holding aircraft to clear the taxiway OFA.

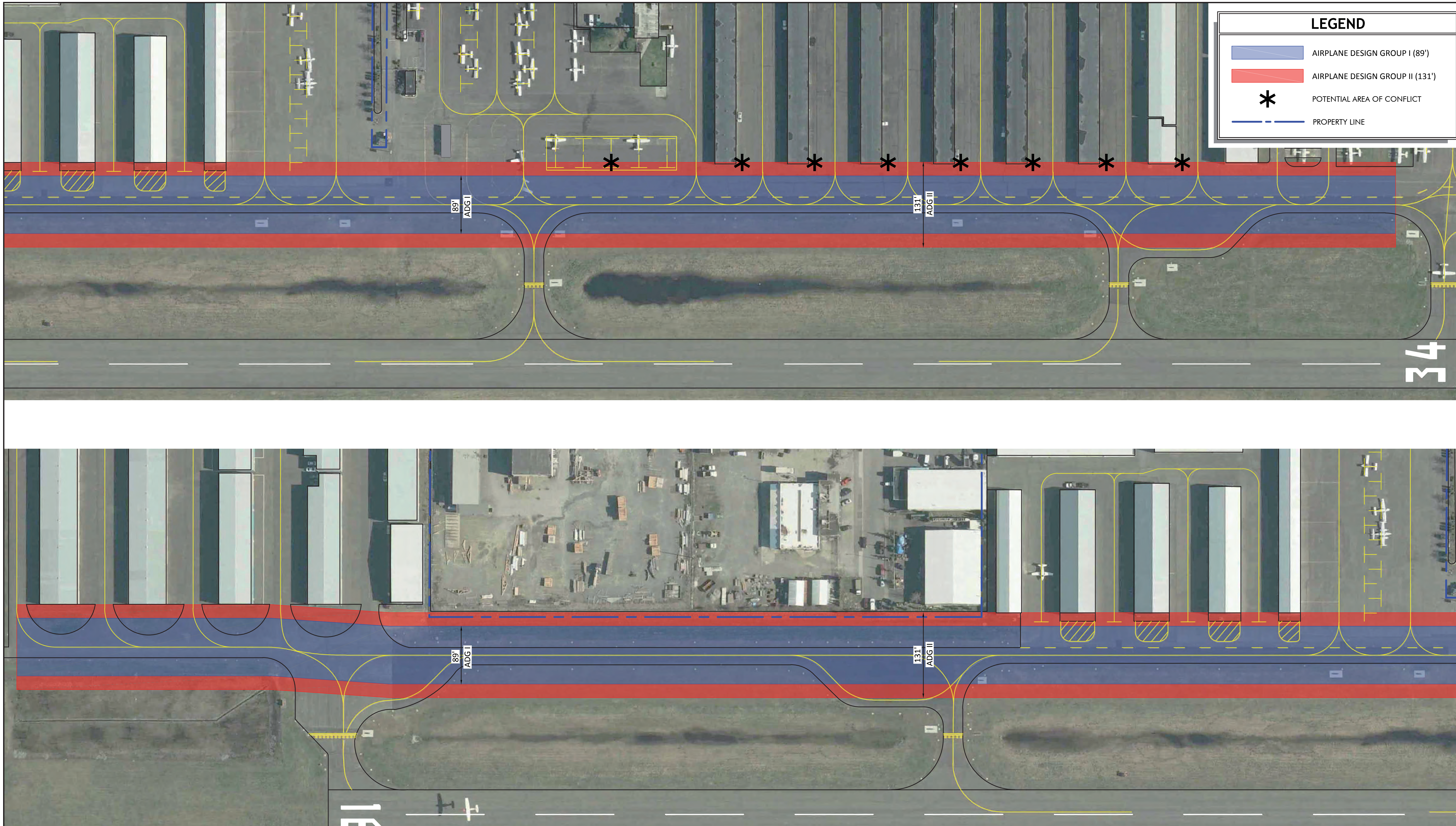
North Hangar Access Taxiway

The north hangar access taxiway extends beyond the north end of Taxiway A and the end of Runway 16. The taxiway OFA appears to be free of obstructions. The eastern side of the structure supporting protective netting over the northeast stormwater detention area is located approximately 40 feet from the taxiway centerline. The height of the structure varies with much of the detention area below runway and taxiway grade to accommodate drainage flow. The height of the structure located within 44.5 feet of the taxiway centerline should be verified to ensure that it does not exceed 3 inches above grade, or verify that the structure meets FAA frangibility through field survey standards.

South Access Taxiway

The south access taxiway extends beyond the south end of Taxiway A along the western side of the south tiedown apron and connects to an aircraft holding area south of Taxiway C and the south end of Runway 34. The taxiway OFA appears to be free of obstructions.

It is noted that the south access taxiway and the taxilane located along the east edge of the south aircraft hold area are parallel with approximately 52 feet of separation (centerline to centerline). The ADG I standard for parallel taxiway/taxilane centerline to centerline separation is 69 feet.



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PARALLEL TAXIWAY OFA (AG I & ADG II RESERVE) | **FIG. 4-6**

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TAXILANES

The Airport has a variety of taxilanes including apron taxilanes and hangar taxilanes that serve predominantly ADG I aircraft. The ADG I taxilane OFA standard dimension is 79 feet wide, extending 39.5 feet from centerline.

North Hangar Area Taxilanes

The north hangar area has five stub taxilanes providing access to adjacent hangars. As noted in the Inventory chapter, the clearances provided on these taxilanes (measured as the opening between hangar rows) vary between approximately 70 and 80 feet. Vehicles observed parked in front of hangars along the taxilanes are obstacles within the taxilane OFA.

Auburn Condo Hangar Association (ACHA) Taxilanes

The ACHA hangar area is served by four east-west taxilanes that connect to Taxiway A and a north-south taxilane that serves the eastern row of hangars. The south units in the southern-most hangar are accessed via the north aircraft parking apron. The clearances provided on the hangar taxilanes vary between approximately 50 and 60 feet. The clearance provided for the north-south taxilane is reduced to approximately 40 feet by electrical panels and protective bollards installed on the east ends of the east-west hangars. Vehicles observed parked in front of hangars along the taxilanes are obstacles within the taxilane OFA.

It appears that the taxilanes were privately developed within the hangar lease area and were not built to FAA standards. These taxilanes are not rated in WSDOT pavement management reports for the airport, which generally indicates privately developed/leased pavements that are not maintained by the Airport. No action is currently required by the Airport.

South Hangar Area Taxilanes

The south hangar area has eight stub taxilanes providing access to adjacent hangars. The clearances provided on these taxilanes vary between approximately 75 and 80 feet. Vehicles observed parked in front of hangars along the taxilanes are obstacles within the taxilane OFA.

Note: FAA Taxilane OFA Clearance

The FAA allows a modification to standards for Taxilane OFA clearance based on the following formula: 1.2 x airplane wingspan plus 20 feet. Using this formula, small hangars with 40-foot wide doors can accommodate most small single-engine and some smaller multi-engine aircraft. Assuming 1-foot of wingtip clearance on both sides, a 40-foot wide door opening could accommodate an aircraft with up to a 38-foot wing span. Based on an aircraft with a 38-foot wingspan, the corresponding taxilane OFA clearance derived from this formula would be approximately 66 feet (38' x 1.2 + 20' = 65.6'). For comparison, a Cessna 172 and 182 both have wingspans of 36 feet; a Cessna 150 has a wingspan of 33.3

feet. Hangars with larger door openings, capable of accommodating larger aircraft would require increased taxilane OFA width using this formula.

Relocation of hangars to meet taxilane OFA standards is not common, although any new or replacement hangars (and the associated taxilanes) should be planned to meet the applicable ADG I taxilane object free area clearance standard. A modification to FAA standards using the FAA-defined formula, providing an acceptable level of safety, should be noted for these hangars.

South Apron Taxilanes

The south tiedown apron has three east-west taxilanes that have 79 feet of clearance between the adjacent tiedown "T" markings. However, since the OFA clearance is measured from the taxilane centerline to a fixed/moveable object (parked aircraft), aircraft located in the tiedowns actually penetrate the taxilane OFA. For most small airplanes, the front portion of the aircraft extends 3 to 5 feet forward of the tiedown markings (into the adjacent taxilane). This can reduce the 79-foot opening on the taxilanes to less than 70 feet. When larger aircraft, such as twin-engine aircraft, are parked in the small airplane tiedowns, the adjacent taxilane clearance is reduced even more.

Main Apron Taxilanes

The main tiedown apron has three east-west taxilanes, a north-south taxilane located between the west ends of the tiedown rows and the transient aircraft parking positions, and an access taxilane located near Taxiway E with clearances varying from 61 to 71 feet between the adjacent marked parking positions. The actual clearances from the taxilane centerlines and adjacent parked aircraft is considerably less than the ADG I standard (79 feet). The aircraft fueling area located at the north end of the main apron is adjacent to taxilanes that extend from the apron to the parallel taxiway. The fuel storage tank and pumps and the aircraft fueling positions on the north and south sides of the tank are partially within defined taxilane OFAs.

North Apron Taxilanes

The north tiedown apron has two east-west taxilanes that have 79 feet of clearance between the adjacent tiedown "T" markings. However, the clearance provided from the taxilane centerlines to parked aircraft (fixed/moveable object) is less than the ADG I taxilane OFA standard.

Auburn Flight Service (FBO) Access Taxilanes

The FBO lease area is served by two paved and one grass surfaced east-west taxilanes that connect to Taxiway A. The clearances provided on the taxilanes (to adjacent parked aircraft) are considerably less than the ADG I OFA standard (79 feet). It appears that the taxilanes were privately developed within the lease area and were not built to FAA standards. These taxilanes are also not rated in WSDOT pavement management reports for the Airport.

Figure 4-2 and **Figure 4-3,** presented earlier in the chapter illustrate the nonstandard taxilane clearances on existing aprons. When required by FAA, changes in parking configurations are typically implemented when the apron areas are rehabilitated, reconfigured, or expanded. Options for addressing existing apron configuration and conforming to OFA clearance standards will be included in the alternatives analysis. All new aircraft parking aprons should be designed to provide standard taxilane OFA clearances to the adjacent parked aircraft, rather than tiedown anchors. Options for providing additional vehicle parking adjacent to hangar areas should also be considered in the alternatives evaluation.

Building Restriction Line (BRL)

A building restriction line (BRL) identifies the minimum setback required to accommodate a typical building height, such as a T-hangar or large conventional hangar, based on the ability to remain clear of all runway and taxiway clearances on the ground, and the protected airspace surrounding a runway. Taller buildings are located progressively farther from a runway in order to remain beneath the 7:1 Transitional Surface slopes that extend laterally from both sides of a runway.

EAST BRL (307 FEET FROM RUNWAY CENTERLINE)

The 2002 Airport Layout Plan depicts a 307-foot BRL on the east side of Runway 16/34. The 307-foot BRL can accommodate structures with roof heights up to 26 feet above runway elevation (at the BRL) without penetrating the runway transitional surface associated with the existing visual approach. Taller structures can be accommodated with increased runway separation. Most hangar rows on the airport are oriented east-west, with the west ends of each row aligned with the BRL. Most of the hangars have roof peak heights ranging from approximately 16 to 26 feet. No existing hangars or other structures are listed as obstructions on the 2002 Airspace Plan.

WEST BRL (251 FEET FROM RUNWAY CENTERLINE)

There are no structures (on airport property) located on the west side of Runway 16/34. The 2002 Airport Layout Plan depicts the west BRL 251 feet from runway centerline, which can accommodate structures with roof heights up to 18 feet above runway elevation without penetrating the existing runway transitional surface.

The nearest off-airport structures on the west side of the runway are located approximately 380 feet from runway centerline. The structures are not listed as obstructions on the 2002 Airspace Plan, but the roof heights for the close-in structures should be verified during a future obstruction survey.

<u>Instrument Approach Upgrade Note:</u>

As noted earlier, the potential development of a straight-in instrument approach to either runway end requires a 500-foot wide primary surface, compared to current 250-foot wide primary surface. The impact on the BRLs for Runway 16/34 would be a 125-foot lateral shift (to maintain the same building heights) of the transitional surface and the beginning of its 7:1 slope. The 26-foot vertical clearance provided by the existing 307-foot east BRL would be reduced to approximately 8 feet and all existing buildings located along the BRL would penetrate the transitional surface. A future BRL would be needed to site new buildings. The 26-foot building height provided by the east BRL would require an increase to 432 feet, while a T-hangar or smaller conventional hangar (18-foot typical roof peak) would require a 376-foot BRL. These setbacks may be feasible for future redevelopment options for the east landside areas and new development on the west side of the runway. However, in both cases, the increased airspace footprint would reduce the amount of developable land available to site buildings. **Figure 4-4**, presented earlier in the chapter illustrates the changes in setbacks that would be associated with an upgrade to a straight-in instrument approach.

Runway Protection Zones (RPZ)

The FAA provides the following definition for runway protection zones:

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

Runway protection zones (RPZ) with buildings, roadways, or other items do not fully comply with FAA standards. It is recognized that realigning major surface roads located within the runway protection zone may not always be feasible. It is recommended that airport sponsors control the RPZs through ownership whenever possible. Alternatively, avigation easements[3] should be acquired where the airport purchases an easement that limits the height of any constructed items and may limit types of uses or activities that are allowed in the area.

The 2002 Airport Layout Plan depicts existing and future RPZs for Runway 16 and 34 based on standards for small aircraft and approach visibility minimums ("visual and not lower than 1-mile"). The RPZ dimensions are 250 x 450 x 1,000 feet. This standard is consistent with the current and future design aircraft and the existing circling and potential straight-in nonprecision instrument approaches. Since the 2002 ALP drawing depicts future displaced thresholds for both runway ends, separate arrival and departure RPZs are identified. The departure RPZs would begin 200 feet beyond the end of the useable runway; the arrival RPZs would begin 200 feet beyond the displaced thresholds.

[3] An avigation easement (*avigation = aviation + navigation*) involves the purchase of airspace rights over a particular defined ground area. The easement normally limits the maximum height of any natural or built items and may include provisions restricting the type of activities permitted. Compensation is negotiated between the airport owner and property owner.

Note: FAA Guidance of RPZs and Roads (Fall 2012)

In October 2012, the FAA released new guidance regarding runway protection zones and roads. In short, the policy directs airport sponsors to evaluate any planned changes to existing RPZs that introduce or increase the presence of roads in RPZs. Existing roads within RPZs are also to be evaluated during master planning to determine if feasible alternatives exist for realignment of roads outside RPZs or for changes to the RPZs themselves. Any proposed increase in the length of Runway 16/34 is subject to review by FAA headquarters in Washington D.C. The evaluation of the RPZ configuration will be included in all runway evaluation options to be addressed in the alternatives analysis.

Aircraft Parking Line

The aircraft parking line (APL) represents the minimum setback required for locating aircraft parking in order to clear the adjacent runway-taxiway system. The location of the APL is generally determined by the more demanding of runway airspace clearance and taxiway obstruction clearance.

The 2002 Airport Layout Plan does not depict APLs on either side of Runway 16/34, but existing aircraft parking areas are depicted. The nearest aircraft parking areas (transient parking positions located south of the fuel island) are located approximately 285 feet east of runway centerline; other aircraft tiedowns are located as close as 295 feet from runway centerline. At 285 feet from runway centerline, an aircraft tail height of approximately 22.8 feet can be accommodated without penetrating the current visual runway transitional surface that extends outward along the sides of the runway. Most small single-engine aircraft have tail heights less than 9 feet. Multi-engine piston aircraft typically have tail heights ranging from 9 to 13 feet, and turboprops and small business jets typically range from 14 to 17 feet.

Two specific factors discussed in this chapter have the potential of affecting existing aircraft parking configurations. First, the potential development of a straight-in instrument approach would require larger airspace surfaces and increased runway setbacks for aircraft parking. With a 500-foot wide primary surface, a 306-foot setback would be required to accommodate a typical single engine airplane with a tail height of 8 feet, which represents a loss of approximately 20 feet of apron for parking directly adjacent to Taxiway A. The existing tail height clearance at 285 feet would be reduced to approximately 5 feet with expanded nonprecision instrument airspace. Small aircraft parked in the western row (facing west) of transient tiedowns on the main apron (south of the fuel island) would penetrate the transitional surface by an average of 1 to 3 feet. **Figure 4-4**, presented earlier in the chapter illustrates the changes in setbacks that would be associated with an upgrade to a straight-in instrument approach.

The second item is related to the ADG II object free area reserve for Taxiway A. Based on the existing parallel taxiway location (240 feet from runway centerline), the minimum aircraft parking setback would be 305.5 feet to accommodate the taxiway OFA. This is virtually identical to the change that would be triggered by an upgrade in instrument approach capabilities, but it is important to remember that this separation would be also required for the current “circling” instrument approach capabilities coupled with

ADG II design standards. Depending on the City's preference with regard to these items, options for relocation/reconfiguration of aircraft parking positions may be included in the development alternatives.

Figures 4-4 and 4-6, presented earlier in the chapter depict the increased setbacks associated with upgraded instrument approach capabilities and the taxiway OFA clearances associated with ADG I and ADG II (reserve).

Runway - Parallel Taxiway Separation

Runway 16/34 has a full length east parallel taxiway with runway separation of 240 feet, which exceeds the ADG I standard, but meets the ADG A/B-II standard. The 2002 Airport Layout Plan depicts a future west parallel taxiway with 225 feet runway separation, consistent with ADG I standards.

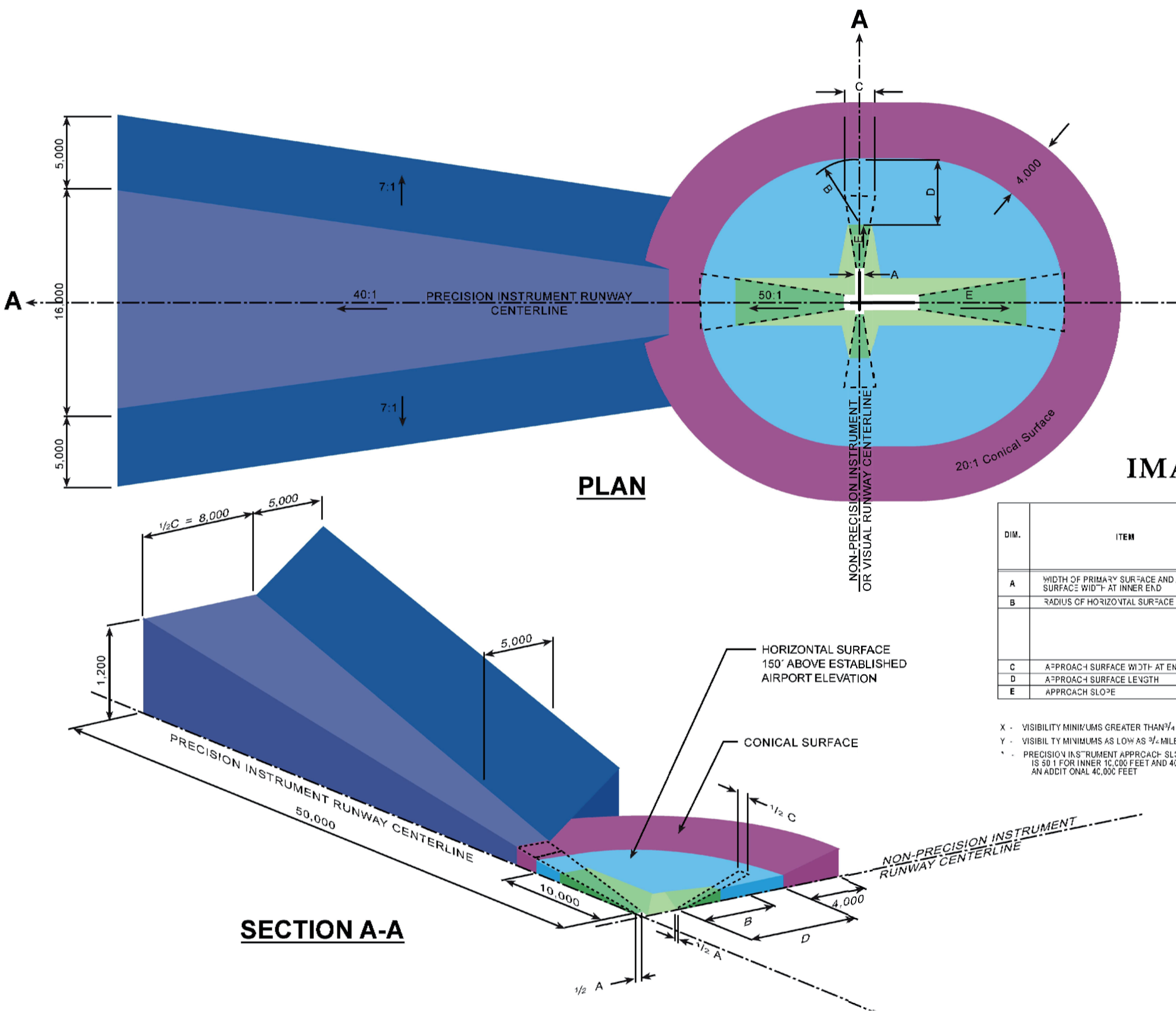
FAR Part 77 Surfaces

Airspace planning for U.S. airports is defined by Federal Air Regulations (FAR) Part 77 – Objects Affecting Navigable Airspace. FAR Part 77 defines imaginary surfaces (airspace) to be protected surrounding airports. **Figures 4-7 and 4-8** on the following pages illustrate plan and isometric views of generic Part 77 surfaces. **Table 4-4** summarizes the airspace surface dimensions for Auburn Municipal Airport based on current and future approach options.

TABLE 4-4: FAR PART 77 AIRSPACE SURFACES

ITEM	RUNWAY 16/34 *(Utility - Visual)* *(Current Standard, as depicted on 2002 Airspace Plan)*	RUNWAY 16/34 *(Utility Non-Precision Instrument)* *(Optional Future Standard)*
Width of Primary Surface	250 feet	**500 feet**
Transitional Surface	7:1 Slope to 150 feet above runway	7:1 Slope to 150 feet above runway
Approach Surface Width at End	1,250 feet	**2,000 feet**
Approach Surface Length	5,000 feet	5,000 feet
Approach Surface Slope	20:1	20:1
Horizontal Surface Elevation Horizontal Surface Radius	150 feet above airport elevation 5,000 feet	150 feet above airport elevation 5,000 feet
Conical Surface	20:1 for 4,000 feet	20:1 for 4,000 feet

The 2002 Airspace Plan depicts airspace surfaces based on "utility" visual approaches for Runway 16/34. As noted earlier, the existing airspace associated with Runway 16/34 supports the current nonprecision instrument approach with a visual final approach segment. The 2002 Airspace Plan obstruction table lists 8 items including power lines (2), trees (2), ground surface (3), and a business sign. The table indicates that all of the obstructions except the trees were "fixed" with "no action" recommended. It appears that "fixed" indicates the obstruction/locations were fixed and could not be modified. The two trees were recommended to be removed. Areas of terrain penetration are depicted in the conical surfaces, directly east and west of the runway.



SURFACE SLOPE KEY

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

CIVIL AIRPORT IMAGINARY SURFACES

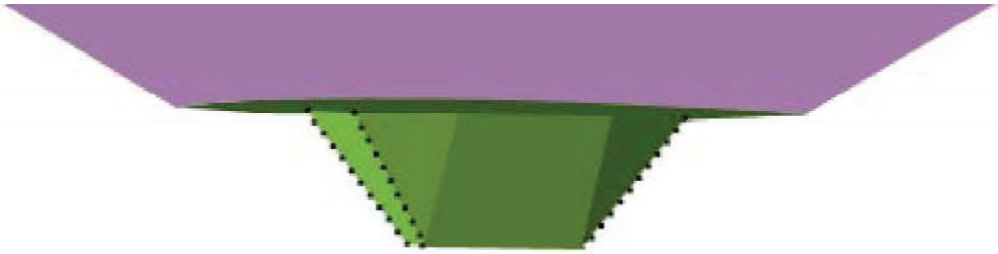
DIM.	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		UTILITY	LARGER THAN UTILITY	UTILITY	LARGER THAN UTILITY X	LARGER THAN UTILITY Y	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000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

X - VISIBILITY MINIMUMS GREATER THAN ¾ MILE

Y - VISIBILITY MINIMUMS AS LOW AS ¾ MILE

* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

HEIGHT HAZARD AIRSPACE SURFACES



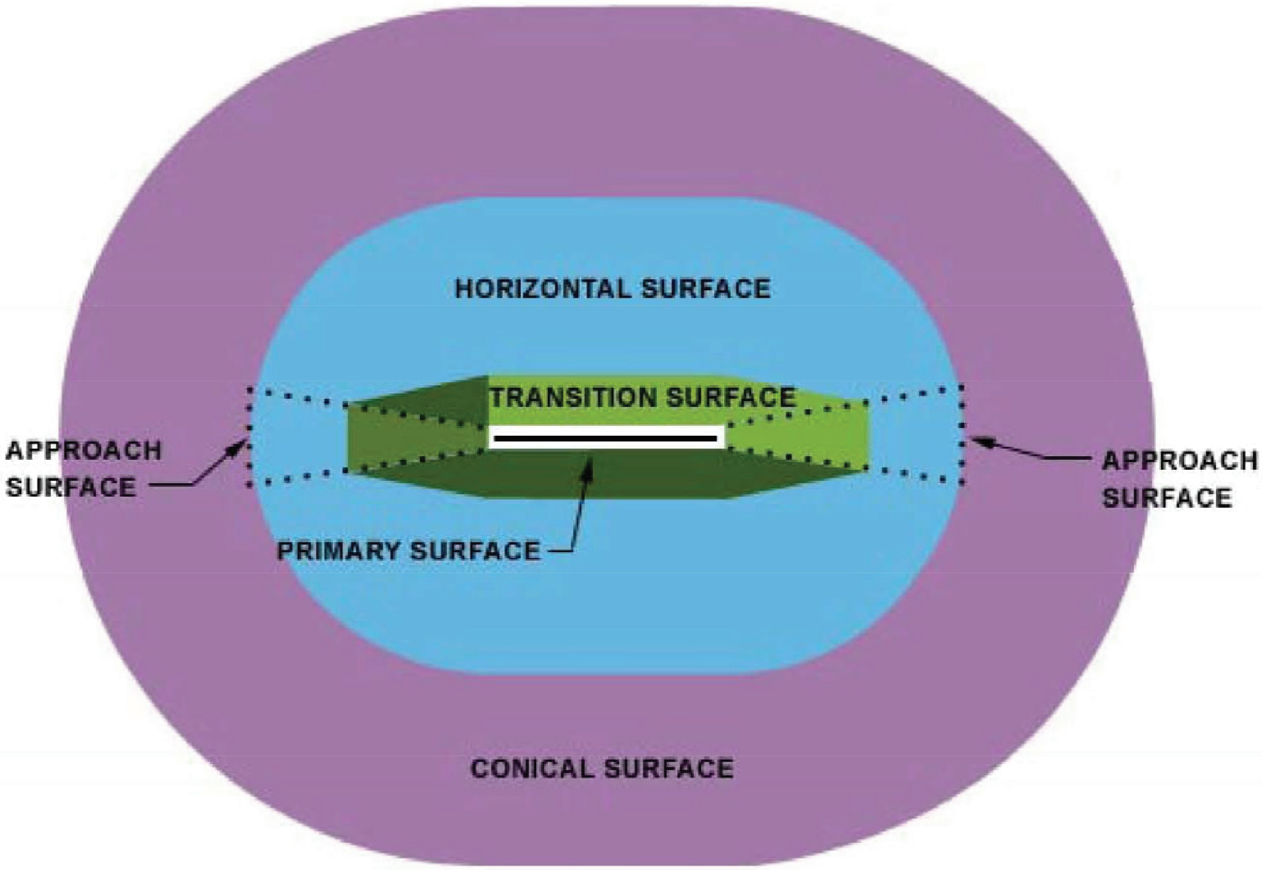


IMAGE SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (AVIATION DIVISION).

A review of topographical mapping will be conducted to verify the obstruction clearance for all airspace surfaces associated with Auburn Municipal Airport as part of the drawing update. Updated obstruction data (where available) will be added to the updated airspace plan being prepared in the master plan update. Data gathered during future obstruction surveys should be added to the airspace plan drawing through periodic updates.

Approach Surfaces

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

The 2002 Airspace Plan depicts ultimate 20:1 approach surfaces for Runway 16/34 (in plan view) based on the recommended (future) 3,953-foot runway length. The drawing's profile view depicts both the existing and ultimate FAR Part 77 approach surfaces and ultimate "visual obstruction clearance approach surfaces" for the runway. The approach surfaces are consistent with the runway category, approach capabilities, and approach visibility minimums. The approach surfaces extend 5,000 feet from the end of the runway primary surface.

In addition to the eight obstructions noted on the Airspace Plan, several close-in items are identified as existing or future approach surface obstructions on the Inner Approach Surface drawing. Two existing obstructions are noted: Runway 34 (parking lot – 5-foot penetration) and Runway 16 (building – 1.8-foot penetration). The drawing indicates that the electrical transmission lines located approximately 1,800 feet from the existing end of Runway 16 do not penetrate the current 20:1 FAR Part 77 approach surface. The current FAA 5010 Airport Record Form identifies an "East-West High Voltage Transmission Line, 80 feet above ground level, located 1,804 feet north of Runway 16 threshold at 20:1."

The ultimate obstruction data tables on the drawing identify 6 obstructions for Runway 16 and 4 obstructions for Runway 34. The obstructions include buildings (5), power lines (2), roadways (2) and a parking lot. The drawing indicates that for the future runway configuration, displaced thresholds and obstacle clearance surfaces will be required to provide unobstructed 20:1 surfaces for Runway 16 and 34 over the noted obstructions, except the parking lot (Rwy 34 end), which was identified "to be removed." The previously charted obstructions and any new building or obstruction data available will be reviewed and incorporated into the updated airport plan drawings for use in evaluating runway configuration options. No terrain penetrations are identified in the approach surfaces for Runway 16 or 34.

PRIMARY SURFACE

The primary surface is a rectangular plane of airspace, which rests on the runway (at centerline elevation) and extends 200 feet beyond the runway end. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., VASI, runway or taxiway edge lights, etc.). The primary surface end connects to the inner portion of the runway approach surface.

The 2002 Airspace Plan depicts a 250-foot wide primary surface for Runway 16/34 that is consistent with the runway category, existing approach capabilities and approach visibility minimums. No obstructions to the primary surface were identified on the 2002 plan.

TRANSITIONAL SURFACE

The transitional surface is located at the outer edge of the primary surface, represented by a plane of airspace that rises perpendicularly at a slope of 7 to 1, until reaching an elevation 150 feet above runway elevation. This surface should be free of obstructions (i.e., parked aircraft, structures, trees, etc.). No building or parked aircraft penetrations were identified within the Runway 16/34 transitional surfaces on the 2002 Airspace Plan, although one item (business sign) was listed with a 3-foot penetration (no action recommended on plan).

HORIZONTAL SURFACE

The horizontal surface is a flat plane of airspace located 150 feet above runway elevation with its boundaries defined by the radii (5,000 feet for utility runways) that extend from each runway end. The outer points of the radii for each runway are connected to form an oval, which is defined as the horizontal surface.

The 2002 Airspace Plan depicted airport elevation at 63 feet above mean sea level (MSL) with a horizontal surface elevation of 213 feet above mean sea level (MSL). No terrain penetrations or other obstructions were identified within the horizontal surface on the 2002 Airspace Plan.

CONICAL SURFACE

The conical surface is an outer band of airspace, which abuts the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The top elevation of the conical surface for Runway 16/34 is 413feet MSL, 200 feet above the horizontal surface and 350 feet above airport elevation. Seven of the eight obstructions noted on the 2002 Airspace Plan were located in the conical surface, including ground surface, trees, and powerlines. Terrain penetrations were identified within the conical surface directly east and west of the runway (no action recommended on plan).

Airside Requirements

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

- Runways
- Taxiways
- Airfield Instrumentation and Lighting

RUNWAYS

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

Runway Orientation & Wind Coverage

The orientation of runways for takeoff and landing operations is primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. A runway's wind coverage is measured by an aircraft's ability to operate with a "direct" crosswind, which is defined as 90 degrees to the direction of travel. For runway planning purposes, the maximum direct crosswind for small aircraft is 12 miles per hour; larger general aviation aircraft are typically designed to accommodate a 15 mile per hour direct crosswind. Aircraft are able to operate safely in progressively higher wind speeds as the crosswind angle decreases and the wind direction turns more closely to the direction of flight. In addition, some aircraft are designed to safely operate with higher crosswind components. Ideally, an aircraft will take off and land directly into the wind or with light crosswind. The FAA recommends that primary runways accommodate at least 95 percent of local wind conditions; when this level of coverage is not provided, the FAA recommends development of a secondary (crosswind) runway.

The 2002 Airport Layout Plan indicates that Runway 16/34 has estimated wind coverage of 99.2 percent at 12 miles per hour. Local pilots indicate that the existing runway alignment is generally favorable with the local prevailing winds.

Runway Length

Runway length requirements are based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway. For general aviation airport runways used predominantly by small aircraft (maximum takeoff 12,500 pounds of less), the FAA recommends an evaluation based on a percentage of the small airplane fleet that is consistent with aircraft use. A common planning approach for general aviation runways accommodating a combination of single engine and multi-engine piston aircraft is to base future runway length planning on 95 or 100 percent of the small airplane fleet (aircraft 12,500 pounds and less), or for small airplanes with 10 or more seats.

The 2002 Airport Master Plan recognized the existing runway's ability to accommodate 95 percent of the small airplane fleet and suggested use of the 100 percent segment for long term planning based on FAA runway length planning criteria. It was noted that the length required to accommodate 100 percent of the small airplane fleet was 3,500 feet. The FAA indicates that use of the 100 percent of fleet standard is generally appropriate for airports primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area. [4]

However, the 2002 master plan also noted the City's desire to provide additional runway pavement for safety, particularly for accelerate-stop distances for multi-engine aircraft both in training and normal use. For these reasons, **the 2002 Airport Master Plan's recommended length for Runway 16/34 was 3,953 feet**. This dimension also reflected the limitations of the airport site, particularly the surface streets located at the north and south ends of the runway.

The existing and future design aircraft identified in the updated aviation activity forecasts (Chapter 3) is a multi-engine piston aircraft. The majority of these aircraft are included in Aircraft Approach Category B and Airplane Design Group I (ADG I). In addition to the typical range of general aviation activity, the potential exists for Auburn Municipal Airport to accommodate small package express aircraft, including a variety of ADG I and II turboprops. Several of these aircraft fall into the FAA defined category of "small airplanes with 10 or more seats." With this potential activity in mind, the use of this planning criteria appears to provide a reasonable upper range of runway capabilities for Auburn Municipal Airport that is also consistent with the previously-defined desire to provide additional runway pavement for safety purposes. The FAA runway length model indicates that 4,060 feet is required to accommodate small airplanes with 10 or more seats at Auburn Municipal Airport. **A runway length of approximately 4,000 feet (with displaced thresholds) can be accommodated within the limits of adjacent streets, which is comparable to the 2002 Airport Master Plan recommendation of 3,953 feet.**

A summary of FAA recommended runway lengths for planning based on the requirements of small aircraft is presented in **Table 4-5**. **Figure 4-9** depicts the existing length of Runway 16/34 and the length required to accommodate small airplanes with 10 or more seats.

4 FAA Advisory Circular (AC) 150-5325-4B, Runway Length Requirements for Airport Design

TABLE 4-5: FAA RECOMMENDED RUNWAY LENGTHS FOR PLANNING- (FROM FAA COMPUTER MODEL)

Runway Length Parameters for Auburn Municipal Airport

- Airport Elevation: 63 feet MSL
- Mean Max Temperature in Hottest Month: 78 F
- Maximum Difference in Runway Centerline Elevation: 7 Feet
- Wet and Slippery Runways
- Existing Runway Length: 3,400'

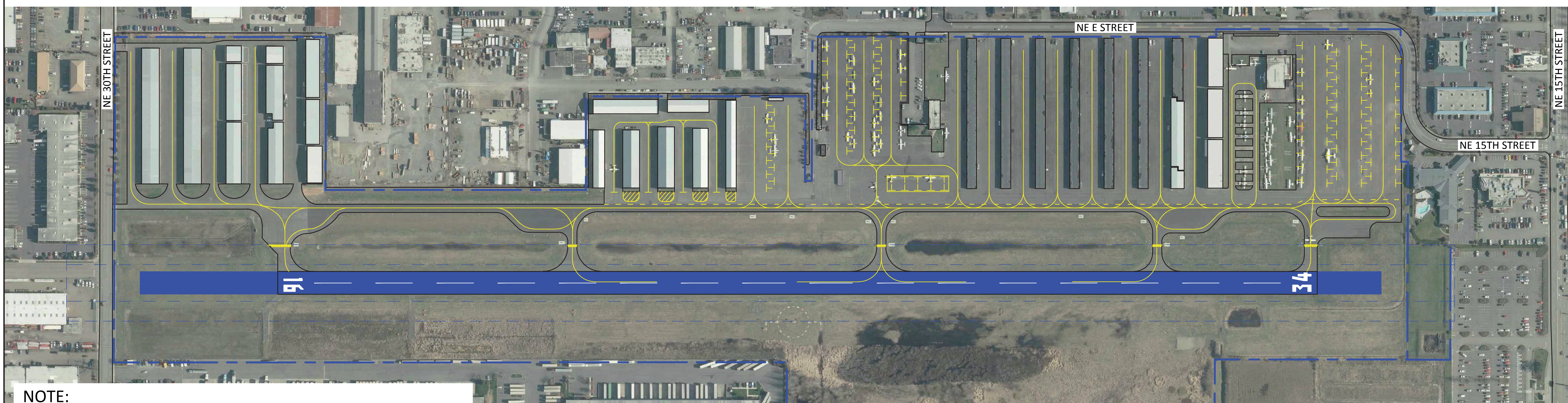
Small Airplanes with less than 10 seats	
➢ 75 percent of these airplanes	2,400 feet
➢ 95 percent of these airplanes	2,950 feet
➢ 100 percent of these airplanes	3,500 feet (corresponds to design aircraft)
➢ Small airplanes with 10 or more seats	4,060 feet (corresponds to typical accelerate-stop distances for piston twins and ADG II Reserve)

Accelerate-Stop Distance

For most multi-engine aircraft, pilots are trained that if an engine fails before attaining liftoff speed, the only proper action is to discontinue the takeoff. If the engine fails after liftoff with the landing gear still down, the takeoff should be discontinued if touch-down and roll-out on the remaining runway is still possible. Continuing a takeoff on one engine is only recommended when other options are not available since multi-engine piston aircraft typically lose 80 to 90 percent of their climb performance when operating on one engine.

The accelerate-stop distance is the distance required for an aircraft to accelerate to liftoff speed and, assuming failure of an engine at the instant liftoff speed is reached, throttle to idle, apply maximum braking and stop. Aircraft manufacturers assume that the pilot will recognize the engine failure within 3 seconds and act decisively. The accelerate-stop distance for a typical multi-engine piston aircraft (Beechcraft Baron 58P) was reviewed based on the conditions noted above for Auburn Municipal Airport to calculate runway length requirements. At maximum gross takeoff weight, the Baron 58P requires approximately 3,600 feet for the accelerate-stop distance on a dry runway surface with optimal pilot performance. This distance could be expected to increase by 10 to 15 percent (approximately 3,960 to 4,140 feet) on a wet runway. The manufacturer indicates that at 81 knots just before takeoff, upon engine failure, the aircraft will travel approximately 410 feet in the 3 seconds before the pilot cuts power on the good engine and begins to apply maximum braking. Although the accelerate-stop calculation is not reflected in the "normal" takeoff distances required for takeoff roll and climb to 50 feet, it reflects a valid margin of safety for pilots operating multi-engine aircraft on Runway 16/34 and warrants consideration in the master plan moving forward.

RUNWAY 3400' X 75' (EXISTING)



NOTE:
1. THE INFORMATION DEPICTED IN THIS FIGURE IS FOR RUNWAY LENGTH ILLUSTRATION PURPOSES ONLY AND DOES NOT REFLECT A SPECIFIC RECOMMENDATION OR RUNWAY CONFIGURATION.

RUNWAY 4060' X 75' (SMALL AIRPLANES WITH 10 OR MORE SEATS)

Runway Width

Runway 16/34 is 75 feet wide, which exceeds the ADG I standard of 60 feet and meets the ADG II (reserve) standard (75 feet).

AIRFIELD PAVEMENT

An updated airfield pavement maintenance and management study for Auburn Municipal Airport will be completed by WSDOT Aviation in 2013. The updated pavement plan, along with other engineering analyses was the primary decision making tools for the ongoing maintenance and replacement of airfield pavements. All airfield pavements require periodic crackfilling, vegetation removal and sealcoating to optimize useful life. For planning purposes, rehabilitation of asphalt pavements is typically assumed on a 15- to 25-year cycle, depending on use and pavement design. A prioritized list of pavement rehabilitation or reconstruction projects will be provided in the updated capital improvement program.

With effective maintenance, the parallel taxiway and runway should not require rehabilitation until the end of the current twenty-year planning period or beyond. As indicated in the Inventory Chapter (Table 2-7) various apron sections and hangar taxilanes were included in the “major rehabilitation” category, with some areas included in the “reconstruction” category based on the 2012 inspection and ratings. The predicted pavement conditions for the next ten years will be included in the 2013 document. Based on the recent ratings and normal wear, most of the existing apron and taxilane pavements can be expected to require at least rehabilitation, with some sections requiring reconstruction during the next twenty years. **Table 4-6** summarizes the most recent (2012) pavement ratings and the forecast ratings.

TABLE 4-6: SUMMARY OF AIRFIELD PAVEMENT CONDITION (PCI RATINGS)

PAVEMENT	2012 PCI RATING[1,2]	2020 PCI RATING[2]
Runway 16/34	81/76	67/60
Taxiway A (East Parallel Taxiway)	100	92
Exit Taxiways C, D, E, F	100/61	92/52
Exit Taxiway G	60	52
North Hangar Access Taxiway	75	65
South Access Taxiway (south of Rwy 34)	60	52
North Tiedown Apron (north of fuel)	65	54
Center Apron/Main Apron	45/76/29	34/65/22
South Tiedown Apron	71	60

North Hangar Taxilanes	75	65
ACHA Hangar Taxilanes	Not rated	N/R
South Hangar Taxilanes	45	34
Auburn Flight Service South FBO Taxilanes	Not rated	N/R

1. WSDOT Airport Pavement Management System, Applied Pavement Technology, 2012
2. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from "failed" to "excellent."

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between apron and runways, while other taxiways become necessary as activity increases and safer and more efficient use of the airfield is needed. The existing taxiway system at Auburn Municipal Airport provides aircraft access to the runway and all landside facilities located on the east side of the runway. No existing taxiway access is provided on the west side of the runway.

Parallel Taxiway

The east parallel taxiway serving Runway 16/34 provides efficient access to the runway from the airport's landside facilities. The parallel taxiway has five 90-degree connecting exit taxiways which facilitate movement of aircraft between the runway and parallel taxiway. The parallel taxiway has four aircraft holding areas that allow efficient traffic flows. No major capacity or service related improvements are anticipated. The west parallel taxiway is 25 feet wide, which meets the ADG I taxiway width standard.

The 2002 Airport Layout Plan depicts additional taxiway improvements at both ends of the runway in conjunction with runway extension/displaced threshold projects. A future west parallel taxiway (1,700 feet x 25 feet) is also depicted with exit taxiway connections located at the existing Runway 34 end, the future Runway 34 end, and in line with Taxiway E on the east side of the runway. As noted earlier, the future west parallel taxiway is depicted with a 225-foot runway separation, which meets the ADG I standard, but is 15 feet less than the ADG II separation used on Taxiway A.

Taxilanes

The future development of new hangars or aircraft parking on the airport will require additional taxilane access. Access taxiways and taxilanes serving small hangar developments are 25 feet wide for ADG I aircraft with a 79-foot wide object free area. As noted earlier in this chapter, several existing hangar taxilanes do not meet FAA taxilane object free area clearing standards. While it may not be feasible to relocate existing hangars, new hangars should be configured to meet FAA standards.

The taxilanes located within aircraft parking aprons should be configured to provide the standard object free area clearances. Options for reconfiguring existing aprons to meet standards will be evaluated in the alternatives analysis. Apron reconfigurations are generally completed as part of a required pavement rehabilitation or reconstruction project.

Light airplane tiedown rows and adjacent taxilanes are typically designed to accommodate airplane design group (ADG) I aircraft; parking positions for larger multi-engine aircraft should be sized appropriately. The taxilane centerline to the nearest fixed/moveable object (parked aircraft) of 39.5 corresponds to the object free area dimensions for ADG I.

AIRFIELD INSTRUMENTATION, LIGHTING AND MARKING

Navigational Aids

Runway 16/34 currently supports a circling nonprecision GPS instrument approach (RNAV-GPS A). There are no ground based electronic navigational aids located on the airport. Any improvement to the current instrument approach (approach descent and visibility minimums) would also utilize satellite-based platforms rather than ground-based systems.

Instrument approaches currently being designed for general aviation airports typically use WAAS or LPV platforms, depending on the airfield capabilities and surrounding airspace. The FAA is currently implementing "NextGen" capabilities in the national airspace system that will eventually allow more efficient movement of aircraft between airports and provide more innovative instrument approach and departure routing and other capabilities.

It is anticipated that no on-site electronic navigational aids will be required during the current planning period.

Runway/Taxiway Lighting

The lighting systems associated with Runway 16/34 were installed new as part of the runway rehabilitation conducted in 2004. The lighting systems include medium intensity runway edge lighting (MIRL), runway end identifier lights (REIL), and visual approach slope indicators (VASI). The systems meet the standard for general aviation runways with visual or nonprecision instrument approaches. The parallel taxiways and exit taxiways are equipped with medium-intensity taxiway lighting (MITL).

Most lighting systems have a useful life of 20 to 25 years, depending on weather exposure and maintenance history. The visual approach slope indicator (VASI) units will likely require replacement with the current equivalent (precision approach path indicators - PAPI). The runway and taxiway edge lights, REILS, and the airport beacon should not require replacement until late in the 20-year planning or beyond.

Runway Markings

Runway 16/34 has basic (visual) markings, consistent with existing approach capabilities. The markings (threshold marking bars, runway end numbers, centerline stripe) are in excellent condition and were applied in the 2004 rehabilitation project. The runway exit taxiways have yellow aircraft hold line markings located 125 feet from runway centerline, which meets the runway OFA and OFZ clearing standard.

In the event the current instrument approach was to be replaced with a straight-in approach, the runway markings would need to be upgraded to non-precision instrument (NPI), which consists of threshold markings (6 vertical bars), runway end numbers, and runway aiming point markings, located 1,020 feet from each end of the runway. The FAA Flight Procedures Office is only permitted to design straight-in approaches for runways with NPI markings in place, so early coordination would be required if a straight-in approach is found to feasible and if the City decides to pursue that option.

Airfield Signage

The lighted airfield signage (location, mandatory, directional, destination, and distance remaining signs) are internally illuminated and were installed new during the runway and lighting rehabilitation projects.

Airfield Lighting

Airport management reports that the existing airport beacon operates normally.

The lighted wind cone on the west side of the runway is in good condition. Airports will often locate supplemental wind cones near runway ends to provide pilots with additional information about surface wind conditions.

ON FIELD WEATHER DATA

Auburn Municipal Airport does not currently have on-site weather observation. Aircraft conducting instrument approaches at the airport are required to use the SEATAC altimeter setting. Automated Weather Observation Systems (AWOS and ASOS) are located at five airports within 15 miles of Auburn Municipal Airport. It appears that existing weather data is adequate to support local instrument operations. However, adding onsite weather should be considered as the overall development and use of the airport evolves. The addition of on-site weather observation capabilities would support airport operations in both visual and instrument conditions. Onsite weather would also allow aircraft licensed under FAR Part 135 (air taxi/charter) to operate in IFR conditions.

Landside Facilities

For general aviation airports, landside facilities are generally defined as those that serve aircraft, passenger needs and their related functions. At Auburn Municipal Airport, landside facilities include aircraft aprons, hangars, and fixed base operator (FBO) space and aircraft fueling facilities. The Airport Management Group (AMG), the City's contract airport manager, is also responsible for managing the City's aviation fuel storage and dispensing system. As noted in the Inventory Chapter, the Airport has several commercial tenants providing variety of aviation services.

The 2002 Airport Layout Plan does not depict specific development areas for additional commercial tenants. Future hangar development options will be developed in the alternatives analysis and will include space to accommodate commercial tenants in addition to aircraft storage. Options for providing additional aviation fuel storage may be considered for the west side of the runway, depending on its future development needs.

AIRCRAFT PARKING AND TIEDOWN APRON

Aircraft aprons provide parking for locally based aircraft that are not stored in hangars and for transient aircraft visiting the airport and ground operations such as aircraft fueling. At Auburn Municipal Airport, the four primary apron areas accommodate small airplane tiedowns for local and transient aircraft, and aircraft fueling. The Airport does not currently have a designated parking area for helicopter use, although helicopters are accommodated within existing tiedown aprons by airport management on an individual basis.

Larger aircraft parking is also accommodated on the apron (in small airplane tiedown rows), although there are no parking positions designed for larger aircraft. As noted earlier, larger aircraft parked in the small airplane tiedown rows typically extend well into the adjacent taxilanes, which reduces the available taxilane clearance. The addition of parking positions for twin-engine or other larger aircraft should be addressed in the apron alternatives evaluation.

As noted in the Inventory Chapter, the Airport has approximately 169 small airplane tiedowns located on four aprons, although not all tiedowns are marked or actively used. 35 of the tiedowns are located on leased apron areas at Auburn Flight Service. The existing apron configurations do not meet FAA taxilane object free area clearance standards for ADG I aircraft in several areas. Options for reconfiguring the aprons to meet standards will be included in the alternatives evaluation. It is noted that in order to meet FAA design standards, some reduction in the number of tiedown positions may be needed. Based on this possibility, future space calculations should not assume that 100 percent of existing tiedown capacity will be available to meet forecast demand. Given the relatively large number of unused tiedowns and the relative scarcity of developable land for new hangar construction, converting a portion of existing parking apron capacity to hangar development may also be considered in the alternatives analysis.

In order to address the uncertainty associated with predicting long term demand, aircraft apron reserve areas should be identified to preserve the airport's ability to accommodate user needs. A development reserve area equal to 50 to 100 percent of the net twenty year parking demand will provide a conservative planning guideline to accommodate unanticipated demand, changes in existing apron configurations, and demand beyond the current planning period. The location and configuration of the development reserves will be addressed in the alternatives analysis.

Aircraft Parking Demand (Local and Itinerant)

For planning purposes, it is assumed that 80 percent of forecast based aircraft will be stored in hangars and 20 percent will use apron parking. Based on these assumptions, 66 light aircraft tiedowns will be required for locally-based aircraft by 2032. These estimates may prove to be overly optimistic in gauging apron parking demand for based aircraft as existing hangars (doors on the open-front T-hangars, etc.) are improved or additional hangar space is developed at the airport. However, this approach will ensure that adequate apron is preserved for long term use.

FAA **Advisory Circular 150/5300-13A** suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy day operations. Future demand for itinerant parking spaces was estimated based on 20 percent of design day itinerant operations (20% of daily itinerant operations divided by two, to identify peak parking demand). The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number itinerant spaces to determine future itinerant ramp requirements. By 2032, itinerant aircraft parking requirements are estimated to be 31 aircraft parking positions. Based on the projected distribution of air traffic, the parking positions will be primarily small airplane tiedowns, but would also include parking positions for multi-engine aircraft and other business class aircraft (single-engine/multi-engine turboprops, very light jets, etc.), and parking for helicopters. **Table 4-7** summarizes projected aircraft parking requirements based on the updated aviation activity forecasts.

Aircraft Fueling Apron

The existing aircraft fueling area can accommodate two small aircraft on the apron located on the north and south sides of the fuel tanks. However, as noted earlier, the existing clearance between the fueling area and the adjacent taxilane to the east does not meet FAA taxilane OFA standards. Options for reconfiguring existing taxilanes or relocating the fueling apron will be addressed in the airport development alternatives. The analysis will also evaluate the space requirements to provide additional fuel grades, such as jet fuel or auto gasoline.

Helicopter Practice Pad

The Airport has a small unpaved pad located on the west side of the runway that accommodates helicopter flight training activities. The pad is located approximately 180 feet from runway centerline, which is outside the ADG I protected areas for the runway (runway safety area, object free area, and obstacle free zone). The pad functions as a parking area rather than a designated landing area.

AIRCRAFT HANGARS

Auburn Municipal Airport accommodates a wide variety of hangars including commercial hangars and hangars used primarily for aircraft storage. It is estimated that 80 percent of the airport's 274 based aircraft are stored in hangars, with the remaining aircraft parked on aircraft apron. For planning purposes, it is assumed that existing hangar space is committed and all additional (forecast) demand would need to be met through new construction. Improvements to the City's open-front T-hangars may affect demand for new construction, although given an uncertain timeframe for making improvements, it is prudent to plan for new construction and let the market forces determine future needs.

As indicated in the aviation activity forecasts, the number of based aircraft at Auburn Municipal Airport is projected to increase by 55 aircraft during the twenty year planning period. Based on a projected 80 percent hangar utilization level, additional long term demand for new hangar space is estimated to be 44 spaces. A planning standard of 1,500 square feet per based aircraft stored in hangars is used to project gross space requirements (44 aircraft = 66,000 square feet). The projected hangar requirements for aircraft storage at Auburn Municipal Airport are presented in **Table 4-7.**

TABLE 4-7: APRON AND HANGAR FACILITY REQUIREMENTS SUMMARY

ITEM	BASE YEAR (2012)	2017	2022	2027	2032
Based Aircraft Forecast	**274**	**280**	**291**	**308**	**329**
Aircraft Parking Apron ***(Note: capacities reflect current configuration of existing apron areas, actual capacity when reconfigured may be significantly different.)***					
Small Aircraft Tiedowns	169				
Total Apron Area *(includes taxilanes and unusable space required for hangars access)*	51,000 sy				
Projected Needs (*Gross Demand*) [1]					
Itinerant Single Engine Aircraft Tiedowns (@ 360 SY each)		17 spaces / 6,120 sy	18 spaces / 6,480 sy	19 spaces / 6,840 sy	22 spaces / 7,920 sy
Locally Based Tiedowns (@ 300 SY each)		56 spaces / 16,800 sy	58 spaces / 17,400 sy	62 spaces / 18,600 sy	66 spaces / 19,800 sy
Multi-Engine Aircraft Parking (@ 625 SY each)		4 spaces / 2,500 sy	5 spaces / 3,125 sy	5 spaces / 3,125 sy	5 spaces / 3,125 sy
Small Helicopter Parking Positions (@ 380 SY each)		3 spaces / 1,140 sy	3 spaces / 1,140 sy	4 spaces / 1,520 sy	4 spaces / 1,520 sy
Total Apron Needs		**80 spaces 26,560 SY**	**84 spaces 28,145 SY**	**90 spaces 30,085 SY**	**97 spaces 32,365 SY**
Aircraft Hangars *(Existing Facilities)*					
Existing Hangar Spaces (est.)	253				

Projected Needs ***(Net Increase in Demand)*** [2]					
(New) Hangar Space Demand **(@ 1,500 SF per space)** *(Cumulative twenty year projected demand: 45 spaces / 67,500 SF)*		**+5 spaces / 7,500 sf**	**+9 spaces / 13,500 sf**	**+14 spaces / 21,000 sf**	**+17 spaces / 25,500 sf**

1. Aircraft parking demand levels identified for each forecast year represent forecast gross demand.
2. Hangar demand levels identified for each forecast year represent the net increase above current hangar capacity.

In addition to aircraft storage, additional demand for business related and commercial hangar needs should be anticipated. Specialized aviation service businesses such as engine & airframe repair, avionics, interior and paint shops generally prefer locations that provide convenient aircraft access. Highly successful aviation service businesses generally rely on both locally based aircraft and their ability to attract customers from outside the local area. While there is no specific formula to predict demand for general aviation service businesses at a particular airport, reserving several spaces for larger commercial hangars is recommended.

Individual aircraft owners needs vary and demand can be influenced by a wide range of factors beyond the control of an airport. In addition, the moderate forecast growth in based aircraft may be exceeded if conditions are favorable. For this reason, it is recommended that hangar development reserves be identified to address the uncertainty of hangar market conditions and demand factors. Conservative development reserves should be established to accommodate a combination of conventional hangars -and T-hangars, roughly equal to 50 to 100 percent of the twenty year forecast (net) demand. The location and configuration of the development reserves will be addressed in the alternatives analysis.

Surface Access and Vehicle Parking

EAST LANDSIDE AREA

The surface access to the east landside area of the Airport appears to be adequate. Automated vehicle gates are located adjacent to the hangar areas and aircraft aprons. As noted earlier, the hangar areas have minimal vehicle parking areas and vehicles often park on the taxilanes adjacent to hangars. Due to limited space adjacent to existing hangars, options for adding vehicle parking may be limited, but should be explored. Potential redevelopment or infill in the east landside area may require additional vehicle parking.

WEST LANDSIDE AREA

There is no existing surface access to the undeveloped area on west side of the runway. The 2002 Airport Layout Plan identifies future access to the area from the B Street to the northwest corner of the west development area. Other access options may be available from the south through adjacent property and 15th Street. The vehicle parking requirements for the west side of the runway will depend on the type of use. Commercial development typically requires more vehicle parking capacity than aircraft storage. Options for providing functional vehicle parking in the west and east landside areas should be addressed in the alternatives evaluation. The City of Auburn parking code can provide guidance on parking allocations based on building square footage or another acceptable metric.

Support Facilities

AVIATION FUEL STORAGE

The city-owned aviation fuel storage (12,000 gallon Aviation Gasoline) and dispensing facilities appear to be adequate to accommodate current demand. As noted earlier, the existing clearance between the fueling area and the adjacent north-south apron taxilane does not meet FAA standards. Options for addressing the current configuration will be included in the evaluation of airport development alternatives. In addition, adequate space should be reserved to accommodate additional tanks that may be needed for jet fuel or automobile gasoline. The growth in manufacturing of small turbine aircraft, particularly single engine turboprops, very light jets, and turbine helicopters will increase demand for jet fuel for transient aircraft in addition to demand from locally-based turbine aircraft. It is also noted that several light airplane manufacturers are now offering diesel engines (using jet fuel) as an alternative to conventional AVGAS fueled piston engines.

The development of a secondary containment area for (future) mobile fuel truck parking should also be considered. Most mobile fuel trucks in use today have single wall tank construction and do not provide the secondary containment of double wall aboveground bulk storage tanks. It is anticipated that federal or state regulations will eventually require secondary containment for single wall tank mobile fuel trucks when unattended, such as for overnight parking when the trucks are not in service or otherwise monitored. Locating secondary containment areas for airport fuel trucks in close proximity to the bulk fuel storage areas may be the most efficient use of land in the terminal area.

AIRCRAFT WASH DOWN FACILITIES

The existing aircraft wash down facilities appear to be adequate.

AIRPORT UTILITIES

The existing utilities on the airport appear to be adequate both in capacity and service within the developed areas of the airport. Extensions of water, sanitary sewer and electrical service to serve future west landside developments would be required. All power lines located on the airfield should be buried. Expansion or upgrade of existing stormwater systems will be required as the impervious surface on the airport increases through development.

SECURITY

The airport has chain link fencing extending around the airport perimeter, with vehicle and pedestrian gates located adjacent to existing hangar and aircraft parking areas. Future landside development will require reconfigurations of existing fencing and additional controlled access gates.

Property Acquisition

The 2002 Airport Layout Plan depicts six separate parcels for acquisition. Five of the parcels are located near the south end of the runway. The parcels include the park & ride parking lot (2.7 acres), the grassy area immediately north of the park & ride lot (1.2 acres), a parcel near the southwest corner of the airport (2.75 acres), and two narrow strips of property (0.05 and 0.2 acres) for access or fencing. A 1.47 acre parcel located on the east side of the airport, immediately north of 26th Street was also identified for future acquisition. A review of current King County property records indicates that the larger parcels have not been acquired. A review of City property needs will be conducted to determine if these parcels should remain identified for future acquisition. Due to the fact that the east landside area is nearing full-build out and the costs of developing the west landside area will be significant, there may be other parcels adjacent to the airport's east side that could provide future opportunities for airport land expansion. This information will also be included the review of property needs.

West Landside Area

The 2002 Airport Layout Plan depicts future T-hangars with taxiway connections to the runway. As part of the master plan update, the development constraints and costs of developing the west parcel are being reviewed. The site has a considerable acreage consisting of wetlands and wetland buffers. Development that impacts these areas would require mitigation (on-site or off-site) that is highly regulated. The FAA generally discourages on-site wetland on airports due to concerns about potential increase in bird attraction. The cost of bringing the site up to buildable standards includes fill and grading, roadway access and extension of utility service. The City has indicated that the options for future development of this site will require sufficient revenue or other benefits to justify the costs of development/mitigation. This would suggest that commercial/industrial aviation-related development capable of generating revenue or employment may prove to be a highest and best use, compared to aircraft storage, which has more limited revenue streams. Options for developing the west parcel as a fully integrated part of the airport will be included the alternatives analysis

Facility Requirements Summary

The projected twenty year facility needs for Auburn Municipal Airport are summarized in **Table 4-8**. As noted in the table, maintaining existing pavements represents a significant, ongoing facility need. The updated forecasts of aviation activity anticipate moderate growth in activity that will result in similarly moderate airside and landside facility demands beyond existing capabilities.

The existing airfield facilities have the ability to accommodate a significant increase in activity, with targeted facility improvements. For the most part, the need for new or expanded facilities, such as aircraft hangars, will be market driven, although there will be significant front end investments required in preparation, utility extensions, road extensions, and taxiway/taxilane construction. The nonconforming items noted at the beginning of this chapter are relatively minor and can be addressed systematically during the current planning period to improve overall safety for all users.

TABLE 4-8: FACILITY REQUIREMENTS SUMMARY

ITEM	SHORT TERM	LONG TERM
Runway 16/34	• 600-foot Runway Extension / Reserve • Displaced Thresholds for Obstruction Clearance • Pavement Maintenance[1]	• ADG II Development Reserves (option) • Pavement Maintenance[1]
Taxiways and Taxilanes	• Pavement Maintenance[1] • Extend Taxiway A for Runway Extensions • Rehabilitate Hangar Taxilanes • Taxiways/Taxilanes West Landside Area • Modify Aircraft Hold Area (south of Taxiway C)	• Pavement Maintenance[1] • West Parallel Taxiway (partial length) • Taxiways/Taxilanes to New Hangar Areas • ADG II Development Reserves (option)
Aircraft Aprons	• Reconfigure Aircraft Parking Aprons (rehabilitate/reconstruct older sections) to meet FAA taxilane clearing standards • Business Aircraft Parking • Helicopter Parking • Pavement Maintenance[1]	• Pavement Maintenance[1] • Apron Development Reserves • Aircraft Fueling Area Reserve
Hangars	• Define development areas for T-hangars, conventional hangars, and commercial hangars based on forecast demand	• Hangar development reserves
Navigational Aids and Lighting	• Upgrade Instrument Approach	• Taxiway Edge Lighting (MITL) West Taxiways • PAPIs Rwy 16 & 34 • Supplemental Wind Cone
Fuel Storage	• Fueling Area (address taxilane clearances) • Define Reserve Area for additional fuel tanks/grades	• Identify Secondary Containment Area(s) for Fuel Truck Parking
FBO	• Identify FBO reserve(s) for commercial aviation tenants	• Same
Utilities	• Extend Service to New Development Areas	• Same

Roadways and Parking	• Extend/Improve Roads to New Development Areas • Add designated vehicle parking adjacent to hangars and apron areas.	• Same
Security	• Add Automated Gates for West landside area • Flood Lighting	• Same

[1] Vegetation control, crackfill, sealcoat, slurry seal, localized patching, joint rehabilitation, etc., as required.

AIRFIELD CAPACITY

Annual service volume (ASV) is a measure of estimated airport capacity and delay used for long-term planning. ASV, as defined in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay, provides a reasonable estimate of an airport's operational capacity. The ratio between demand and capacity helps to define a timeline to address potential runway capacity constraints before they reach a critical point. If average delay becomes excessive (greater than 3 minutes per aircraft), significant congestion can occur on a regular basis, which significantly reduces the efficient movement of air traffic. ASV is calculated based on the runway and taxiway configuration, percent of VFR/IFR traffic, aircraft mix, lighting, instrumentation, the availability of terminal radar coverage and the level of air traffic control at an airport.

For long-term planning purposes, the FAA estimates ASV for a single runway with no air carrier traffic is approximately 230,000; hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions. Although these estimates assume optimal conditions (air traffic control. etc.), they provide a reasonable basis for approximating existing and future capacity:

- *Existing Capacity: 93,136 Annual Operations / 230,000 ASV = 40.5% (demand/capacity ratio)*
- *Future Capacity: 128,565 Annual Operations/ 230,000 ASV = 55.9% (demand/capacity ratio)*

Based on these ratios, the average delay per aircraft would be expected to remain below three minutes through the planning period. The FAA recommends that airports proceed with planning to provide additional capacity when 60 percent of ASV is reached. As noted in the Forecast Chapter, the airfield has accommodated significantly higher traffic volumes in recent years when local flight school operations were active. In the future, exit taxiway enhancements (high speed exits, etc.) may be appropriate to reduce runway occupancy times and maintain adequate capacity.

Chapter 5 – Airport Development Alternatives

Chapter 5 – Airport Development Alternatives

The evaluation of future development options represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.

Introduction

As noted in the facility requirements evaluation, current and long term planning for Auburn Municipal Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft.

All proposed facility improvements are consistent with applicable FAA airport design standards and FAR Part 77 airspace planning standards. Airplane Design Group I (ADG I) standards are recommended for all facilities including the runway, major taxiways, aircraft parking apron and access taxiways. All proposed improvements are compatible with the airport's existing instrument approach capabilities. ADG II dimensional standards are proposed as reserves, based on existing airfield configurations and the potential increase in business aircraft activity, particularly single- and multi-engine turboprops.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved airport layout plan (ALP) identifies future improvements that were the product of the last master planning process. The master plan update provides a fresh look at addressing facility needs, but also allows the components of the previous preferred alternative to be retained if they meet current needs.

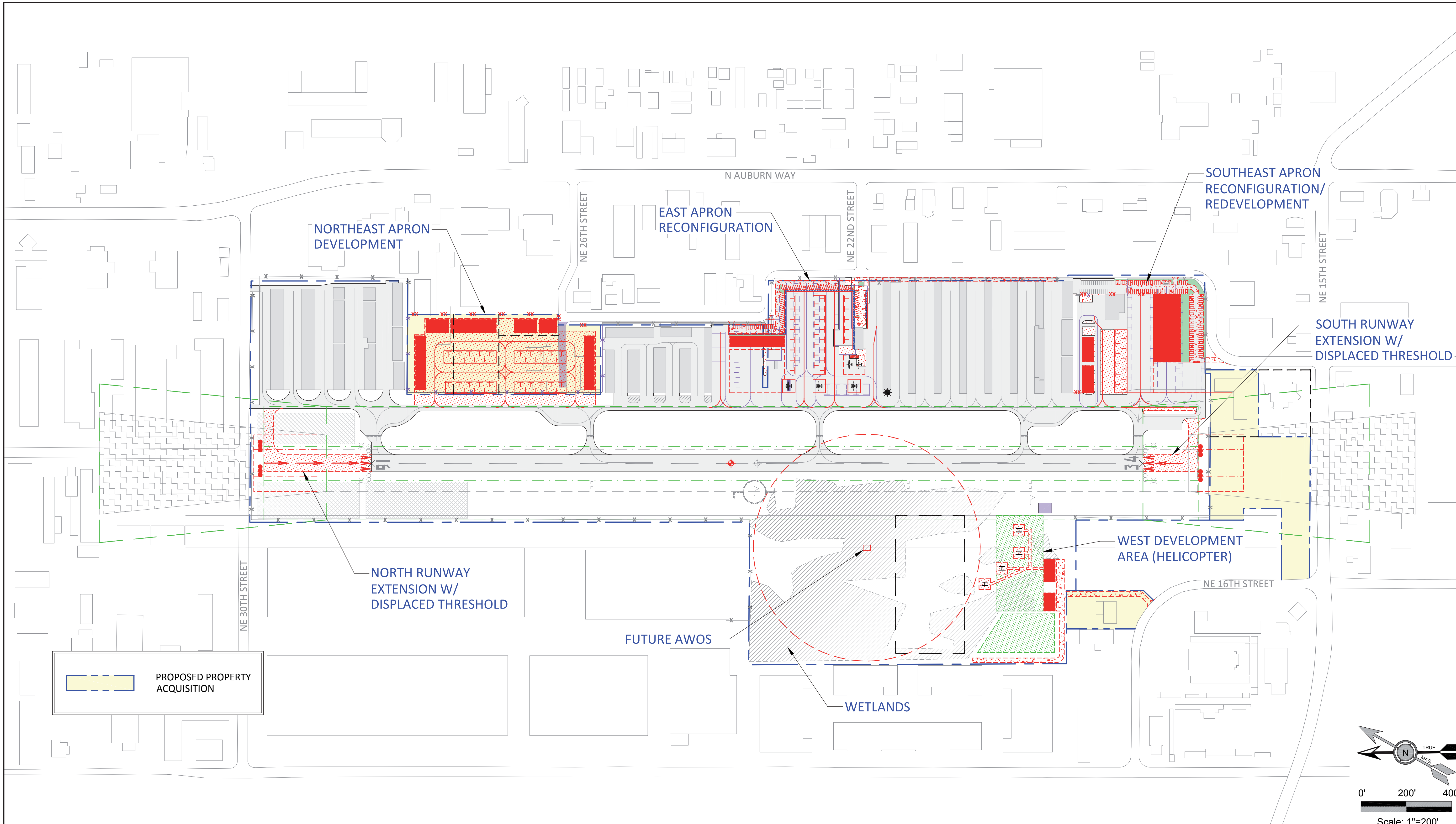
The preliminary alternatives will be evaluated to identify general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined. From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. The Consultant will integrate these items into a draft preferred alternative that will be reviewed and refined as the City proceeds through the process of selecting a final preferred development alternative for Auburn Municipal Airport. Throughout this process, public input and coordination with the FAA will also help to shape the preferred alternative.

Once the preferred alternative is selected by the City, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated airport layout plan (ALP) drawings that will be used to guide future improvements at the airport.

Preferred Development Alternative Summary

A preferred alternative was developed through the evaluation process described above. For the convenience of the reader, a graphic summary (**Figure 5-0**) of the preferred alternative is presented on the following page. The original sequence and process of evaluation that was reflected in draft working papers is maintained in the sections that follow the executive summary. A complete description of the elements of the preferred alternative is presented in last section of the chapter. The primary features of the Preferred Alternative include:

- North and South Runway Extensions with displaced thresholds (future runway 4,118 x 75 feet)
- Declared distances to be used to limit usable runway for specific takeoff and landing operations
- Reconfigured East Apron (Terminal Area) including upgraded main public entry; new access roadways and vehicle parking; aircraft parking; aircraft fueling; and fixed base operator (FBO) buildings/commercial hangars.
- Reconfigured Southeast Apron including upgraded public entry and vehicle parking; FBO/professional aviation center; hangars; and reconfigured aircraft parking.
- Future East Aviation Area for development of additional aircraft parking and hangars. This development will require property acquisition, site remediation and redevelopment from its current industrial use.
- West Aviation Area. Initial development with low impact helicopter facilities and Automated Weather Observation System (AWOS) to avoid wetland areas. Long term development to be determined by City based on project economics, including wetland mitigation costs.
- Property Acquisition – individual parcels located around south and east airport perimeter with potential for aviation use or to improve land use compatibility.



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PREFERRED DEVELOPMENT ALTERNATIVE ELEMENTS | FIG. 5-0

CITY OF AUBURN WASHINGTON

CENTURY WEST ENGINEERING CORPORATION

No-Action Alternative

In addition to proactive options that are designed to respond to future facility needs defined in the previous chapter, a "no-action" option also exists, in which the City may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a "maintenance-only" mode. This approach could be driven by a situation where the cost of expansion and the accompanying increase in maintenance and operation expenses were not closely aligned with available development options and revenue potential. The primary result of this alternative would be the inability of the airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety and operational limits of the existing airport facilities.

The City of Auburn has a long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable. Consistent with these policies, future improvements must meet the financial requirements of the City in order to provide a sustainable path forward.

The no-action alternative establishes a baseline from which the action alternatives can be developed and compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity and the ability to operate an airport on a financially sustainable basis.

Preliminary Development Alternatives

With a limited amount of undeveloped land available on the airport, redeveloping, improving or infilling existing areas provides economy and optimizes land use efficiency. The costs for developing new areas such as the 23-acre west parcel are significant and will require a strong financial case to justify the investment. Targeted investments in facilities with strong revenue- or job creation potential are priorities. The type and composition of future development on the airport that is defined in the master plan will be a critical element in this policy.

The facility needs identified in the previous chapter include a variety of airside (runway-taxiway) and landside needs (aircraft parking, hangars, fueling, support facilities, etc.). Items such as fencing, lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative.

The preliminary alternatives are organized around the airside facilities and three landside areas to address these broad needs and other related needs:

- **Airside Development Options (Runway/Taxiway)** ***(see note on this section)***
- **Landside Development Options - Terminal Area**
- **Landside Development Options - Southeast Apron**
- **Landside Development Options - West Landside Area**

The preliminary development alternatives are described below with graphic depictions (**Figures 5-1 through 5-5**) provided to illustrate the key elements of each alternative. The preliminary alternatives are intended to facilitate a discussion and evaluation about the best path to meet the facility needs of the airport.

It is important to note that the eventual preferred alternative selected by the City may come from one of the preliminary alternatives, a combination or hybrid of the preliminary alternatives, or a new concept that evolves through the evaluation and discussion of the preliminary alternatives. As noted earlier, the City also has the option of limiting future facility improvements based on financial considerations or development limitations. Once the elements of the preferred alternative are defined, they will be integrated into the updated Airport Layout Plan (ALP) as "future" development and the individual projects will be included in the updated capital improvement program.

LANDSIDE DEVELOPMENT OPTIONS - TERMINAL AREA

The terminal area for Auburn Municipal Airport consists of the main apron, fueling area and buildings located on the east side of the airport, near mid-runway. The preliminary development options prepared for the terminal area focus on improving the efficiency of facility layouts, conforming to FAA design standards, and identifying infill opportunities. A primary consideration in evaluating the terminal area options and the southeast apron options, described later the chapter, is to determine the desired mix of aircraft parking and other development (hangars, etc.) that can be accommodated within the defined areas while meeting FAA design standards.

Terminal Area Option A

The elements of Option A are depicted in **Figure 5-1** and include:

- Reconfigured Aircraft Tiedowns and Taxilanes (FAA design standards)
- Aircraft Fueling Area Expansion
- New Hangar Sites (2 units)
- Upgrade Existing T-Hangars
- Relocate Airport Management Office

- Transient Business Aircraft Parking
- Airport Commercial Building Site
- Vehicle Parking

The east-west configuration of existing tiedown rows is maintained for the main apron and north apron, although the number of tiedown rows is reduced in order to meet FAA taxilane clearance standards within the aprons. For small airplanes (ADG I), the overall clearance required for taxilanes is 79 feet, measured 39.5 feet from taxilane centerline to a fixed or moveable object (parked aircraft). The existing tiedown "T" markings and anchors on all of the airport's paved aprons were installed with a 79-foot separation, but the distance does not account for aircraft physically located in a tiedown. For most single engine airplanes, the front portion of the aircraft will extend 4 to 5 feet forward of the tiedown anchors located under the wing, which extends into the adjacent taxilane clear area. To meet FAA standards, the spacing between tiedown rows is increased to account for the parked aircraft. This change applies to all aircraft tiedowns in the terminal area and the southeast apron. The timing for reconfiguration may be determined by a variety of factors, but is generally deferred until major pavement rehabilitation is required or if apron reconfiguration is part of an overall redevelopment project.

As depicted, the apron reconfiguration provides 38 small tiedowns and 4-5 drive through positions for multi-engine aircraft. The main apron is configured with one center tiedown row (double sided) and two outer tiedown rows (24 tiedowns). The smaller apron located north of the main apron is configured with one double tiedown row and two additional tiedowns (14 tiedowns). A single row of transient drive-through parking positions (4 multi-engine aircraft depicted) is provided at the south end of the main apron. These positions are intended for aircraft not suited for small airplane tiedowns.

The apron taxilanes are reconfigured to provide clearance around the aircraft fueling area and the aircraft parking positions. The existing airport management office and a maintenance shed are relocated/removed to accommodate reconfigured taxilanes or aircraft parking. The airport management office is relocated to the west end of Building "506."

Small areas of new apron paving are identified as part of the reconfiguration. The east end of the terminal apron is converted to hangar sites. As depicted, two medium conventional hangars (50'x80' typical) are located at the end of the ADG I east-west taxilanes. Vehicle parking is provided adjacent to the hangars and apron.

The aircraft fueling area is expanded to accommodate a second 12,000 gallon fuel tank and two additional fueling positions.

The existing access road entering the terminal area from 23rd Street is shortened and the vehicle gate relocated to accommodate apron reconfiguration. Vehicle parking is located adjacent to the north apron, accessible from 23rd Street.

An airport commercial building site is located immediately east of Building 506 that would be capable of accommodating a variety of aviation related uses. A 2-story building (approximately 8,000 square feet) with adjacent vehicle parking is depicted. Vehicle access would be provided from the existing driveway serving Building 506.

Upgrades (doors) are proposed for City-owned open T-hangars located south of the main apron to increase demand and building utilization. Airport management indicates that current occupancy in the open hangars is relatively low, due largely to the exposure to weather.

Terminal Area Option B

The elements of Option B are depicted in **Figure 5-2** and include:

- Reconfiguring Aircraft Tiedowns and Taxilanes (FAA design standards)
- Relocate/Expand Aircraft Fueling Area
- FBO/Mixed Use Hangar Site
- Executive Hangar Site (4-unit)
- Upgrade Existing T-Hangars
- Transient Business Aircraft Parking
- Vehicle Parking

Option B replaces the existing east-west tiedown row configuration with a north-south tiedown row that extends from the main apron to the north apron. The front section of the apron is configured to accommodate ADG II aircraft in a west-facing transient parking row, with 115-foot taxilane clearance provided. The back section of the apron is intended to accommodate ADG I aircraft (79-foot taxilane clearance). The apron taxilanes are reconfigured to provide clearance around the aircraft fueling area and the aircraft parking positions to meet FAA dimensional standards. The existing access road entering the terminal area from 23rd Street is vacated to accommodate apron reconfiguration. The existing airport management office and a maintenance shed are relocated/removed. Small areas of new apron paving are identified as part of the reconfiguration.

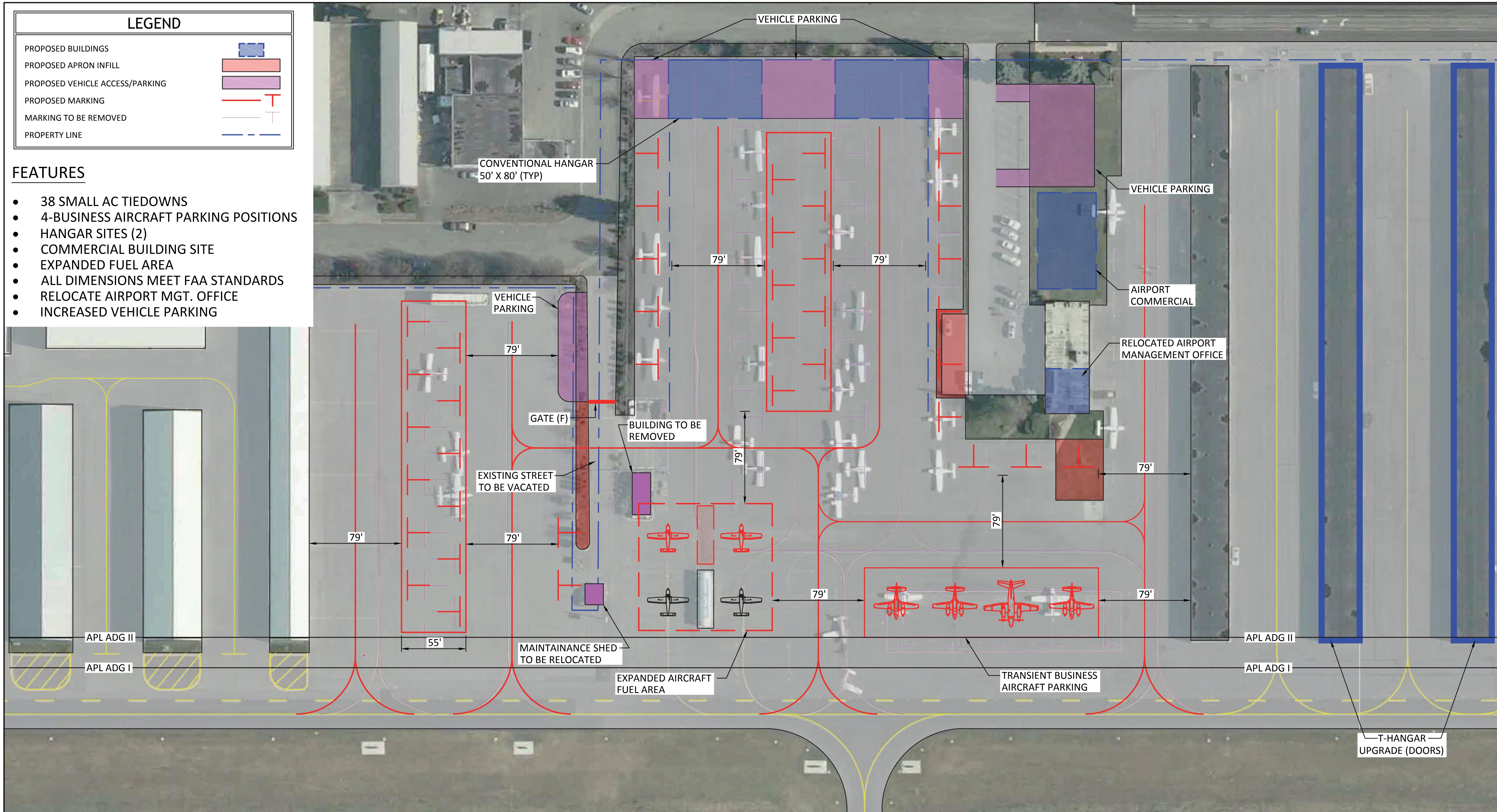
The east end of the main apron is converted to an FBO building/hangar site (2 story building, 25,000 square feet depicted) with vehicle parking. Vehicle access is provided from E Street and 23rd Street. An aircraft loading/unloading area is located in front of the FBO building. Airport management offices would be located in the building.

As depicted, the apron is configured with one tiedown row (double sided - 16 tiedowns). A single row of 5 to 6 transient drive-through parking positions is provided at the north end of the main apron with direct access to the adjacent parallel taxiway. These positions are intended for aircraft not suited for small airplane tiedowns.

A hangar site is located immediately east of Building 506 that would be capable of accommodating a 4-unit executive hangar or a larger conventional hangar. Vehicle access is provided from the existing driveway serving Building 506. Vehicle parking is expanded to serve the hangar and the adjacent FBO building site.

The aircraft fueling area is relocated to the south end of the apron with a reserve to accommodate a second 12,000 gallon fuel tank and two additional fueling positions.

The proposed upgrade (doors) to City-owned open T-hangars identified in Option A is maintained in this option.



TERMINAL AREA OPTION A

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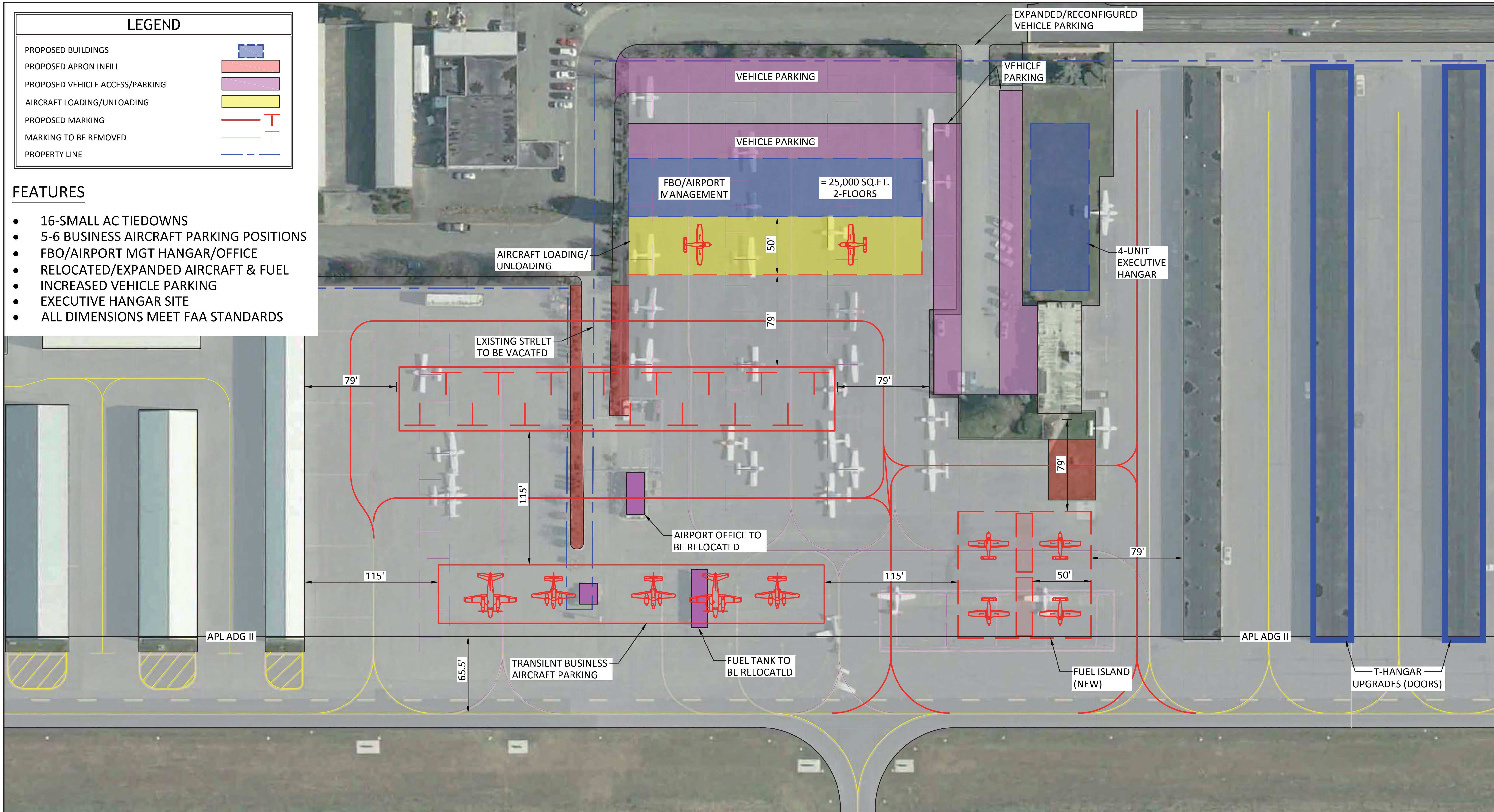
TERMINAL AREA OPTION A | **FIG. 5-1**



TERMINAL AREA OPTION B

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TERMINAL AREA OPTION B | **FIG. 5-2**

LANDSIDE DEVELOPMENT OPTIONS - SOUTHEAST APRON

Three proposed apron reconfiguration options were developed for the southeast apron. The options include fixed wing and helicopter parking, and hangar development. The options are depicted in **Figure 5-3**:

Apron Option A – Helicopter/Fixed Wing Parking

The elements of Option B include:

- 16 Small Airplane Tiedowns
- 6 Small Helicopter Parking Positions
- FBO/Aviation Commercial Building Site
- Vehicle Parking

Option A reconfigures the tiedown apron to accommodate a combination of fixed-wing aircraft and small helicopters. The proposed configuration would permit helicopters to hover-taxi from the runway-taxiway system to parking with reduced interaction with fixed wing aircraft, particularly small airplane tiedowns. This option would allow the airport to accommodate a locally-based helicopter flight training operation.

Small airplane tiedowns (16 depicted) are located near the east end of the apron, adjacent to the FBO building. The east section of the apron is intended to accommodate ADG I aircraft (79-foot taxilane clearance) and the taxilanes are reconfigured to provide clearance with aircraft parking positions to meet FAA dimensional standards.

The east end of the apron is converted to accommodate an FBO building/hangar site with vehicle parking. Vehicle access is provided from E Street. If developed in phases (building and vehicle parking), additional tiedowns would be maintained at the existing east end of the apron.

Apron Option B – Business/Executive Aircraft Hangars

The elements of Option B include:

- 17 Small Airplane Tiedowns
- Business Aircraft/Executive Hangar Sites
- Aircraft Apron (Leased with Hangar Sites)
- Vehicle Parking

Option B reconfigures the tiedown apron to accommodate development of several conventional hangars or executive hangars (4 hangars depicted; 5,000 sf typical) on the south side of the apron, with small airplane tiedowns (11 positions) maintained along the north edge and reconfigured tiedowns (6 positions) located near the southwest corner of the apron. A center east-west taxilane provides access to both areas.

As depicted, the south side of the apron is capable of accommodating ADG II aircraft (115-foot taxilane clearance) and the access taxilane is reconfigured to meet FAA dimensional standards. A section of apron immediately south of the taxilane would be included in the hangar lease for temporary aircraft parking (in front of the hangars). Vehicle access and parking is provided from NE E Street; additional vehicle parking abuts 16th Street NE.

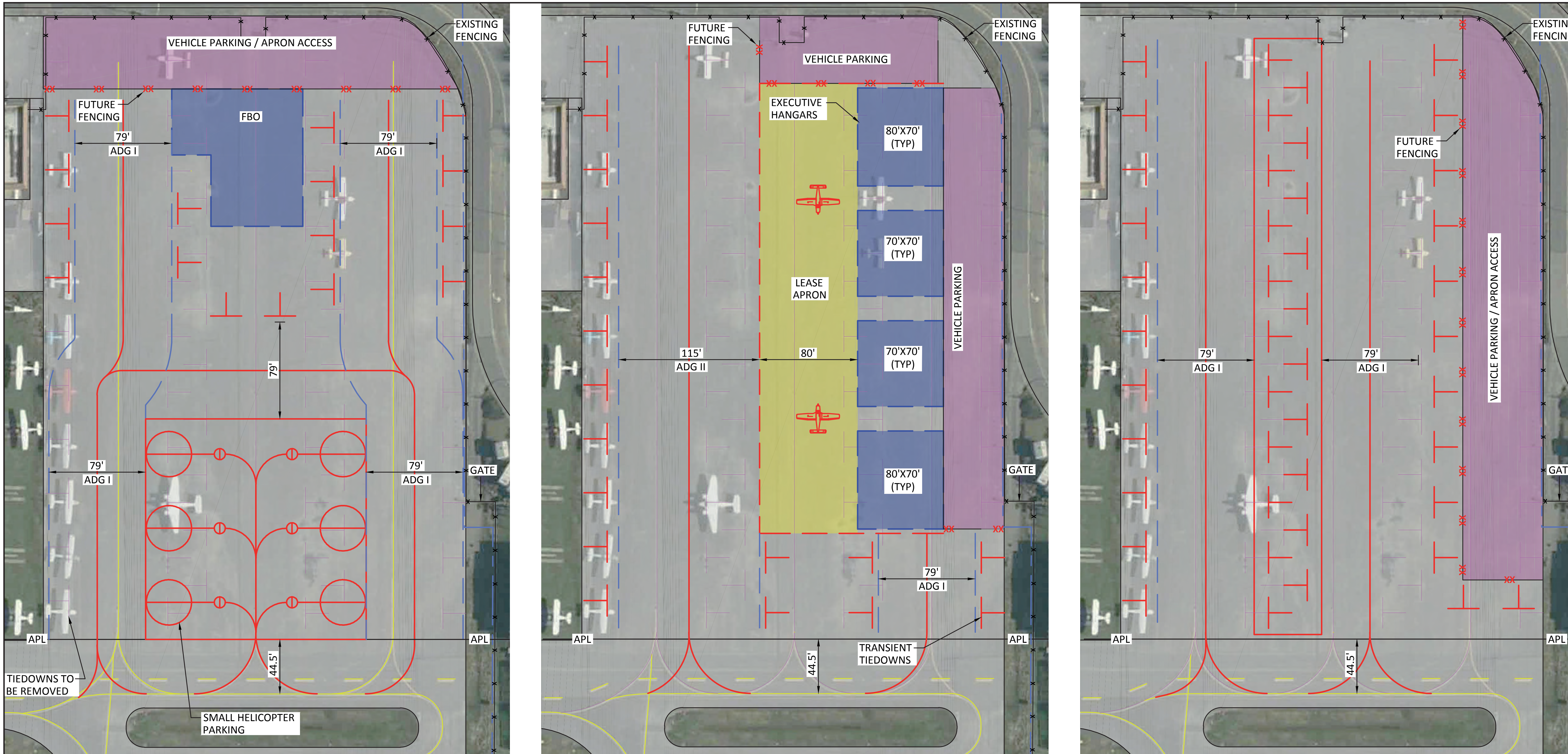
Apron Option C – Small Airplane Tiedowns

The elements of Option C include:

- 44 Small Airplane Tiedowns
- Vehicle Parking

The focus of Option C is to maximize small airplane parking, while meeting FAA taxilane clearance standards.

The reconfigured apron consists of two east-west ADG I taxilanes (79-foot taxilane clearance) serving three adjacent tiedown rows. The north and south rows are single-sided and the center row is double-sided, providing 44 tiedowns. Vehicle access and parking is provided from NE D Street.



APRON OPTION A

- 16 SMALL AIRCRAFT TIEDOWNS
- 6 SMALL HELICOPTER PARKING POSITIONS
- FBO/FLIGHT SCHOOL
- VEHICLE PARKING

APRON OPTION B

- 17 SMALL AIRCRAFT TIEDOWNS
- 4 EXECUTIVE HANGAR SITES
- VEHICLE PARKING

APRON OPTION C

- 44 SMALL AIRCRAFT TIEDOWNS
- VEHICLE PARKING

LANDSIDE DEVELOPMENT OPTIONS – WEST PARCEL

An area of approximately 23 acres located on the west side of the runway is the only undeveloped landside area currently located on the airport. Although opportunities for acquiring additional property abutting the east side of the airport may occur over time, the long-term plan for the west parcel is central in evaluating the airport's ability to accommodate future facility needs.

A large percentage of the west area consists of wetlands. Development of this site will involve varying degrees of wetland mitigation, depending on the footprint of the development. The cost of wetland mitigation, combined with extending utilities, surface access, and providing for stormwater management creates a relatively expensive development scenario. Based on these factors, it is assumed that the financial feasibility of developing this site will require a use with strong revenue generation or employment potential that provides the City of Auburn with sufficient justification for the investment and the ability to set reasonable user fees/lease rates for prospective tenants. FAA funding of wetland mitigation (for aeronautical safety, due to proximity to the runway) could significantly reduce local site development costs, but the infrastructure costs would still represent a significant local investment.

The development and economic constraints associated with the site will play a large role in defining its future use. Market conditions will also be significant in determining revenue generating potential for a variety of potential uses.

For planning purposes, several conceptual development options have been prepared for the west landside area. **Figure 5-4** depicts two development options that utilize a large portion of the site, or the entire site. Both options require significant (off-site) wetland mitigation. **Figure 5-5** depicts two lower density development options that significantly reduce on-site wetland impacts.

<u>West Development Option A – Helicopter Apron</u>

The elements of Option A include:

- Helicopter Parking Apron (22 parking positions depicted)
- Commercial Hangar Sites (aircraft storage, operations, classrooms)
- Vehicle Parking
- Partial Length Parallel Taxiway
- Surface Access
- Development Reserve (north section)

Option A locates a helicopter parking apron in the southern half of the parcel, with space to accommodate several large hangars along the western side of the apron. This concept would be consistent with a larger locally-based helicopter flight training school. The apron could also be configured to accommodate a combination of helicopters and fixed wing aircraft. The building development area has the potential of accommodating a variety of related facilities related to aerospace and aviation education.

A partial-length west parallel taxiway with taxiway connections into the west parcel is depicted. Options for extending the parallel taxiway to the Runway 34 end could be accommodated for ADG I aircraft within an existing easement.

Surface access is provided to the site from the south via an easement connection to 16th Street.

The north section of the site is identified as a development reserve. This area contains the largest concentration of wetlands. Future use would be determined based on market demand and site development considerations.

West Development Option B – Air Cargo/Mixed Use Hangars

The elements of Option B include:

- Aircraft Parking Apron (10 cargo parking positions depicted)
- Air Cargo Building Sites with Truck Access/Loading
- Vehicle Parking and Surface Access
- Mixed Use Commercial Hangar Area
- Aircraft Fuel Storage Area (identified as jet fuel)
- Partial Length Parallel Taxiway

Option B locates an air cargo apron in the northern half of the parcel, with space to accommodate several large cargo buildings around the perimeter of the apron. The cargo concept is specific to the potential of accommodating express cargo operations that are currently located at other nearby airports. Runway length effectively limits aircraft size to single-engine and multi-engine turboprops, which are used extensively to transport cargo and small package express to smaller communities throughout Washington.

The apron is configured with two north-south taxilanes designed for ADG II aircraft (115-foot taxilane clearance) providing access to two drive-through parking rows. A partial-length west parallel taxiway with taxiway connections into the west parcel is depicted.

As with Option A, surface access is provided to the site from the south via an easement connection to 16th Street.

The south section of the site is configured with three rows of commercial and mixed use hangars. Surface access to the middle and eastern hangar rows divides the site into two separate development areas. The hangar development area is also configured to accommodate ADG II aircraft.

West Development Option C – Moderate Wetland Mitigation Option

The elements of Option C include:

- Medium Development Area (Approximately 8 acres)
- Building Sites located on Southern Half of Site
- Avoids Largest Wetland Areas on Site
- Aviation/Non-Aviation Use Potential

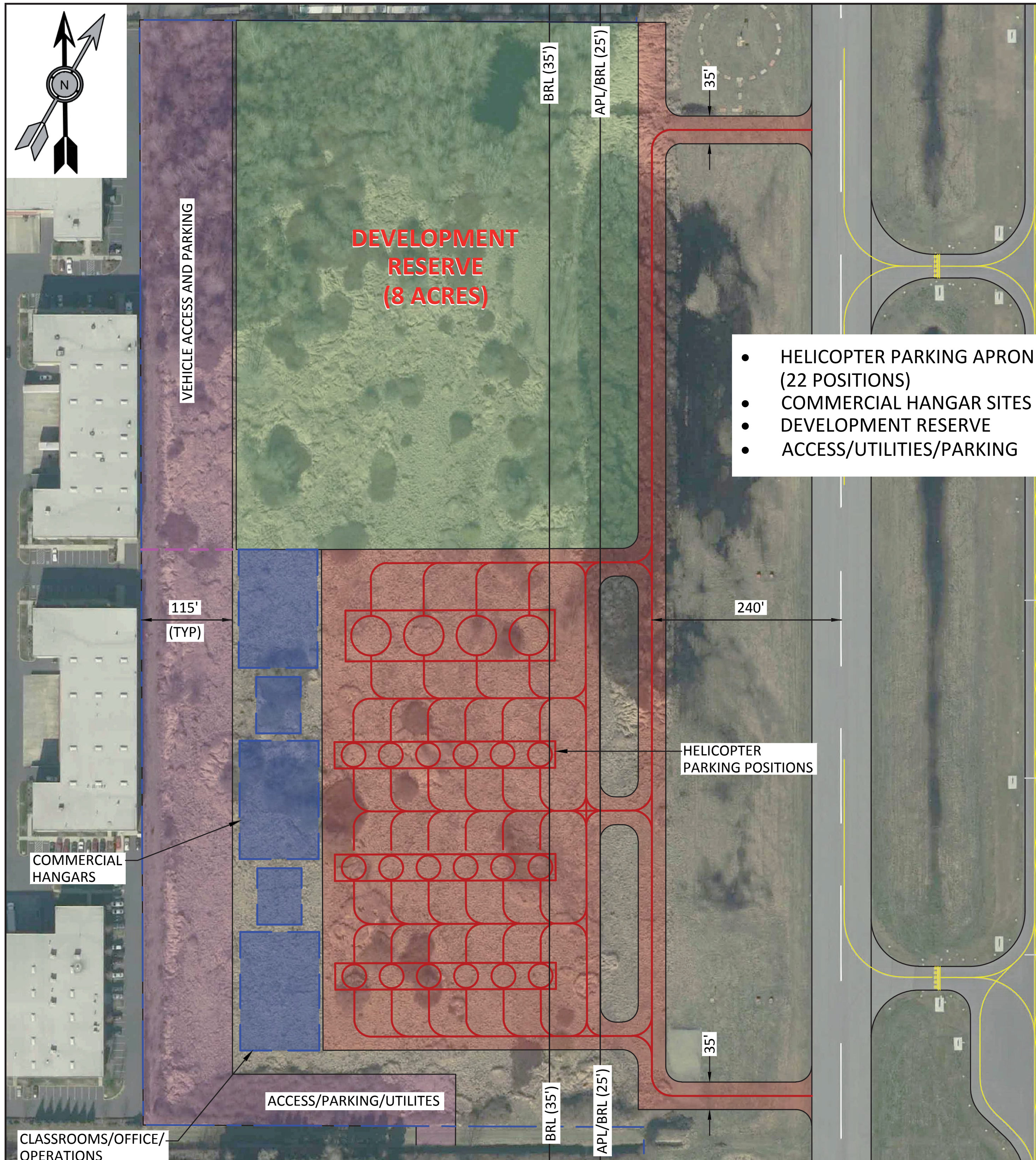
Option C provides a moderate development concept that reduces wetland impact and mitigation requirements by concentrating development in areas with less wetland coverage. It is anticipated that the cost of extending surface access and utilities to the site will make the smaller scale development more costly on a per square foot basis. Options for providing taxiway connection to the runway can be added in the event that aviation related uses are considered moving forward.

West Development Option D – Minimal Wetland Mitigation Option

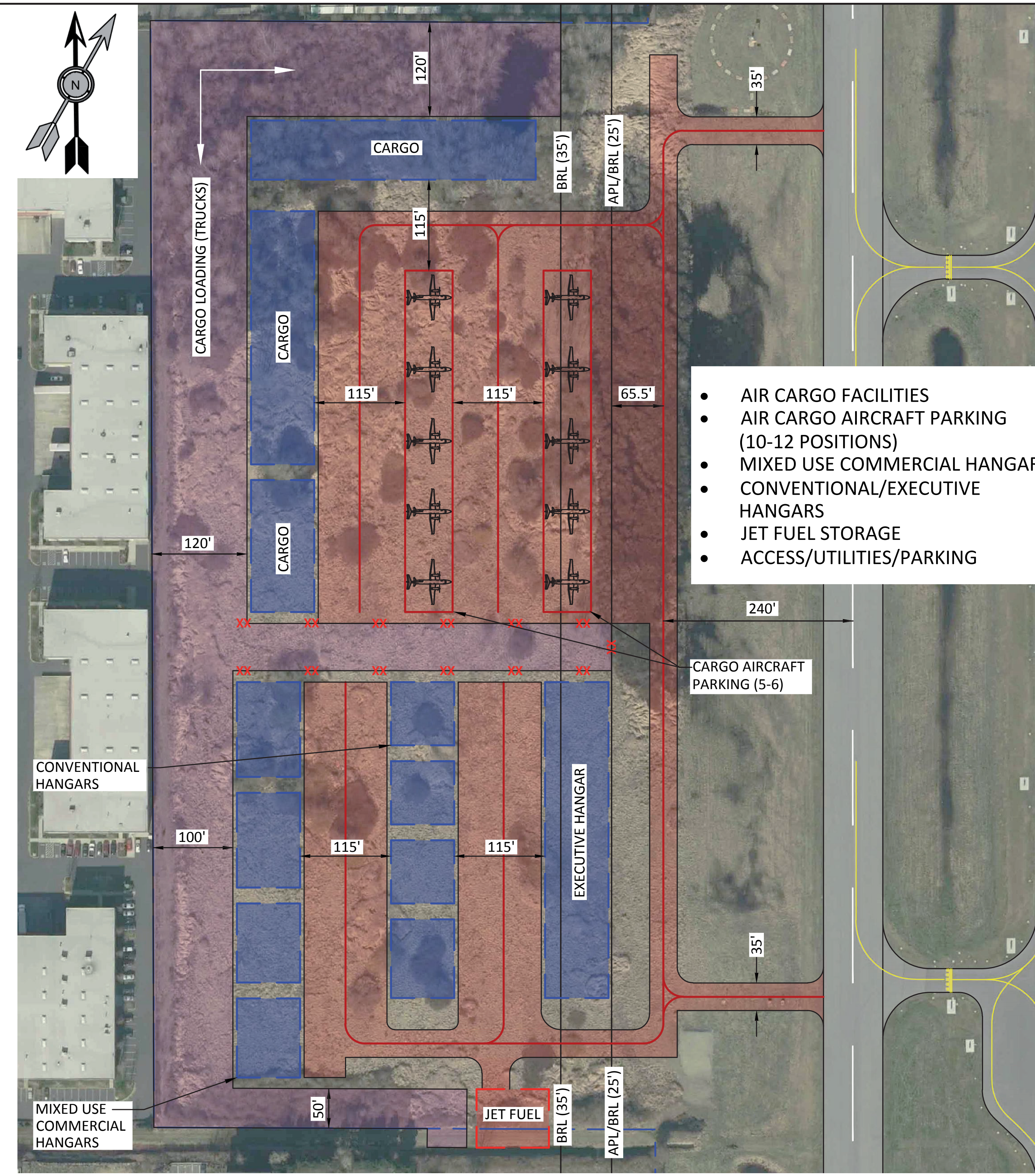
The elements of Option D include:

- Smaller Development Area (Approximately 5 acres)
- Building Sites located on Southern End of Site
- Avoids Largest Wetland Areas on Site
- Aviation/Non-Aviation Use Potential

Option D provides a low intensity development concept that significantly reduces wetland impact and mitigation requirements by concentrating development at the extreme south end of the site. As with Option C, the cost of extending surface access and utilities to the site will make the smaller scale development more costly on a per square foot basis. Options for providing taxiway connection to the runway can be added in the event that aviation related uses are considered moving forward.



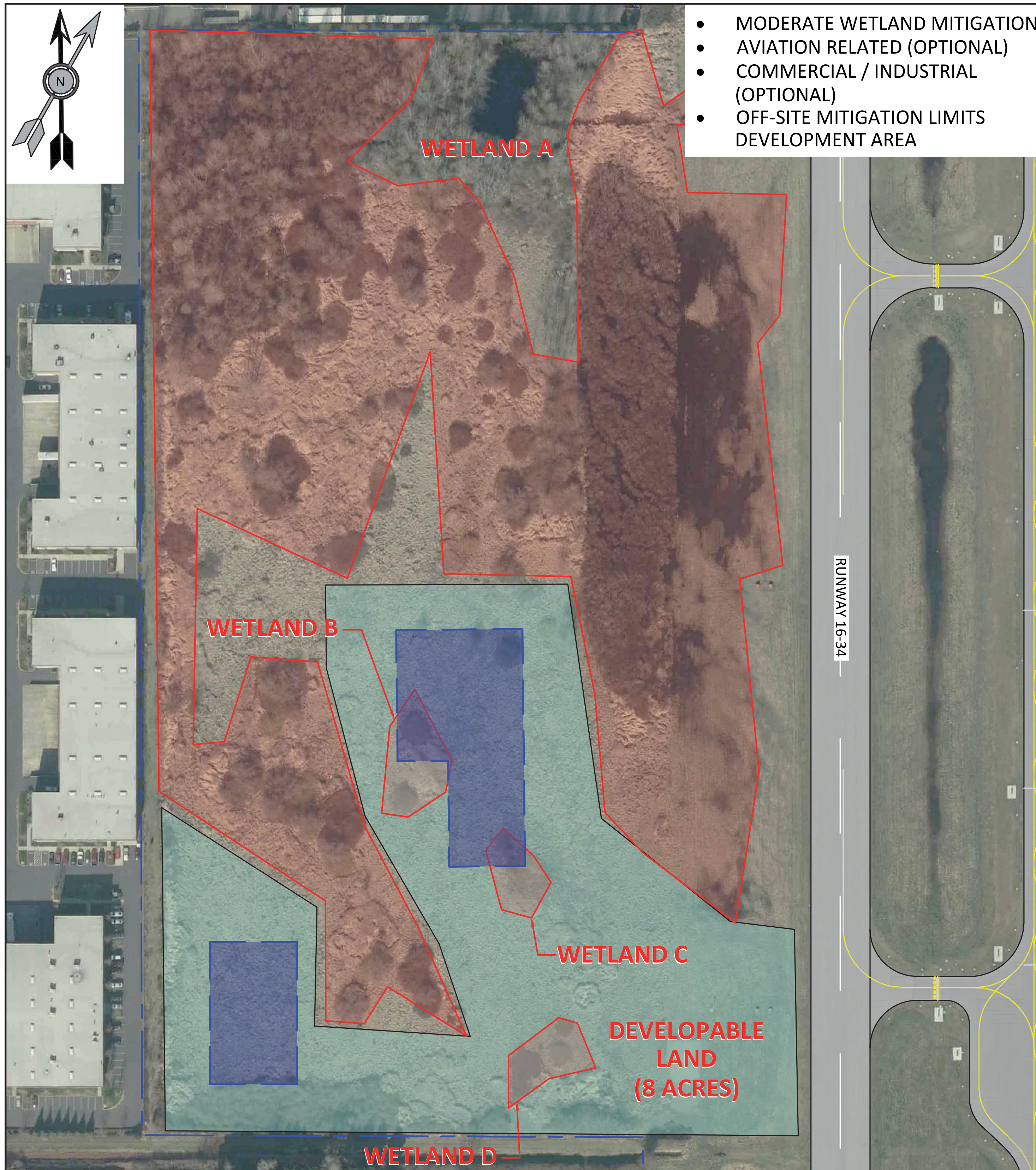
WEST DEVELOPMENT OPTION A HELICOPTER



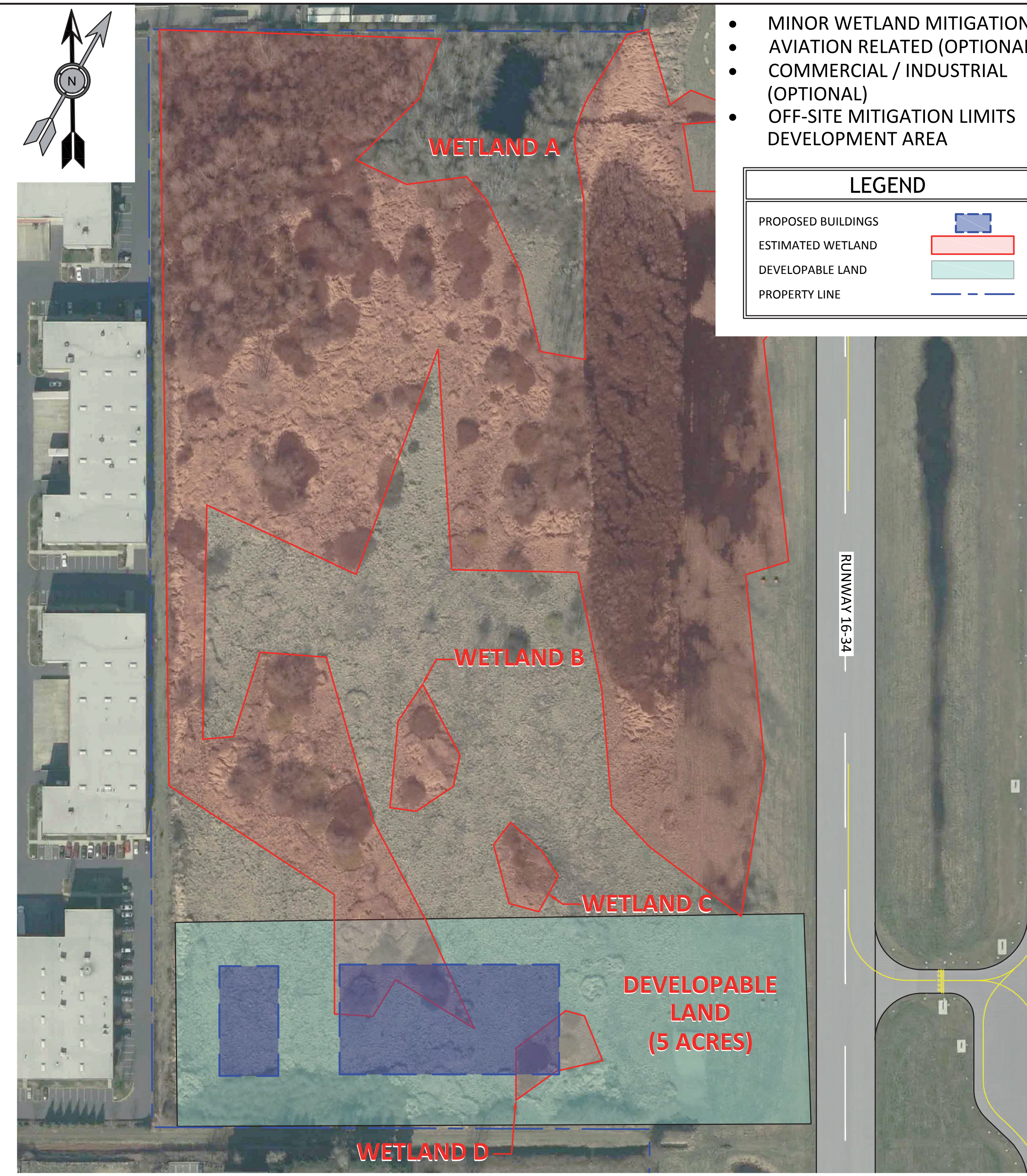
WEST DEVELOPMENT OPTION B AIR CARGO/MIXED USE HANGARS

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

WEST LANDSIDE DEVELOPMENT OPTIONS A & B | **FIG. 5-4**



WEST DEVELOPMENT OPTION C



WEST DEVELOPMENT OPTION D

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

WEST LANDSIDE DEVELOPMENT OPTIONS C & D | **FIG. 5-5**

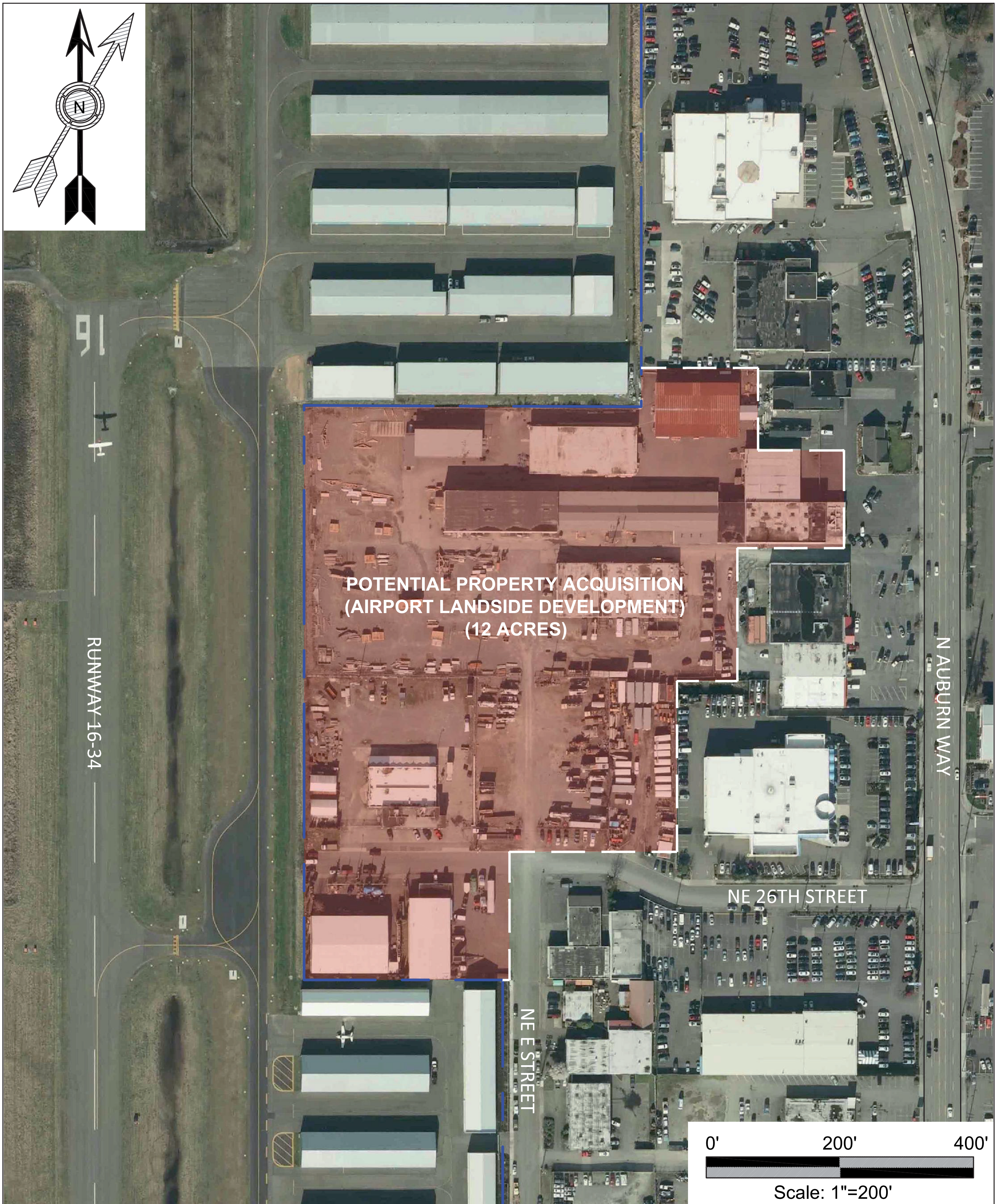
CENTURY WEST ENGINEERING CORPORATION

EAST LANDSIDE EXPANSION OPTIONS – PROPERTY ACQUISITION

It is noted that any of the proposed reconfiguration options for the terminal area or southeast aprons—either to meet FAA apron design standards or to accommodate other development will reduce aircraft parking capacity currently available.

As noted in the Inventory Chapter, the airport currently has a total of 169 small airplane tiedowns, including those currently in use and others not in regular use. 24 of tiedowns are included in the leased grassy and hard stand parking areas in front of Auburn Flight Service. Accounting for these positions, approximately 145 tiedowns are currently available on the three public aprons on the east side of the runway. Based on the parking calculation conducted in the Facility Requirements analysis, long term (2032) demand for aircraft parking is estimated to be 97 spaces, including 88 small airplane tiedowns, 5 multi-engine parking positions, and 4 transient helicopter parking positions.

The number of small airplane parking positions in the east landside area varies greatly depending on the combination of preliminary development options. From a low of about 44 parking positions to a high of 86 positions, it is evident that additional long-term capacity for aircraft parking may be needed within the current twenty year planning period. Changes in hangar utilization could affect the timing of the demand, but options for acquiring property to provide additional landside capacity should be considered. **Figure 5-6** depicts an industrial area abutting the east side of the airport. The area consists of several individual parcels totaling approximately 12 acres. It is unknown whether any of the property owners would have an interest in a land sale, but based on the airport's limited landside capacity, the city may consider exploring property acquisition options.



POTENTIAL AIRPORT LANDSIDE DEVELOPMENT AREA | **FIG. 5-6**

Airside Development Options

SITE CHARACTERISTICS/LIMITATIONS

The main component of the airside development options is an extension of Runway 16/34 that would increase useable runway length based on to the practical limits of the site (roadways at both ends of the runway). As noted in the facility requirements chapter, the existing runway length of 3,401 feet is too short to accommodate the accelerate-stop distance required for typical small piston multi-engine aircraft (design aircraft) under dry runway conditions, and is significantly shorter than required under wet runway conditions. The same constraints also affect multi-engine turbine aircraft operating on the runway.

The FAA generally recommends that airport master plans be developed in an "unconstrained" manner when initially defining future demand and related facility improvements, rather than establishing pre-defined limits that drive the planning process. In reality, most airports face some practical limit on facility development within their boundaries or on readily-developable adjacent lands. There is often very limited value in exploring major expansion scenarios involving significant cost and impacts on a community, except in rare cases where the overall economic value of the expansion provides a clear pubic benefit.

Ignoring the physical site constraints associated with Auburn Municipal Airport opens a highly theoretical discussion of "what if" that requires extensive changes of built items beyond the airport, including relocation of a major Bonneville electrical transmission line, significant property acquisition and business relocation expense, and realignment of major surface streets.

CONSISTENCY WITH PREVIOUS PLANNING

The current airport planning effort is attempting to maintain consistency with the previous airport master plan approved by the FAA and the City of Auburn in 2002. The 2002 plan recognized the practical limits for lengthening Runway 16/34 created by major surface streets at both ends of the runway: 15th Street NW (Principal Arterial) to the south and 30th Street NE (Non-Residential Collector) to the north. The two streets effectively limit physical runway development to approximately 4,100 feet, and require displaced thresholds to maintain clear approaches and declared distances to address other physical features. Recognizing these site constraints is a significant factor in the current master planning process that underscores the importance of finding innovative design solutions while maintaining an acceptable level of safety.

FAA Advisory Circular (AC) 150/5300-13A, Airport Design describes various applications for use of displaced thresholds. The AC notes *"Threshold displacement should be undertaken only after a full evaluation reveals that displacement is the best alternative."* As noted in the 2002 airport master plan, and confirmed again in the 2013 master plan update, the use of displaced thresholds for Runway 16 and 34 represents the best option available for future runway configuration based on the built items that directly impact approach obstruction clearance. Extending the runway without use of displaced thresholds is only feasible if numerous built items are removed. It is believed that the cost of clearing a shifted Runway 16 approach alone could easily be in the $10 to $20 million range (BPA transmission line relocation, new powerline right of way acquisition, realigned or abandoned 30th Street, property acquisition, building removal, utility relocation, etc.). The financial feasibility for this level of effort is considered low.

The use of displaced thresholds maintains the existing unobstructed approach paths for both runway ends. The additional runway pavement provided at both runway ends is intended to address specific aircraft operational requirements, particularly multi-engine aircraft accelerate-stop and landing distances. The proposed improvements **significantly** improve safety and present the best available development option, consistent with FAA runway design guidance.

FAA GUIDANCE (RUNWAY PROTECTION ZONES)

On September 27, 2012 the FAA released a memorandum **Interim Guidance on Land Uses Within a Runway Protection Zone** (RPZ). The intent of the memorandum was to clarify FAA policy on land uses within RPZs. The FAA emphasizes that the interim guidance does not reflect a new policy with regard to land uses and roads within RPZs, but is intended to provide a consistent, systematic evaluation method based on existing design standards. However, the formal process for evaluating proposed projects at the FAA headquarters level is new and relatively untested, and the criterion used to make a final determination is not clearly defined.

The FAA Seattle ADO recently indicated that the RPZ interim guidance is being reviewed/modified internally to address a variety of concerns which surfaced during early implementation of the policy. A second version of the interim guidance is expected in late 2013 and final guidance is expected in 2014 or beyond. In addition to clarifying the evaluation and determination process, the FAA is expected to clarify whether the final guidance and resulting determinations will be "recommended" or "mandatory."

As noted earlier in the chapter, the evaluation of airside (runway) development options was delayed to allow for additional coordination between the Consultant, City of Auburn and FAA Seattle Airports District Office (ADO), in large part due to use of the RPZ interim guidance noted above. Discussions held during several meetings and teleconferences focused on previous planning, site constraints, project justification, and the 2012 FAA interim guidance on land uses within runway protection zones.

The coordination helped to identify key issues and concerns, and prompted additional policy discussions within the ADO, particularly regarding the use (and funding) of displaced thresholds as part of runway projects. Although the Seattle ADO has long discouraged constructing runway extensions or new runways with displaced thresholds, it is evident that the ability for airport sponsors to conform to the intent of FAA's interim guidance on land uses within RPZs and the ADO policy on constructing displaced thresholds will need to be reconciled. The issues continue to evolve and proposed runway improvements will be evaluated on a case by case basis by the FAA for the foreseeable future.

The FAA interim guidance memorandum outlines an evaluation process related to the introduction of land uses within RPZs. Under the heading "New or Modified Land Uses in the RPZ," the memo identifies seven categories of land uses "requiring coordination with APP-400" [FAA National Airport Planning and Environmental Division, Washington, D.C.]. The section indicates that coordination is required *"…when any of the (described) land uses would enter the limits of the RPZ as the result of:*

- An airfield project (e.g., runway extension, runway shift)
- A change in the critical design aircraft that increases RPZ dimensions
- A new or revised instrument approach procedure that increases runway dimensions
- A local development proposal in the RPZ (either new or reconfigured)"

The memorandum notes "The interim policy only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location." If neither of these conditions occurs as the result of the proposed development, it would appear that preparation of an "RPZ memo" for FAA APP 400 review is not required. The FAA Seattle ADO is currently determining whether a separate RPZ memo and headquarters review is required for the proposed runway extension options (presented later in the chapter), particularly for options that do not involve any changes to the location of existing RPZs or the composition of roadways or other land uses within existing RPZs.

JUSTIFICATION OF NEED

The need for additional length on Runway 16/34 was noted in the both the forecast and facility requirements analyses and is required to improve safety for light twin-engine aircraft accelerate-stop

and landing operations, particularly during wet runway conditions. The updated 20-year forecast of multi-engine aircraft operations for Auburn Municipal Airport ranges from 800 to 1,400.

As noted in the facility requirements chapter, the FAA requires justification for all FAA-funded runway extensions. Typically, documentation of a minimum 500 annual itinerant operations by aircraft that are constrained by the existing runway length is required to meet the FAA's "substantial use" threshold for funding. Local pilots operating multi-engine turbine and piston aircraft on Runway 16/34 report weight limited or time of day restricted takeoffs during warmer months. Airport officials will be required by FAA to document activity and demonstrate justification prior to project implementation, assuming FAA funding.

As noted in the facility requirements chapter, the accelerate-stop distance for a typical multi-engine piston aircraft (Beechcraft Baron 58P) was reviewed for Auburn Municipal Airport to evaluate runway length requirements. At maximum gross takeoff weight, the Baron 58P requires approximately 3,600 feet for the accelerate-stop distance on a dry runway surface with optimal pilot performance (recognizing engine failure and responding within 3 seconds). This distance could be expected to increase by up to 15 percent (approximately 4,140 feet) on a wet runway.

The importance of having the longer of the accelerate-stop and accelerate-go (takeoff and climb to 50 feet) distances for multi-engine aircraft operations is emphasized in the FAA Handbook 8083.3A –

Transitioning to Multi Engine Airplanes. As noted in the handbook *"Once the decision to reject a takeoff is made* (when an engine failure occurs before liftoff), *the pilot should promptly close both throttles and maintain directional control with the rudder, nosewheel steering, and brakes. Aggressive use of rudder nosewheel steering, and brakes may be required to keep the aircraft on the runway. Particularly, if an engine failure is not immediately recognized and accompanied by prompt closure of both throttles. However, the primary objective is not necessarily to stop the airplane in the shortest distance, but to maintain control of the airplane as it decelerates. In some situations, it may be preferable to continue into the overrun area under control rather than to risk directional control loss, landing gear collapse, or tire/brake failure in an attempt to stop the airplane in the shortest possible distance."*

This principle relates directly to the use of displaced thresholds (in lieu of stopways or simple paved overruns) at the far end of the takeoff runway for aircraft roll-out and stopping after a rejected takeoff. The use of displaced thresholds at the takeoff end of the runway provides additional useable runway for pilots to reach liftoff speed or to recognize and safely react to an engine failure experienced during a critical stage of takeoff. As noted earlier, the 2002 FAA-approved Airport Layout Plan (ALP) depicts future runway extensions at both ends of Runway 16/34, with the extensions configured as displaced thresholds.

Available data indicate the current level of multi-engine aircraft operations at Auburn Municipal Airport exceeds the FAA "substantial use threshold" of 500 annual operations. However, it is important to note that the airport has previously experienced significantly higher levels of multi-engine activity when locally-based flight training schools were in operation. As noted in Table 3-8 (forecast chapter), a "Flight School Scenario" was included among several preliminary forecast projections, with more than 180,000 annual operations by 2032 (compared to 128,000 operations in the FAA-recommended forecast). This simply suggests that if a major flight training operation relocated to the airport in the future, an increase in multi-engine activity, above forecast levels could be expected.

Preliminary Airside (Runway) Options

Based on the additional coordination with FAA described earlier, the Consultant has prepared two preliminary runway options for review. Both options limit the runway footprint to developable lands bordered by existing city streets at both ends, as depicted on the 2002 FAA-approved Airport Layout Plan (ALP). **Option A** closely follows the FAA's guidance on new or modified land uses in RPZs, as currently presented in the "interim" form. **Option B** is consistent with common runway design practices, where some changes to RPZ configuration/location and land uses within the RPZs occur. This option reflects the potential for flexibility in the application of FAA's RPZ policy when it is refined and finalized. It is important to note that both options involve identical runway configurations, but apply declared distance limitations in different ways depending on the level of flexibility allowed by FAA for future projects.

RUNWAY OPTION A

Runway Option A (see **Figure 5-7**) was designed specifically to avoid any changes in the location, function, or composition of land uses (public roads, vehicle parking, buildings, etc.) within the existing RPZs for Runway 16/34 in order to conform to the interim guidance provided by FAA. This is accomplished by adding displaced thresholds at both ends of the runway but effectively "freezing" the existing RPZ locations and designating them as future "arrival/departure RPZs" for the extended runway.

The proposed improvements will provide additional runway length for takeoff while maintaining existing landing threshold locations and the existing 20:1 obstacle clearance surfaces (as depicted on the 2002 ALP drawing set). Portions of the displaced threshold at the opposite end of the runway will be included in published landing distance available and accelerate-stop distance available declared distance dimensions, but will not be included in available takeoff run or distance available dimensions. The amount of useable runway for accelerate-stop and landing distance calculations will be based on runway safety area provided at end of runway. The runway reconfiguration includes new taxiway connections, new or modified lighting, marking and signage. Declared distances would be published in FAA airfield directories and pilots are responsible for observing the published dimensions.

North End: Option A extends Runway 16/34 by 475 feet at the north end to increase useable runway lengths for specific aircraft operations. The new runway section would be designated as displaced threshold for the existing Runway 16 threshold. The full length of the displaced threshold would be available for Runway 16 aircraft takeoff operations, while Runway 16 approaches and landings would not be affected (an increase in useable runway would also be provided by the proposed extension at the south end of the runway, described later in this section). No changes to the existing Runway 16 visual guidance indicators or runway end identifier lights (REIL) are required. The approximate runway lengths available (to be verified during survey and design) for Runway 16 operations are summarized below:

OPTION A DECLARED DISTANCE SUMMARY (RWY 16)

RUNWAY 16	CURRENT USEABLE RUNWAY	OPTION A	INCREASE IN USEABLE RUNWAY
Takeoff	3,401 feet	3,875 feet	474 feet (+13.9%)
Landing	3,401 feet	3,595 feet	194 feet (+5.7%)
Accelerate-Stop (emergency)	3,401 feet	4,069 feet	668 feet (+19.6%)

The northern runway extension is contained entirely within existing airport property and is designed to provide adequate wingtip clearance from the centerline of the northern-most connecting taxiway and a new frangible jet/prop blast fence that would protect users on the adjacent 30th Street.

Approximately 278 feet of northern runway extension (immediately north of the Runway 16 threshold) would be available for Runway 34 landing distance available and accelerate-stop distance calculations. The full length of the displaced threshold is not available for these operations due to the requirement to provide standard (240 feet) runway safety area at the far end of the runway.

South End: Option A extends Runway 16/34 by 243 feet at the south end to increase useable runway lengths for specific aircraft operations. The new runway section would be designated as displaced threshold for the existing Runway 34 threshold. The full length of the displaced threshold would be available for Runway 34 aircraft takeoff operations, while Runway 34 approaches and landings would not be affected (an increase in useable runway would also be provided by the proposed extension at the north end of the runway described above). No changes to the existing Runway 34 visual guidance indicators or runway end identifier lights (REIL) are required. The approximate runway lengths available (to be verified during survey and design) for Runway 34 operations are summarized below:

OPTION A - DECLARED DISTANCE SUMMARY (RWY 34)

RUNWAY 34	CURRENTUSEABLE RUNWAY	OPTION A	INCREASE IN USEABLE RUNWAY
Takeoff	3,401 feet	3,643 feet	242 feet (+7.1%)
Landing	3,401 feet	3,679 feet	278 feet (+8.2%)
Accelerate-Stop (emergency)	3,401 feet	3,922 feet	521 feet (+15.3%)

The southern runway extension is contained entirely within existing airport property, although property acquisition is required to accommodate a portion of the extended runway safety area and a new frangible jet/prop blast fence that would protect users in the adjacent Park and Ride lot. The future end of runway pavement is approximately 192 feet to the north edge of the parking lot. The hotel property located near the southeast corner of the runway precludes a southern extension of Taxiway A to provide access a longer section of displaced threshold.

RUNWAY OPTION B

Runway Option B (see **Figure 5-8**) provides the same future runway configuration as Option A, which maximizes the useable runway footprint within the practical development limits of the airport site. The primary change is related to the placement of the departure RPZs, which then affect takeoff distance and takeoff run available declared distance dimensions for the runway. As with Option A, this option includes displaced thresholds at both ends of Runway 16/34 to increase available runway lengths for specific aircraft operations.

Unlike Option A, which locates the departure RPZs 200 feet beyond the opposite runway thresholds, Option B locates the departure RPZs to coincide with the end of useable runway for takeoff based on FAA runway safety area and object free area standards at the far ends of the runway. This adjustment reflects runway design practices that were commonly in use prior to the FAA's interim guidance on land uses in RPZs.

Option B creates separate arrival and departure RPZs at both runway ends. The arrival RPZs are unchanged from Option A or the arrival/departure RPZs currently defined for Runway 16/34. As a result, there are no changes to approach obstruction clearance, roads, or other land uses within the arrival RPZ. By shifting the departure RPZs north and south, existing land uses and roads located within the existing RPZs for Runway 16/34 become slightly more prominent in the relocated RPZs.

As noted earlier, the final FAA guidance for addressing land uses in RPZs has not been finalized. Option B provides a marginal increase in useable runway compared to Option A for some aircraft operations in the event the final FAA policy allows additional design flexibility when implemented.

North End: Same physical pavement configuration and dimensions as Option A. Shifting the departure RPZs outward, increases takeoff distance dimensions (declared distances) compared to Option A. The approximate runway lengths available (to be verified during survey and design) for Runway 16 operations are summarized below:

OPTION B DECLARED DISTANCE SUMMARY (RWY 16)

RUNWAY 16	CURRENT USEABLE RUNWAY	OPTION B	INCREASE IN USEABLE RUNWAY
Takeoff	3,401 feet	4,069 feet	668 feet (+19.6%)
Landing	3,401 feet	3,595 feet	194 feet (+5.7%)
Accelerate-Stop (emergency)	3,401 feet	4,069 feet	668 feet (+19.6%)

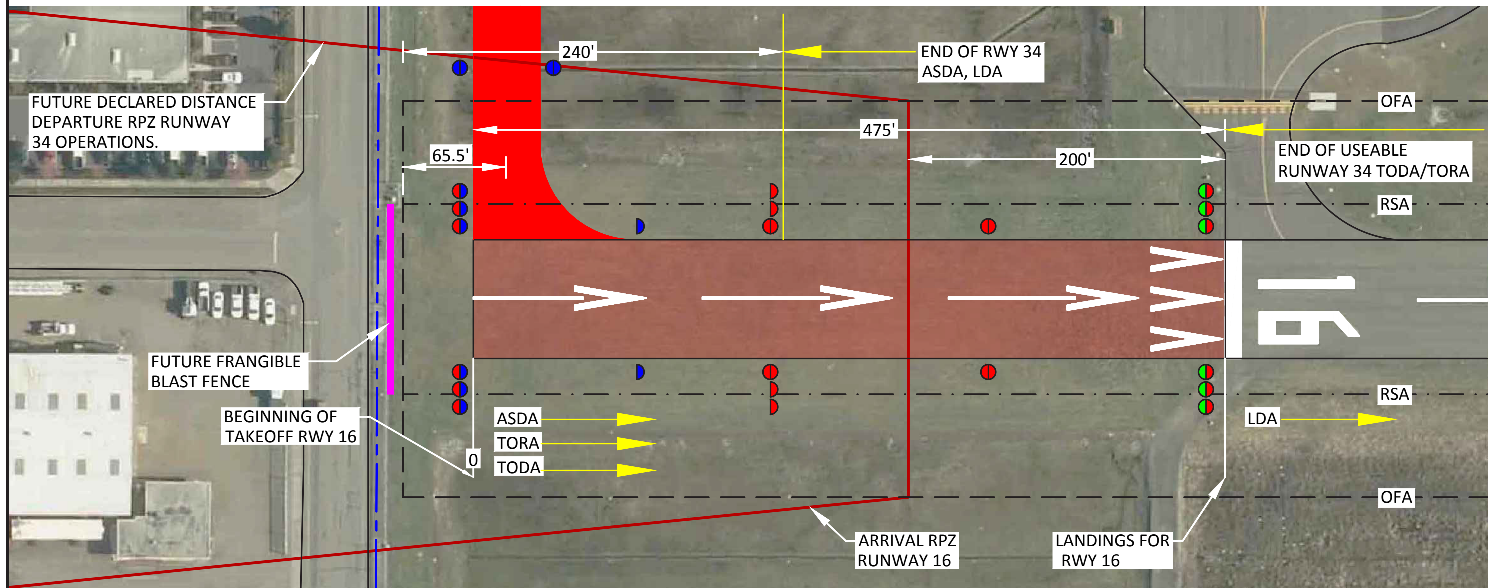
South End: Same physical pavement configuration and dimensions as Option A. Shifting the departure RPZs outward, increases takeoff distance dimensions (declared distances) compared to Option A. The approximate runway lengths available (to be verified during survey and design) for Runway 34 operations are summarized below:

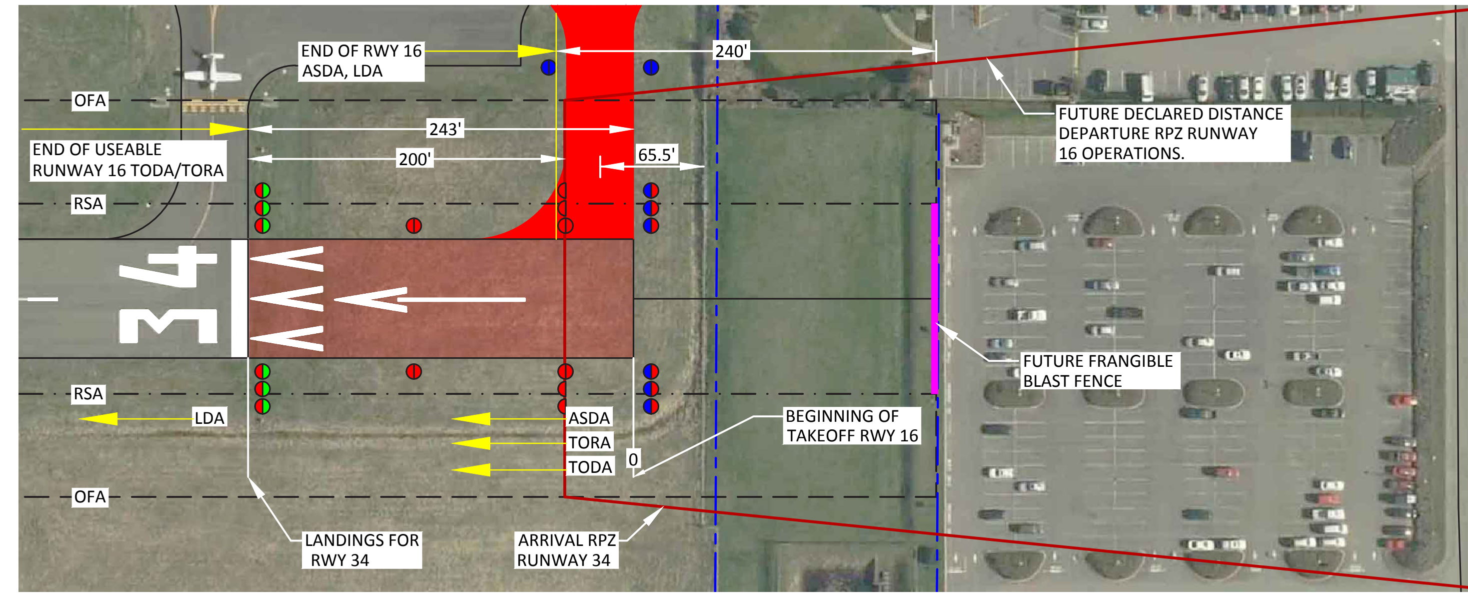
OPTION B - DECLARED DISTANCE SUMMARY (RWY 34)

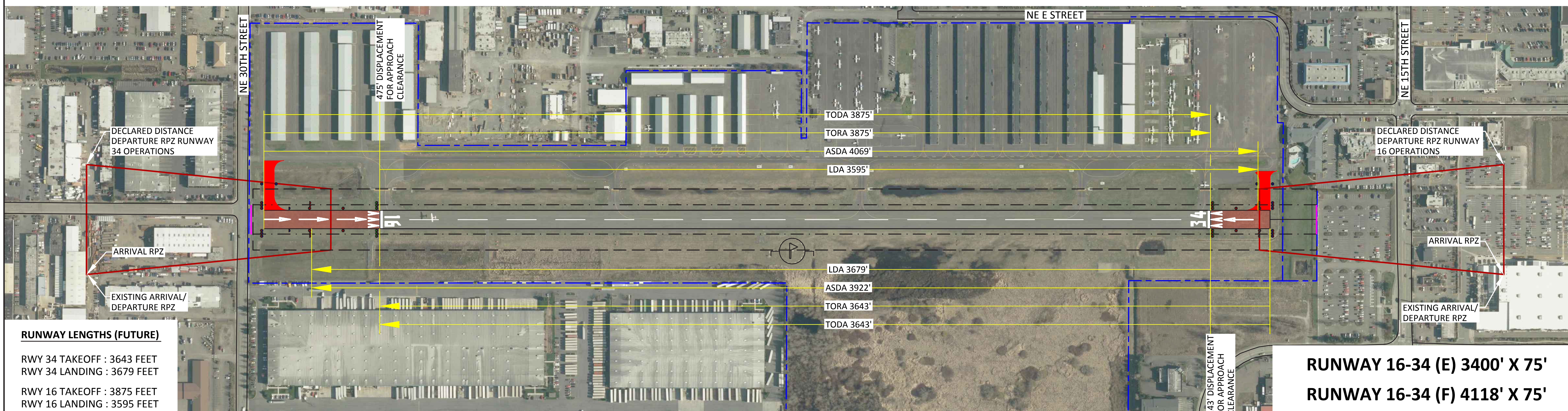
RUNWAY 34	CURRENT USEABLE RUNWAY	OPTION B	INCREASE IN USEABLE RUNWAY
Takeoff	3,401 feet	3,922 feet	521 feet (+15.3%)
Landing	3,401 feet	3,679 feet	278 feet (+8.2%)
Accelerate-Stop (emergency)	3,401 feet	3,922 feet	521 feet (+15.3%)

SUMMARY

The preliminary airside (runway) options will be evaluated by the planning advisory committee and City staff, with input provided by FAA, to identify a preferred development alternative that can be combined with the preferred landside development alternative for depiction on the updated Airport Layout Plan (ALP).







RUNWAY LENGTHS (FUTURE)

RWY 34 TAKEOFF : 3643 FEET
RWY 34 LANDING : 3679 FEET

RWY 16 TAKEOFF : 3875 FEET
RWY 16 LANDING : 3595 FEET

RUNWAY 16-34 (E) 3400' X 75'

RUNWAY 16-34 (F) 4118' X 75'

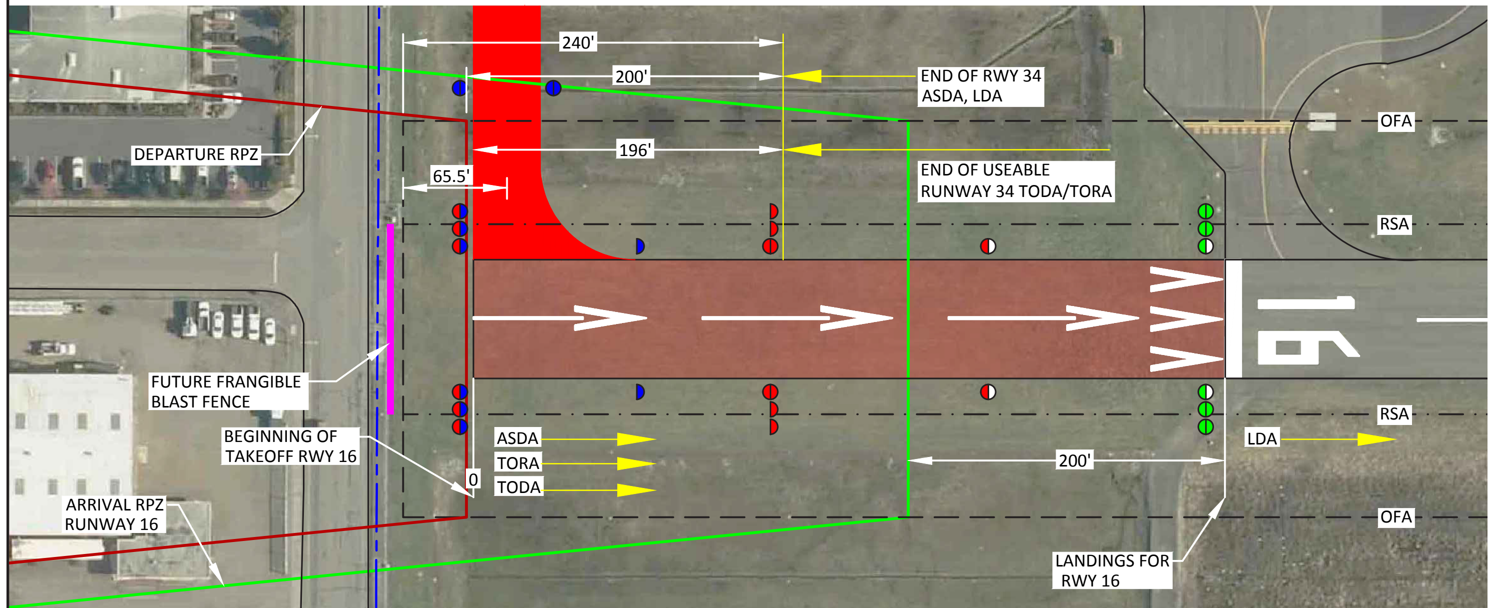
KEY FEATURES

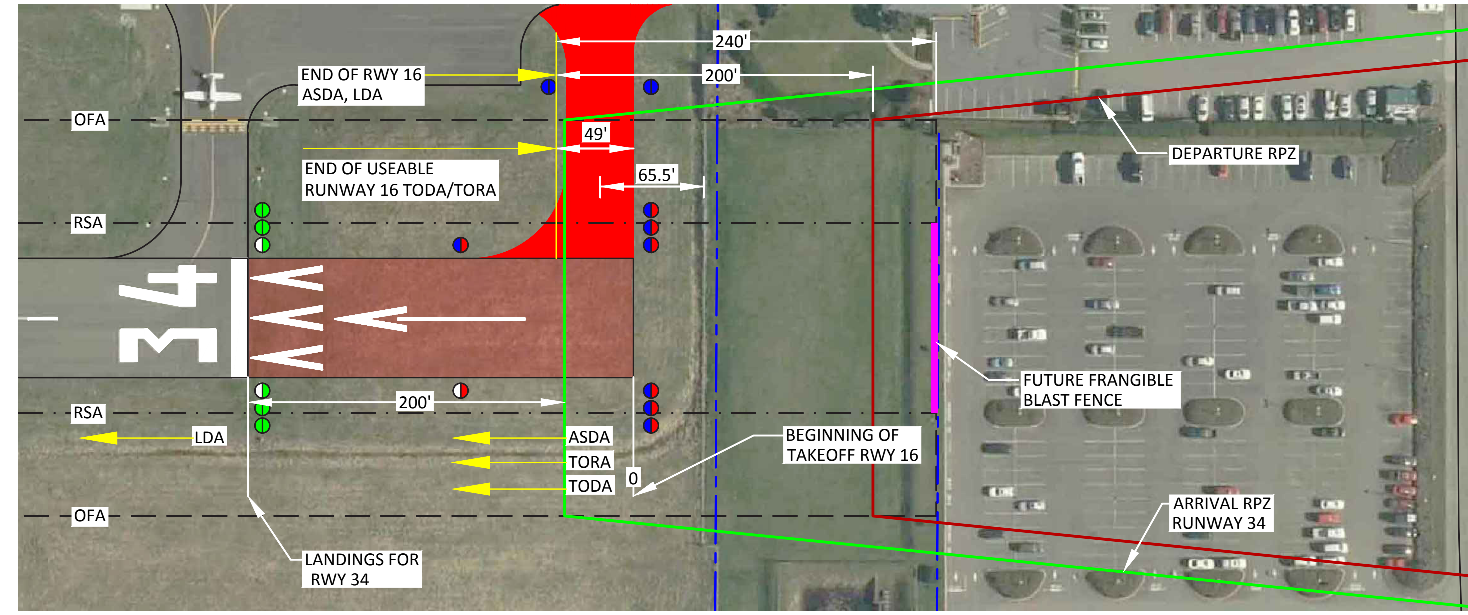
- NO CHANGE IN EXISTING RPZ LOCATIONS (THROUGH USE OF DECLARED DISTANCES)
- NO CHANGE IN CURRENT ROAD/RPZ CONFIGURATION

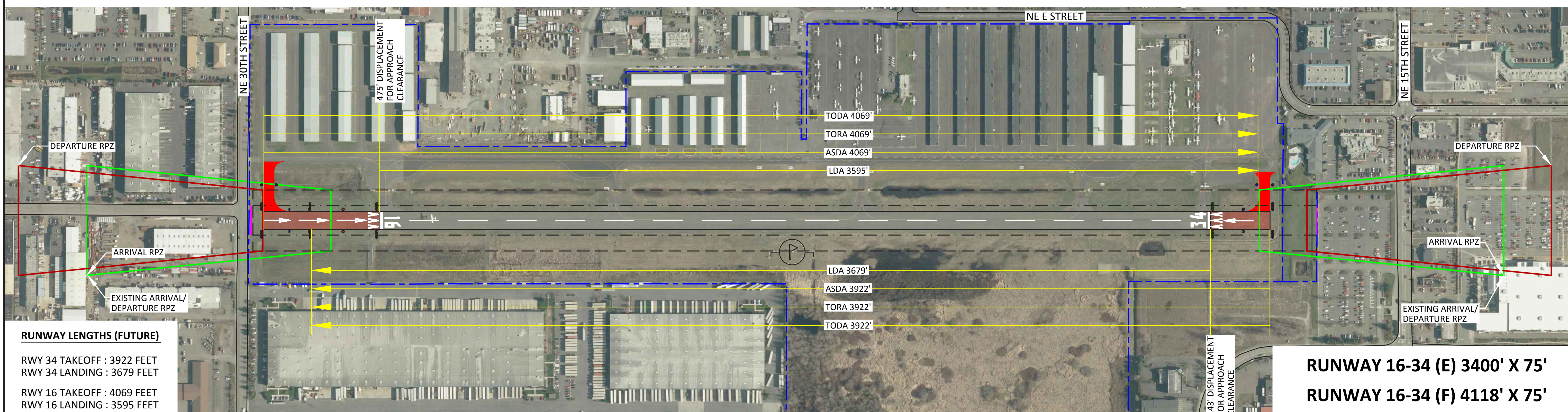
DISPLACED THRESHOLDS WITH DECLARED DISTANCES

NOTES

1. DECLARED DISTANCES USED TO MAINTAIN DEPARTURE RPZ @ BOTH RUNWAY ENDS.
2. THIS OPTION LIMITS USABLE RUNWAY FOR TAKEOFF AT FAR ENDS OF RUNWAY, BY MAINTAINING EXISTING DEPARTURE RPZ'S.
3. DECLARED DISTANCES WOULD BE PUBLISHED IN FAA AIRPORT / FACILITIES DIRECTORY (A / FD).
4. DISTANCE TO GO SIGNAGE AND LIGHTING REQUIRED TO IDENTIFY END OF USEABLE RUNWAY.







RUNWAY LENGTHS (FUTURE)

RWY 34 TAKEOFF : 3922 FEET
RWY 34 LANDING : 3679 FEET

RWY 16 TAKEOFF : 4069 FEET
RWY 16 LANDING : 3595 FEET

RUNWAY 16-34 (E) 3400' X 75'

RUNWAY 16-34 (F) 4118' X 75'

DISPLACED THRESHOLDS WITH DECLARED DISTANCES

NOTES

1. DECLARED DISTANCES COMBINED WITH DISPLACED THRESHOLDS.
2. DECLARED DISTANCES WOULD BE PUBLISHED IN FAA AIRPORT / FACILITIES DIRECTORY (A / FD).
3. DISTANCE TO GO SIGNAGE AND LIGHTING REQUIRED TO IDENTIFY END OF USEABLE RUNWAY.

Refined Landside Development

The preliminary landside development alternatives, presented earlier in the chapter, were designed to accommodate the forecast aviation demand and the corresponding facility requirements for Auburn Municipal Airport for the twenty year planning period (2012-2032). The preferred elements of the preliminary alternatives were identified and further refined to reflect review comments provided by members of the planning advisory committee, city staff, airport management, airport users, FAA and WSDOT Aviation. The airside (presented earlier) and landside elements of the preferred alternative will be incorporated into the draft Airport Layout Plan (ALP) and Capital Improvement Program to allow further review and refinement. Figures 5-9 through 5-12, presented at the end of this section, depict the refined elements of the preferred landside alternative. Below is a short summary of each area:

EAST TERMINAL AREA DEVELOPMENT (SEE FIGURE 5-9)

The refined terminal area concept includes a new building to accommodate fixed base operator (FBO) office and hangar space, airport management offices, and related uses. As depicted, the 2-story building is approximately 24,000 square feet of finished interior space, which could be reduced by incorporating full height hangar space as part of the ground floor. The actual building configuration would be determined by market demand and lease potential. At more than 500 feet east of the runway centerline, a building height of approximately 54 feet (above runway elevation) could be accommodated without penetrating the runway transitional surface. Local zoning will determine maximum building height allowed that is compatible with the protected airspace.

The terminal area development includes a new one-way perimeter roadway and sidewalk extending from the main airport entrance, northward to the FBO building site. The existing access roadway is reconfigured and a new south access road extends from the main entrance to the south hangar area. The development includes 71 new vehicle parking spaces located north of the main entrance to serve the FBO building and the adjacent aircraft parking apron. The existing roadway and vehicle parking serving the "506" building is reconfigured to accommodate the reconfigured main apron. 17 vehicle parking spaces (reduced from 33) are located along the entrance roadway, west of a new roundabout.

When combined, the new FBO building and the existing "506" building could provide approximately 28,000 square feet of leasable office and commercial space. With commercial hangar space (assume 6,000 square feet) integrated into the new FBO building, the two buildings would provide approximately 16,000 square feet of leasable office and operations space. City of Auburn off street vehicle parking requirements (ACC 18.52.020) are determined based on use, with a prescribed number of parking spaces per square feet of building area. The requirements for land uses most similar to potential airport development (warehousing, business and professional office, and small (<15,000 sf) retail commercial) range from 1 space per 2,000 square feet (warehousing) to 2.5 spaces per 1,000 square feet (small retail). Depending on actual uses within the buildings, and the building configurations, vehicle parking requirements could range from 35 to 70 spaces. The additional parking in the terminal area would be available to serve the adjacent aircraft parking apron and hangars.

The reconfigured apron maintains existing east-west rows of small airplane tiedowns, although the spacing between the rows has been increased to meet FAA design standards. The reconfigured main apron includes 28 small airplane tiedowns and three drive-through parking positions. The aircraft fueling area is relocated to the south end of the main apron, directly west of the "506" building. The existing airport management office is removed with that function relocated to the new FBO building or the "506" building (to be determined).

EAST TERMINAL AREA DEVELOPMENT (POTENTIAL PROPERTY ACQUISITION) (SEE FIGURE 5-10)

As noted previously, the reconfiguration of existing aircraft parking aprons to meet FAA design standards combined with forecast demand for aircraft parking and other types of aviation use facilities on the airport is expected to generate the need for additional aircraft parking capacity (approximately 40 to 50 additional parking positions) in the second half of the 20-year planning period. The cost of wetland mitigation and site development on the west side of Runway 16/34 suggests that acquisition of industrial lands adjacent to the east side of the airport may provide a more economical approach for developing future aviation use facilities.

The discussion of property acquisition options at this stage is intended only to address long term planning needs and has not involved formal analysis of individual land parcels or site conditions, and has not gauged the interest of individual property owners in a potential sale. If the development concept is approved by the City Council, additional refinement will include identifying individual parcel boundaries to determine overall acreage and the current ownership structure to depict on the updated airport layout plan drawing. It is anticipated that the process of property acquisition would extend over many years and be accomplished as parcels become available. As such, facility development may occur in incremental steps based on the assembly of individual land parcels.

The industrial area located north of the terminal area was previously identified as a potential future development area for airport facilities (see Figure 5-6). **Figure 5-10** depicts an aircraft parking apron (36 tiedowns) and hangar development configuration that illustrates the scale and development potential of the site. As depicted, the apron has three taxilane connections to the parallel taxiway and two rows of east-west facing tiedowns with hangar sites located around the apron. Additional development area is located further east (east of NE E Street), depending on the boundaries of individual parcels acquired. Changes in surface access (NE 26th and NE E Street) would be required as part of the redevelopment.

SOUTHEAST TERMINAL AREA DEVELOPMENT (SEE FIGURE 5-11)

The refined landside development concept for this area includes a commercial aviation building, reconfigured apron, additional hangars, and vehicle parking. To accommodate the redevelopment, the existing aircraft parking function would be partially relocated to the main apron area and to other areas of the airport.

As depicted, a two-story commercial aviation building (approximately 72,000 square feet) is located on the southeast apron. The building is intended to accommodate a full service fixed base operator (FBO) with hangar, operations, commercial and office space for tenants. The actual building configuration would be determined by market demand and lease potential. At more than 440 feet east of the runway centerline, a building height of approximately 45 feet (above runway elevation) could be accommodated without penetrating the runway transitional surface. Local zoning will determine maximum building height allowed that is compatible with the protected airspace.

The building is configured with ADG II aircraft access on the north and west ends with a single taxilane connection to the parallel taxiway. The existing aircraft apron located west of the building is maintained for FBO use. The development would eliminate the existing small airplane tiedowns on the southeast apron and reconfigure the apron area directly west of the Auburn Flight Service hangar. A single east-west taxilane connects the north section of the apron and the hangar to the parallel taxiway. 12 small airplane tiedowns are located along the south side of the access taxilane.

Two new multi-unit hangars (4 to 5 units with south facing doors) are located near the north end of the area, adjacent to the apron west of the existing Auburn Flight Service hangar. The hangar located nearest the parallel taxiway (305.5 feet from runway centerline) would be limited to a height of approximately 25 feet on the west wall elevation, although slightly higher roof elevations could be accommodated east of the building restriction line (BRL) remaining beneath the 7:1 transitional surface slope that extends outward from the runway. Vehicle access to the new hangars avoids existing utility and stormwater lines located at the north edge of the development area.

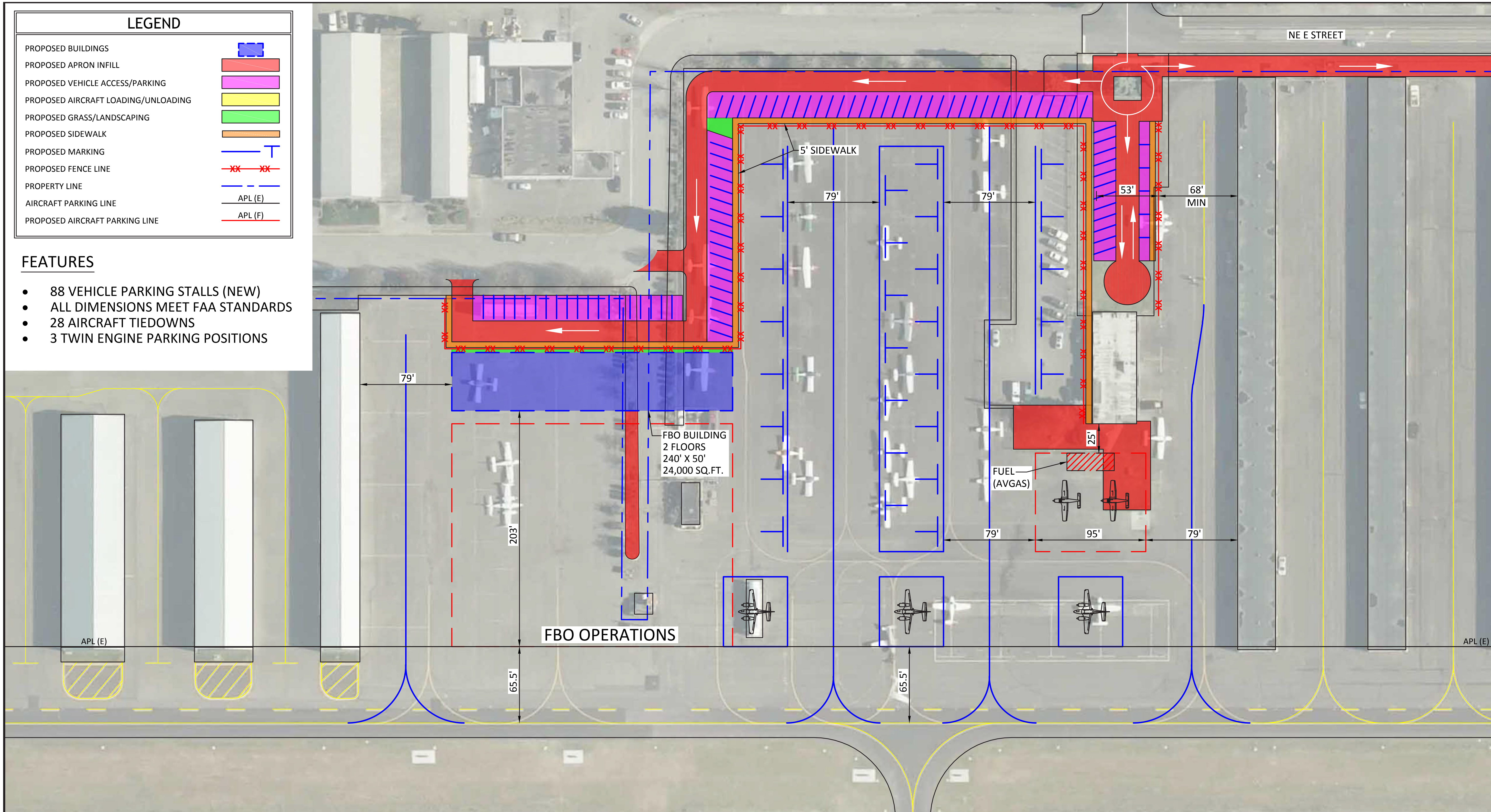
The development includes approximately 132 vehicle parking spaces with access to NE E Street and NE 16th Street. Based on the combination of hangar space and other building functions (office space, commercial space, public areas, etc.) the off street parking identified will be adequate to meet city parking standards, including providing for ADA accessible spaces, bicycle parking, etc. Additional amenities include sidewalks and planting strips.

WEST HELICOPTER DEVELOPMENT (SEE FIGURE 5-12)

Based on the evaluation of preliminary development options for the west parcel, a refined concept was created for small helicopter facilities. The proposed development limits the size of the development footprint to minimize or avoid impacts to existing wetland areas. As depicted, four individual helicopter parking pads and a building area are located at south the site. Pervious surface paths connect the parking pads to the adjacent buildings. Helicopters will be required to continue using the runway-taxiway for takeoffs and landings and hover taxi to/from the parking pads. The area would accommodate both locally-based and transient flight training operations on the opposite side of the runway from fixed wing traffic.

Vehicle access (easement required) is provided to the south end of the site from NE 16th Street. The access road extends around the southern and western perimeter of the site and could extend along the entire western side of the parcel to support future development. Vehicle parking is located adjacent to the building area. Additional expansion area is depicted near the southwest corner of the parcel (non-wetland area).

No taxiway connections between the helicopter facilities and the runway are anticipated in the initial development, although taxiway and apron facilities could be added in the future, which may require wetland mitigation. A separate helicopter practice area is identified north of the parking pad. This area would accommodate training activities occurring near the surface (hovering, hover-taxiing, etc.) that do not require any built items on the ground. The existing gravel surfaced practice pad located near the end of Runway 34 would be removed.



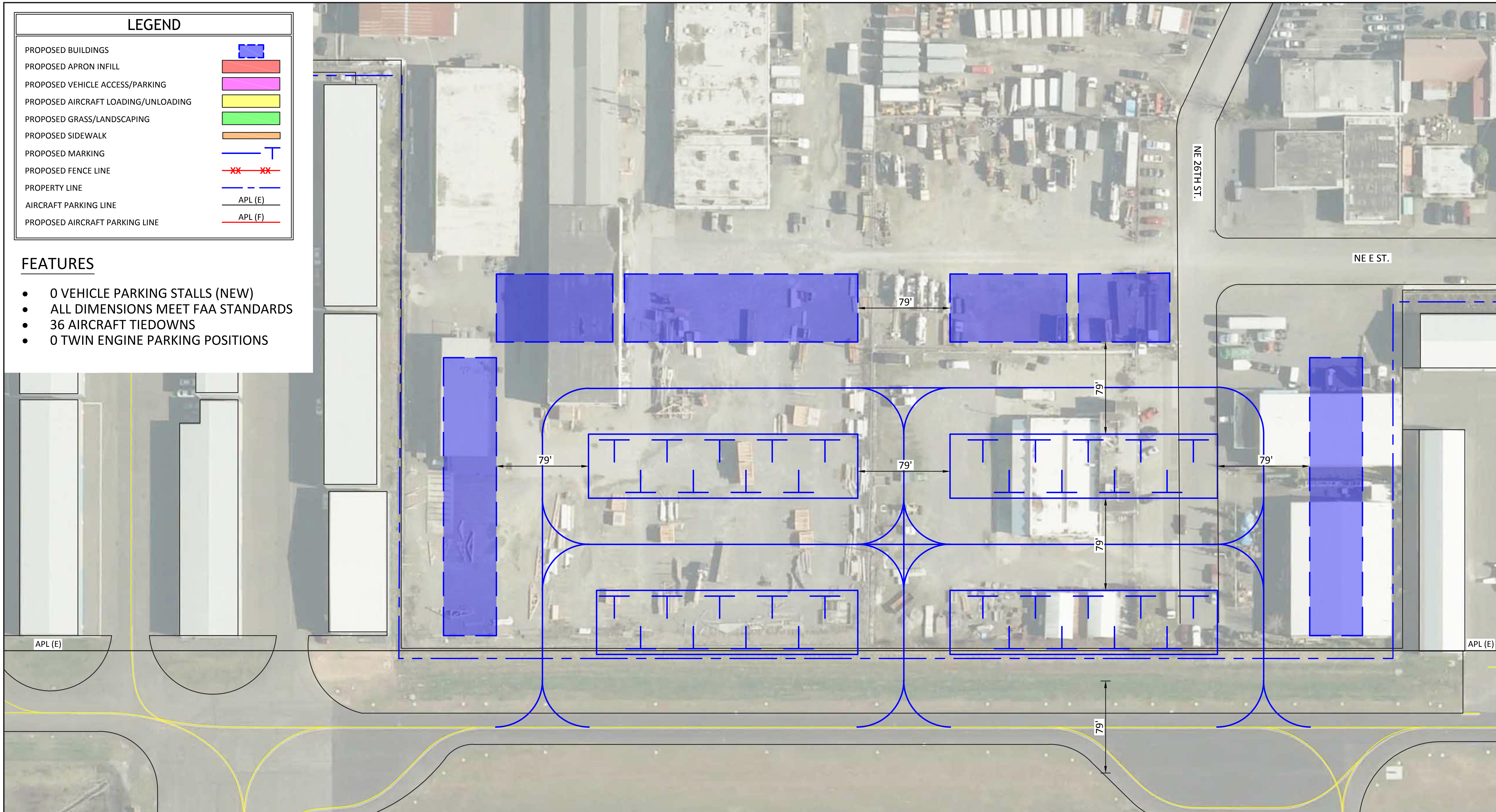
TERMINAL AREA

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

EAST TERMINAL DEVELOPMENT | **FIG. 5-9**

CENTURY WEST ENGINEERING CORPORATION

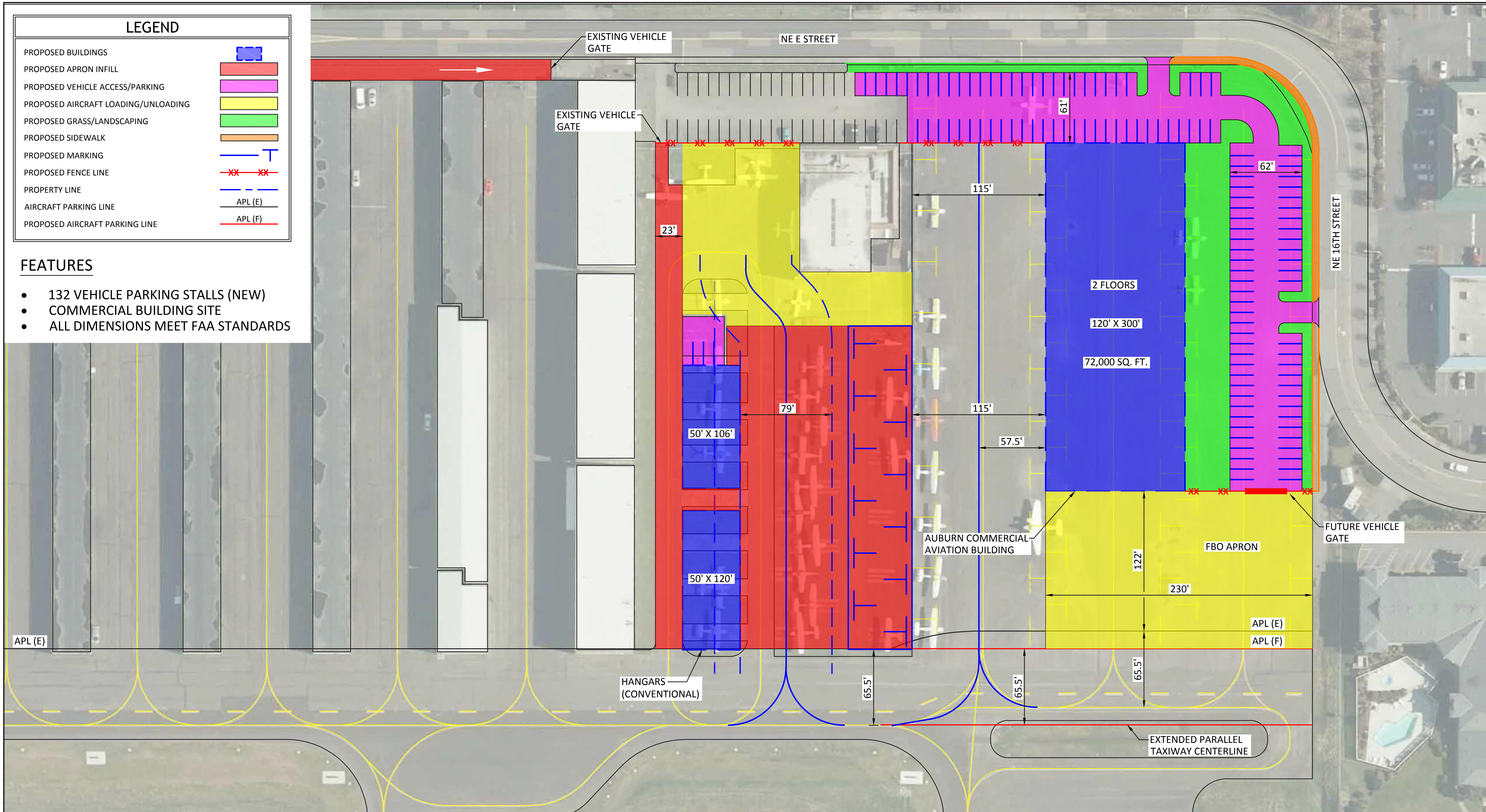


AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

N.E. OFF AIRPORT TERMINAL DEVELOPMENT | **FIG. 5-10**

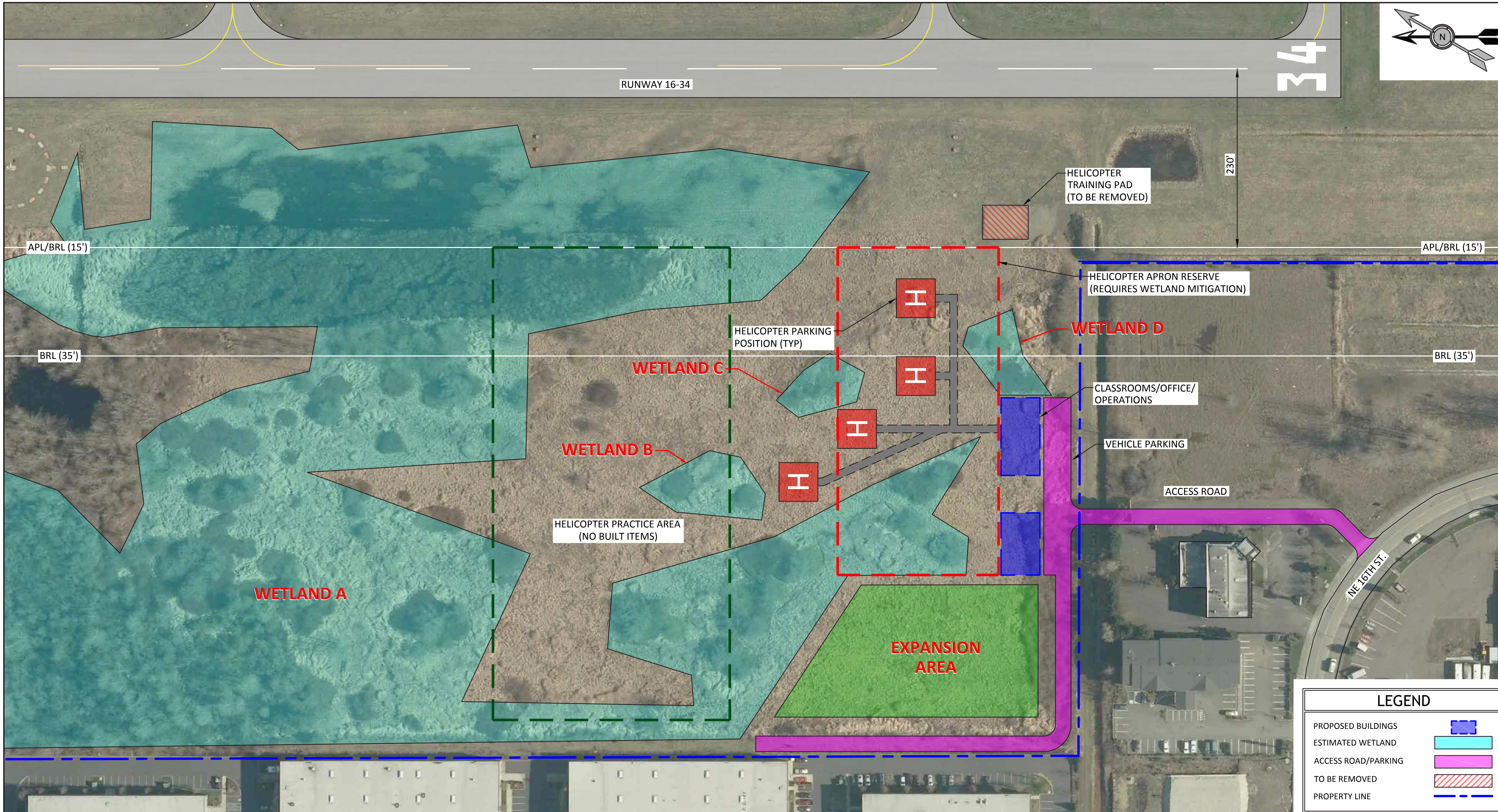
CENTURY WEST ENGINEERING CORPORATION



SOUTH TERMINAL AREA

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

SOUTHEAST TERMINAL DEVELOPMENT | **FIG. 5-11**



AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

WEST LANDSIDE HELICOPTER PADS | **FIG. 5-12**

CENTURY WEST ENGINEERING CORPORATION

Chapter 6 – Environmental Review

Chapter 6 – Environmental Review

Introduction

The purpose of this Environmental Review is to identify physical or environmental conditions of record which may affect the recommended improvements at Auburn Municipal Airport. This environmental review includes the evaluation of airport noise for both existing conditions and future years and an evaluation of other environmental conditions unique to the site.

With the exception of the airport noise evaluation and wetland delineation, the scope of work for this element is limited to compiling, reviewing and briefly summarizing information of record from applicable local, federal and state source for the airport site and its environs. The airport noise evaluation was conducted based on prescribed Federal Aviation Administration (FAA) guidelines, using the FAA's Integrated Noise Model (INM) computer software with several airport-specific inputs including FAA-approved air traffic forecasts, fleet mix, common aircraft flight tracks, and existing/future runway configurations.

Local Site Conditions

Auburn Municipal Airport is located in a densely developed urban area, surrounded primarily by commercial and industrial land uses. The review of existing airport site conditions and items of interest included water resources (wetlands, stormwater), air quality, species of concern, and wildlife hazards. A planning level analysis of stormwater drainage was conducted to document both existing conditions and potential changes that may be related to future proposed development. The analysis indicates that future master plan development projects (new impervious surfaces) will require measures to minimize impacts of increased stormwater runoff. A wetland delineation was performed for the undeveloped area located on the west side of the runway to define wetland boundaries and classifications for use in subsequent evaluations. The stormwater, wetland, and environmental conditions inventory memoranda are included in **Appendix D and E**.

Airport Noise Analysis

AIRPORT NOISE AND NOISE MODELING

It is often noted that noise is the most common negative impact associated with airports. A simple definition of noise is "unwanted sound." However, sound is measurable, whereas noise is subjective. The relationship between measurable sound and human irritation is the key to understanding aircraft noise impact. A rating scale has been devised to relate sound to the sensitivity of the human ear. The A-weighted decibel scale (dBA) is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. This system of measurement is used because the human ear functions over such an enormous range of sound energy impacts. At a psychological level, there is a rule of thumb that the human ear often "hears" an increase of 10 decibels as equivalent to a "doubling" of sound.

The challenge to evaluating noise impact lies in determining what amount and what kind of sound constitutes noise. The vast majority of people exposed to aircraft noise are not in danger of direct physical harm. However, much research on the effects of noise has led to several generally accepted conclusions:

- The effects of sound are cumulative; therefore, the duration of exposure must be included in any evaluation of noise.
- Noise can interfere with outdoor activities and other communication.
- Noise can disturb sleep, TV/radio listening, and relaxation.
- When community noise levels have reached sufficient intensity, community wide objection to the noise will likely occur.

Research has also found that individual responses to noise are difficult to predict.[1] Some people are annoyed by perceptible noise events, while others show little concern over the most disruptive events. However, it is possible to predict the responses of large groups of people – i.e. communities.

[1] Beranek, Leo, *Noise and Vibration Control*, McGraw-Hill, 1971, pages ix-x.

Consequently, community response, not individual response, has emerged as the prime index of aircraft noise measurement.

On the basis of the findings described above, a methodology has been devised to relate measurable sound from a variety of sources to community response. For aviation noise analysis, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The DNL methodology is used in conjunction with the standard A-weighted decibel scale (dBA) which is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. DNL has been adopted by the U. S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration (FAA) for use in evaluating noise impacts. In a general sense, it is the yearly average of aircraft-created noise for a specific location (i.e., runway), but includes a calculation penalty for each night flight.

The FAA has determined that a significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same time frame. As an example, an increase from 63.5 dB to 65 dB is considered a significant impact. The DNL methodology also includes a significant calculation penalty for each night flight. DNL levels are normally depicted as contours. These contours are generated from noise measurements processed by a FAA-approved computer noise model. They are superimposed on a map of the airport and its surrounding area. This map of noise contour levels is used to predict community response to the noise generated from aircraft using that airport.

The basic unit in the computation of DNL is the sound exposure level (SEL). An SEL is computed by mathematically summing the dBA level for each second during which a noise event occurs. For example, the noise level of an aircraft might be recorded as it approaches, passes overhead, and then departs. The recorded noise level of each second of the noise event is then added logarithmically to compute the SEL. To provide a penalty for nighttime flights (considered to be between 10 PM and 7 AM), 10 dBA is added to each nighttime dBA measurement, second by second. Due to the mathematics of logarithms, this calculation penalty is equivalent to 10-day flights for each night flight.[2]

A DNL level is approximately equal to the average dBA level during a 24-hour period with a weighting for nighttime noise events. The main advantage of DNL is that it provides a common measure for a variety of different noise environments. The same DNL level can describe an area with very few high noise events as well as an area with many low-level events.

[2] Where Leq ("Equivalent Sound Level") is the same measure as DNL without the night penalty incorporated, this can be shown through the mathematical relationship of:

$$Leq_d = 10 \log \left(\frac{N_d \times 10^{(SEL/10)}}{86{,}400} \right)$$

If SEL equals the same measured sound exposure level for each computation, and if N_d = 10 daytime flights, and N_n = 1 night-time flight, then use of a calculator shows that for any SEL value inserted, $Leq_d = Leq_n$.

Noise Abatement Procedures

Recognizing that Auburn Municipal Airport is located in a developed area with noise sensitive areas nearby, the City of Auburn has established noise abatement procedures for pilots operating at the airport:

- Noise sensitive areas runway south to north on both the east and west side of the airport
- All fixed wing and helicopter aircraft traffic patterns are located on the west side of the airport
- Fixed wing fly Westside pattern 1,000' MSL over highway
- Rotorcraft fly Westside pattern 500' MSL over RR tracks
- Rotorcraft must remain clear of fixed wing aircraft
- All aircraft shall avoid making turn prior to reaching 500' MSL while departing
- LHT for Rwy 34 and RHT for Rwy 16
- Fixed wing aircraft entering pattern from the east are expected to overflight the airport east to west at 1,500' MSL and enter on the downwind on 45
- Over flight of Emerald Downs and their stables is prohibited

An informational sign located near the Runway 16 threshold provides additional

information to pilots:

- Noise Abatement Procedure: Runway 16
- Turn right to avoid hospital approximately 1 mile south of runway
- Assume southwest heading as soon as practicable
- Turn point at pilot's discretion

The City of Auburn has provided an online form for citizen noise complaints on the City's website (see **Appendix F**).

NOISE MODELING AND CONTOUR CRITERIA

DNL levels are typically depicted as contours. Contours are an interpolation of noise levels drawn to connect all points of a constant level, which are derived from information processed by the FAA-approved computer noise model. They appear similar to topographical contours and are superimposed on a map of the airport and its surrounding area. It is this map of noise levels drawn about an airport, which is used to predict community response to the noise from aircraft using that airport. DNL mapping is best used for comparative purposes, rather than for providing absolute values. That is, valid comparisons can be made between scenarios as long as consistent assumptions and basic data are used for all calculations. It should be noted that a line drawn on a map by a computer does not imply that a particular noise condition exists on one side of the line and not on the other. These calculations can only be used for comparing average noise impacts, not precisely defining them relative to a specific location at a specific time.

NOISE AND LAND-USE COMPATIBILITY CRITERIA

Federal regulatory agencies of government have adopted standards and suggested guidelines relating DNL to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 DNL noise contour. Federal agencies supporting this concept include the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

Federal Aviation Regulations (FAR) Part 150, Airport Noise Compatibility Planning provides guidance for land-use compatibility around airports. **Table 6-1** summarizes the federal guidelines for compatibility or non-compatibility of various land uses and noise exposure levels. Under federal guidelines, all land uses, including residential, are considered compatible with noise exposure levels of 65DNL and lower. Generally, residential and some public uses are not compatible within the 65-70 DNL, and above. As noted in this table, some degree of noise level reduction (NLR) from outdoor to indoor environments may be required for specific land uses located within higher-level noise contours. Land uses such as commercial, manufacturing, some recreational uses, and agriculture are compatible within 65-70 DNL contours.

Residential development within the 65 DNL contour and above is not recommended and should be discouraged. Care should be taken by local land use authorities to avoid creating potential long-term land use incompatibilities in the vicinity of the airport by permitting new development of incompatible land uses such as residential subdivisions in areas of moderate or higher noise exposure. Washington's airport noise and land use compatibility guidelines discourage residential development within the 55 DNL contour, although it is not prohibited. Auburn Municipal Airport is located within an area of predominantly industrial and commercial zoning that provides an effective land use buffer between the airport and residential development.

The City of Auburn has established elements of airport overlay zoning defined by the ultimate FAR Part 77 airspace surfaces. Any portions of the Part 77 surfaces that extend over adjacent jurisdictions (King County, City of Kent, etc.), should also be addressed, ideally through joint adoption of an airport overlay zone ordinance, consistent with state and federal airport protection guidelines.

TABLE 6-1: LAND USE COMPATIBILITY WITH DNL

	Yearly Day-Night Average Sound Level (DNL) in Decibels					
LAND USE	<65	65-70	70-75	75-80	80-85	85+
Residential						
Residential, other than mobile homes & transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, and Concert Halls	Y	25	30	N	N	N
Government Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, Business and Professional	Y	Y	25	30	N	N
Wholesale and Retail-Building Materials, Hardware and Farm Equipment and Farm Equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail Trade-General	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing General	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (except livestock) and Forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock Farming and Breeding	Y	Y(6)	Y(7)	N	N	N
Mining and Fishing, Resource Production and Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y(5)	Y(5)	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N

Nature Exhibits and Zoos	Y	Y	N	N	N	N
Amusement Parks, Resorts and Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables and Water Recreation	Y	Y	25	30	N	N

Y (Yes) Land-use and related structures compatible without restrictions.

N (No) Land-use and related structures are not compatible and should be prohibited.

NLR - Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into design and construction of the structure.

25, 30 or 35 - Land uses and structures generally compatible; measure to achieve NLR or 25, 30 or 35 dB must be incorporated into design and construction of the structure.

NOTES:

1. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Levels Reduction (NLR) of at least 25dB and 30dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. Land-use compatible, provided special sound reinforcement systems are installed.
6. Residential buildings require an NLR of 25.
7. Residential buildings require an NLR of 30.
8. Residential buildings not permitted.

SOURCE: Federal Aviation Regulations, Part 150, Airport Noise Compatibility Guidelines

PLANNING PERIOD NOISE CONTOURS

A noise analysis of the effects of existing aircraft operations and proposed projects/activities linked to the updated airport master plan has been performed using the FAA's Integrated Noise Model (INM), version 7.0c. The INM data runs are included in **Appendix G.**

The noise contours and associated information have been developed to assess current and future aircraft noise exposure and support local land use compatibility planning. Data from the updated forecasts of activity levels were assigned to the common arrival, departure and airport traffic pattern flight tracks defined for the runways. The existing and future noise contours were generated based on the FAA-approved master plan aircraft operations forecast for 2012, 2017 and 2032.

The current year (2012) noise contours reflect the existing runway configuration. The future (2017 and 2032) noise contours reflect the planned change to the runway configuration, which involves runway extensions (with displaced thresholds) at both ends.

The runway use (directional) distributions for the updated noise analysis are consistent with the noise analysis conducted in the previous master plan. The current runway use distribution (60% Runway 16/40% Runway 34) and traffic patterns are maintained for all noise runs.

The fixed wing aircraft and helicopter traffic patterns for Runway 16/34 are located on the west side of the runway. The west side traffic pattern provides standard left hand traffic for Runway 34 and right hand traffic for Runway 16. The fixed wing pattern altitude is 1,000 feet above mean sea level (MSL), and the helicopter traffic pattern is 500 feet MSL. The downwind leg of the fixed wing traffic pattern is aligned with Highway 167 and the helicopter pattern downwind leg is aligned with the railroad tracks located between Highway 167 and Emerald Downs racetrack. The existing traffic pattern locations are maintained for all future year noise analyses.

The current and future year noise contours are depicted in **Figure 6-1**. The contours are plotted in 5 DNL increments from 65 DNL to 85 DNL, which is consistent with FAA noise and land use compatibility planning. As noted earlier in this section, under federal standards, all land uses are considered compatible with noise exposure below 65 DNL and the FAA does not formally recognize noise levels below 65DNL in its land use compatibility planning assessments. As part of the FAA-approved Airport Layout Plan (ALP) drawing set, the Airport Land Use Plan will depict the 2032 noise contours beginning at 65 DNL, consistent with the FAA standard.

<u>Noise Contours Overview</u>

The current and future year noise contours (65 DNL or above) extend beyond airport property at both runway ends and along the sides of the airport. As noted above, the future year noise contours assume the runway extensions at both ends are completed. Based on the runway configuration, the use of displaced thresholds and declared distances, the runway ends will be located immediately adjacent to airport property lines beyond each runway end. The use of blast fences is recommended to protect pedestrians and vehicles during takeoff. The future runway configuration extends the noise contours outward (north and south) beyond airport property at each end of the runway. However, the affected land areas are zoned commercial or industrial and have moderate or low sensitivity to noise exposure and have comparatively high ambient (background) noise levels generated by various activities and vehicle/truck traffic.

One area of potential land use incompatibility is the motel located near the southeast corner of the airport. Although the indoor spaces within the building may be compatible with current and forecast noise exposure levels with noise level reductions (NRL), the outdoor facilities, including the swimming pool are not compatible with higher noise exposure levels. This property is identified as future property acquisition on the airport layout plan (ALP), maintaining the recommendation from the 2002 ALP.

Table 6-2 summarizes the overall size (measured in square miles) of the 65 to 85 DNL noise contours for the current, 5-year, and 20-year INM runs. The increase in surface area for each noise level is consistent with the forecast increase in air traffic, minor changes in aircraft fleet mix, and planned changes to the current runway configuration. It is noted that the airport currently consists of approximately 110 acres, which translates into 0.172 square miles. This surface area represents a portion of the overall size of each contour.

TABLE 6-2: CURRENT AND FUTURE NOISE CONTOUR SIZE

	Size of Contours (in square miles)		
DNL Noise Levels	**2012**	**2017**	**2032**
65	0.26	0.29	0.33
70	0.12	0.14	0.16
75	0.05	0.06	0.07
80	0.02	0.02	0.02
85	0.01	0.01	0.01
Total Area (sq. miles) (DNL 65-85)	**0.46**	**0.52**	**0.59**

Note: Current airport property area is 110 acres (0.17 square miles); a portion of each contour area noted above is located over airport property.

2012 Noise Contours

The 65 DNL noise contour extends approximately 800 feet outward to sides of Runway 16/34 and approximately 220 feet beyond the north airport property line, and 880 feet beyond the south property line. The motel located adjacent to the southeast corner of airport is located within the 65 DNL contour. The Metro Park and Ride lot located between the south end of the runway and 15th Street NE is located within the 65 DNL contour.

A characteristic of aircraft noise exposure on a runway is the increase in contour size (width) near the ends of the runway. Like wake turbulence generated from aircraft wings during flight, noise energy is dissipated behind and to the sides of the aircraft. The enlarged contours near the runway ends reflect the increase in noise generated during the initial application of power for takeoff and during the initial slow movement of aircraft at the beginning of the takeoff roll. The low altitude of aircraft during final approach and landing also concentrates noise exposure at the runway ends.

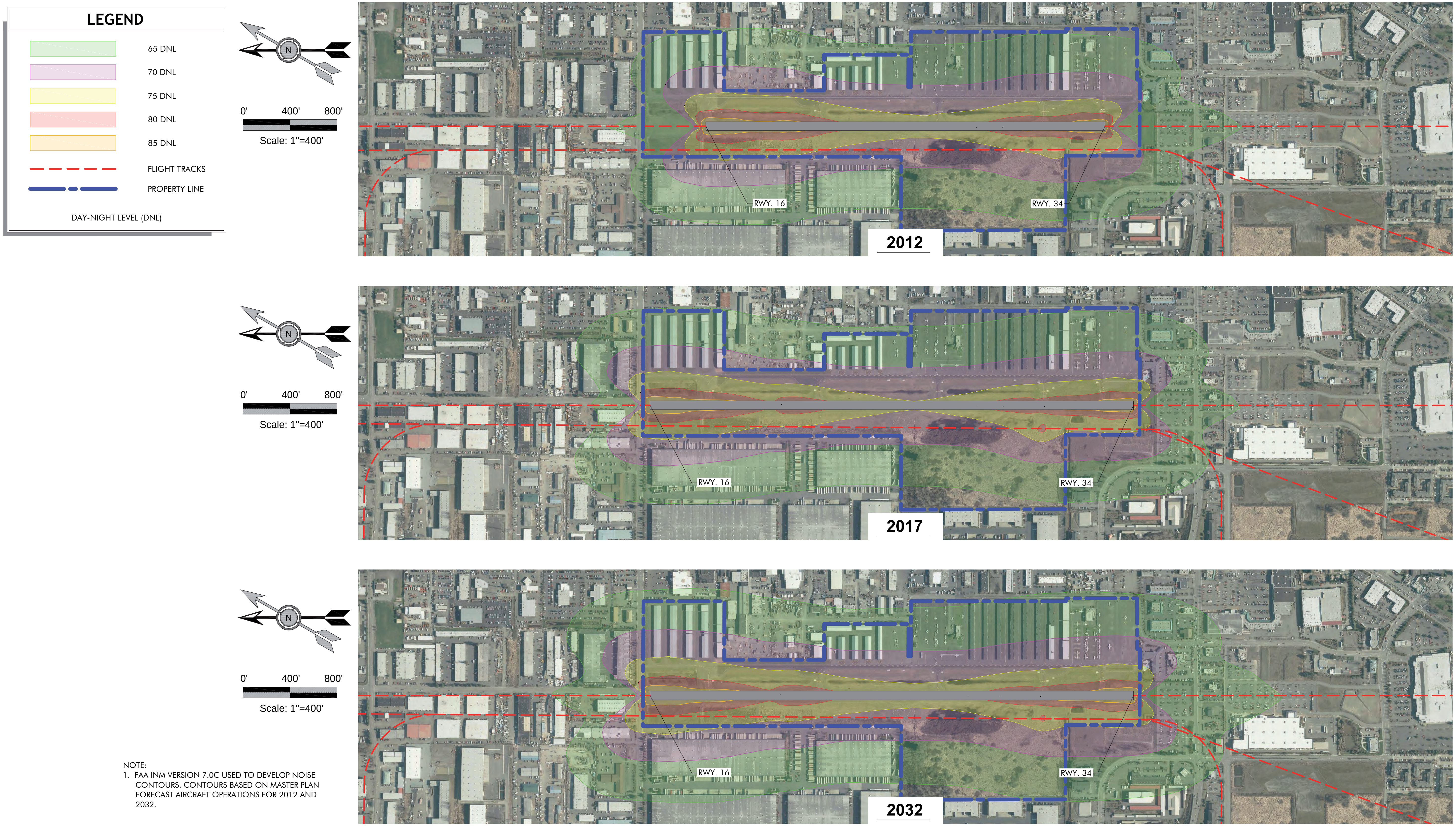
Continuous areas of 70 and 75 DNL contours extend along the entire runway length and slightly beyond each runway end. A portion of the 70 DNL contour located near the north end of the runway extends off airport property (east and west) over industrial areas. A small sliver of the 75 DNL contour at the north end of the runway extends off airport property to the west over an industrial area (warehouse, truck parking). Areas of 80 and 85 DNL contours are located at each runway end, contained entirely within airport property. The noise contours widen slightly to the west, due to the west traffic patterns established for fixed wing aircraft and helicopters.

2017 Noise Contours

The noise contours for 2017 have the same overall shape as the 2012 contours, with a slight increase in size based on the forecast increase in aircraft operations and increased runway length. The contour is elongated based on the planned runway extensions at both ends. The runway extensions increase the area of 65 to 75 DNL noise exposure beyond the airport's north and south property line; areas of 80 and 85 DNL also increase marginally, but are contained within airport property or adjacent street right of way. The land uses surrounding the runway's north end is predominantly light and heavy manufacturing with areas of 70 and 75 DNL noise exposure. The motel located adjacent to the southeast corner of airport is located within the 70 DNL contour. The Metro Park and Ride lot located between the south end of the runway and 15th Street NE is located within the 65 and 70 DNL contours.

2032 Noise Contours

The noise contours for 2032 have the same overall shape as the 2012 and 2017 contours, with continued growth due to the forecast increase in flight activity. The motel located adjacent to the southeast corner of airport is located within the 70 DNL contour, although the outdoor pool is located within the 75 DNL contour. The Metro Park and Ride lot located between the south end of the runway and 15th Street NE is located within the 65 and 70 DNL contours.



NOTE:
1. FAA INM VERSION 7.0C USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2012 AND 2032.

Chapter 7 – Financial and Development Program

Chapter 7 – Financial and Development Program

Introduction

The purpose of this chapter is to present the projects identified in the Airport Capital Improvement Program (ACIP) that have been developed and assembled based on the analyses conducted in the Facility Requirements and Development Alternatives chapters (Chapters Four and Five). The ACIP projects are summarized in **Table 7-1.** The ACIP is organized in short-, intermediate- and long-term periods that reflect both project prioritization and financial capabilities. Several factors were considered in determining project prioritization, including safety, forecast demand, the need to maintain/replace existing airfield facilities, and financial capabilities of both the City and FAA to support the development program based on existing funding mechanisms.

The master plan preferred alternative includes airside and landside elements. The north and south extension of Runway 16/34 with displaced thresholds is identified as a high priority project. The reconfiguration of the north and south terminal areas is intended to meet FAA design standards (apron design, etc.) and respond to market demand for facilities. Several areas of property acquisition are recommended, based on the availability of funding including the Metro Park and Ride lot, several parcels near the northeast section of the airport and parcels at the south end of the airport.

The ACIP lists all major projects included in the twenty year planning period addressed in the Master Plan. Individual projects for the first five years of the planning period are listed in order of priority by year. Projects for the intermediate and long-term phases of the planning period (years 6-20) are listed in order of priority but have not been assigned a year. Each project's eligibility for FAA funding is noted, based on current federal legislation and funding formulas. Specific project details are depicted on the updated airport layout plan and terminal area plan drawings contained in Chapter 8.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). As proposed, approximately 80 percent of the airport's 20 year ACIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation related fees. These funds are distributed by FAA under appropriations set by Congress to all airports in the United States that are included in the federal airport system (National Plan of Integrated Airport Systems – NPIAS).

However, as noted in **Table 7-1**, the projected twenty year total for FAA eligible projects in the ACIP significantly exceeds current FAA funding levels through the non-primary entitlement program. While other types of FAA funding may be available for some projects, it is reasonable to assume that despite establishing eligibility for FAA funding, not all eligible projects are likely to be funded by FAA. As the City manages its ACIP, maximizing the use of available FAA and other outside sources of funding is assumed. However, in some cases, the limited availability of outside funds may require projects to be deferred, or funded with increased levels of City, State or private funding.

Airport Development Schedule and Cost Estimates

Cost estimates for each individual project were developed in 2014 dollars based on typical construction costs associated for the specific type of project. The project costs listed in the ACIP represent order-of-magnitude estimates that approximate design engineering, environmental, other related costs, sales tax, and contingencies. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required at the time of project implementation to provide more refined and detailed estimates of the development costs.

In future years, as the plan is carried out, these cost estimates can continue to assist management by adjusting the 2014-based figures for subsequent inflation. This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

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

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)[1]

USCPI-U
238.343 **(1982-1984 = 100)** **June 2014**

Multiplying the change ratio (Y) times any 2014-based cost figures presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation. Several different CPI-based indices are available for use and any applicable index may be substituted by the City in its financial management program.

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

The first phase of the capital improvement program includes the highest priority projects recommended during the first five years of the planning period. Intermediate and long term projects are anticipated to

[1] U.S. Consumer Price Index for All Urban Consumers (USCPI-U)

occur in the 6 to 20 year time period, although changes in demand or other conditions could accelerate or slow demand for some improvements.

SHORT TERM PROJECTS

The short term program contains work items of the highest priority. Priority items include improvements related to safety. Because of their priority, these items will need to be incorporated into the State Capital Improvement Program (SCIP) managed by the FAA Seattle Airport District Office and WSDOT Aviation. To assist with this process, the short term projects are scheduled in specific calendar years for the first six years of the planning period (2014-2019).

The main focus in the short term development period is to address runway improvements, acquire property to protect the runway protection zone (RPZ) area, perform maintenance on airport hangars and to conduct an environmental assessment for the planned runway extension.

<u>Short Term Projects:</u>

- Runway, taxiway and apron sealcoat and related pavement maintenance
- Complete airport obstruction survey and AGIS survey
- Environmental assessment/Categorical Exclusion (CATEX) report for runway extension
- South T-hangar door retrofit
- Property acquisition (Metro Park and Ride lot) to control the inner portion of Runway 34 “RPZ” runway protection zone
- Install an above ground fuel tank (1) 12,000 gallon Jet A with pumps
- Design runway extension project
- Construct north and south runway extensions with displaced thresholds
- Automated Weather Observation System (AWOS) installation
- Precision Approach Path Indicator (PAPI)
- West Side Fencing

INTERMEDIATE & LONG TERM PROJECTS

Several intermediate or long term projects are considered to be current needs. However, based on the limited funding resources available, it was necessary to shift some projects to the longer term timeline. However, projects may be completed sooner in the event that additional funding can be generated.

Intermediate Term Projects (6-10 years)

- West helicopter parking pads (gravel) and access paths
- West helicopter area access road
- Main terminal area reconfiguration
- Sealcoat and repaint markings on the parallel taxiway and exits
- Runway 16/34 sealcoat and repaint markings (4,118' x 75')
- South T-hangar door retrofit
- Property acquisition for the Armstrong parcel
- Terminal area access road and parking area (reconfigured main entrance)
- Terminal area fencing and automated gates (2)
- Fixed Based Operator building and General Aviation terminal
- South T-hangar door retrofit
- Property acquisition for the east industrial land and site remediation
- Southeast apron infill (reconfigured apron)
- Apron, taxiway and taxilane sealcoat and repaint markings
- Reconfigure terminal apron, sealcoat and repaint markings
- Airport Master Plan Update

Long Term Projects (11-20 years)

- Southeast Terminal Area access road (main entrance to the south)
- South hangar area fencing and automated gate
- Runway 16/34 overlay and repaint markings for the original runway section (3,400' x 75')
- Overlay parallel taxiway and exit taxiways
- Aircraft tiedown apron (new north apron, east landside, phase 1)
- Aircraft tiedown apron (new north apron, east landside, phase 2)
- Replace the parallel taxiway medium intensity taxiway lighting (MITL)
- Property acquisition, motel parcel
- Property acquisition (Metro Park and Ride lot) remainder of parcel outside of Runway 34 runway protection zone (RPZ)

- Vehicle parking and access road (southeast apron area)
- Southeast terminal area reconfigured fencing and automated gate (1)
- North hangar taxilanes, sealcoat and repaint markings
- South T-hangar door retrofit
- Southeast apron, south hangar taxilane and parallel taxiway frontage, overlay and repaint markings
- North hangar taxilanes, overlay and repaint markings (to be phased based on condition and funding)
- South T-hangar door retrofit (buildings in rows 3-7 TBD)
- Airport beacon and tower replacement
- Medium intensity runway lighting (MIRL) for Runway 16/34 replacement
- Runway end identifier lighting (REIL) for Runway 16 and 34 replacement
- Precision approach path indicator (PAPI) for Runway 16 and 34 replacement
- Parallel taxiway and exits sealcoat and repaint markings
- Runway 16/34 sealcoat and repaint markings (4,118' x 75')

Auburn Municipal Airport

Current NPE $ Accumulation: **$450,000** **(Including FY2014)**

Prepared by Century West Engineering

FINAL CIP 20 YEAR CAPITAL IMPROVEMENT PROGRAM 2014-2034

5 year NPE $ = $750,000 *(based on current legislation/funding levels)*

20 year NPE $ = $3,000,000 *(based on current legislation/funding levels)*

Short Term	Yr	Project	ID	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental / Sales Tax	Total Cost	FAA GA Entitlement	Other FAA ***	Local Costs		
2014	**0**	Runway, Taxiway and Apron Sealcoat *		Pavement Rehabilitation	LS	1	$578,000	$578,000	$180,000	$758,000	$450,000	$185,000	$123,000		
Subtotal - Year 1								$578,000	$180,000	$758,000	$450,000	$185,000	$123,000		
														NPE Accumulation	*$0*
2015	**1**	Airport Obstruction Survey/AGIS Survey		Other	LS	1	$150,000	$150,000	$60,000	$210,000	$150,000	$39,000	$21,000	*FY 2015 NPE*	*$150,000*
		South T-Hangar Door Retrofit (Row 3) *		Other	ea	17	$15,000	$255,000	$102,000	$357,000	$0	$0	$357,000		
		Environmental Assessment/CatEX Report N&S Runway Extensions		Environmental	LS	1	$115,000	$115,000	$46,000	$161,000	$0	$144,900	$16,100		
														Total Available (NPE)	*$150,000*
Subtotal - Year 2								$520,000	$208,000	$728,000	$150,000	$183,900	$394,100		
														NPE Accumulation	*$0*
2016	**2**	Design - Runway Extension Project		Other	LS	1	$100,000	$100,000	$40,000	$140,000	$126,000	$0	$14,000	*FY 2016 NPE*	*$150,000*
														Total Available (NPE)	*$150,000*
Subtotal - Year 3								$100,000	$40,000	$140,000	$126,000	$0	$14,000		
														NPE Accumulation	*$24,000*
2017	**3**	North and South Runway Extensions w/ Displaced Thresholds **		Pavement Construction	LS	1	$760,000	$760,000	$304,000	$1,064,000	$174,000	$783,600	$106,400	*FY 2017 NPE*	*$150,000*
		Propperty Acquisition - Metro Park & Ride Lot (Inner Portion of Rwy 34 RPZ)		Land	LS	1	$300,000	$300,000	$120,000	$420,000	$0	$378,000	$42,000	*Total Available (NPE)*	*$174,000*
		Construct Fuel Farm for Jet A		Other	LS	1	$100,000	$100,000	$40,000	$140,000	$0	$0	$140,000		
Subtotal - Year 4								$1,160,000	$464,000	$1,624,000	$174,000	$1,161,600	$288,400		
														NPE Accumulation	*$0*
2018	**4**	No Project/Carryover												*FY 2018 NPE*	*$150,000*
														Total Available (NPE)	*$150,000*
Subtotal - Year 4								$0	$0	$0	$0	$0	$0		
														NPE Accumulation	*$150,000*
2019	**5**	Automated Weather Observation System (AWOS)		Other	LS	1	$192,000	$192,000	$76,800	$268,800	$241,920	$0	$26,880	*FY 2019 NPE*	*$150,000*
		Precision Approach Path Indicator (PAPI)		Lighting	ea	1	$100,000	$100,000	$40,000	$140,000	$58,080	$67,920	$14,000	*Total Available (NPE)*	*$300,000*
		Taxiway Sealcoat/Restripe		Pavement Maintenance	LS	1	$42,000	$35,800	$14,320	$50,120	$0	$45,108	$5,012		
		West Side Fencing		Other	LS	1	$37,800	$37,800	$15,120	$52,920	$0	$47,628	$5,292		
Subtotal - Year 5								$365,600	$146,240	$511,840	$300,000	$160,656	$51,184		
							0-5	**$2,723,600**	**$1,038,240**	**$3,761,840**	**$1,200,000**	**$1,691,156**	**$870,684**		

* Costs based on actual budgets

** Engineering and Environmental for project conducted in previous year; tax & contingency reduced to 30%

*** Other FAA Funding Total listed for reference only based on general project eligibility

Intermediate Term	2020-2024	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental/ Sales Tax	Total Cost	FAA GA Entitlement	FAA Eligible **	Local Costs
		West Helicopter Parking Pads (Gravel) & Access Paths	Construction	SY	1,740	$15	$29,100	$11,640	$40,740	$36,666	$0	$4,074
		West Helicopter Facilities Access Road	Other	SY	3,690	$75	$279,750	$111,900	$391,650	$352,485	$0	$39,165
		Main Terminal Apron Reconfiguration	Pavement Rehab/Construction	LS	1	$1,389,650	$1,389,650	$555,860	$1,945,510	$360,849	$1,390,110	$194,551
		Parallel Taxiway & Exits - Sealcoat/Repaint Markings	Pavement Maintenance	SY	12,900	$2	$35,800	$14,320	$50,120	$0	$45,108	$5,012
		Runway 16/34 Sealcoat/Repaint Markings (4,118 x75')	Pavement Maintenance	SY	33,980	$2	$87,960	$35,184	$123,144	$0	$110,830	$12,314
		South T-Hangar Door Retrofit (Row 8) (Twin engine aircraft hangar)	Other	ea	6	$6,000	$36,000	$14,400	$50,400	$0	$0	$50,400
		Property Acquisition - Armstrong Parcel	Land	LS	1	$3,164,150	$3,164,150	$1,265,660	$4,429,810	$0	$3,986,829	$442,981
		Terminal Area Access Road & Parking (Main Entrance & North Section)	Other	LS	1	$298,750	$298,750	$119,500	$418,250	$0	$376,425	$41,825
		Terminal Area Reconfigured Fencing & Automated Gates (2)	Security	LF	1,300	$18	$63,400	$25,360	$88,760	$0	$79,884	$8,876
		FBO Building/GA Terminal	Other	SF	24,000	$120	$2,920,000	$1,168,000	$4,088,000	$0	$0	$4,088,000
		Relocate AVGAS Tank, Pumps	Other	LS	1	$30,000	$30,000	$12,000	$42,000	$0	$0	$42,000
		South T-Hangar Door Retrofit (Buildings in Rows 3-7 - TBD)	Other	ea	17	$6,000	$102,000	$40,800	$142,800	$0	$0	$142,800
		Property Acquisition - East Industrial Land	Land	acres	6.8	$100,000	$680,000	$272,000	$952,000	$0	$856,800	$95,200
		East Industrial Area - Site Remediation	Other	acres	6.8	$50,000	$340,000	$136,000	$476,000	$0	$428,400	$47,600
		Southeast Apron Infill (Reconfigured Apron)	Pavement Construction	SY	4,135	$75	$313,125	$125,250	$438,375	$0	$394,538	$43,838
		Southeast Apron and P. Txy Frontage - Sealcoat, Repaint Markings	Pavement Maintenance	SY	21,460	$2	$47,920	$19,168	$67,088	$0	$60,379	$6,709
		South Hangar Taxilanes and P. Txy Frontage - Sealcoat. Repaint Markings	Pavement Maintenance	SY	47,900	$2	$100,800	$40,320	$141,120	$0	$127,008	$14,112
		Reconfigured Terminal Apron - Sealcoat, Repaint Markings	Pavement Maintenance	SY	22,000	$2	$46,000	$18,400	$64,400	$0	$57,960	$6,440
		Airport Master Plan Update	Planning	LS	1	$150,000	$150,000	$60,000	$210,000	$0	$189,000	
		North Hangar Taxilanes - Sealcoat, Repaint Markings	Pavement Maintenance	SY	11,000	$2	$24,000	$9,600	$33,600	$0	$30,240	$3,360
Subtotal - Year 6-10							**$10,138,405**	**$4,055,362**	**$14,193,767**	**$750,000**	**$8,133,510**	**$5,289,257**

** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.

5 year NPE $ = $750,000

Long Term	2025-2034	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental/ Sales Tax	Total Cost	FAA GA Entitlement	FAA Eligible **	Local Costs
		South Hangar Access Road (Main Entrance - South)	Other	LS	1	$135,000	$135,000	$54,000	$189,000	$0	$170,100	$18,900
		South Hangar Area Relocated Fence + Automated Gate (1)	Security	LF	850	$18	$35,300	$14,120	$49,420	$0	$44,478	$4,942
		Runway 16/34 Overlay/Repaint Markings (original runway section 3,400')	Pavement Rehabilitation	SY	28,000	$55	$1,560,000	$624,000	$2,184,000	$1,500,000	$465,600	$218,400
		Parallel Taxiway & Exits - Overlay/Repaint Markings	Pavement Rehabilitation	SY	10,940	$55	$611,700	$244,680	$856,380	$0	$770,742	$85,638
		Aircraft Tiedown Apron (New North Apron - East Landside - Phase 1)	Pavement Construction	SY	16,400	$75	$1,233,000	$493,200	$1,726,200	$0	$1,553,580	$172,620
		Aircraft Tiedown Apron (New North Apron - East Landside - Phase 2)	Pavement Construction	SY	16,400	$75	$1,233,000	$493,200	$1,726,200	$0	$1,553,580	$172,620
		West Parallel Taxiway - MITL	Lighting	LF	5,368	$60	$322,080	$128,832	$450,912	$0	$405,821	$45,091
		Property Acquisition - Motel	Land	LS	1	$2,780,100	$2,780,100	$1,112,040	$3,892,140	$0	$3,502,926	$389,214
		Propperty Acquisition - Metro Park & Ride Lot (Rwy 34 RPZ)	Land	LS	1	$1,747,248	$1,747,248	$698,899	$2,446,147	$0	$2,201,532	$244,615
		Reconfigued Southeast Apron Overlay, Repaint Markings	Pavement Maintenance	SY	11,390	$55	$631,450	$252,580	$884,030	$0	$795,627	$88,403
		Vehicle Parking and Access Road (Southeast Apron Area)	Other	LS	1	$470,000	$475,000	$190,000	$665,000	$0		
		Southeast Terminal Area Reconfigured Fencing & Automated Gate (1)	Security	LF	500	$18	$29,000	$11,600	$40,600	$0	$36,540	$4,060
		South Hangar Taxilanes and P. Txy Frontage - Sealcoat. Repaint Markings	Pavement Maintenance	SY	47,900	$2	$100,800	$40,320	$141,120	$0	$127,008	$14,112
		Reconfigured Terminal Apron - Sealcoat, Repaint Markings	Pavement Maintenance	SY	22,000	$2	$46,000	$18,400	$64,400	$0	$57,960	$6,440
		North Hangar Taxilanes - Sealcoat, Repaint Markings	Pavement Maintenance	SY	11,000	$2	$24,000	$9,600	$33,600	$0	$30,240	$3,360
		South T-Hangar Door Retrofit (Buildings in Rows 3-7 - TBD)	Other	ea	17	$6,000	$102,000	$40,800	$142,800	$0	$0	$142,800
		Southeast Apron and P. Txy Frontage - Overlay, Repaint Markings	Pavement Maintenance	SY	21,460	$55	$1,185,300	$474,120	$1,659,420	$0	$1,493,478	$165,942
		South Hangar Taxilanes and P. Txy Frontage - Overlay, Repaint Markings (to be phased based on condition and funding)	Pavement Maintenance	SY	47,900	$55	$2,639,500	$1,055,800	$3,695,300	$0	$3,325,770	$369,530
		North Hangar Taxilanes - Overlay, Repaint Markings (to be phased based on condition and funding)	Pavement Maintenance	SY	11,000	$55	$607,000	$242,800	$849,800	$0	$764,820	$84,980
		South T-Hangar Door Retrofit (Buildings in Rows 3-7 - TBD)	Other	ea	17	$6,000	$102,000	$40,800	$142,800	$0	$0	$142,800
		Airport Beacon & Tower (replacement)	Lighting	LS	1	$125,000	$125,000	$50,000	$175,000	$0	$157,500	$17,500
		MIRL Runway 16/34 (replacement original section - 3,400')	Lighting	LF	3,660	$60	$219,600	$87,840	$307,440	$0	$276,696	$30,744
		REIL - Runway 16 & 34 (replacement)	Lighting	ea	2	$25,000	$50,000	$20,000	$70,000	$0	$63,000	$7,000
		PAPI - Runway 16 & 34 (replacement)	Lighting	ea	2	$60,000	$120,000	$48,000	$168,000	$0	$151,200	$16,800
		Parallel Taxiway & Exits - Sealcoat/Repaint Markings	Pavement Maintenance	SY	10,940	$2	$31,880	$12,752	$44,632	$0	$40,169	$4,463
		Runway 16/34 Sealcoat/Repaint Markings (4,118 x75')	Pavement Maintenance	SY	33,980	$2	$87,960	$35,184	$123,144	$0	$110,830	$12,314
							$16,233,918	**$6,493,567**	**$22,727,485**	**$1,500,000**	**$18,099,197**	**$2,463,289**
						20 Yr Total	$29,095,923	$11,587,169	$40,683,092	$3,450,000	$27,923,863	$8,623,229

** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.

10 year NPE $ = $1,500,000

Capital Funding Sources

FEDERAL GRANTS

Federal funding is provided through the Federal Airport Improvement Program (AIP). This reauthorization is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The program provides grant funding for airports listed in the National Plan of Integrated Airport Systems (NPIAS). Under current legislation, eligible general aviation airports can receive up to $150,000 per year in general aviation "non-primary entitlement" grants. If a project is anticipated to cost in excess of $150,000, the participating airport can roll over the funding allocations for up to four years, at which time the accumulated total of funds can be used for larger projects. Any unused funds that remain beyond the maximum allowable roll over period revert to the FAA for use at other airports. These funds may only be used for eligible capital improvement projects and may not support airport operation and maintenance costs. Current FAA funding levels are 90 percent with a 10 percent local match. WSDOT Aviation Division grants may be available to reduce the local share, depending on the availability of funding.

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

Projects such as hangar construction or fuel systems are eligible for funding, although the FAA indicates that this category of project would be considered to be a much lower priority than other airfield needs.

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

STATE FUNDING

The Washington State Department of Transportation - Aviation Division provides an additional source of funding for airport projects in the form of grants through its Airport Aid Grants program. The Aviation Division has established grant criteria for airport sponsors requesting aid to define projects related to pavement, safety, maintenance, security improvements or planning.

Although Aviation Division funding is distributed widely to general aviation airports throughout the state, predicting any consistent level of funding for purposes of local long term financial planning is not possible. Competition for the limited grant funds is consistently high, with a priority often given to airports with limited resources or to airports that are not eligible to receive FAA grants. Project funding is determined on a case-by-case basis and is affected by overall funding levels and competition among airports during any particular state budget cycle (biennium).

For these reasons, no specific level of Aviation Division funding has been assumed in the CIP presented in **Table 7-1**. It is recommended that the City regularly apply for WSDOT funding for eligible projects; however, the limitations on funding availability suggest that it would not be prudent to assume that any specific level or formula percentage is available. In the instances when Aviation Division grant requests are successful, the City's required expenditure in the form of local match for FAA grants or funding non-FAA eligible projects will be reduced.

The current maximum grant award through the Aviation Division is $250,000, although grants of that amount are uncommon due to the large number of applications for funding normally received. When funding levels permit, the Aviation Division attempts to assist NPIAS general aviation airports with funds needed to match FAA grants. Up to half of the 10 percent local match may be funded through Aviation Division grants, although as noted above, the available funding within each biennial funding cycle effectively limits the ability to support large grant awards.

<u>State Capital Improvement Program (SCIP)</u>

The FAA's Seattle Airport District Office (ADO) is working with state aviation agencies in Washington, Oregon and Idaho to develop a coordinated "state" capital improvement program, known as the SCIP. The SCIP is intended to become the primary tool used by FAA, state aviation agencies and local airport sponsors to prioritize funding. The program has reached full implementation with current and near term future funding decisions prioritized through evaluation formulas. Airport sponsors are asked to provide annual updates to the short term project lists annually in order to maintain a current system of defined project needs. The short term priorities identified in the master plan CIP will be imported into the SCIP and will be subject to additional prioritization for funding in competitive statewide evaluations.

LOCAL FUNDING

As currently defined, the locally funded (City/tenant) portion for twenty year planning period is estimated to be just over $8.3 million (approximately 20 percent of the total project development costs). The relatively high share of local cost is attributed to several projects that are not likely to receive FAA funding. Hangar construction costs, building maintenance and utility extensions have not been included in the CIP and no FAA funding is assumed.

The majority of local matching funds are generated through airport revenues, including fuel flowage fees, land leases and sale proceeds from non-aviation parcels in the airport industrial park. The City reviews Auburn Municipal Airport's rates and fees schedule and land lease terms annually to ensure that the airport is generating fair and reasonable revenue for its facilities. Property appraisals are also recommended to periodically gauge local market valuation.

Airport sponsors occasionally fund infrastructure and revenue-generating development such as hangars locally, either through an inter fund loan or the issuance of long term debt (bonds).

Cash Flow Analysis

Based on data provided by the city and the noted assumptions on future events, a projection of airport operating revenues and expenses for the 20-year planning period is presented in **Table 7-2**. According to Auburn Municipal Airport 2014 Projected Income and Expenses Report, the airport is currently operating with a positive cash flow of $52,494 for 2014 and increasing annually (based off operating revenues and expenses only). The airport budget is expected to improve over the next five years as debt service interest and principal reduction decreases to zero and overall airport activity increases.

The airport has three primary revenue categories: user charges, land leases, buildings and facilities. The city indicates that the current rates and fees structure is generally in line with market rates at other general aviation airports in the region. For the purposes of projecting future revenues, it is assumed that revenues will increase at an average rate of 3-5 percent annually, through the 20-year planning period. This rate assumes both an increase in revenue-producing activities on the airport (new leases etc.) and periodic increases in current rates and fees to account for inflation and market conditions.

The current level of maintenance and operating expenses is considered to be reasonable based on size of the facility and reflects the efficient use of staff and outside resources. It is anticipated that airport operating and maintenance expenses will generally increase at a rate slightly higher than inflation to reflect both normal cost increases and nominal increases in expenses that would attribute to increased activity. Additional maintenance expenses are also anticipated as the airfield continues to expand physically. Although the precise staging of facility expansion will depend on market demand and availability of funding the new facilities identified in the 20-year CIP. The costs of maintaining the airfield can be reasonably expected to increase incrementally as the facility expands.

Table 7-2
Auburn Municipal Airport
Airport Revenues and Expense Projections for Operations (does not include capital spending)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Airport Operating Revenues											
Land Leases (3% yr increase)	$212,726	$217,925	$223,280	$228,796	$239,208	$245,060	$251,087	$258,620	$266,378	$274,370	$282,601
Rent-Bldg, Hangar, Tiedowns (3% yr increase)	$422,502	$484,905	$502,820	$521,473	$540,898	$561,129	$582,200	$599,666	$617,656	$636,186	$655,271
Fuel Sales (3% yr increase)	$16,000	$16,800	$17,640	$26,022	$28,073	$30,339	$32,848	$33,833	$34,848	$35,894	$36,971
Interest Income (0% yr increase)	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Misc. Revenue (0% yr increase)	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Total Revenues	**$653,228**	**$721,630**	**$745,740**	**$778,291**	**$810,179**	**$838,528**	**$868,135**	**$894,119**	**$920,883**	**$948,449**	**$976,843**
Airport Operating Expenses											
Personnel Services (4.5% yr increase)	$26,888	$27,909	$29,177	$30,506	$31,897	$33,354	$34,880	$36,450	$38,090	$39,804	$41,595
Supplies (0% yr increase)	$2,000	$2,045	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Services & Charges (2.5% yr increase)	$22,840	$23,360	$23,902	$24,459	$25,085	$25,748	$26,520	$27,183	$27,863	$28,559	$29,273
AMG Contract Services (2.5% yr increase)	$358,000	$366,950	$376,124	$385,151	$394,394	$403,860	$414,360	$424,719	$435,337	$446,220	$457,376
Stormwater (2.5% yr increase)	$24,331	$24,331	$24,940	$25,563	$26,202	$26,857	$27,663	$28,355	$29,063	$29,790	$30,535
Principal Reduction	$125,000	$135,000	$150,000	$165,000	$175,000	$190,000	$0	$0	$0	$0	$0
Debt Service Interest	$41,675	$44,418	$38,343	$42,859	$24,168	$16,293	$0	$0	$0	$0	$0
Total Expenses	**$600,734**	**$624,013**	**$644,486**	**$675,538**	**$678,746**	**$698,112**	**$505,423**	**$518,706**	**$532,353**	**$546,373**	**$560,779**
Total Revenue after Expenses	***$52,494***	***$97,617***	***$101,254***	***$102,753***	***$131,433***	***$140,416***	***$362,712***	***$375,413***	***$388,530***	***$402,076***	***$416,064***
Total Revenue after Expenses W/Revenue Rollover	***$52,494***	***$150,111***	***$251,365***	***$354,118***	***$485,551***	***$625,967***	***$988,679***	***$1,364,092***	***$1,752,621***	***$2,154,697***	***$2,570,761***

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Airport Operating Revenues										
Land Leases (3% yr increase)	$291,079	$299,811	$308,805	$318,069	$327,612	$337,440	$347,563	$357,990	$368,730	$379,792
Rent-Bldg, Hangar, Tiedowns (3% yr increase)	$674,929	$695,177	$716,033	$737,514	$759,639	$782,428	$805,901	$830,078	$854,980	$880,630
Fuel Sales (3% yr increase)	$38,080	$39,222	$40,399	$41,611	$42,859	$44,145	$45,469	$46,833	$48,238	$49,686
Interest Income (0% yr increase)	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Misc. Revenue (0% yr increase)	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Total Revenues	**$1,006,088**	**$1,036,210**	**$1,067,237**	**$1,099,194**	**$1,132,110**	**$1,166,013**	**$1,200,933**	**$1,236,901**	**$1,273,948**	**$1,312,107**
Airport Operating Expenses										
Personnel Services (4.5% yr increase)	$43,467	$45,423	$47,467	$49,603	$51,835	$54,168	$56,605	$59,152	$61,814	$64,596
Supplies (0% yr increase)	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Services & Charges (2.5% yr increase)	$30,005	$30,755	$31,524	$32,312	$33,120	$33,948	$34,797	$35,666	$36,558	$37,472
AMG Contract Services (2.5% yr increase)	$468,810	$480,531	$492,544	$504,857	$517,479	$530,416	$543,676	$557,268	$571,200	$585,480
Stormwater (2.5% yr increase)	$31,298	$32,081	$32,883	$33,705	$34,547	$35,411	$36,296	$37,204	$38,134	$39,087
Principal Reduction	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Debt Service Interest	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	**$575,580**	**$590,789**	**$606,417**	**$622,477**	**$638,981**	**$655,942**	**$673,374**	**$691,291**	**$709,706**	**$728,635**
Total Revenue after Expenses	***$430,508***	***$445,421***	***$460,820***	***$476,717***	***$493,129***	***$510,071***	***$527,559***	***$545,611***	***$564,243***	***$583,472***
Total Revenue after Expenses W/Revenue Rollover	***$3,001,268***	***$3,446,690***	***$3,907,509***	***$4,384,226***	***$4,877,355***	***$5,387,426***	***$5,914,985***	***$6,460,596***	***$7,024,838***	***$7,608,311***

Notes: AMG Data/Projections Years 2014-2020
2014-2020 projections developed by AMG ("Realistic Revenue" projection)
Assumed annual increases (%) are applied from 2020 to 2034
Projections do not include depreciation or amortization
Building replacement fund balances not included

Chapter 8 – Airport Layout Plan

Chapter 8 – Airport Layout Plan Drawings

Introduction

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

- Sheet 1 – Cover Sheet
- Sheet 2 – Airport Data Sheet
- Sheet 3 – Airport Layout Plan
- Sheet 4 –North Terminal Area Plan
- Sheet 5 –South Terminal Area Plan
- Sheet 6 – Airport Airspace Plan (FAR Part 77)
- Sheet 7 – Runway 16 RPZ and Inner Approach Plan and Profile
- Sheet 8 – Runway 34 RPZ and Inner Approach Plan and Profile
- Sheet 9 – Runway 16 Approach Plan and Profile
- Sheet 10 – Runway 34 Approach Plan and Profile
- Sheet 11 –Airport Land Use Plan W/2032 Noise Contours
- Sheet 12 – Exhibit "A" Airport Property Plan

The airport layout plan drawings provide detailed information for existing and future facilities. The future improvements depicted in the drawing set are consistent with the airport master plan's updated 20-year capital improvement program contained in Chapter 7. The ALP drawing set will be submitted along with the draft final airport master plan report to Federal Aviation Administration (FAA) for review and approval. The drawings will be reviewed by the FAA Airports District Office (ADO) with additional review coordinated with other FAA offices (Flight Procedures, Flight Standards, etc.). Once approved, the final ALP drawing set will be signed by the Port of Auburn and the FAA Seattle Airports District Office (ADO). As individual projects are completed, minor "as-built" updates to the ALP drawing may be completed (with FAA coordination) without updating the airport master plan. A complete update of the full ALP drawing set will be conducted as part of the next master plan update.

The airport layout plan drawings are prepared using AutoCAD® computer-aided drafting software, which allows for easier updating and revision. The drawing files may also be imported into local geographic information systems (GIS) to support land use planning, airport overlay zone mapping, etc.

A brief summary of the individual drawings is provided below:

AIRPORT DATA SHEET DRAWING

The Airport Data Sheet drawing contains detailed runway and airfield dimensions, FAA dimensional standards, wind roses, and other data that is reflected on the sheets in the drawing set.

AIRPORT LAYOUT PLAN DRAWING

The Airport Layout Plan (ALP) drawing graphically depicts existing and future airfield facilities. The current and future design standards for the runway-taxiway system are based on Airplane Design Group I (ADG I) for small aircraft (Airport Reference Code B-I – small), which corresponds to the multi-engine piston design aircraft. An ADG II development reserve is also identified based on the potential to accommodate single-engine turboprops such as the Cessna Caravan or Pilatus PC-12. These aircraft are also classified as small aircraft with takeoff weights below 12,500 pounds and they are included in Aircraft Approach Category A (Airport Reference Code: A-II).

Increasing the length of Runway 16/34 is recommended as high priority project in the current 20-year planning period. The increase in runway length will improve safety and the ability to accommodate the current and forecast fleet of multi-engine piston aircraft for both takeoff and accelerate-stop distances.

Based on the site configuration, FAA design standards, and approach obstruction clearing requirements, extensions are at both ends of Runway 16/34 are recommended. The new sections of runway will be configured as displaced thresholds to maintain current approach obstruction clearance from a variety of off-airport built items in including structures and major overhead electrical transmission lines. The extension at the Runway 16 end is 475 feet long and will have adequate taxiway OFA clearances for both ADG I and ADG II (reserve) aircraft to the adjacent fence. A blast fence is recommended to be located beyond the north end of the runway on frangible (breakaway) mounts. The blast fence would be designed to protect pedestrians and vehicles travelling on NE 30th Street from prop or jet blast for aircraft takeoffs on Runway 16. The extension at the Runway 34 end is 234 feet long.

Aircraft operations at both runway ends will be similar in that aircraft may begin their takeoff roll at the far ends of the runway and landings will occur at the displaced thresholds. Published declared distances will limit usable runway lengths for various operations to reflect the close proximity of the runway ends and fixed objects (fences, etc.). The runway length available for takeoff will be defined by the existing runway threshold location at the end opposite of takeoff. This design feature maintains the existing runway protection zones (RPZ) in their current locations, required by FAA to avoid increasing the presence or prominence of roads within the RPZs.

Two additional exit taxiways will be added at the north and south ends of the east parallel taxiway (Taxiway A).

The airport's two primary landside areas located on the east side of the runway will be reconfigured to accommodate a variety of facility upgrades.

The main terminal area, located near mid-runway includes several upgrades:

- Reconfigured Aircraft Parking Apron (small airplane tiedowns and drive through parking for business class aircraft)
- Relocated Aircraft Fueling Area
- FBO/Commercial Aviation Building (new)
- New/Reconfigured Access Roads and Vehicle Parking

The south terminal area, located near the southeast corner of the airport includes several upgrades:

- Reconfigured Aircraft Parking Apron (includes Auburn Flight Service apron)
- FBO/Commercial Aviation Building (new) with ADG II Taxilane Access
- New/Reconfigured Access Roads and Vehicle Parking
- Conventional Hangar Sites

The proposed development in the southwest section of the airport is initially limited to low impact helicopter facilities (parking pads, buildings, etc.) that could be developed without significantly impacting onsite wetlands. A new vehicle access roadway would be extended to the development from NE 16th Street. Longer term development options will be considered by the City based on the cost of wetland mitigation. Expansion reserves are depicted near the southern end of the development area.

Several areas of property acquisition are depicted on the ALP including the motel located near the southeast corner of the airport; the Metro Park & Ride Lot located near the south end of the runway; a parcel located near the southwest corner of the airport; and an area of industrial development near the northeast corner of the airport. Several of these parcels were previously recommended for acquisition (as depicted on the 2002 ALP) while others represent areas identified in the current master plan as having high potential for aviation use. The northeast area consists of several smaller parcels, some of which extend east of the area depicted on the ALP. The City of Auburn has indicated an interest in acquiring parcels in this area for airport use, with potential redevelopment of portions located further east for commercial (non-airport) use.

Future facilities are color-coded (red) to distinguish them from existing facilities. Future facilities are represented in the airport master plan's 20-year capital improvement program (CIP) as individual projects or project groupings. Long term development reserves depicted on the ALP are also color coded (green). These items are intended to serve as placeholders or are provided for reference only. Demand for facilities identified as development reserves is not anticipated to occur in the current 20-year planning period and therefore the corresponding projects are not included in the master plan CIP. A change of events that could move a development reserve into an actual project would require updated planning and coordination with FAA.

TERMINAL AREA PLAN DRAWINGS

Terminal Area Plan drawings for the main landside areas located on the east side of Runway 16/34 provide additional detail for existing and new facilities. Recommended improvements include reconfigured/expanded aircraft parking apron, new fixed base operator (FBO) buildings, new hangar areas, fuel storage facilities, taxiway reconfigurations and access roads.

FAR PART 77 AIRSPACE DRAWING

The FAR Part 77 Airspace drawing depicts the protected airspace defined for Runway 16/34 in Federal Air Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*. The airspace plan drawings depict the five "imaginary surfaces" defined in FAR Part 77.25 including the primary, transitional, approach, horizontal and conical surfaces, previously described in Chapter 4. Part 77 surfaces should be free of built or terrain obstructions to the great extent possible. Objects that penetrate FAR Part 77 surfaces may require action to mark or remove depending on their severity, location and the feasibility of the action. The drawing includes a table of obstructions with recommended dispositions.

The physical characteristics of the Part 77 surfaces are defined the size of aircraft using the runway and the approach capabilities of the runway. Runway 16/34 accommodates small aircraft (12,500 pounds or less) with nonprecision instrument approach capabilities (to the airport environment).

- **Runway Approach Surfaces**: Both approach surfaces extend 5,000 feet from the end of the runway primary surface with a slope of 20:1. The approach surface slope represents the horizontal distance required for each increment of vertical rise.

- **Primary Surface:** Based on the approach capabilities (nonprecision instrument with visual final approach segments), the primary surface is 250 feet wide (125 feet on either side of runway centerline), extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway with the same elevation as the nearest point on the runway centerline. For Runway 16/34, the ultimate primary surface is 4,518 feet long and 250 feet wide.
- **Runway Transitional Surface:** The runway transitional surfaces extend outward and upward from the outer edges of the primary surface. The transitional surfaces have a slope of 7:1 and extend to an elevation 150 feet above airfield elevation and connect to the runway horizontal surface. On- and off-airport structures constructed under the transitional surfaces on both sides of Runway 16/34 have generally been sited to avoid penetrating the surface that extends outward from the edges of the 250-foot wide primary surface.
- **Horizontal Surface:** The horizontal surface is drawn from 5,000-foot radii that extend from both ends of the primary surface to form an oval. The horizontal surface is a flat plane of airspace with an elevation 150 feet above airport elevation.
- **Conical Surface:** The conical surface extends from the outer edge of the horizontal surface at a slope of 20:1 for 4,000 feet. Areas of terrain penetration are identified in the west and east sections of the conical surface.

RUNWAY APPROACH SURFACE PLAN AND PROFILE DRAWINGS

The Approach Surface drawings depict plan and profile views of the runway approach surfaces depicted in the FAR Part 77 airspace plan. The drawings provide additional detail in identify obstructions, terrain and other physical features within the approach surfaces. The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan. The drawing also depicts the threshold siting surface (TSS) that is used to mitigate obstructions to the Part 77 approach surfaces. The appropriate applications, dimensions and slope for the TSS are defined in FAA Advisory Circular (AC) 150/5300-13A (paragraph 303, section b.).

RUNWAY RPZ & INNER APPROACH SURFACE DRAWINGS

The runway protection zone (RPZ) and inner approach surface drawings depict detailed plan views of these areas and a profile view of the approach surface and threshold siting surface (when used). The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan and Approach Surface Plan and Profile drawings.

AIRPORT LAND USE PLAN

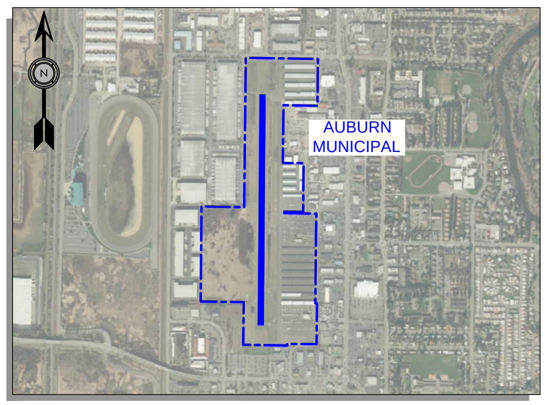
The Airport Land Use Plan drawing depicts existing land uses and zoning for the airport and its immediate vicinity. 20-year noise contours are also depicted on the drawing. The land areas surrounding the Airport are heavily developed with industrial (light and heavy) and commercial land uses. These land uses provide a buffer between airport operations and nearby residential land uses and other noise sensitive land uses (hospitals, churches, schools, etc.). The Airport and its immediate surroundings are located within the Auburn city limits.

EXHIBIT "A" – AIRPORT PROPERTY PLAN

The Airport Property Plan drawing provides depicts all property owned by the City on the airport. The drawing notes the form of ownership or control (fee simple, avigation easement, etc.) and the date of acquisition per FAA guidelines. Areas of recommended property acquisition are also depicted.

AUBURN MUNICIPAL AIRPORT (S□□)
AIRPORT MASTER PLAN

CITY OF AUBURN□ WASHIN□TON
AIP NO□ □□□□□□□□□□□□□□□□□□□
AIRPORT LAYOUT PLAN
MAY □□□□



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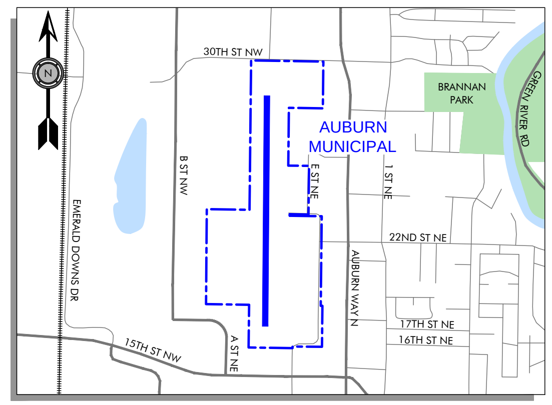

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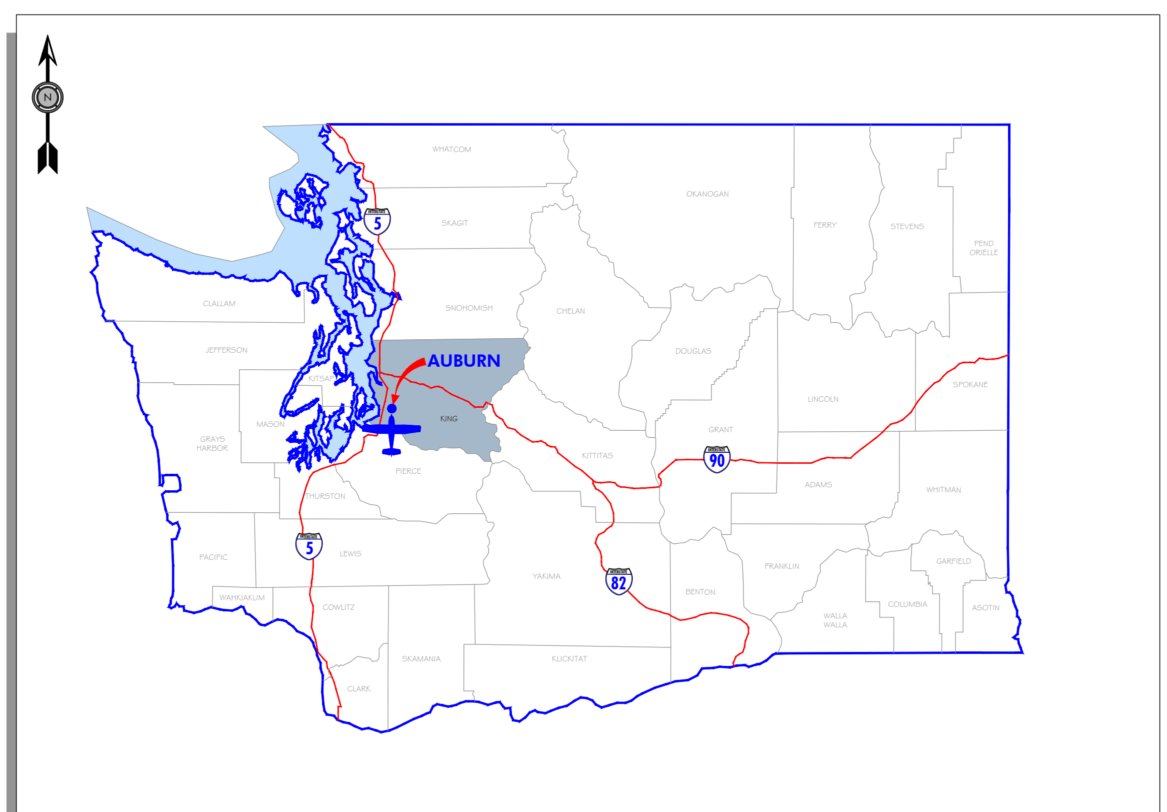

□OCATION MA□

SHEET INDEX

NUMBER	CONTENTS
1	COVER SHEET
2	AIRPORT DATA SHEET
3	AIRPORT LAYOUT PLAN
4	NORTH TERMINAL AREA PLAN
5	SOUTH TERMINAL AREA PLAN
6	AIRPORT AIRSPACE PLAN (FAR PART 77)
7	RUNWAY 16 RPZ AND INNER APPROACH PLAN AND PROFILE
8	RUNWAY 34 RPZ AND INNER APPROACH PLAN AND PROFILE
9	RUNWAY 16 APPROACH PLAN AND PROFILE
10	RUNWAY 34 APPROACH PLAN AND PROFILE
11	AIRPORT LAND USE PLAN W/2032 NOISE CONTOURS
12	EXHIBIT "A" AIRPORT PROPERTY PLAN

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Bend, Oregon 97702
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AIRPORT DATA TABLE

DESCRIPTION	EXISTING	FUTURE
AIRPORT ELEVATION (MSL)	62.8'	63.4' EST.
AIRPORT ACREAGE	110	123.83
ARP COORDINATES LAT. LONG.	N 47° 19' 39.66" W 122° 13' 35.96"	N 47° 19' 40.79" W 122° 13' 35.96"
MAGNETIC DECLINATION	16°8'25"E (3/2014) ANNUAL RATE OF CHANGE 0°10.6'W	ANNUAL RATE OF CHANGE 0°10.6'W
MEAN MAX. DAILY TEMPERATURE	78.8°	SAME
FAA IDENTIFIER	S50	SAME
DATUM	NAD 83/NGVD 88	SAME

RUNWAY DATA TABLE

	EXISTING CONDITIONS RUNWAY 16 - 34	FUTURE CONDITIONS RUNWAY 16 - 34
RUNWAY LENGTH AND WIDTH	3400' X 75'	4118' X 75' (SEE NOTE 1)
RUNWAY LIGHTING	MIRL	SAME
RUNWAY PAVEMENT STRENGTH (LBS)	12,500 SW	SAME
RUNWAY PAVEMENT TYPE	ASPHALT	SAME
RUNWAY PERCENT WIND COVERAGE (12 MPH)	98.9%	SAME
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE	0.194%	0.230% EST.
AIRPORT REFERENCE CODE (ARC)	B-I (SMALL)	SAME / (A-II RESERVE)
FAR PART 77 DESIGNATION	UTILITY (VISUAL)	SAME
NPIAS ROLE / SERVICE LEVEL	RELIEVER	SAME
TERMINAL NAVAIDS	NONE	SAME
TAXIWAY LIGHTING	MITL	SAME
TAXIWAY MARKING	CENTERLINE	SAME

RUNWAY DATA TABLE

	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	FUTURE STANDARD
RUNWAY SAFETY AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END (SEE NOTE 2)	3880' X 120' 240'	3880' X 120' 240'	4598' X 120' 240' (SEE NOTE 2)	4598' X 120' 240' (SEE NOTE 2)
OBJECT FREE AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END (SEE NOTE 2)	3880' X 250' 240'	3880' X 250' 240'	4598' X 250' 240' (SEE NOTE 2)	4598' X 250' 240' (SEE NOTE 2)
OBSTACLE FREE ZONE LENGTH AND WIDTH LENGTH BEYOND RUNWAY END (SEE NOTE 2)	3800' X 250' 200'	3800' X 250' 200'	4518' X 250' 200' (SEE NOTE 2)	4518' X 250' 200' (SEE NOTE 2)
OFZ PENETRATION (YES/NO) (SEE NOTE 2)	NO	NO	NO	NO

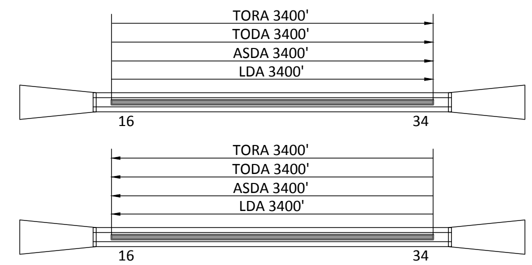
	EXISTING CONDITIONS		FUTURE CONDITIONS	
RUNWAY END	16	34	16	34
RUNWAY APPROACH CATEGORY	VISUAL	VISUAL	SAME	SAME
RUNWAY APPROACH SLOPE PART 77 REQUIRED	20:1	20:1	20:1	20:1
ACTUAL	20:1 (SEE NOTE 3)	20:1 (SEE NOTE 3)	20:1 (SEE NOTE 3)	20:1 (SEE NOTE 3)
APPROACH VISIBILITY MINIMUMS	1 MILE	1 MILE	SAME	SAME
RUNWAY MARKINGS	VISUAL	VISUAL	SAME	SAME
RUNWAY END COORDINATES LAT. LONG.	N 47° 19' 56.43" W 122° 13' 36.13"	N 47° 19' 22.88" W 122° 13' 35.78"	N 47° 20' 01.11" W 122° 13' 36.18"	N 47° 19' 20.47" W 122° 13' 35.75"
INSTRUMENTATION AND APPROACH AIDS	GPS	GPS	GPS / NEXTGEN	GPS / NEXTGEN
VISUAL AIDS	VASI4; REIL	VASI4; REIL	PAPI4; REIL	PAPI4; REIL
CRITICAL AIRCRAFT (ARC)	CESSNA 340A		SAME / PILATUS PC-12 (RESERVE)	
WINGSPAN	<49'		SAME (RESERVE <79')	
WEIGHT (LBS)	<12,500		SAME	
APPROACH SPEED	<91 KNOTS		SAME	
LENGTH OF HAUL	<500 MILES		SAME	

NON STANDARD CONDITIONS

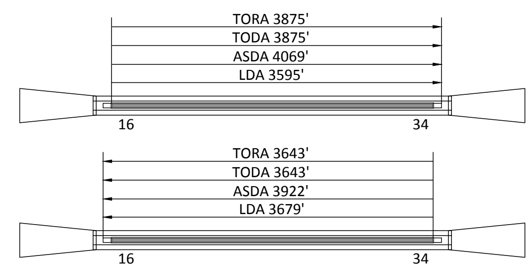
NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA	CLEARANCE TO PARKED AIRCRAFT LESS THAN STANDARD	RECONFIGURE APRON
2	TAXILANE OFA	CLEARANCE TO ADJACENT HANGAR LESS THAN STANDARD	USE FAA ALTERNATIVE TAXILANE OFA CLEARANCE STANDARD BASED ON MAX AC WINGSPAN
3	OFA / OFZ / RSA	AREA PROVIDED BEYOND RUNWAY ENDS LESS THAN ADG I STANDARD	DISPLACED THRESHOLDS AND DECLARED DISTANCES USED TO PROVIDE STANDARD DIMENSIONS BEYOND RUNWAY ENDS FOR SPECIFIC OPERATIONS

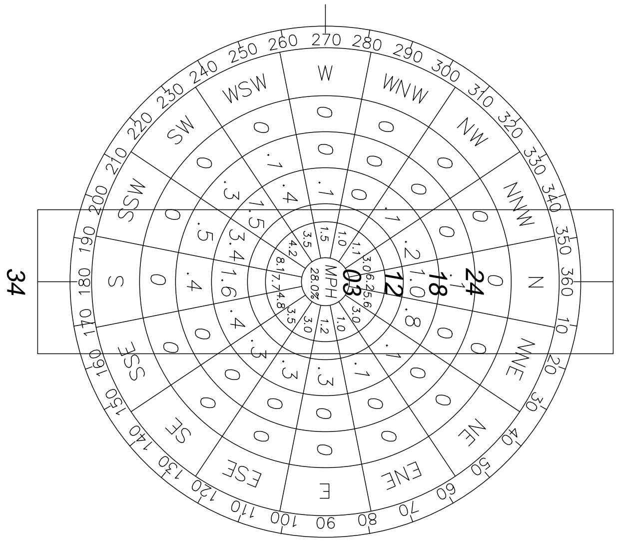
RUNWAY □□□□□ DECLARED DISTANCES

EXISTING



FUTURE





ALL WEATHER WIND ROSE

SOURCE:
ESTIMATED BY CH2MHILL, JULY 1977
12 MPH 98.9%

NOTES:

1. FUTURE RUNWAY HAS DISPLACED THRESHOLDS (RWY 16 475'; RWY 34 243'.)
2. THE ENDS OF THE FUTURE OFZ, RSA, AND OFA BASED ON THE LIMITS OF AIRPORT PROPERTY (FENCE). RUNWAY LENGTHS AVAILABLE FOR TAKEOFF AND LANDING DEFINED BY DECLARED DISTANCES (PER FAA AC 150/5300-13A).
3. UNOBSTRUCTED 20:1 APPROACH OBTAINED WITH THRESHOLD SITING SURFACES ESTABLISHED AT EACH RUNWAY THRESHOLD.

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0003-018-2012) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: ____________

SIGNATURE

CITY OF AUBURN APPROVAL

APPROVAL DATE: ____________

SIGNATURE

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DM	JLS	WMR	AS SHOWN
DATE: MAY 2015		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

AIRPORT DATA SHEET

FIGURE NO.
-

SHEET NO.
2 OF 12

BUILDING / FACILITY KEY

	DESCRIPTION
1	TERMINAL / FBO APRON
2	SMALL AIRCRAFT TIEDOWN APRON (EXISTING)
3	BUILDING "506" AIRPORT MANAGER OFFICE (CITY OWNED)
4	AUBURN FLIGHT SERVICE FBO HANGAR (EXISTING)
5	TENANT OWNED CONVENTIONAL HANGAR (EXISTING)
6	CITY OWNED T-HANGAR (EXISTING)
7	TENANT OWNED T-HANGAR/EXECUTIVE HANGAR (EXISTING)
8	AVIATION FUEL STORAGE/ SELF FUELING AREA (EXISTING)
9	AVIATION USE BUILDINGS (FUTURE)
10	CONVENTIONAL HANGAR (FUTURE)
11	AWOS (FUTURE)
12	AIRCRAFT FUEL APRON (FUTURE)
13	AIRCRAFT PARKING APRON (FUTURE)
14	HELICOPTER PARKING POSITION (FUTURE)
15	OFFICE (EXISTING)
16	AIRPORT FBO/COMMERCIAL BUILDING (FUTURE)
17	VEHICLE PARKING (FUTURE)

NOTES:

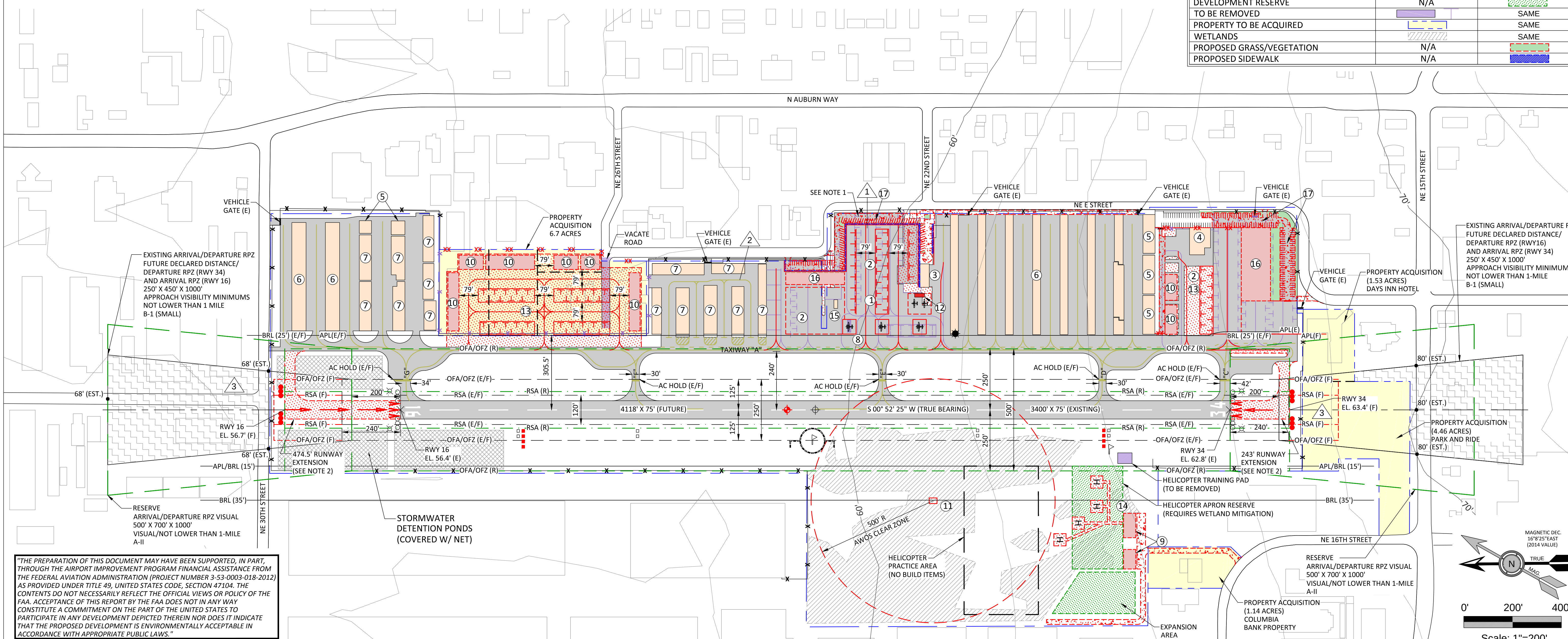
1. SEE TERMINAL AREA PLAN DRAWINGS (SHEETS 4 AND 5) FOR DETAILS ON FUTURE APRON CONFIGURATIONS.
2. FUTURE RUNWAY LENGTHS AVAILABLE FOR TAKEOFF AND LANDING WILL BE LIMITED BY DECLARED DISTANCES (TO BE PUBLISHED A/FD). ADDITIONAL USEABLE RUNWAY PROVIDED BY BOTH ENDS TO BE CONFIGURED WITH DISPLACED THRESHOLDS.
3. THE EXISTING ARRIVAL/DEPARTURE RUNWAY PROTECTION ZONES (RPZ) FOR RUNWAY 16 AND 34 WILL BE MAINTAINED IN THEIR CURRENT LOCATIONS. THE END OF USEABLE RUNWAY FOR TAKEOFF WILL BE DETERMINED BY THE LOCATIONS OF THE EXISTING DEPARTURE RPZ FOR EACH RUNWAY END. DEPARTURE RPZ CONFIGURATIONS DETERMINED BY USE OF DECLARED DISTANCES TO MITIGATE UNACCEPTABLE INCOMPATIBLE LAND USES (PER AC 150/5300-13A).
4. ARC A-II RSA & OFA RESERVES DEPICTED FOR REFERENCE.
5. A-II RESERVE RPZ (500' X 700' X 1000') DEPICTED FOR REFERENCE. CONTINUED USE OF "SMALL AIRPLANES EXCLUSIVELY" RPZ (250' X 450' X 1000') SHOULD BE CONSIDERED FOR TYPICAL A-II SINGLE ENGINE TURBOPROPS (<12,000)
6. PROPERTY ACQUISITION APPROXIMATELY 13.83 ACRES TO BE PURSUED AS PARCELS AND FUNDING BECOME AVAILABLE.

NON STANDARD CONDITIONS

NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA	CLEARANCE TO PARKED AIRCRAFT LESS THAN STANDARD	RECONFIGURE APRON
2	TAXILANE OFA	CLEARANCE TO ADJACENT HANGAR LESS THAN STANDARD	USE FAA ALTERNATIVE TAXILANE OFA CLEARANCE STANDARD BASED ON MAX AC WINGSPAN
3	OFA / OFZ / RSA	AREA PROVIDED BEYOND RUNWAY ENDS LESS THAN ADG I STANDARD	DISPLACED THRESHOLDS AND DECLARED DISTANCES USED TO PROVIDE STANDARD DIMENSIONS BEYOND RUNWAY ENDS FOR SPECIFIC OPERATIONS

LEGEND

	EXISTING	FUTURE
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		SAME
GROUND CONTOURS	10'	SAME
AIRPORT REFERENCE POINT (ARP)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		SAME
VISUAL GUIDANCE INDICATORS	(VASI)	(PAPI)
WIND INDICATOR		SAME
SEGMENTED CIRCLE WIND INDICATOR		SAME
FENCE		
BEACON		SAME
THRESHOLD LIGHTS		
ACCESS ROAD/VEHICLE PARKING	N/A	
AVIGATION EASEMENT		SAME
DEVELOPMENT RESERVE	N/A	
TO BE REMOVED		SAME
PROPERTY TO BE ACQUIRED		SAME
WETLANDS		SAME
PROPOSED GRASS/VEGETATION	N/A	
PROPOSED SIDEWALK	N/A	



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SIGNATURE

CITY OF AUBURN APPROVAL

APPROVAL DATE: ____________

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DESIGNED BY: DM	DRAWN BY: JLS	CHECKED BY: WMR	SCALE: AS SHOWN
DATE: MAY 2015		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN

FIGURE NO.
-

SHEET NO.
3 OF 12

BUILDIN□ □FACILITY □EY

	DESCRIPTION
1	TERMINAL / FBO APRON
2	SMALL AIRCRAFT TIEDOWN APRON (EXISTING)
3	BUILDING "506" AIRPORT MANAGER OFFICE (CITY OWNED)
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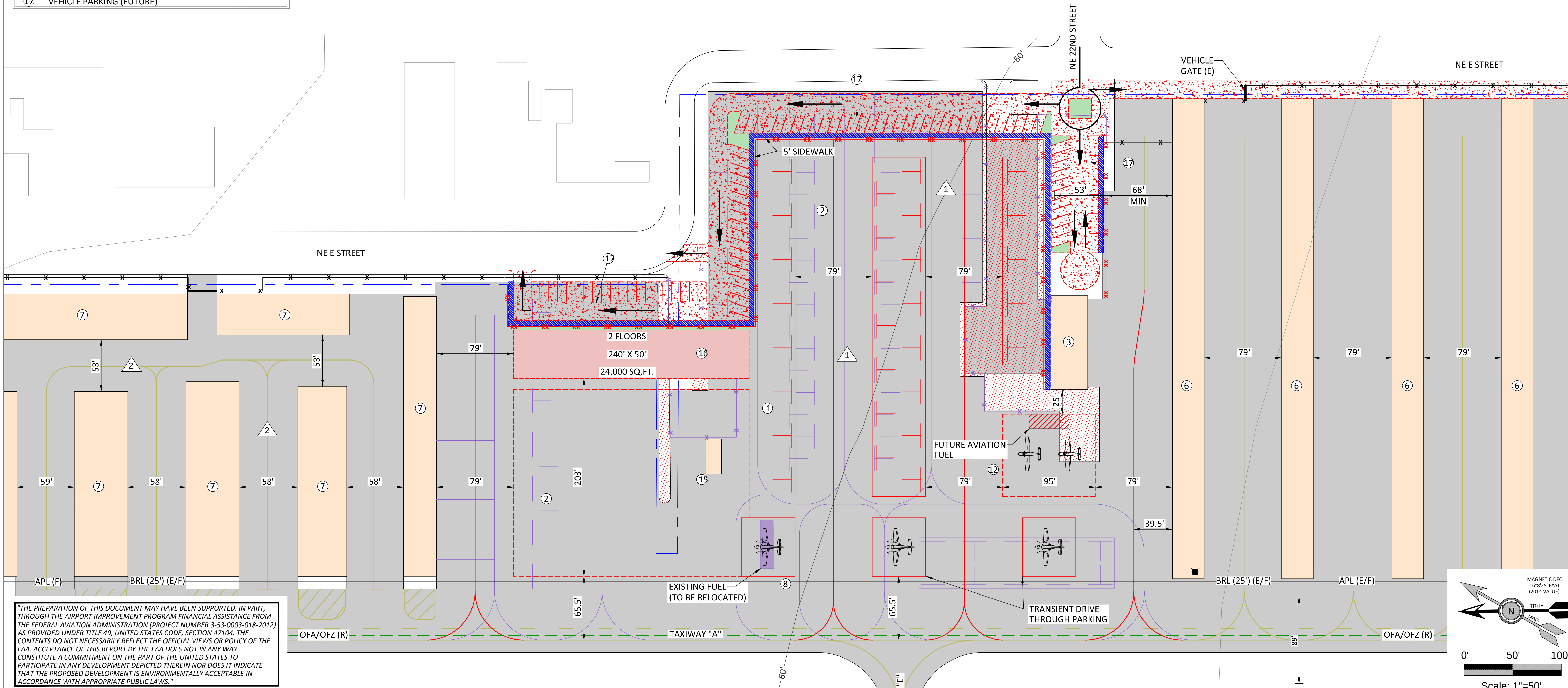
15	OFFICE (EXISTING)
16	AIRPORT FBO/COMMERCIAL BUILDING (FUTURE)
17	VEHICLE PARKING (FUTURE)

NON STANDARD CONDITIONS

NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA	CLEARANCE TO PARKED AIRCRAFT LESS THAN STANDARD	RECONFIGURE APRON
2	TAXILANE OFA	CLEARANCE TO ADJACENT HANGAR LESS THAN STANDARD	USE FAA ALTERNATIVE TAXILANE OFA CLEARANCE STANDARD BASED ON MAX AC WINGSPAN
3	OFA / OFZ / RSA	AREA PROVIDED BEYOND RUNWAY ENDS LESS THAN ADG I STANDARD	DISPLACED THRESHOLDS AND DECLARED DISTANCES USED TO PROVIDE STANDARD DIMENSIONS BEYOND RUNWAY ENDS FOR SPECIFIC OPERATIONS

LE□END

	□□I□TING	FUTUR□
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
GROUND CONTOURS	10'	SAME
FENCE		
ACCESS ROAD/VEHICLE PARKING	N/A	
TO BE REMOVED		N/A
PROPOSED GRASS/VEGETATION	N/A	
PROPOSED SIDEWALK	N/A	



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AUBURN MUNICIPAL AIRPORT

NORTH TERMINAL AREA PLAN

FIGURE NO.
-

SHEET NO.
4 OF 12

BUILDING FACILITY KEY

	DESCRIPTION
1	TERMINAL / FBO APRON
2	SMALL AIRCRAFT TIEDOWN APRON (EXISTING)
3	BUILDING "506" AIRPORT MANAGER OFFICE (CITY OWNED)
4	AUBURN FLIGHT SERVICE FBO HANGAR (EXISTING)
5	TENANT OWNED CONVENTIONAL HANGAR (EXISTING)
6	CITY OWNED T-HANGAR (EXISTING)
7	TENANT OWNED T-HANGAR/EXECUTIVE HANGAR (EXISTING)
8	AVIATION FUEL STORAGE/ SELF FUELING AREA (EXISTING)
9	AVIATION USE BUILDINGS (FUTURE)
10	CONVENTIONAL HANGAR (FUTURE)
11	AWOS (FUTURE)
12	AIRCRAFT FUEL APRON (FUTURE)
13	AIRCRAFT PARKING APRON (FUTURE)
14	HELICOPTER PARKING POSITION (FUTURE)
15	OFFICE (EXISTING)
16	AIRPORT FBO/COMMERCIAL BUILDING (FUTURE)
17	VEHICLE PARKING (FUTURE)

NON STANDARD CONDITIONS

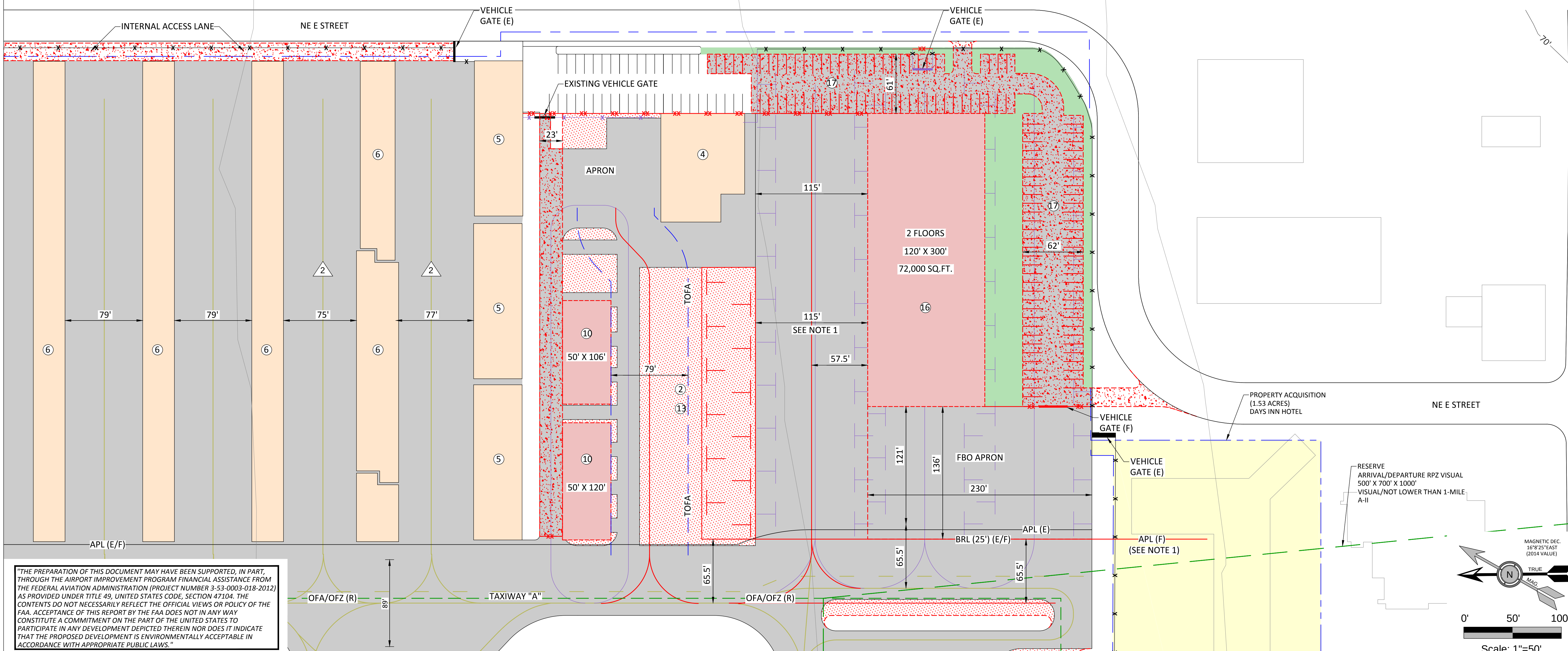
NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA	CLEARANCE TO PARKED AIRCRAFT LESS THAN STANDARD	RECONFIGURE APRON
2	TAXILANE OFA	CLEARANCE TO ADJACENT HANGAR LESS THAN STANDARD	USE FAA ALTERNATIVE TAXILANE OFA CLEARANCE STANDARD BASED ON MAX AC WINGSPAN
3	OFA / OFZ / RSA	AREA PROVIDED BEYOND RUNWAY ENDS LESS THAN ADG I STANDARD	DISPLACED THRESHOLDS AND DECLARED DISTANCES USED TO PROVIDE STANDARD DIMENSIONS BEYOND RUNWAY ENDS FOR SPECIFIC OPERATIONS

LEGEND

	EXISTING	FUTURE
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
GROUND CONTOURS	10'	SAME
FENCE		
ACCESS ROAD/VEHICLE PARKING	N/A	
TO BE REMOVED		N/A
PROPOSED GRASS/VEGETATION	N/A	
PROPERTY TO BE ACQUIRED		N/A
TAXIWAY OBJECT FREE AREA (TOFA)		SAME

NOTE:

1. SOUTH APRON AND TAXIWAY A CLEARANCES BASED ON ADG II STANDARD (RESERVE)



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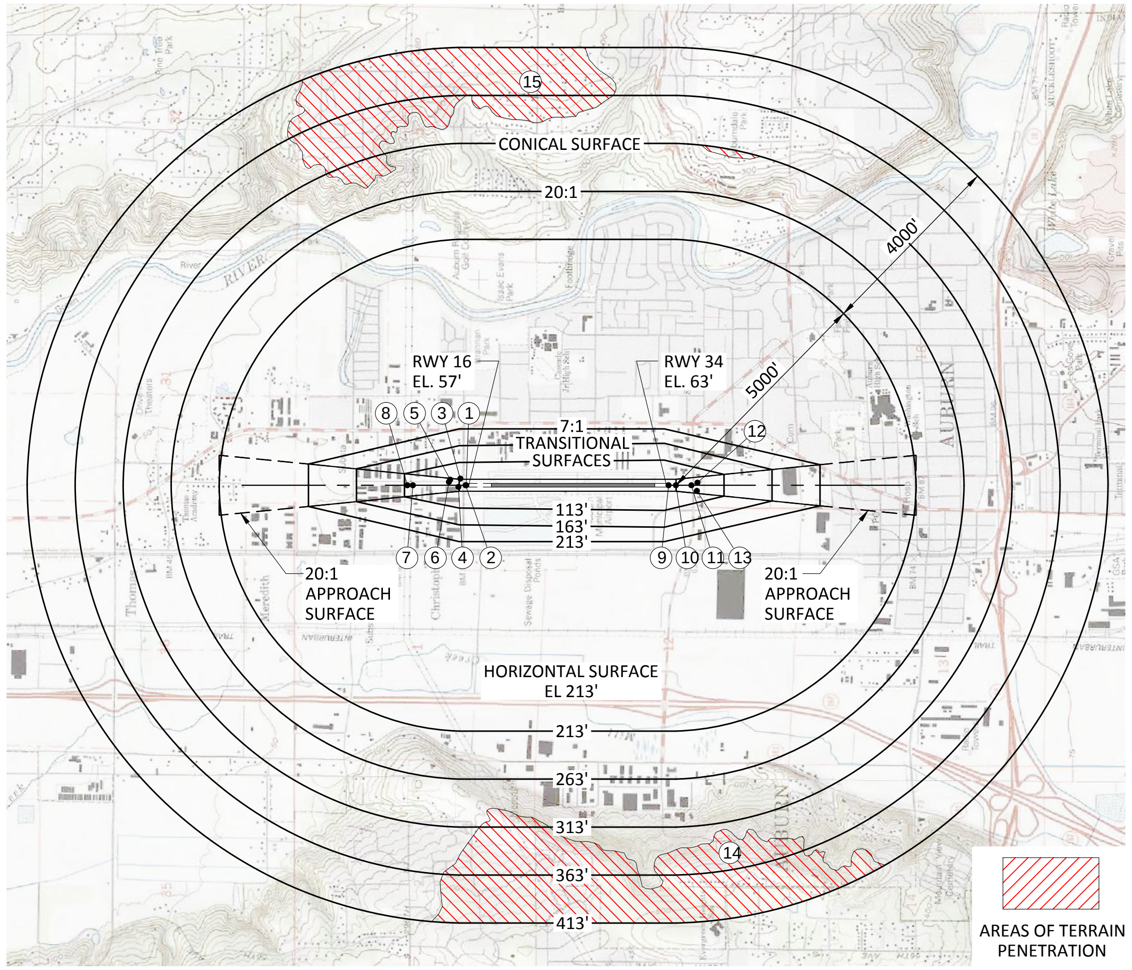
DATE: MAY 2015		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

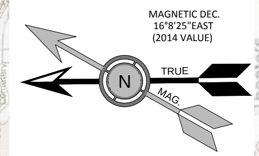
SOUTH TERMINAL AREA PLAN

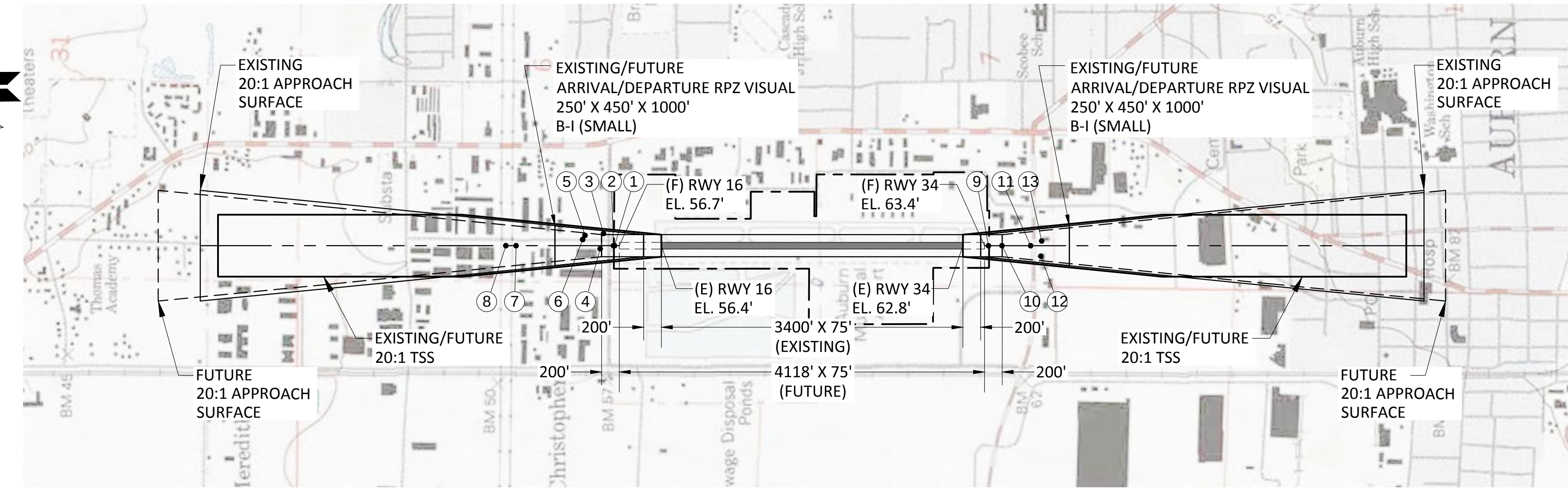
FIGURE NO. -

SHEET NO. 5 OF 12



AREAS OF TERRAIN PENETRATION

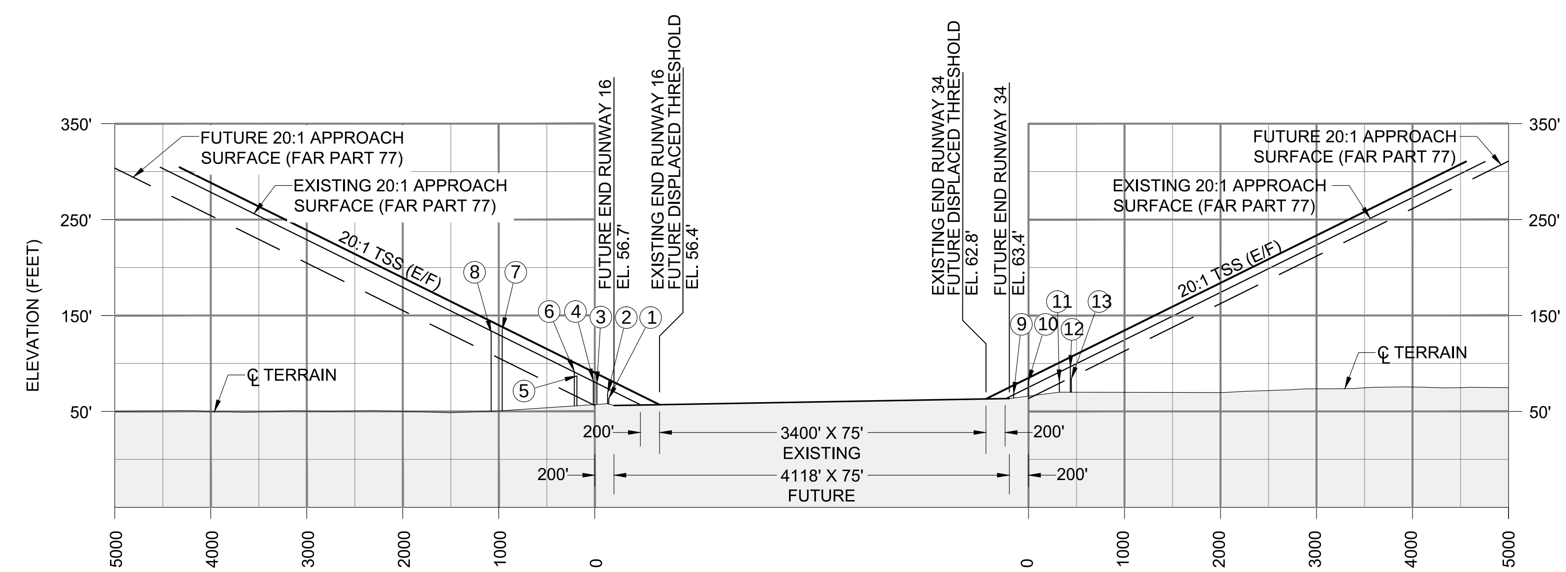




RUNWAY □□□□□ PLAN □IEW

0' 1000' 2000'

Scale: 1"=1000'



0' 100' 200'

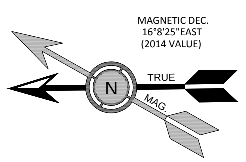
SCALE OF FEET
VERTICAL SCALE 1"=100'

RUNWAY □□□□□ PROFILE □IEW

0' 1000' 2000'

SCALE OF FEET
HORIZONTAL SCALE 1"=1000'

FAR PART □□ PLAN □IEW



0' 2000' 4000'

Scale: 1"=2000'

RUNWAY □□□□□

FAR PART 77 DIMENSIONAL STANDARDS

- RUNWAY ULTIMATE LENGTH = 4118'
- RUNWAY TYPE = B-I (SMALL)
- PRIMARY SURFACE WIDTH = 250'
- APPROACH SURFACE INNER WIDTH = 250'
- APPROACH SURFACE OUTER WIDTH = 1,250'
- APPROACH SURFACE LENGTH = 5,000'
- RADIUS OF HORIZONTAL SURFACE = 5,000'
- APPROACH SLOPE = 20:1

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	FENCE	APPROACH (RWY 16)	64'	0'	54'	6'	YES	OCS/TSS W/ DISPLACED THRESHOLD
2	NE 30TH STREET	APPROACH (RWY 16)	69'	0'	66'	10'	NO	OCS/TSS W/ DISPLACED THRESHOLD
3	BUILDING	APPROACH (RWY 16)	79'	138'	178'	22'	NO	OCS/TSS W/ DISPLACED THRESHOLD
4	BUILDING	APPROACH (RWY 16)	83'	34'	215'	25'	NO	OCS/TSS W/ DISPLACED THRESHOLD
5	BUILDING	APPROACH (RWY 16)	87'	117'	387'	22'	NO	OCS/TSS W/ DISPLACED THRESHOLD
6	POWER POLE	APPROACH (RWY 16)	92'	69'	413'	25'	NO	OCS/TSS W/ DISPLACED THRESHOLD
7	POWER LINE	APPROACH (RWY 16)	132.6'	0'	1164'	32'	NO	OCS/TSS W/ DISPLACED THRESHOLD
8	POWER LINE	APPROACH (RWY 16)	135.6'	0'	1279'	23'	NO	OCS/TSS W/ DISPLACED THRESHOLD
9	FENCE	APPROACH (RWY 34)	68'	0'	45'	4'	YES	OCS/TSS W/ DISPLACED THRESHOLD
10	PARKING LOT	APPROACH (RWY 34)	81'	0'	197'	15'	NO	OCS/TSS W/ DISPLACED THRESHOLD
11	NE 15TH STREET	APPROACH (RWY 34)	81'	0'	520'	2'	NO	OCS/TSS W/ DISPLACED THRESHOLD
12	BUILDING	APPROACH (RWY 34)	96'	119'	635'	11'	NO	OCS/TSS W/ DISPLACED THRESHOLD
13	BUILDING	APPROACH (RWY 34)	84'	53'	645'	0'	NO	OCS/TSS W/ DISPLACED THRESHOLD
14	TERRAIN	CONICAL	300' - 520'	6730'	-498'	0'	NO	NO ACTION
15	TERRAIN	CONICAL	320' - 480'	6191'	2134'	0'	NO	NO ACTION

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. FUTURE RUNWAY TO BE CONFIGURED WITH DISPLACED THRESHOLDS AT BOTH ENDS TO MAINTAIN EXISTING APPROACH OBSTRUCTION CLEARANCE. THRESHOLD SITING SURFACES (20:1) IDENTIFIED FOR BOTH RUNWAY ENDS.

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DM	JLS	WMR	AS SHOWN
DATE: MAY 2015		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

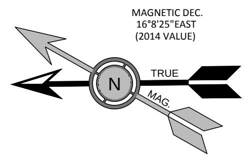
AIRPORT AIRSPACE PLAN (FAR PART □□)

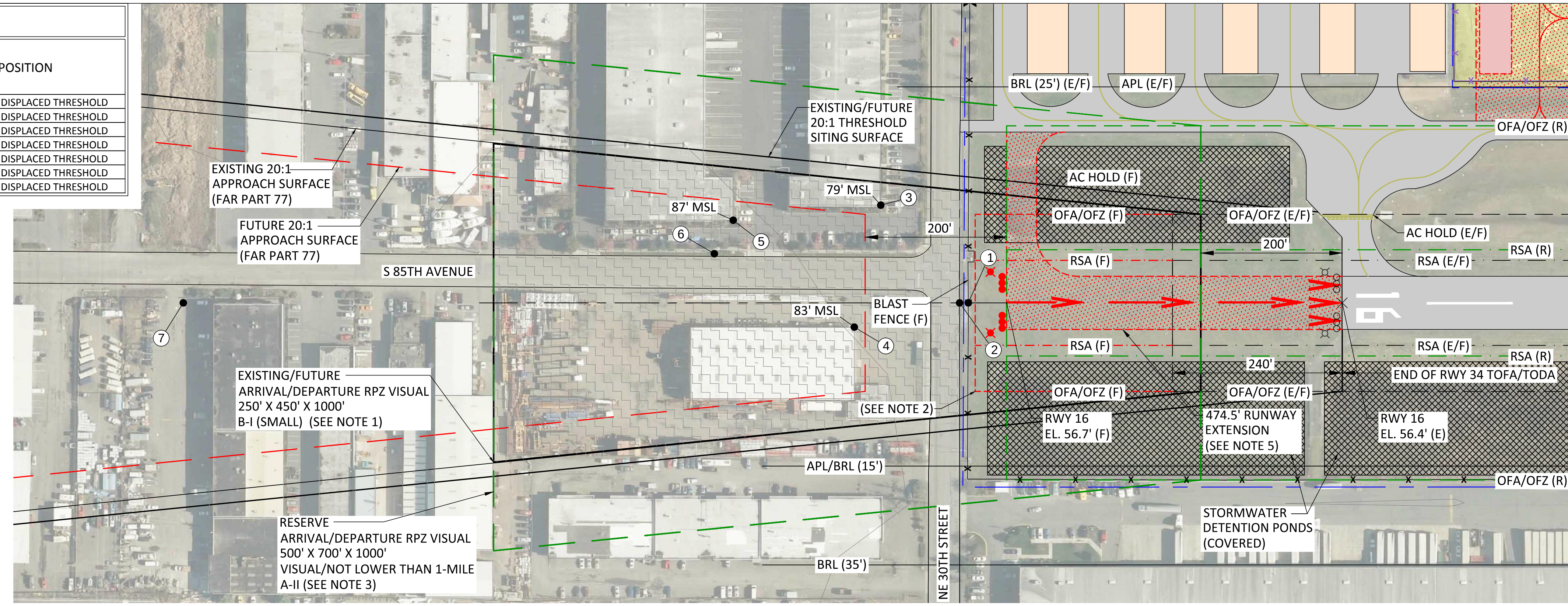
FIGURE NO. -

SHEET NO. 6 OF 12

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	FENCE	APPROACH (RWY 16)	64'	0'	54'	6'	YES	OCS/TSS W/ DISPLACED THRESHOLD
2	NE 30TH STREET	APPROACH (RWY 16)	69'	0'	66'	10'	NO	OCS/TSS W/ DISPLACED THRESHOLD
3	BUILDING	APPROACH (RWY 16)	79'	138'	178'	22'	NO	OCS/TSS W/ DISPLACED THRESHOLD
4	BUILDING	APPROACH (RWY 16)	83'	34'	215'	25'	NO	OCS/TSS W/ DISPLACED THRESHOLD
5	BUILDING	APPROACH (RWY 16)	87'	117'	387'	22'	NO	OCS/TSS W/ DISPLACED THRESHOLD
6	POWER POLE	APPROACH (RWY 16)	92'	69'	413'	25'	NO	OCS/TSS W/ DISPLACED THRESHOLD
7	POWER LINE	APPROACH (RWY 16)	132.6'	0'	1164'	32'	NO	OCS/TSS W/ DISPLACED THRESHOLD

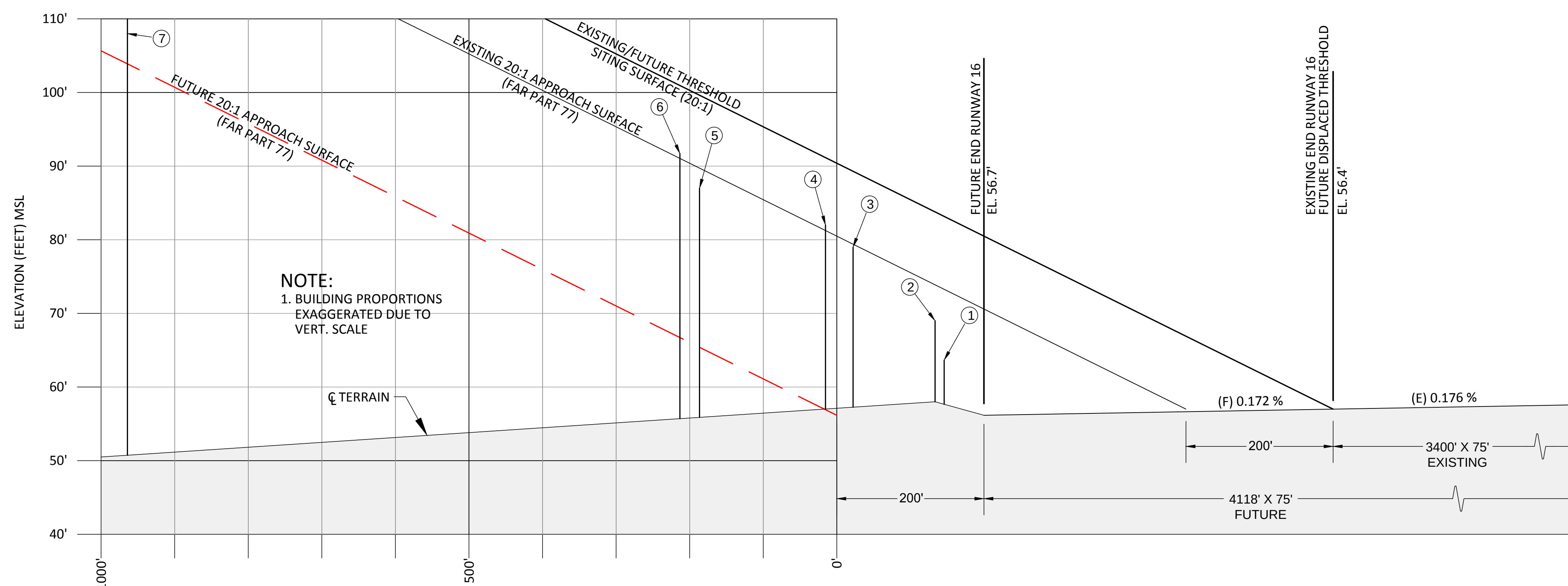




0' 100' 200'

Scale: 1"=100'

RUNWAY 16 PLAN VIEW



0' 10' 20'

Vertical Scale: 1"=10'

RUNWAY 16 PROFILE VIEW

0' 100' 200'

Horizontal Scale: 1"=100'

NOTES:

1. FUTURE RPZ LOCATION DETERMINED BY DECLARED DISTANCES TO MITIGATE ROAD AND OTHER OFF-AIRPORT LAND USES WITHIN EXISTING RPZ (NO CHANGE IN EXISTING CONDITIONS WITHIN RPZ, PER FAA GUIDANCE ON LAND USES IN RPZ'S).

2. FUTURE END OF RSA, OFA, AND OFZ AT RUNWAY 16 END LIMITED BY FIXED OBJECT FENCE. DECLARED DISTANCES AND DISPLACED THRESHOLD USE TO PROVIDE REQUIRED PROTECTED/CLEAR AREAS, FOR TAKEOFF AND LANDING OPERATIONS.

3. A-II RESERVE RPZ (500' X 700' X 1000') DEPICTED FOR REFERENCE. CONTINUED USE OF "SMALL AIRPLANES EXCLUSIVELY" RPZ (250' X 450' X 1000') SHOULD BE CONSIDERED FOR TYPICAL A-II SINGLE ENGINE TURBOPROPS (<12,000)

4. SEE SHEET (3 OF 12) FOR FULL LEGEND.

5. FUTURE RUNWAY LENGTHS AVAILABLE FOR TAKEOFF AND LANDING WILL BE LIMITED BY DECLARED DISTANCES (TO BE PUBLISHED A/FD). ADDITIONAL USEABLE RUNWAY PROVIDED BY BOTH ENDS TO BE CONFIGURED WITH DISPLACED THRESHOLDS.

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DATE: MAY 2015		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

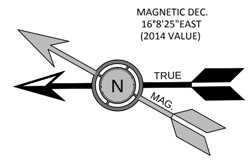
RUNWAY □□ RP□ AND INNER APPROACH PLAN AND PROFILE

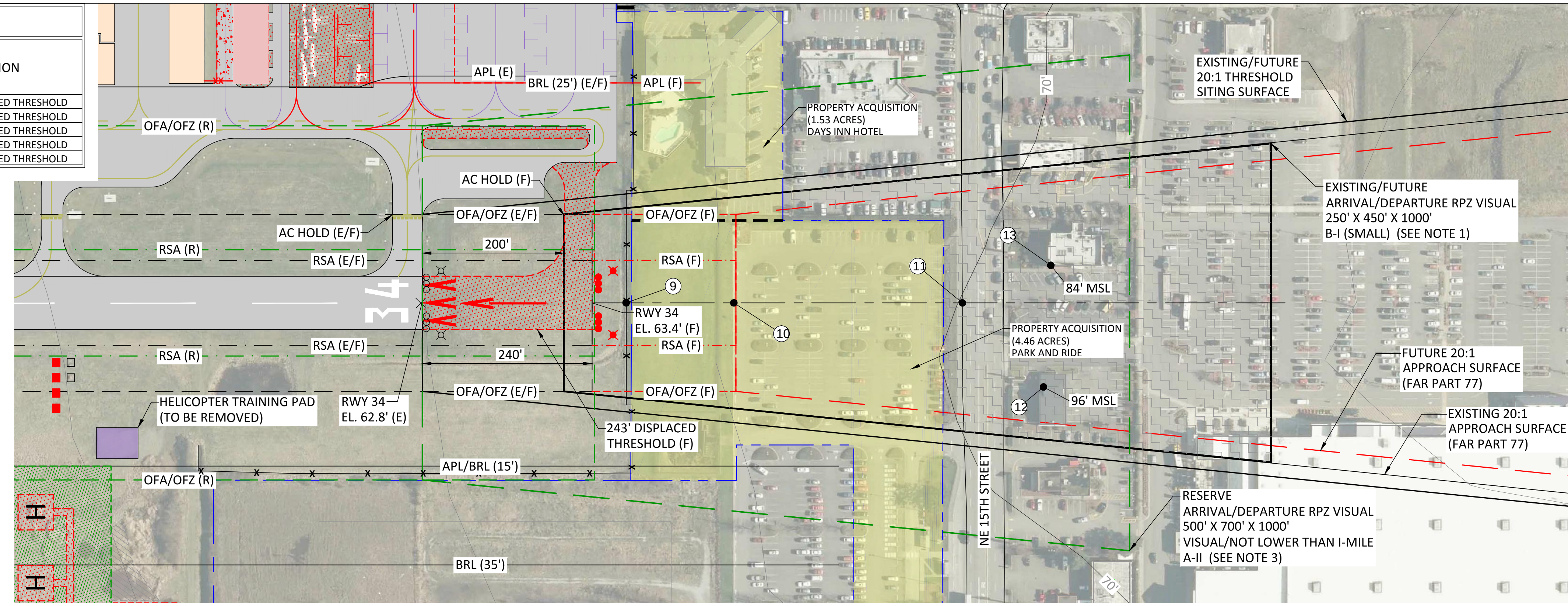
FIGURE NO.
-

SHEET NO.
7 OF 12

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
9	FENCE	APPROACH (RWY 34)	68'	0'	45'	4'	YES	OCS/TSS W/ DISPLACED THRESHOLD
10	PARKING LOT	APPROACH (RWY 34)	81'	0'	197'	15'	NO	OCS/TSS W/ DISPLACED THRESHOLD
11	NE 15TH STREET	APPROACH (RWY 34)	81'	0'	520'	2'	NO	OCS/TSS W/ DISPLACED THRESHOLD
12	BUILDING	APPROACH (RWY 34)	96'	119'	635'	11'	NO	OCS/TSS W/ DISPLACED THRESHOLD
13	BUILDING	APPROACH (RWY 34)	84'	53'	645'	0'	NO	OCS/TSS W/ DISPLACED THRESHOLD

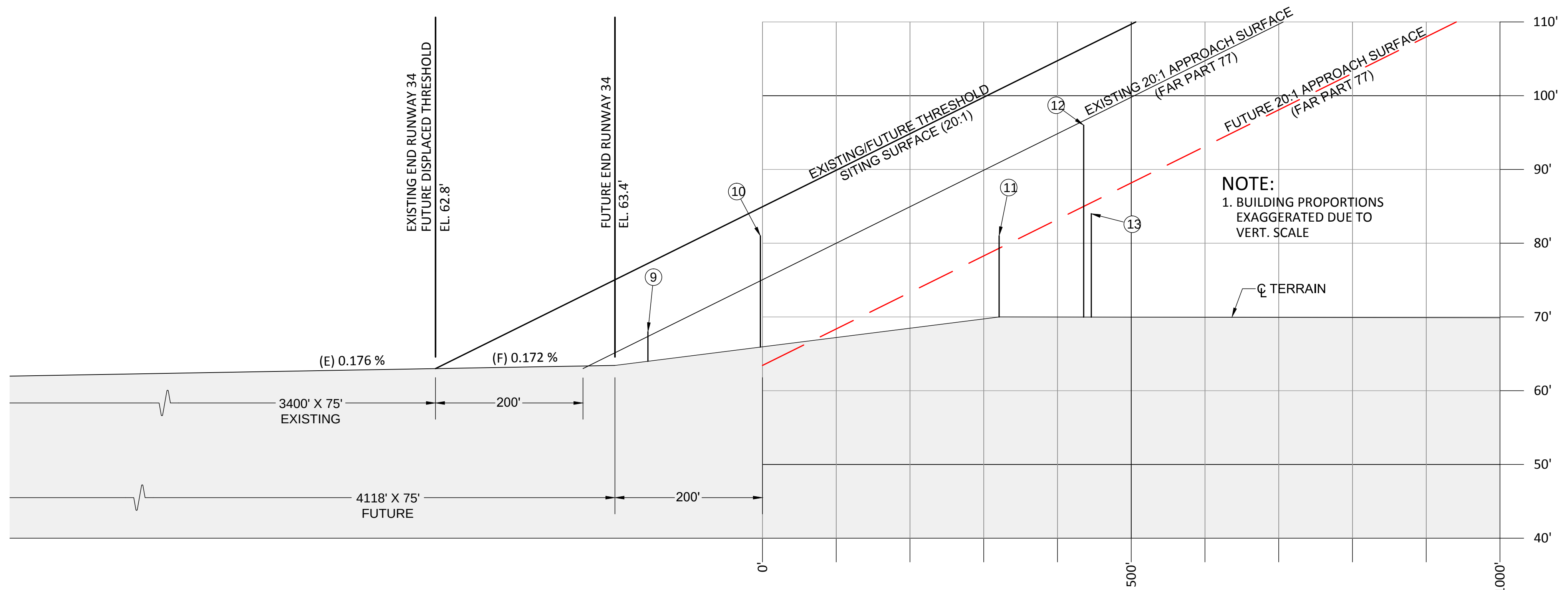




0' 100' 200'

Scale: 1"=100'

RUNWAY 34 PLAN VIEW



0' 10' 20'

Vertical Scale: 1"=10'

RUNWAY 34 PROFILE VIEW

0' 100' 200'

Horizontal Scale: 1"=100'

NOTES:

1. FUTURE RPZ LOCATION DETERMINED BY DECLARED DISTANCES TO MITIGATE ROAD AND OTHER OFF-AIRPORT LAND USES WITHIN EXISTING RPZ (NO CHANGE IN EXISTING CONDITIONS WITHIN RPZ, PER FAA GUIDANCE ON LAND USES IN RPZ'S).
2. FUTURE END OF RSA, OFA, AND OFZ AT RUNWAY 16 END LIMITED BY FIXED OBJECT FENCE. DECLARED DISTANCES AND DISPLACED THRESHOLD USE TO PROVIDE REQUIRED PROTECTED/CLEAR AREAS, FOR TAKEOFF AND LANDING OPERATIONS.
3. A-II RESERVE RPZ (500' X 700' X 1000') DEPICTED FOR REFERENCE. CONTINUED USE OF "SMALL AIRPLANES EXCLUSIVELY" RPZ (250' X 450' X 1000') SHOULD BE CONSIDERED FOR TYPICAL A-II SINGLE ENGINE TURBOPROPS (<12,000).
4. SEE SHEET (3 OF 12) FOR FULL LEGEND.

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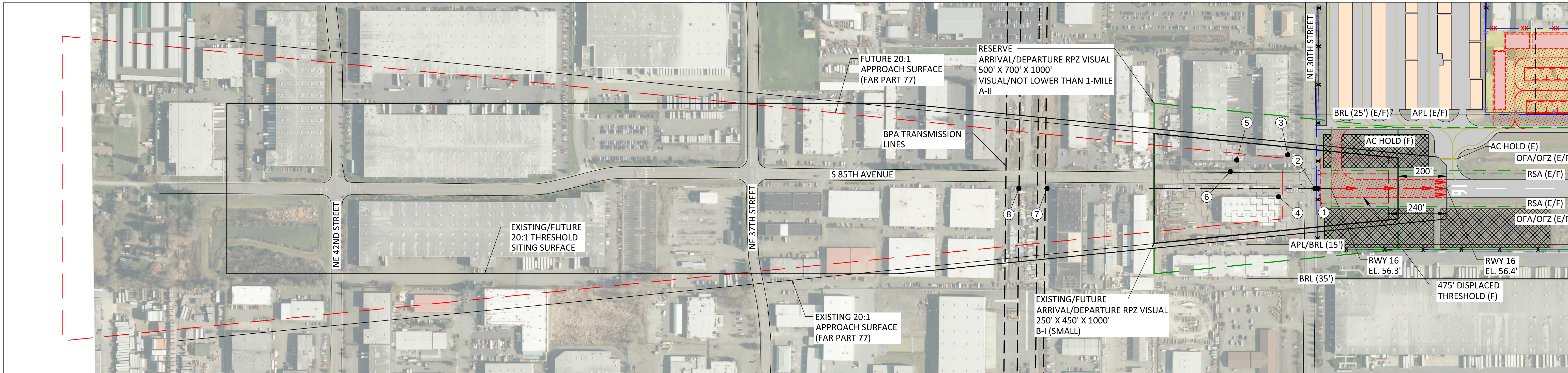
AUBURN MUNICIPAL AIRPORT

RUNWAY □□ RP□ AND INNER APPROACH PLAN AND PROFILE

FIGURE NO. -

SHEET NO. 8 OF 12



0' 200' 400'

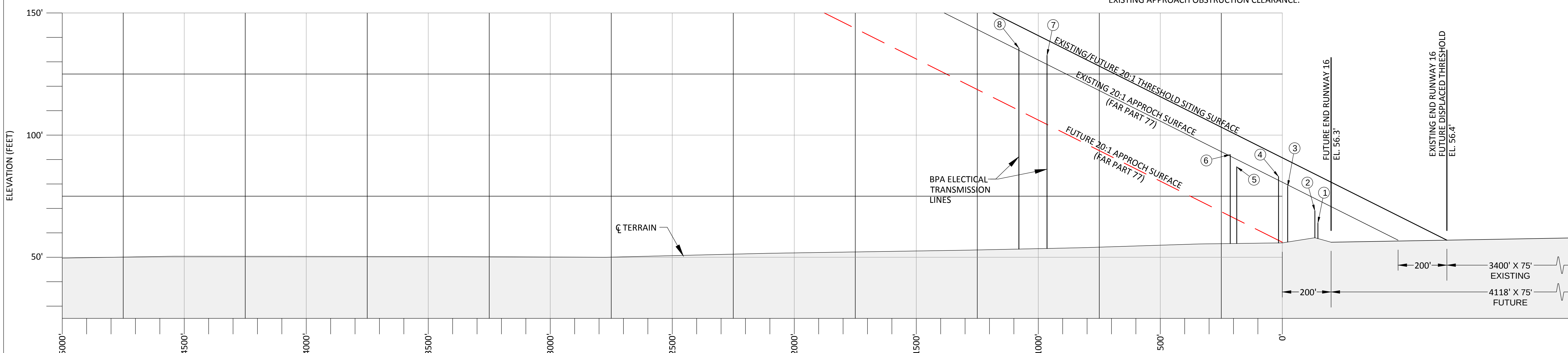
Scale: 1"=200'

RUNWAY 16 PLAN VIEW

SEE SHEET 6 OF 12 FOR OBSTRUCTION DETAIL (LIST)

NOTES:

1. TSS DIMENSIONS BASED ON DAY/NIGHT OPERATIONS FOR VISUAL RUNWAY (FAR PART 77); APPROACHES: CIRCLING PROCEDURES.
2. FUTURE RUNWAY 16 THRESHOLD (DISPLACED) TO MAINTAIN EXISTING APPROACH OBSTRUCTION CLEARANCE.
3. SEE SHEETS 6 & 7 FOR OBSTRUCTION DETAILS.



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0' 20' 40'

Vertical Scale: 1"=20'

RUNWAY 16 PROFILE VIEW

0' 200' 400'

Horizontal Scale: 1"=200'

MAGNETIC DEC. 16°8'25"EAST (2014 VALUE)

N TRUE MAG

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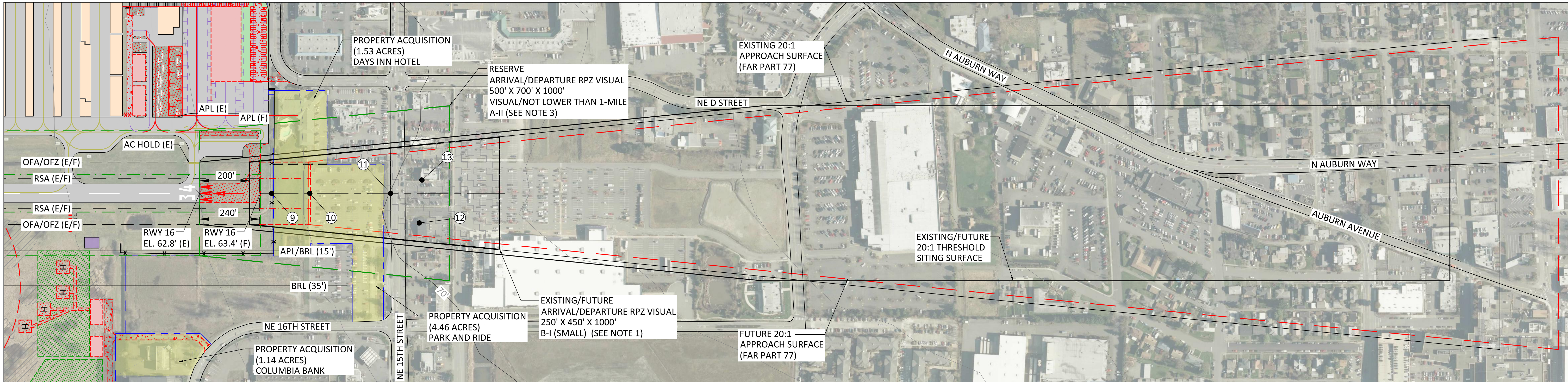
AUBURN MUNICIPAL AIRPORT

RUNWAY ▫▫ APPROACH PLAN AND PROFILE

FIGURE NO. -

SHEET NO. 9 OF 12



0' 200' 400'

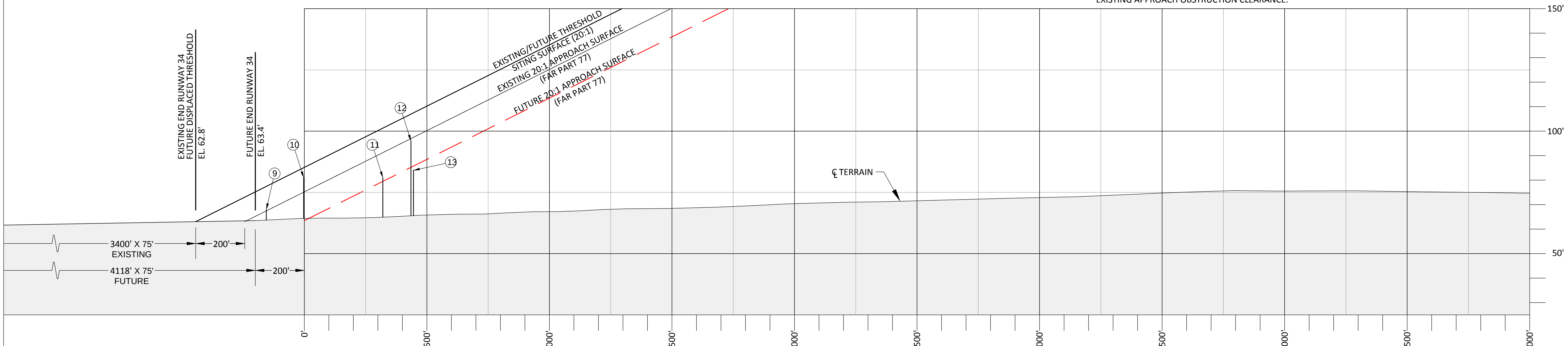
Scale: 1"=200'

RUNWAY 34 PLAN VIEW

SEE SHEET 6 OF 12 FOR OBSTRUCTION DETAIL (LIST)

NOTES:

1. TSS DIMENSIONS BASED ON DAY/NIGHT OPERATIONS FOR VISUAL RUNWAY (FAR PART 77); APPROACHES: CIRCLING PROCEDURES.
2. FUTURE RUNWAY 34 THRESHOLD (DISPLACED) TO MAINTAIN EXISTING APPROACH OBSTRUCTION CLEARANCE.
3. SEE SHEETS 6 & 8 FOR OBSTRUCTION DETAIL.



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0' 20' 40'

Vertical Scale: 1"=20'

RUNWAY 34 PROFILE VIEW

0' 200' 400'

Horizontal Scale: 1"=200'

MAGNETIC DEC. 16°8'25"EAST (2014 VALUE)

TRUE

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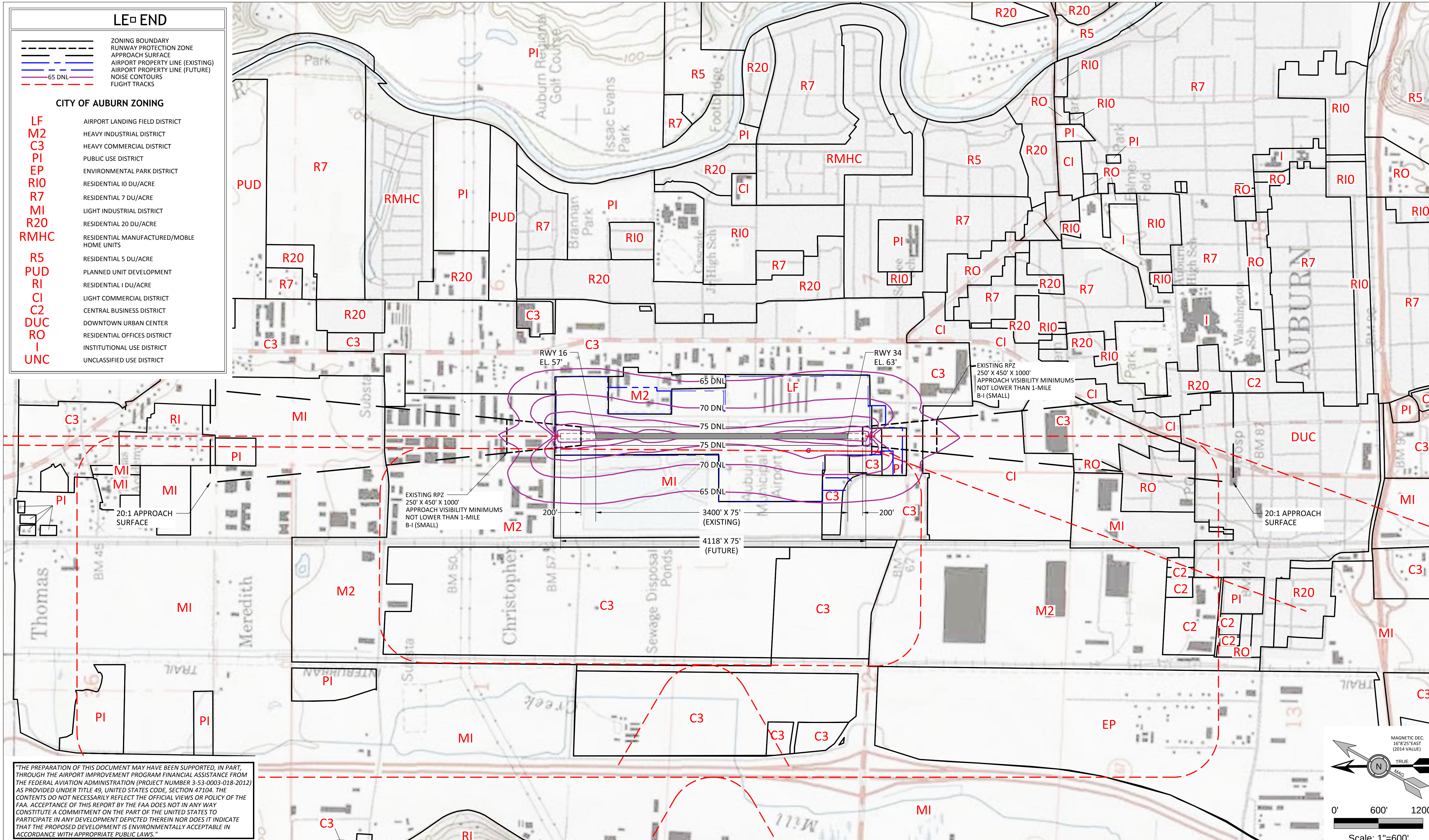
AUBURN MUNICIPAL AIRPORT

RUNWAY □□ APPROACH PLAN AND PROFILE

FIGURE NO. -

SHEET NO. 10 OF 12



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AUBURN MUNICIPAL AIRPORT

LAND USE PLAN
W□□□□□ NOISE CONTOURS

FIGURE NO. -

SHEET NO. 11 OF 12

AIRPORT PROPERTY OWNERSHIP INFORMATION

FEE PARCELS	PRIOR OWNER	CURRENT OWNER	ACRES	DATE ACQUIRED	AUDITORS FILE NUMBER	ACQUISTION PURPOSE	FAA PROJECT NUMBER
1	AUBURN SEWER DEPT	CITY OF AUBURN		7/27/82	8207299002	AERONAUTICAL	5-53-0003-01 1978,1979 3-53-0003-01 1982
2	AUBURN STREET DEPT	CITY OF AUBURN	0.15	12/29/82	8212290512	AERONAUTICAL	
3	GARRETT	CITY OF AUBURN	22.05	3/17/97	9704030925	AERONAUTICAL	
4	VALLEY CENTER LLC	CITY OF AUBURN	2.98	03/06/98	9803061751	AERONAUTICAL	3-53-0003-08
5	AUBURN STREET DEPT	CITY OF AUBURN	0.34	12/11/86	8703100683	AERONAUTICAL	

PARCEL TO BE ACQUIRED	CURRENT OWNERSHIP	TOTAL ACRES	ACQUISITION PURPOSE
1	KING COUNTY DEPT OF TRANS	1.17	APPROACH

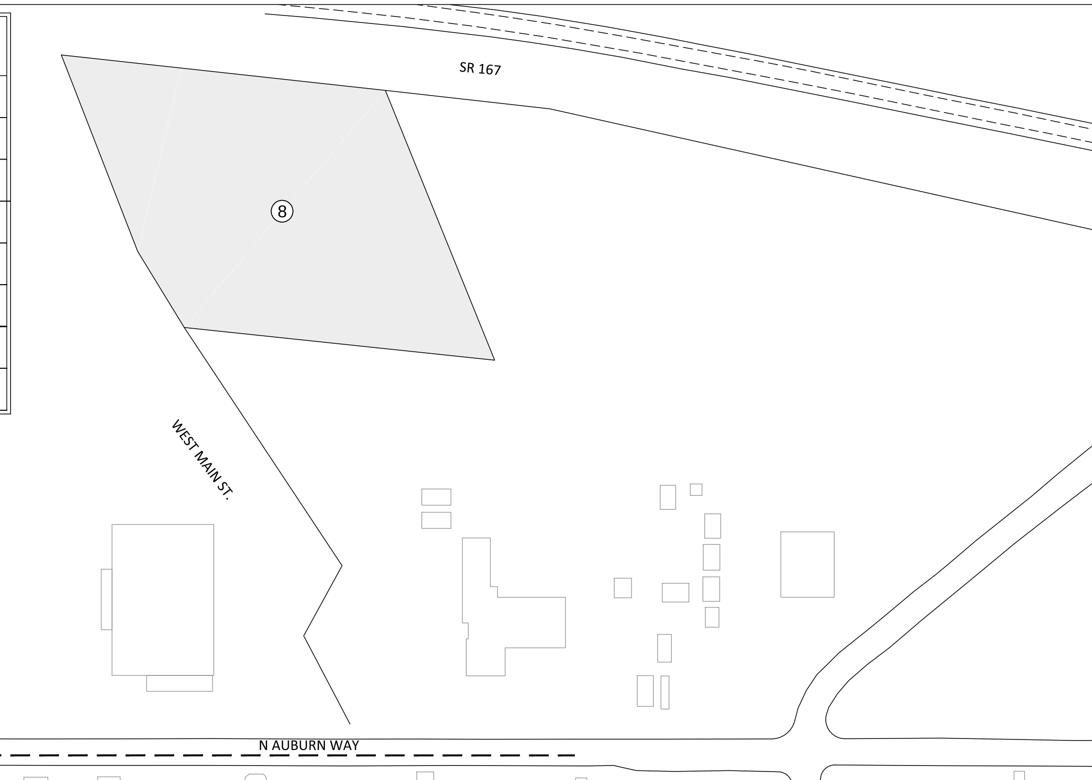
AVIGATION EASEMENT	OWNERSHIP	EASEMENT ACRES	DATE ACQUIRED	FAA PROJECT NUMBER	ACQUISTION PURPOSE
1	SHAUGHNESSY	2.85	7/6/79	5-53-0003-02	APPROACH
2	SPRINGER	0.04	7/6/79	5-53-0003-02	APPROACH
3	WRIGHT	0.37	5/17/78	5-53-0003-01	APPROACH
4	ANDRE	1.34	7/6/79	5-53-0003-01	APPROACH
5	LONE	3.01	8/14/70		APPROACH
6	LONE	1.55	8/14/70		APPROACH
7	BURLINGTON NORTHERN	2.78	1/28/80		APPROACH
8	CITY OF AUBURN	2.40	8/3/98	3-53-0003-09	AERONAUTICAL/MITIGATION

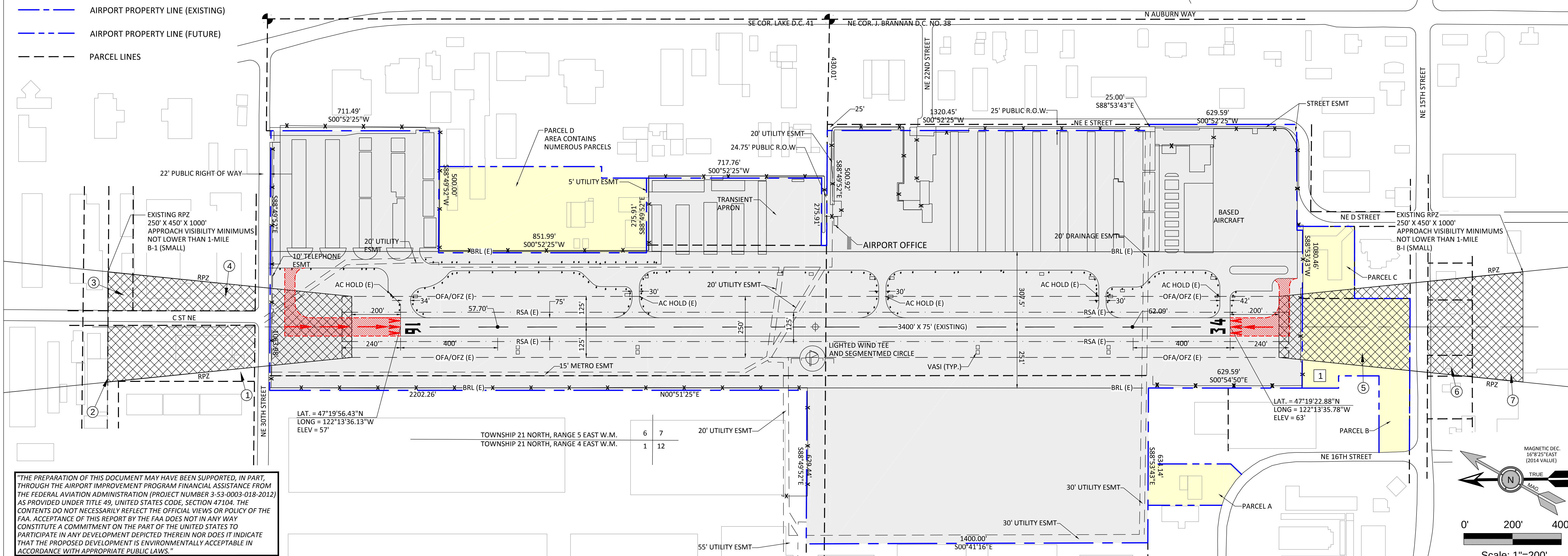
PROPERTY ACQUISITION (PROPOSED)

PARCEL A	1.14 ACRES
PARCEL B	4.46 ACRES
PARCEL C	1.53 ACRES
PARCEL D	6.70 ACRES

LEGEND

- EXISTING FEE OWNERSHIP
- FUTURE RUNWAY PAVEMENT
- AVIGATION EASEMENT (EXISTING)
- PROPOSED PROPERTY ACQUISITION
- AIRPORT PROPERTY LINE (EXISTING)
- AIRPORT PROPERTY LINE (FUTURE)
- PARCEL LINES





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AUBURN MUNICIPAL AIRPORT

EXHIBIT "A" AIRPORT PROPERTY PLAN

FIGURE NO. -

SHEET NO. 12 OF 12

Chapter 9 – Airport Land Use Compatability

Chapter 9 – Airport Land Use Compatability

Introduction

This chapter describes land use associated with Auburn Municipal Airport and its surroundings, land use controls and other issues related to airport compatibility and jurisdictional responsibilities. A summary of environmental conditions associated with the airport, including updated noise exposure is provided in Chapter Six and in **Appendices D, E and G**.

Government Roles in Airport Land Use

FEDERAL

The Federal Aviation Administration (FAA) does not have authority to regulate off airport land use, including the construction of built items. Land use regulation is a local responsibility and FAA has a technical advisory role based on its interest in protecting the airspace associated with an airport as part of the national airspace system. The FAA has a role in regulating on-airport land use through approval of the Airport Layout Plan (ALP) and airport sponsor compliance with FAA Airport Improvement Program (AIP) grant assurances, which include measures to maintain airport land use compatibility and to protect the aeronautical function of an airport by restricting the location of non-aviation land uses.

Under 14 Code of Federal Regulations (CFR), Part 77, the FAA has the authority to review proposed construction through its 7460-1 (Notice of Construction or Alteration) process. The FAA review addresses compatibility both on and off airport based on the potential for creating a "hazard to air navigation" that is associated with obstructions/penetrations in defined airspace. FAA airspace reviews include FAR Part 77 surfaces; Terminal Instrument Procedures (TERPS) surfaces, visual runway traffic patterns, and visual navigation aid (e.g., VASI, PAPI, etc.) protected airspace. When a proposed structure penetrates navigable airspace, the FAA will issue a letter objecting to the proposed action (determination of presumed hazard to air navigation) for the consideration of local authorities. When proposed actions do not present a hazard to air navigation, a "no objection" finding is issued. It is important to note that this analysis is based on an obstruction evaluation and is not intended to address land use compatibility in terms of noise exposure or proximity to an airport or runway.

In cases where the airport sponsor is also the local land use authority, local land use actions are reviewed for compliance with the FAA grant assurances intended to protect airports from incompatible land uses.

The FAA recommends that local jurisdictions include the following language in their development codes: "Nothing in this chapter shall diminish the responsibility of project proponents to submit a Notice of Construction or Alteration to the Federal Aviation Administration if required in accordance with Federal Aviation Regulations Part 77, "Objects Affecting Navigable Airspace."

FAR Part 150 (Airport Noise Compatibility Planning) provides guidance for land use compatibility around airports. The 1990 Airport Noise and Capacity Act (ANCA) defines federal policy on the regulation of airport noise (operating curfews, aircraft restrictions, etc.), with the intent of standardizing noise controls throughout the national system.

STATE

Washington State's goals for land use planning are defined by the Growth Management Act (GMA), adopted by the Washington State Legislature in 1990. In 1996, the GMA was amended to assist in preserving the social and economic benefits of aviation. The GMA requires towns, cities and counties to address airport land use compatibility, and identifies airports as "essential public facilities."

The following summary developed by the WSDOT Aviation Division explains the intent of the Act:

"RCW 36.70.547 and RCW 36.70A.510 require all cities and counties to adopt comprehensive plan goals, policies and regulations to discourage development of incompatible land uses adjacent to public use airports. Local jurisdictions must consult with aviation interests, including WSDOT Aviation, when adopting comprehensive plan amendments to address airport land use compatibility during GMA updates, subject to the schedule designated by state law."

WSDOT Aviation Division reviews comprehensive plans and regulations; provides technical assistance on aviation issues; and provides land use compatibility guidelines to help local jurisdictions protect airports from incompatible uses. The Aviation Division recommends that local jurisdictions consider three primary areas in determining potential land use compatibility: height hazards, noise, and safety. The specific measures used by each jurisdiction are locally determined based on the guidelines provided by the

Aviation Division. Although local compliance with RCW 36.70 is required, the means and degree to which local jurisdictions (cities and counties) achieve compliance are not mandated.

It is recognized that an airport's surrounding land use may extend beyond the immediate jurisdiction to include unincorporated county land areas, or nearby municipalities. Since the responsibility for land use controls may involve more than one jurisdiction, it is critical that effective communication and coordination occur between the airport and all local jurisdictions.

The Washington Department of Transportation – Aviation Division (WSDOT Aviation) recommends that local land use jurisdictions develop practices that protect the airspace surrounding airports within the FAA Part 77 Airspaces and establish when it is appropriate to submit a FAA 7460-1 form prior to construction.

- This could be accomplished by incorporating FAR Part 77 airspace surface layers into GIS mapping to automatically flag land parcels located beneath a defined surface to determine whether a new development will penetrate the airspace.

- Require applicants for all proposed development located within the boundaries of the defined FAR Part 77 airspace surfaces to submit FAA Form 7460-1 Notice of Proposed Construction or Alternation and receive a "no hazard" finding from FAA, prior to issuing local permits.

Consider adding or modifying language to the Comprehensive Plan to strengthen airport protection:

- Establishing the airport as an Essential Public Facility "EPF", WAC 365-196-550 to protect the airport and surrounding areas. Cities and Counties should create their own lists of EPF to include the minimum set forth in RCW 36.70A.200.

- Include the airport in the Transportation System Inventory.

- Recognize the significance of the airport for economic development.

- Create policies that discourage the development of incompatible land uses adjacent to the airport.

LOCAL

The role of Local government is to ensure that their comprehensive plans, goals, policies and regulations discourage development of incompatible land uses near airports. As noted earlier, these rules are codified in the Revised Code of Washington (RCW) 36.70.547 and 36.70A.510 for all local jurisdictions.

Land Use Jurisdiction

The City of Auburn has land use authority for Auburn Municipal Airport and its immediate surroundings. Auburn Municipal Airport is situated on approximately 110 acres of land, approximately two miles north of downtown Auburn. Two major highways are located within 1 to 2 miles of the airport. Highway 167 is approximately 4,400 feet west of the runway and Highway 18 is approximately 7,300 feet south of the runway.

The surrounding areas north, south, east and west of the City of Auburn are under the jurisdiction of King County or the adjacent municipalities of Kent, Algona, Federal Way and Pacific. **Figure 9-1** depicts the defined city limit boundaries and urban growth areas for the City of Auburn.

Comprehensive Plan Land Use

The City of Auburn's Comprehensive Plan is a guidance document which expresses City's long term vision for growth and development within the community. The Comprehensive Plan land use designation for Auburn Municipal Airport is **"Public and Quasi-Public"** use**,** which designates areas of significant size that provide public and quasi-public services to the community. There are three designations amongst the Public and Quasi-Public category, which the airport falls under the "Landing Field (LF)" category, which provides for the operation and management of the Auburn Municipal Airport. **Figure 9-1** depicts current City of Auburn Comprehensive Plan Land Use designations.

Zoning

Auburn City Code Title 18 - Zoning defines permitted/prohibited uses and development standards for buildings and improvements for land areas in the jurisdiction of the City of Auburn. **Figure 9-2** depicts current zoning within the City of Auburn.

Chapter 18.38 LF Airport Landing Field District defines development restrictions for Auburn Municipal Airport and also incorporates elements of airport overlay zoning (**18.38.040 Zones established generally**). The chapter includes specific airport elevation and other numeric references that will need to be updated upon adoption of the airport master plan. See **Appendix C** for ACC 18.38.

The **LF zone** defines **permitted uses** (18.38.020) for buildings, structures, or parcels of land which shall only be used for the following, unless otherwise noted:

A. Landing, taking off and flying of aircraft, excluding ultralights;

B. Businesses incidental to and necessary or convenient for airport operations, including offices, eating establishments, restrooms, hangars, shops for light repairs, gasoline and oil sales and accessory structures; and

C. Other uses as determined by the hearing examiner to be related to operation and use of the airport.

The **LF zone** defines **restricted uses** (18.38.030) as no use may be made of land within any airport zone in such a manner to create electrical interference with radio communication between the airport and aircraft, making it difficult for fliers using the airport, impair visibility in the vicinity thereof, or otherwise endanger the landing, taking off or maneuvering of aircraft.

Airport Overlay Zone

Chapter 18.38.040-130 defines protected zones and height limitations that coincide with the runway's FAR Part 77 imaginary airspace surfaces (Approach, Transitional, Horizontal, and Conical surfaces) and runway obstacle free area. The FAR Part 77 Airspace for Auburn Municipal Airport is located primarily within the City of Auburn with a portion of the Conical surface extending over the City of Kent.

The City of Auburn has identified the zones surrounding the airport as having compatible land uses. Compatible meaning there is shown to be no significant risk to the safety of persons on the ground or inflight over the area of land. All development surrounding the airport must adhere to the Municipal Code Regulations. The City Planning Department will advise prior to future development and based on the structures proximity and height to the airport if the developer needs to file a FAA 7460-1 Form.

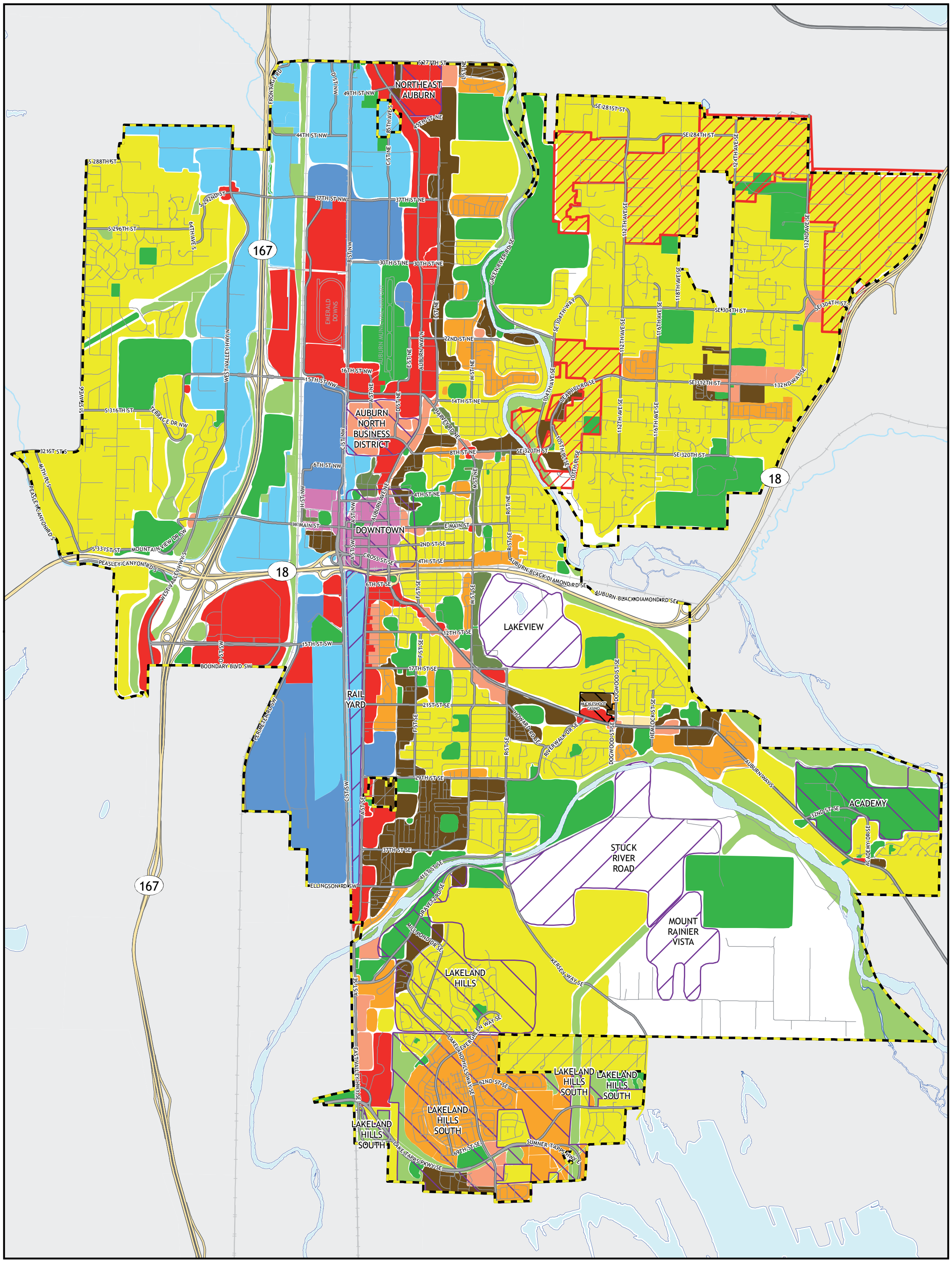
Airport Vicinity Zoning

Chapter 18.23 Commercial and Industrial Zones defines development restrictions for the City's range of commercial and industrial areas. The primary zones surrounding the airport include of the **Light Industrial District (M1), Heavy Industrial District (M2), Light Commercial District (C1), Heavy Commercial District (C3) and Public Use District (P1)**. These zones have maximum height limitations set on them which aids in protecting the airspace surrounding the airport, varying between 45 feet and 75 feet.

Innovation Partnership Zone (IPZ)

The City of Auburn defined and adopted an Innovative Partnership Zone (IPZ) in 2011, which is designed to "create a sustainable model for business & product development, ultimately creating living wage jobs for our citizens and region!" "The Auburn IPZ is a complex business plan that brings the cutting-edge ideas and research programs of our great institution and partners them with the 'real world' of manufacturing and business which operates right here daily in Auburn." More information regarding IZP is on the City of Auburns website as well as on choosewashingtonstate.com.

Auburn Municipal Airport is located entirely within the IPZ boundary of the City; various other stakeholders are within the boundary including Boeing, Green River Community College, FedEx and Century Link. A summary of IPZ designation within the Auburn City Code is provided in **Appendix A.**



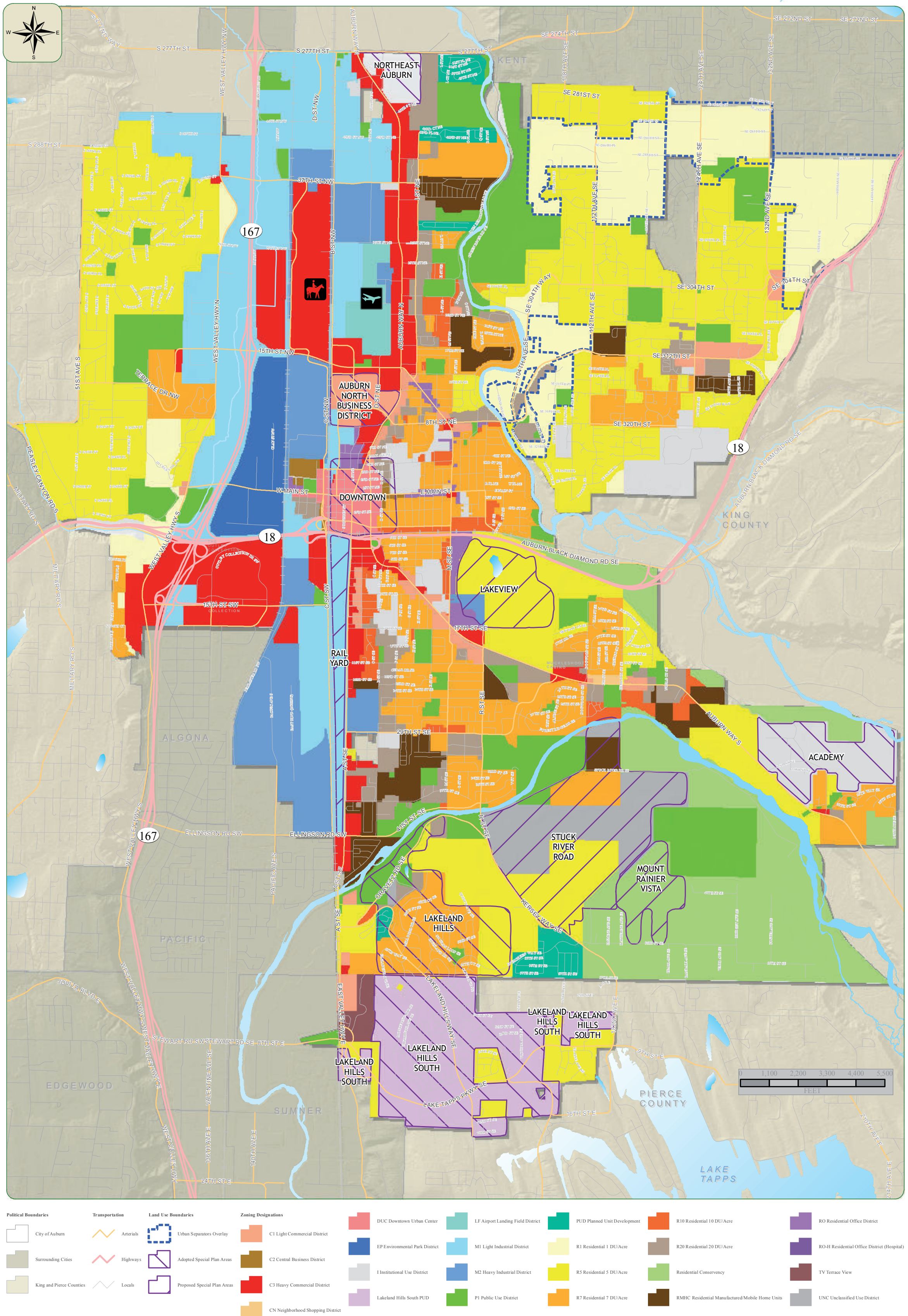
Auburn City Limits
Potential Annexation Areas
Water Features
Adopted Special Plan Areas
Proposed Special Plan Areas
Residential Conservency
Single-Family Residential
Moderate Density Residential
High Density Residential
Office Residential
Neighborhood Commercial
Light Commercial
Heavy Commercial
Downtown
Light Industrial
Heavy Industrial
Public and Quasi-Public
Open Space
Urban Separators Overlay

0 1,000 2,000 3,000 4,000 5,000
FEET

N W E S

Printed On: 01/06/10
Updated On: 01/06/10
Map ID: 1142
Ordinance No: 6280

Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.



NORTHEAST AUBURN
KENT
AUBURN NORTH BUSINESS DISTRICT
DOWNTOWN
RAIL YARD
LAKEVIEW
KING COUNTY
ALGONA
PACIFIC
ACADEMY
STUCK RIVER ROAD
MOUNT RAINIER VISTA
LAKELAND HILLS
LAKELAND HILLS SOUTH
PIERCE COUNTY
EDGEWOOD
SUMNER
LAKE TAPPS
167
18
S 277TH ST
SE 281ST ST
15TH ST NW
W MAIN ST
E MAIN ST
AUBURN BLACK DIAMOND RD SE
ELLINGSON RD SW
SE 304TH ST
SE 312TH ST
SE 320TH ST
FEET
Political Boundaries
City of Auburn
Surrounding Cities
King and Pierce Counties
Transportation
Arterials
Highways
Locals
Land Use Boundaries
Urban Separators Overlay
Adopted Special Plan Areas
Proposed Special Plan Areas
Zoning Designations
C1 Light Commercial District
C2 Central Business District
C3 Heavy Commercial District
CN Neighborhood Shopping District
DUC Downtown Urban Center
EP Environmental Park District
I Institutional Use District
Lakeland Hills South PUD
LF Airport Landing Field District
M1 Light Industrial District
M2 Heavy Industrial District
P1 Public Use District
PUD Planned Unit Development
R1 Residential 1 DU/Acre
R5 Residential 5 DU/Acre
R7 Residential 7 DU/Acre
R10 Residential 10 DU/Acre
R20 Residential 20 DU/Acre
Residential Conservency
RMHC Residential Manufactured/Mobile Home Units
RO Residential Office District
RO-H Residential Office District (Hospital)
TV Terrace View
UNC Unclassified Use District

Chapter 10 – FAA Compliance Review

Chapter 10 – FAA Compliance Review

This chapter discusses the elements associated with the operation and management of Auburn Municipal Airport, as a federally-obligated airport. The Federal Aviation Administration (FAA) encourages airport sponsors to establish and implement programs that promote sound operating practices and ongoing compliance with regulatory requirements. The FAA currently recommends that compliance be addressed during the airport planning process through the review of airport documents; plans, and other records, such as an approved ALP, Exhibit" A" Property Map, Airport Ordinance, Zoning Ordinance, Rules and Regulations, Minimum Standards, airport budgets, leases, easements, permits, and other documents.

City of Auburn Compliance

The City of Auburn maintains a high degree of control over the operation of Auburn Municipal Airport. The City meets all applicable financial reporting and record keeping requirements and employs a variety of "best practices" including periodic review of market rates and fees; land appraisals, formal procurement and contracting practices, coordination with adjacent land owners (avigation easements), local government (land use planning, zoning), state government (airport overlay zoning, environmental agencies, etc.), and tribal government.

There are no known compliance issues associated with airport development, tenant leases, airport land uses or other items. However, as the City moves forward with future airport development, a review is recommended of existing agreements between the City of Auburn and adjacent property owners to accommodate stormwater generated off site in detention ponds constructed on the north end of airport property. The review should examine the terms of the original agreement and the current financial structure associated with the improvements. A review of all compensation paid to the City stormwater and airport funds through initial development of the stormwater facility and through ongoing leasing of airport property is recommended to ensure that the airport has, and continues to receive the equivalent to "fair market value" for the non-aviation use of airport land. In the event that past use of airport land to accommodate off-airport stormwater management impacts the airport's ability to accommodate additional stormwater generated by future airfield improvements, consideration may be given to modifying existing systems or seeking off-site stormwater management solutions for the airport, which would not typically be eligible for FAA funding. The original documentation associated with the stormwater detention ponds is provided in **Appendix H.**

FAA Compliance Overview

A management program based on the FAA's "Planning for Compliance" guidance and the adoption of airport management "Best Practices" is recommended to address FAA compliance requirements and avoid noncompliance, which could have significant consequences.

Airport management "Best Practices" are developed to provide timely information and guidance related to good management practices and safe airport operations for airport managers and sponsors. The practices outlined herein are designed for use by the City of Auburn for evaluating and improving their current and future operation and management program.

Airport sponsors must comply with various federal obligations through agreements and/or property conveyances. These are outlined in FAA Order 5190.6B, Airport Compliance Manual. The contractual federal obligations that a sponsor accepts when receiving federal grant funds or transfer of federal property can be found in a variety of documents including:

- Grant agreements issued under the Federal Airport Act of 1946, the Airport and Airway Development Act of 1970, and Airport lmprovement Act of 1982. Included in these agreement are the requirement for airport sponsors to comply with:
    - Grant Assurances
    - Advisory Circulars
    - Application commitments
    - FAR procedures and submittals
    - Special conditions
- Surplus airport property instruments of transfer
- Deeds of conveyance
- Commitments in environmental documents prepared in accordance with FAA requirements.
- Separate written requirements between a sponsor and the FAA.

Land use compliance and compatible land use planning is often a significant compliance issue for airports. Compliance and suggested best practices are discussed under the following subheadings in this chapter:

- Airport Compliance with Federal and State Grant Assurances
- Environmental Compliance
- Airport User Compliance
- Other Airport Operational Policies and Procedures

Airport Compliance with Grant Assurances

As a recipient of both federal and state airport improvement grant funds, the City of Auburn is contractually bound to various sponsor obligations referred to as "Grant Assurances", that have been put together by the FAA and the Washington Department of Transportation – Aviation Division. These obligations, presented in detail in federal and state grants and state statute and administrative code, document the commitments made by the airport sponsor to fulfill the intent of the grantor (FAA and State of Washington) required in association with acceptance necessary of federal and/or state funding for airport improvements. Failure to comply with the grant assurances may result in a finding of noncompliance and/or forfeiture of future funding. Grant assurances and their associated requirements are to protect the significant investment made by the FAA, state and the City, to preserve and maintain the nation's airports as a valuable national transportation asset, as mandated by Congress.

FAA GRANT ASSURANCES

The FAA's Airport Compliance Program defines the interpretation, administration, and oversight of federal sponsor obligations contained in grant assurances. Currently **FAA Order 5190.6B,** Airport Compliance Manual, defines policies and procedures for the Airport Compliance Program. Although it is not regulatory or controlling with regard to airport sponsor conduct, it establishes the policies and procedures for FAA personnel to follow in carrying out the FAA's responsibilities for ensuring compliance by the sponsor.

Order 5190.6B states: the FAA Airport Compliance Program is, "…designed to monitor and enforce obligations agreed to by airport sponsors in exchange for valuable benefits and rights granted by the United States in return for substantial direct grants of funds and for conveyances of federal property for airport purposes. The Airport Compliance Program is designed to protect the public interest in civil aviation. Grants and property conveyances are made in exchange for binding commitments (federal obligations) designed to ensure that the public interest in civil aviation will be served. The FAA bears the important responsibility of seeing that these commitments are met. This Order addresses the types of commitments, how they apply to airports and what FAA personnel are required to do to enforce them."

To better understand the intent of the FAA Compliance Program, it is important to understand the FAA's goals for a national airport system. The national airport system is currently known as the National Plan of

Integrated Airport Systems (NPIAS), which has historic origins dating back to the 1946 Federal Airports Act. The airport system has evolved through several legislative updates in concert with changes in the organization and scope of the Federal Aviation Administration (FAA). The NPIAS was adopted as part of the Airport and Airway Development Act of 1982, replacing the National Airspace System Plan (NASP), created by earlier legislation. There are approximately 2,500 general aviation airports and 800 commercial service airports in the NPIAS.

According to the FAA, cooperation between the FAA, state and local agencies should result in an airport system with the following attributes:

- Airports should be safe and efficient, located at optimum sites, and be developed and maintained to appropriate standards.
- Airports should be operated efficiently both for aeronautical users and the government, relying primarily on user fees and placing minimal burden on the general revenues of the local, state, and federal governments.
- Airports should be flexible and expandable, able to meet increased demand and accommodate new aircraft types.
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long term
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation and the requirements of residents in neighboring areas.
- Airports should be developed in convert with improvements to the air traffic control system
- The airport system should support national objectives for defense, emergency readiness, and postal delivery
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically not more than 20 miles of travel to the nearest NPIAS airport
- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

FAA AIP grant assurances are summarized and categorized in **Table 10-1**. While Sponsors should understand and comply with all grant assurances, there are several assurances that are common and recurring issues for airport sponsors throughout the country. These are summarized in more detail below. A complete description of current AIP grant assurances is provided in **Appendix I**. It is important to note that the assurances (and corresponding numbers) are applied to Non-Airport Sponsors Undertaking Noise Compatibility Program Projects and Planning Agency Sponsors. These can also be found in the Airport Improvement Program under Grant Assurances.

TABLE 10-1: SUMMARY OF FAA AIP GRANT ASSURANCES (AIRPORT SPONSOR ASSURANCES 3/2014)

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
1. General Federal Requirements							
2. Responsibility and Authority of the Sponsor							
3. Sponsor Fund Availability							
4. Good Title							
5. Preserving Rights and Powers							
6. Consistency with Local Plans							
7. Consideration of Local Interest							
8. Consultation with Users							
9. Public Hearings							
10. Metropolitan Planning Organization							
11. Pavement Preventative Maintenance							
12. Terminal Development Prerequisites							
13. Accounting System, Audit, and Record Keeping Requirements							
14. Minimum Wage Rates							
15. Veteran's Preference							

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
16. Conformity to Plans and Specifications							
17. Construction Inspection and Approval							
18. Planning Projects							
19. Operations and Maintenance							
20. Hazard Removal and Mitigation							
21. Compatible Land Use							
22. Economic Nondiscrimination							
23. Exclusive Rights							
24. Fee and Rental Structure							
25. Airport Revenues							
26. Reports and Inspections							
27. Use by Government Aircraft							
28. Land for Federal Facilities							
29. Airport Layout Plans							
30. Civil Rights							
31. Disposal of Land							

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
32. Engineering and Design Services							
33. Foreign Market Restrictions							
34. Policies, Standards and Specifications							
35. Relocation and Real Property Acquisition							
36. Access by Intercity Bus							
37. Disadvantaged Business Enterprises							
38. Hangar Construction							
39. Competitive Access							

As the airport sponsor, the City of Auburn is responsible for the direct control and operation of Auburn Municipal Airport. Familiarity with, proper monitoring and implementation of sponsor obligations and FAA grant assurances in particular, is the key to maintaining compliance. FAA Order 5190.6B and ongoing communication with the FAA Northwest Mountain Region Compliance Office are both excellent resources for the City when addressing policy and compliance.

DURATION

The terms, conditions and assurance of a grant agreement with the FAA remain in effect for the useful life of a development project, which is typically 20 years from the receipt of the last grant. However, terms, conditions and assurances associated with land purchased with federal funds do not expire.

The airport sponsor should have a clear understanding of and comply with all assurances. The following sections describe the selected assurances in more detail.

Project Planning/Design and Contracting

Sponsor Fund Availability (Assurance # 3)

Once a grant is given to an airport sponsor, the receiving sponsor commits to providing the funding to cover their portion of the total project cost. Currently this amount is ten percent of the total eligible project cost, although it may be higher depending on the particular project components or makeup. Once the project has been completed, the receiving airport also commits to having adequate funds to maintain and operate the airport in the appropriate manner to protect the investment in accordance with the terms of the assurances attached to and made a part of the grant agreement.

Consistency with Local Plans (Assurance #6)

All projects must be consistent with city and county comprehensive plans, transportation plans, zoning ordinances development code, and hazard mitigation plans. The airport sponsor and planners should all familiarize themselves with local planning documents before a project is considered and ensure that all projects follow local plans and ordinances.

In addition to understanding local plans, airport sponsors should be proactive in order to prevent noncompliance with this assurance. The airport sponsor should assist in the development of local plans that incorporate the airport and consider its unique aviation related needs. Sponsor efforts should include the development of goals, policies and implementation strategies to protect the airport as part of local plans and ordinances.

Accounting System Audit and Record Keeping (Assurance# 13)

All project accounts and records must be made available at any time. Records should include documentation of cost, how monies were actually spent, funds paid by other sources and any other financial record associated with the project at hand. Any books, records, documents or papers that pertain to the project should be available at all times for an audit or examination.

General Airport

Good title (Assurance #4)

The airport owner must have a Good Title to affected property when considering projects associated with land, building or equipment. Good Title means the sponsor can show complete ownership of the property without any legal questions, or show it will soon be acquired.

Preserving Rights and Powers (Assurance #5)

No actions are allowed which might take away any rights or powers from the sponsor which are necessary for the sponsor to perform or fulfill any condition set forth by the assurance included as part of the grant agreement. If there is an action taken or activity permitted that might hinder any of those rights or powers it should be discontinued. An example of an action which can adversely affect the rights and powers of the airport is a Through-the-Fence (TTF) activity. TTF activities allow access to airport facilities from off-airport users. In many instances, the airport sponsor cannot control the activities of those operating off the airport resulting in less sponsor control. This loss of control can potentially have an adverse impact to airport users. For example, TTF activities many times do not pay the same rates and charges as on-airport users, resulting in an unfair competitive advantage for business/users located off-airport versus those on-airport.

Airport Layout Plan (ALP) (Assurance #29)

The airport should at all times keep an up-to-date ALP which should include on it both current and future boundaries, facilities/structures, and the location of any non-aviation areas and existing improvements. No changes should be made at the airport to hinder the safety of operations; also no changes should be made to the airport that is not in conformity with the ALP. Any changes of this nature could adversely affect the safety, utility or efficiency of the airport. lf any changes are made to the airport without authorization the alteration must be changed back to their original condition or the airport will have to bear all cost associated with moving or changing the alteration to an acceptable design or location. Additionally no federal participation will occur for improvement projects not shown on an approved ALP.

Disposal of Land (Assurance #31)

Land purchased with the financial participation of an FAA Grant cannot be sold or disposed of by the airport sponsor at their sole discretion. Disposal of such lands are subject to FAA approval and a definitive process established by the FAA. If airport land is no longer considered necessary for airport purposes, and the sale is authorized by the FAA, the land must be sold at fair market value. Proceeds from the sale of the land must either be repaid to the FAA or reinvested in to another eligible airport improvement or noise compatibility project. Land disposal requirements typically arise when a community is building a new airport and the land on which the airport was located is sold with the proceeds used to offset costs of the new airport. In general, land purchased with FAA funds is rarely sold by a sponsor.

<u>Airport Operations and Land Use</u>

Pavement Preventative Maintenance (Assurance #11)

Since January 1995, the FAA has mandated that it will only give a grant for airport pavement replacement or reconstruction projects if an effective airport pavement maintenance-management program is in place. The program should identify the maintenance of all pavements funded with federal financial assistance. The report provides a pavement condition index (PCl) rating (0 to 100) for various section of aprons, runways, taxiways, and a score for overall airport pavements.

Operations and Maintenance (Assurance #19)

All federally funded airport facilities must operate at all times in a safe and serviceable manner. The airport sponsor should not allow for any activities which inhibit or prevent this. The airport sponsor must always promptly mark and light any hazards on the airport, and promptly issue Notices to Airmen (NOTAMs) to advise of any conditions which could affect safe aeronautical use. Exceptions to this assurance include when temporary weather conditions make it unreasonable to maintain the airport. Further, this assurance does not require the airport sponsor to repair conditions which have happened because of a situation beyond the control of the sponsor.

Compatible Land Use (Assurance #21)

Land uses around an airport should be planned and implemented in a manner which ensures surrounding development and activities are compatible with the airport. To ensure compatibility, the sponsor is expected to take appropriate action, to the extent reasonable, including the adoption of zoning laws to guide land use in the vicinity of airports under their jurisdiction. Incompatible land use around airports represents one of the greatest threats to the future viability of airports.

<u>Day to Day Airport Management</u>

Economic Non-Discrimination (Assurance #22)

Any reasonable aeronautical activity offering service to the public should be permitted to operate at the airport as long as the activity complies with airport established standards for that activity. Any contractor agreement made with the airport will have provisions making certain the person, firm or corporation will not be discriminatory when it comes to services rendered as well as rates or prices charged to customers. Provisions include:

- All FBOs on the airport should be subject to the same rate fees, rentals and other charges.
- All persons, firms or corporations operating aircraft can work on their own aircraft with their own employees.
- If the airport sponsor at any time exercises the rights and privileges of this assurance they will be under all of the same conditions as any other airport user would be.
- The sponsor can establish fair conditions which need to be met by all airport users to make the airport safer and more efficient.

The sponsor can prohibit any type, kind or class of aeronautical activity if it is for the safety of the airport. An example of an activity which may be considered for prohibition is sky diving. It is important to point out that the FAA will review such prohibitions and will make the final determination as to whether or not a particular activity type is deemed unsafe at the airport based on current operational dynamics.

Exclusive Rights (Assurance #23)

Exclusive Rights at an airport is often a complicated subject usually specific to individual airport situations. The assurance states the sponsor “will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public..." There are exceptions to this rule. If the airport sponsor can prove that permitting a similar business would be unreasonably costly, impractical or result in a safety concern, the sponsor may consider granting an exclusive right. To deny a business opportunity because of safety, the sponsor must demonstrate how that particular business will compromise safety at the airport. Exclusive rights are very often found in airport relationships with fixed base operations (FBO) but exclusive rights can also be established with any other business at the airport which could assist in the operation of an aircraft at the airport. If an unapproved exclusive rights agreement exists it must be dissolved before a future federal grant is awarded to the airport.

If a sponsor is contemplating denial of a business use at the airport, it is strongly encouraged that they contact their FAA ADO in order to ensure that they have all necessary information and that denial of access is not going to be seen as unjust discrimination. For more in depth information on exclusive rights reference Advisory Circular 150/5190-6, "Exclusive Rights at Federally Obligated Airports.”

Leases and Financial

Fee and Rental Structure (Assurance #24)

Simply put, the fee and rental structure at the airport must be implemented with the goal of generating enough revenue from airport related fees and rents to become self-sufficient in funding day to day operational needs. The airport sponsor should routinely monitor its fee and rental structure to ensure reasonable fees are being charged to meet this goal. Common fees charged by airports include fuel flowage, tie-down, and landing fees and hangar rent.

Airport Revenue (Assurance #25)

All airport revenue and local taxes on aviation fuel should be used toward the operating costs of the airport, the local airport system, or other local facilities which are owned by the same owner of the airport which will directly impact air transportation passengers or property or for noise mitigation on or off airport property. In other words, revenue generated by airport activities must be used to support the continued operation and maintenance of the airport. Use of airport revenue to support or subsidize other non-aviation activities or functions of the sponsor is not allowed and is considered revenue diversion. Revenue diversion is a significant compliance issue subject to cause scrutiny by the FAA.

Other FAA Compliance Requirements

OTHER FEDERAL CONTRACTING AND PROCUREMENT DOCUMENTS

When an airport sponsor accepts an FAA Airport improvement Program (AIP) grant, they agree to adhere to all applicable federal contracting and procurement requirements. Advisory circulars are required for use in AIP funded projects. Included in each grant request is a federal funding checklist that identifies the requirements an airport should consider before accepting the grant. The following items are noted in the checklist:

- ALPs should be up to date
- Exhibit A Property Map may need to be updated if acquiring additional property
- Land Inventory may need to be updated if you have recently acquired land with federal assistance
- Airports must hold good title to the airport landing area
- Appropriate signage and markings must be in place
- RPZ and approach surface deficiencies must be identified and steps to address deficiencies must be noted
- RSAs must meet FAA standards if planning a runway project
- DBE program goals must be met on projects more than $250,000
- Procedures should be in place to handle bid protests
- Open AIP grant projects need to be identified
- Project closeout form must be submitted within 90 days of work completion
- A "Certification of Economic Justification" must be included for routine pavement maintenance projects
- A "Revenue Generating Facility Eligibility Evaluation" must be completed for hangar constructing or fueling facilities
- A "Reimbursable Agreement" and "Non-Fed Coordination" must be completed for navigational aid projects
- A "Relocation Plan" must be completed if a project requires residences or businesses to be relocated

SPECIAL CONDITIONS

In addition to the standard grant assurances discussed above, the state or the FAA may require "Special Conditions" to individual grants which supplement or expand the standard grant assurances. Special Conditions are unique to an individual airport and can be project or administrative in nature. Airport sponsors need to be aware of such conditions that may be applied to their airport.

MULTIJURISDICTIONAL CHALLENGES

In some instances, airports are jointly owned and operated by more than one airport sponsor. In other instances, airports may be located within multiple jurisdictions. While the official airport sponsor is ultimately responsible for adherence with the grant assurance, the actions, or inactions, of surrounding jurisdictions can and do impact the airport sponsor's ability in meeting its sponsor obligations. This is particularly true with land use compatibility issues around airports. As a result, it is important in either circumstance that all jurisdictions affected by the airport understand the operational needs and complexities of having an airport within its jurisdiction. Mutual agreements addressing airport operational or land use protection needs, or other cooperative measures, are recommended by all jurisdictions to both protect the functionality of the airport as well as the safety and well-being of airport user and neighbors.

WSDOT Aviation Division Grant Assurances

In 2013, WSDOT Aviation adopted new grant assurances (WAC Chapter 468-260) for airport sponsors that are intended to protect the public's investment in the Washington aviation system. The WSDOT grant assurances apply to both NPIAS and non-NPIAS airports that receive funding through the WSDOT Airport Aid Grant Program. The WSDOT grant assurances are consistent and complimentary to FAA grant assurances with a significant emphasis placed on land use planning, public process, and environmental stewardship.

A summary of WSDOT grant assurances is provided in **Appendix J**.

Appendix A

IPZ Business Plan

1. Mission:

The mission of Auburn's Urban Center for Innovative Partnerships is to support a vibrant vital economy for the City of Auburn, our local region and the State of Washington. Encouraging the adaption of warehouse districts to mixed use, market-affordable technology clusters and facilitating collaborative partnering among private sector employers, research partners, and programmed workforce development, the IPZ will implement a multi-phased plan across a variety of business sectors beginning with Ecosystems and Rainwater Management. These collaborative clusters will realize new businesses and products; expand our existing knowledge based middle-wage jobs while creating new higher paying employment opportunities for the citizens of our City. Through new partnerships and the clustering of entrepreneurs, ideas will flourish, manufacturing efficiencies will be developed and our diverse business community will expand, creating investment opportunities, new technologies and the general growth of our economy.

2. Goals:

The focal point the State's overall IPZ program is as a resource development tool for general economic development within this zone, the City of Auburn and throughout the State of Washington. Specifically for the City of Auburn our primary goal is job creation for our citizens and the general economic development of our City as a regional center for business enterprise and technology.

Historically, Auburn has developed as a manufacturing center and as a hub for supply/distribution warehouse space. Some of this IPZ's existing businesses and clusters surround advanced technology/high-wage employment manufacturing; the greater percentage of Auburn industry is made up of solid, well established manufacturing clusters employing a significant number of knowledge-based middle-wage workers.

A certain goal of this Innovation Partnership Zone is to capitalize on our diverse manufacturing technology clusters and through the introduction of research partnering, encourage their expansion and development; another goal will be to maximize efficiencies within our supply chain warehousing/distribution industries; and a third and critically important goal will be to persuade our Auburn property owners to encourage the conversion of warehouse inventory to new market-affordable, mid to high-wage employment technology clusters.

In addition, our overall goals also emphasize the creation of marketable products, business retention and expansion, the formation of new business partnerships (including the diversification of manufactures across traditional business lines) and the creation of new technological advances.

3. Leadership/Governance:

a. Administrator:
The IPZ Administrator shall be the Economic Development Manager for the City of Auburn. As administrator he/she will be responsible for day-to-day implementation of this business plan including its Mission, Goals, as well as the general overall success of the IPZ program. The Administrator shall work with the Management Team to promote the economic sustainability of the IPZ and its partners. Further, the Administrator shall actively work to assist existing business organizations within the zone, introduce new partnerships, encourage creativity and fresh ideas, and to promote Auburn as a destination for new businesses and clusters.

b. Management Team:
The Management Team of the Auburn IPZ will include a representative of the following:

- Mayor – Nancy Backus
- Economic Development Manager/Zone Administrator – **Douglas Lein**
- Assistanct Director of Community Development Services – **Jeff Tate**

c. IPZ Advisory Board:
The Management Team shall select representatives to serve as an IPZ Advisory Board. The Board shall consist of 14 members representing the following categories:

- 2 members - City of Auburn City Council
- 1 member - Auburn Area Chamber of Commerce
- 1 member - Washington State University
- 1 member - Green River Community College
- 1 member - Auburn School District
- 1 member - Enterprise Seattle
- 1 member - King County Executive or Representative

- 1 member - Private Sector, Ecosystems & Rainwater Management
- 1 member - Private Sector, Aeronautic Technologies
- 1 member - Private Sector, Construction Technologies & Materials
- 1 member - Private Sector, Green Technologies
- 1 member - Private Sector, Alternative Energy
- 1 member - Private Sector, Green Technologies

The role of the IPZ Advisory Board is to aid in providing oversight to the Management Team in the successful implementation of this Business Plan and general operations of the Urban Center for Innovative Partnership (IPZ). It is with purpose that this Board is formed to help strengthen the IPZ"s commitments, partnerships, controls, communications and overall sustainability.

In its fulfillment of duties, the Board shall meet to periodically to review performance and progress within the IPZ and verify success in achieving the stated purposes of promoting collaboration, research, new technologies, marketable products, company formation/expansion and job creation. The Advisory Board shall formulate a review of operations upon meeting and if needed, present suggestions for improvements to the Management Team for implementation.

The IPZ Administrator shall preside over all meetings and serve as secretary to the Board. The Board shall initially convene by March 30, 2012 and meet not less than annually thereafter; except that any member of the Advisory Board may make a request to the Management Team for consideration of an additional meeting; and the Management Team may direct the Administrator to convene a meeting of the group.

d. Partnership Involvement/Investment

Just as it exists within our community, Auburn celebrates its diversity and believes that it is a cornerstone of our community strength. The same is true within our business community.
The Urban Center for Innovative Partnership is by design, building on our diversity of technology clusters.

Our diverse industries are strong and we are committed through the formation of this IPZ to build on that strength and to encourage growth within and between its various segments. To this end, Auburn has chosen a governance structure that will allow representatives of the various technologies participating through the Advisory Board as equal parts of the whole.

The Auburn IPZ will encourage active partnerships; partnerships where investment in the relationships is done willingly and where involvement comes from our collective good.

As Administrator, Auburn will actively work to make introductions among our businesses. We will encourage meaningful relationships and partnerships; and we will monitor and report on the progress of those relationships.

e. Sustainability Plan (4 years)

To achieve the sustainability and success of the Auburn Urban Center for Innovative Partnership the following steps have been, or will be taken:

1. Investment into numerous "existing sustainability efforts have been accomplished in the recent past within and around the Auburn's IPZ Zone. Examples of those efforts include:

i. Public/private infrastructure investment into the Auburn Junction project (6 blocks of downtown redevelopment, planned for multi-story mixed use office, retail, & residential) featuring cutting edge design concepts brought to the City through the WSU – IDEX project, including storm water vaults; relocation of utilities out of alley ways; fiber optic infrastructure; the installation of green materials; impervious sidewalks and plazas; and the creation of public plazas.

ii. Creation of a Store Front Improvement program.

iii. An Ordinance (ACC 3.60.035) authorizing the reimbursement of the City's portion of the Sales and Use Tax for construction materials and services up to $100,000 to encourage retail business expansion and location within Auburn.

iv. The creation of cultural improvements among employees within the City's Development Departments which instills client/customer friendly approaches to development review.

It should be noted that as was done with the infrastructure improvements in our downtown redevelopment, the IPZ will encourage, track and leverage private sector improvements to maximize the benefits to all IPZ stakeholders.

2. The City as IPZ Administrator will explore and execute incentives to encourage the mission and goals of this business plan. This effort will include:

i. A policy review by City Council to ensure that all Council actions forward demonstrate a consideration of alignment and with the facilitation of this IPZ's mission and goals. This will include a requirement that all Ordinance and Actions taken by the City Council will include a section in the staff report which summarizes the "Business Impacts" of the Action under consideration for Council review.

ii. The City will consider expansion of its existing Ordinance (ACC 3.60.035) to provide a reimbursement of the City's portion of Sales & Use Tax up to $100,000 to encourage opportunities for the conversions of warehouse space to manufacturing; expansion of existing manufacturing space; and the development of new manufacturing facilities within the IPZ.

iii. The Administrator will work to move an Ordinance forward to City Council for the exemptions of requirements for the undergrounding of aerial utility lines which are upgraded or installed as part of the infrastructure improvements within districts of the Auburn IPZ.

iv. The City will explore incentives for the reduction of System Development Charges and Fee Rates for low impact development techniques.

3. Marketing and Commercialization:

The vision, mission and goals of the Auburn IPZ will be clearly communicated out in a variety of means to the zones stakeholders, to our local community and to potential new clients or industries. Communication methods will include:

i. The Administrator will provide a verbal presentation announcing the creation of this Innovative Partnership Zone and reviewing the vision, mission and goals to all relative City of Auburn Departments. Each such presentation shall be co-presented and supported by the appropriate Department Director or Manager.

ii. Investment of $30,000 dollars will be made into a marketing campaign in 2012 which will include advertising for this Urban Center for Innovative Partnerships. This campaign will include brochure which will be used as a mailer to potential client or industry partners; displayed prominently within City Hall; the City Permit Center; and within the Auburn Area Chamber of Commerce.

iii. Print ads and announcements will be displayed within the Auburn Reporter and/or other news advertising sources. These announcements will include IPZ branding; new business recruitment; the creation of new partnerships; announcements regarding new technologies; general policy and mission statements, and educational opportunities for business retention, training and development.

iv. An education and information forum will be presented; and invitation will be sent to each and every licensed business within the Auburn IPZ.

v. A web presentation of the IPZ will be developed and taped and made available for viewing on the City"s Economic Development Web Page and Channel 21.

vi. Signage will be created and posted prominently throughout the IPZ and City announcing the presence of a State of Washington Innovation Partnership Zone.

vii. The City will commit to the physical branding of the IPZ and using each and every event (where appropriate) to discuss, display and advance the vision, mission and goals of the Auburn Center for Emergent Business.

4. Strengths of the Auburn IPZ:

The Urban Center for Innovative Partnerships has numerous strengths. Among those strengths are:

a. This business hub has several existing and well established business clusters and a strong foundational workforce of knowledge-based middle-wage jobs from which we can and will build upon.

b. An eagerness among the business community to talk, share idea, and consider new opportunities. A strong entrepreneurial spirit.

c. A significant amount of warehouse space which is easily converted to market-affordable manufacturing clusters.

d. A City Government which is ready, willing and eager to welcome new business enterprise. Our Mayor, City Council and City Staff are fully prepared to consider new innovative solutions to old problems.

e. A diverse, well balanced workforce; ranging from well trained middle-wage earners to highly educated professionals.

f. An established well developed basic infrastructure and a commitment on the part of the City and partners to add high tech improvements to our established urban environment.

g. A strong team of partners, who are well prepared and willing to make structured investment.

5. Long Term Market Growth for Technologies:

The Auburn IPZ has a significant amount of design and fabrication facilities which offer an opportunity for the formation of new business partnerships including the diversification of manufactures across traditional business lines. These creative partnerships offer the opportunity to bring new ideas, methods and products to market; as well as the opportunity to bring upgrades in our knowledge-based middle-wage jobs and through established, quality, training and workforce development programs, encourage business growth and the growth of high-wage technology type employment for our citizens.

Our IPZ is also home to many Tiers I, II & III suppliers to the aeronautics industry and the Boeing Company. Through partnering and strategies for workforce development we will assist our Aeronautics Clusters to meet the workforce and production demands of the future. In addition we are confident that industry growth will materialize and that our Tier II & III suppliers will be developed into more profitable Tier I suppliers.

The introduction of nano-technologies from our private technology developers, as well as from our research partner (WSU) is already beginning to show promise within the diverse industries of our IPZ. Opportunities for improvements to Epoxies; Resins; Plastics; Paper; Concrete; and Glass have all recently surfaced as areas of significant interest and promise. When we consider the ability which exists here in Auburn to connect this cutting edge research; its introduction to material manufacturing to create lighter and stronger materials; and then the further connection to industries also located within Auburn which are manufacturing real life consumer products, the opportunities are staggering.

6. Entrepreneurial Climate of the Auburn IPZ:

In addition to those outlined in Section 5 above as "Long Term Market Growth for Technologies"; there exists in Auburn an entrepreneurial spirit which has been growing organically, but which is waiting to be cultivated in a more formal way as through the creation of this IPZ and more importantly through the links the IPZ will create between the business, research and training industries.

Auburn's Office of Economic Development in partnership with the Auburn Area Chamber of Commerce recently held its first business retention, expansion and educational opportunity on "Import/Export Forum". The day's forum brought political, economic, business, and community entrepreneurs together to discuss the opportunities for Auburn Manufacturers to expand into the world of Importing and Exporting their goods and services.

This well attended event provided outstanding presentations and panel discussions by many of the State's leading Business Persons and experts from the Dept. of Commerce, World Trade, Port Authorities, Economic Development, etc. and much was gained; but a really amazing

Observation was the interactions, communications and deals that were made during the forums intermissions and break periods.

Local Chocolate manufacturers made connections with World Wide Exporters and now are selling their products in Asia; the same hold true for another manufacturer of Coffee Syrups. A nano scientist made introductions with an Epoxy manufacturer and gained permission to work with their chemists in their lab. An experienced company who imports Foods provided mentoring guidance to a young hydraulics manufacturer who is having trouble navigating the State Department regulations. Representative David Reichert discussed how when he was a young man growing up in Auburn, that he always knew this City would grow as a regional hub of business and how happy he is to be a part of that growth.

These are real life examples of the entrepreneurial spirit that exists here within the Auburn Center for Emergent Business.

7. Commercialization Plan:

As an Economic Development Model, the Auburn IPZ through a phased approach, works with a variety of well established industry clusters and is unique as it offers growth through the dynamic facilitation of partnerships within these working clusters and the Research capabilities of Washington State University (WSU) as well as the workforce development capabilities of Green River Community College (GRCC) and the Auburn High School (AHS) districts.

Our industry clusters and the products they produce are ever-changing and every sector has well established commercialization plans for their goods and services. The IPZ will support research and development within these sectors through design projects such as the WSU - IDEX project which offers creative new approaches to public and private development projects. Ideas from these projects are and will continue to be used to spur fresh new markets and products.

The IPZ will proactively use public projects to introduce private research, investment and development such as its outreach and commitment to Century Link and there investment into public/private fiber-optic development within the downtown IPZ district and throughout our manufacturing districts to encourage high-tech re-development of existing low-rent warehouse districts.

The Urban Center for Innovative Partnerships will serve as a bridge to "tie-in" cutting edge research and development with private sector industries to invigorate low cost manufacturing districts into robust centers of market rate and high paying workforce employment.

8. Performance Measures and Reporting:

The Administrator will collect and report annual performance criteria which will include:

- Number of trained workers added to state workforce as a result of training provided within IPZ;
- Number of potential business sites added (commercial and industrial building developed, redeveloped or newly occupied) attributable to IPZ innovation, research, and commercial application;
- Number and type of other assets developed (to retain, grow and attract business)
- Dollar value of infrastructure and other investments completed;
- Evidence of commercialization of IPZ research (licenses, patents, trademarks, etc.);
- Descriptions of research being conducted within the IPZ and potential commercial applications;
- The IPZ will track private sector investment and will provide information as to how that investment is leveraged for the benefit of the IPZ mission and its stakeholders;
- Other reasonable performance criteria that may be developed by Commerce.

The IPZ Administrator certifies that we will:

- Participate in the annual conference of IPZs, convened by Commerce, and share "lessons learned" and best practices for technology transfer and accelerated commercialization;
- Place the IPZ logo where practical (web, signage, stationery), and market the zone as a State-designated IPZ;
- Notify Commerce of any news events, special events, major changes, innovation activity, new commercialization, or other information that would be of interest to Commerce and the IPZ program.

Appendix B

AUBURN ONE DEPARTURE (OBSTACLE)

SL-10224 (FAA)

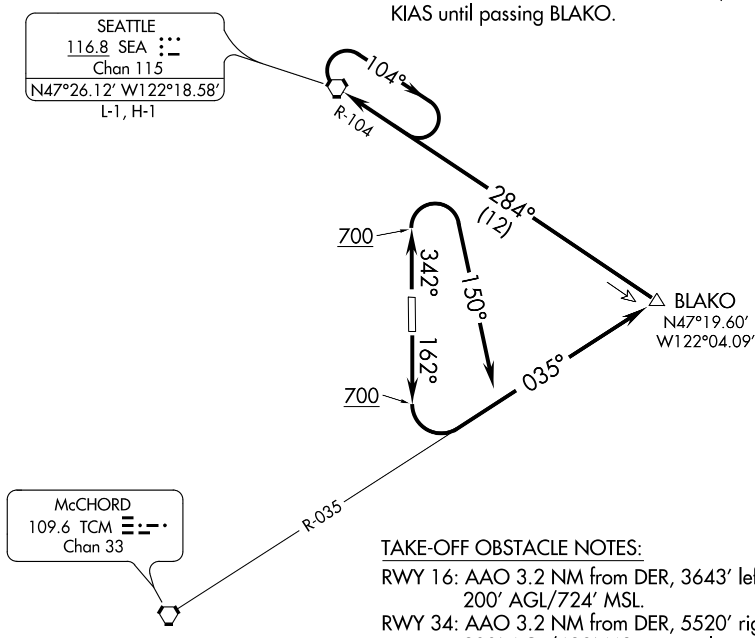
AUBURN MUNI (S5Ø)
AUBURN, WASHINGTON

SEATTLE CLNC DEL
128.0
SEATTLE DEP CON
123.85

TAKE-OFF MINIMUMS

RWY 16: Standard with minimum climb of 266′ per NM to 1200 or 1200-2½ for climb in visual conditions, do not exceed 180 KIAS until passing BLAKO.

RWY 34: Standard with minimum climb of 300′ per NM to 900 or 1200-2½ for climb in visual conditions, do not exceed 180 KIAS until passing BLAKO.



TAKE-OFF OBSTACLE NOTES:

RWY 16: AAO 3.2 NM from DER, 3643′ left of centerline 200′ AGL/724′ MSL.

RWY 34: AAO 3.2 NM from DER, 5520′ right of centerline 200′ AGL/639′ MSL. Powerline 1804′ from DER, on centerline, 80′ AGL/122′ MSL.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 16: Climb heading 162° to 700, then climbing left turn to 3000 via the TCM R-035 to BLAKO INT then left turn via the SEA R-104 to SEA VORTAC; or climb in visual conditions east of RWY 16/34 to cross Auburn Muni southbound at or above 1200′, then climb to 3000 via heading 150° and TCM R-035 to BLAKO INT then left turn via the SEA R-104 to SEA VORTAC. Do not exceed 180 KIAS until passing BLAKO. Thence....

TAKE-OFF RUNWAY 34: Climb heading 342° to 700, then climbing right turn to 3000 via heading 150° to TCM R-035 to BLAKO INT then left turn via the SEA R-104 to SEA VORTAC; or climb in visual conditions east of RWY 16/34 to cross Auburn Muni southbound at or above 1200′, then climb to 3000 via heading 150° and TCM R-035 to BLAKO INT then left turn via the SEA R-104 to SEA VORTAC. Do not exceed 180 KIAS until passing BLAKO. Thence....

....hold E SEA VORTAC, RT, 284° inbound; when authorized by ATC, climb-in-hold to 5000, or as assigned before proceeding on course.

NW-1, 24 JUL 2014 to 21 AUG 2014

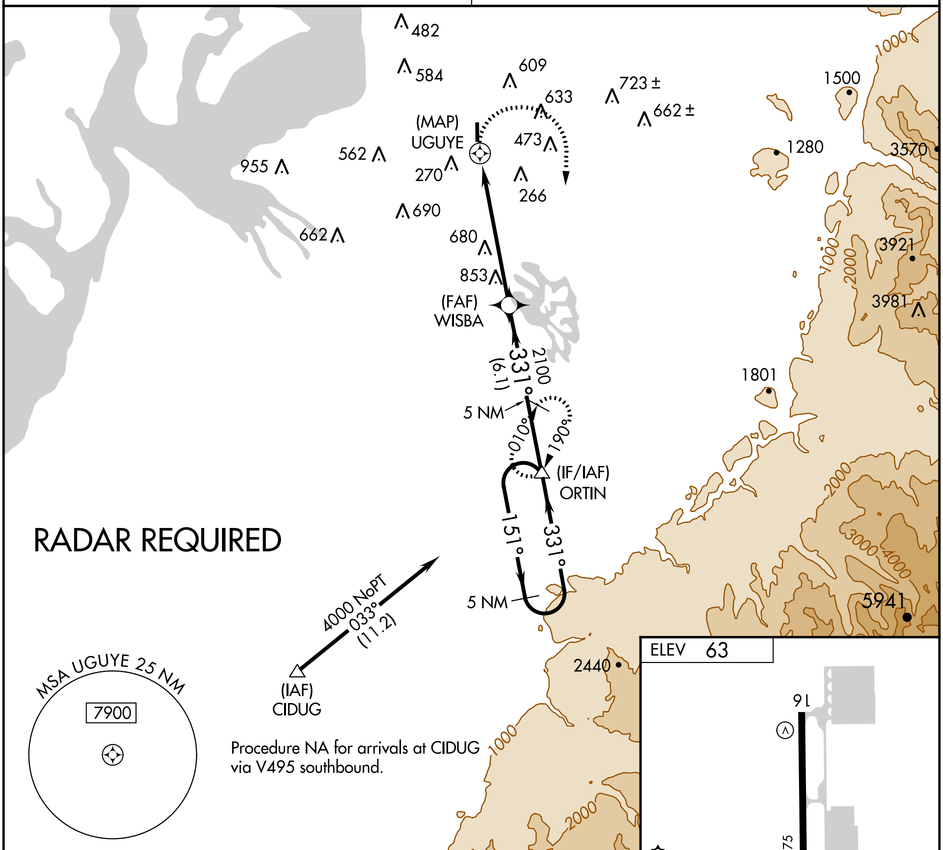
APP CRS	Rwy ldg	N/A
331°	TDZE	N/A
	Apt Elev	63

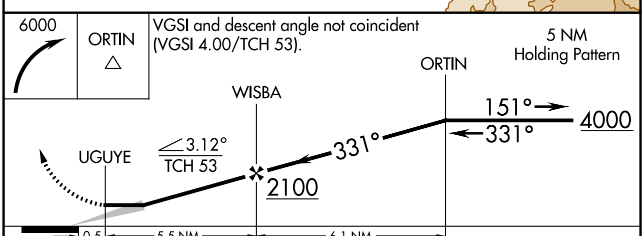
RNAV (GPS)-A
AUBURN MUNI (S5Ø)

T A NA
Circling NA west of Rwy 16-34.
Procedure NA at night.
DME/DME RNP- 0.3 NA.
Use Seattle-Tacoma Intl altimeter setting.

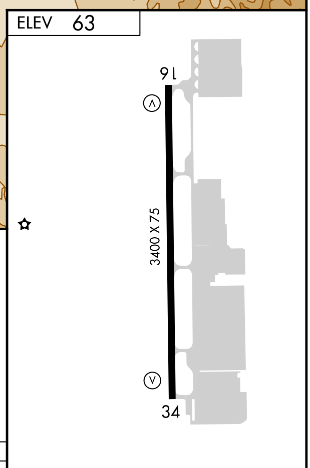
MISSED APPROACH: Climbing right turn to 6000 direct ORTIN and hold, continue climb-in-hold to 6000.

SEATTLE APP CON	AUNICOM
123.85	**122.8** (CTAF) L





CATEGORY	A	B	C	D
CIRCLING	1320-1¼ 1257 (1300-1¼)	1320-1½ 1257 (1300-1½)	NA	



NW-1, 24 JUL 2014 to 21 AUG 2014

NW-1, 24 JUL 2014 to 21 AUG 2014

INSTRUMENT APPROACH PROCEDURE CHARTS

IFR TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

Civil Airports and Selected Military Airports

ALL USERS: Airports that have Departure Procedures (DPs) designed specifically to assist pilots in avoiding obstacles during the climb to the minimum enroute altitude , and/or airports that have civil IFR takeoff minimums other than standard, are listed below. Takeoff Minimums and Departure Procedures apply to all runways unless otherwise specified. Altitudes, unless otherwise indicated, are minimum altitudes in MSL.

DPs specifically designed for obstacle avoidance are referred to as Obstacle Departure Procedures (ODPs) and are described below in text, or published separately as a graphic procedure. If the (Obstacle) DP is published as a graphic procedure, its name will be listed below, and it can be found in either this volume (civil), or the applicable military volume, as appropriate. Users will recognize graphic obstacle DPs by the term "(OBSTACLE)" included in the procedure title; e.g., TETON TWO (OBSTACLE). If not specifically assigned a departure procedure (i.e.,ODP, SID, or radar vector) as part of an IFR clearance, an ODP may be required to be flown for obstacle clearance, even though not specifically stated in the IFR clearance. When doing so in this manner, ATC should be informed when the ODP being used contains a specified route to be flown, restrictions before turning, and/or altitude restrictions.

Some ODPs, which are established solely for obstacle avoidance, require a climb in visual conditions to cross the airport, a fix, or a NAVAID in a specified direction, at or above a specified altitude. These procedures are called Visual Climb Over Airport (VCOA). To ensure safe and efficient operations, the pilot must verbally request approval from ATC to fly the VCOA when requesting their IFR clearance.

Graphic DPs designed by ATC to standardize traffic flows, ensure aircraft separation and enhance capacity are referred to as "Standard Instrument Departures (SIDs)". SIDs also provide obstacle clearance and are published under the appropriate airport section. ATC clearance must be received prior to flying a SID.

CIVIL USERS NOTE: Title 14 Code of Federal Regulations Part 91 prescribes standard takeoff rules and establishes takeoff minimums for certain operators as follows: (1) Aircraft having two engines or less - one statute mile. (2) Aircraft having more than two engines - one-half statute mile. These standard minima apply in the absence of any different minima listed below.

MILITARY USERS NOTE: Civil (nonstandard) TAKEOFF minima are published below. For military takeoff minima, refer to appropriate service directives.

NAME TAKEOFF MINIMUMS

AFTON, WY

AFTON MUNI (AFO)
AMDT 1 06271 (FAA)

DEPARTURE PROCEDURE: **Rwy 16,** Use LUNDI DEPARTURE. **Rwy 34,** use AFTON DEPARTURE.

ALBANY, OR

ALBANY MUNI (S12)
AMDT 2A 11237 (FAA)

DEPARTURE PROCEDURE: **Rwy 16,** turn right. **Rwy 34**, turn left.
All aircraft climb direct CVO VOR/DME and continue climb in CVO VOR/DME holding pattern, (East, right turns, 261° inbound) to cross CVO VOR/DME at or above 3400.

NOTE: **Rwy 34,** light poles 860' from DER, 69' right of centerline, 40' AGL/262' MSL. Light poles 906' from DER, 15' left of centerline, 41' AGL/262' MSL.

NAME TAKEOFF MINIMUMS

ANACONDA, MT

BOWMAN FIELD (3U3)
AMDT 1 07186 (FAA)

TAKEOFF MINIMUMS: **Rwy 4,** std. w/ min. climb of 417' per NM to 9000, or 2800-3 for climb in visual conditions. **Rwy 17,** std. w/ min. climb of 321' per NM to 10200, or 2800-3 for climb in visual conditions. **Rwy 22,** NA-obstacles. **Rwy 35,** std. w/ min. climb of 369' per NM to 9100, or 2800-3 for climb in visual conditions.

DEPARTURE PROCEDURE: **Rwys 4, 35,** climbing right turn to 10200 via heading 130° and CPN VOR/DME R-340 to CPN VOR/DME, continue climb-in-hold to 10200 (north, left turn, 166° inbound), or for climb in visual conditions, cross Bowman Field Airport at or above 7700 then proceed via CPN R-309 to CPN VOR/DME, continue climb-in-hold to 10200 (north, left turn, 166° inbound). **Rwy 17,** climbing left turn to 10200 via heading 100° and CPN VOR/DME R-335 to CPN VOR/DME, continue climb-in-hold to 10200 (north, left turn, 166° inbound), or for climb in visual conditions, cross Bowman Field Airport at or above 7700 then proceed via CPN R-309 to CPN VOR/DME, continue climb-in-hold to 10200 (north, left turn, 166° inbound).

NOTE: **Rwy 17,** multiple trees beginning 865' from DER, 243' left of centerline, up to 70' AGL/5097' MSL. Rod on hangar 570' from DER, 278' left of centerline, 54' AGL/5054' MSL. Multiple trees beginning 787' from DER, 165' right of centerline, up to 70' AGL/5098' MSL. Multiple transmission lines beginning 4602' from DER, 1664' right of centerline, 80' AGL/5159' MSL. **Rwy 35,** multiple transmission lines beginning 2242' from DER, 964' left of centerline, up to 80' AGL/5159' MSL.

24 JUL 2014 to 21 AUG 2014

ARCO, ID
ARCO-BUTTE COUNTY (AOC)
AMDT 1 08157 (FAA)

TAKEOFF MINIMUMS: **Rwy 6,** NA - Obstacles.
DEPARTURE PROCEDURE: Use JATTS DEPARTURE.

ARLINGTON, WA
ARLINGTON MUNI (AWO)
AMDT 3 11237 (FAA)

TAKEOFF MINIMUMS: **Rwy 11,** std. w/min. climb of 400'per NM to 1000, or 1200-2½ for climb in visual conditions. **Rwy 16,** std. w/min. climb of 300'per NM to 1500, or 1200-2½ for climb in visual conditions. **Rwy 29,** std. w/min. climb of 245'per NM to 1400, or 1200-2½ for climb in visual conditions. **Rwy 34,** std. w/min. climb of 260'per NM to 800, or 1200-2½ for climb in visual conditions.

DEPARTURE PROCEDURE: **Rwy 11,** climbing right turn direct WATON LOM, or for climb in visual conditions, cross Arlington Muni at or above 1200 then proceed on 161° course to WATON LOM, thence... **Rwy 16,**climb direct WATON LOM, or for climb in visual conditions, cross Arlington Muni at or above 1200 then proceed on 161° course to WATON LOM, thence ... **Rwy 29,** climbing left turn on 113° course to WATON LOM, or for climb in visual conditions, cross Arlington Muni at or above 1200 then proceed on 161° course to WATON LOM, thence ... **Rwy 34,** climbing left turn on 134° course to WATON LOM, or for climb in visual conditions, cross Arlington Muni at or above 1200 then proceed on 161° course to WATON LOM, thence ...

... Aircraft departing WATON LOM on bearings 150° CW 340° from WATON LOM climb on course. Aircraft departing WATON LOM on bearings 340° CW 150° from WATON LOM, climb in holding pattern (South, left turns, 342° inbound) to cross WATON LOM at or above 4500 before proceeding on course.

NOTE: **Rwy 11,** airport beacon 1116' from DER, 699' left of centerline, 58' AGL/186' MSL. Tree 1443' from DER, 803' left of centerline, 108' AGL/236' MSL. Tree 1819' from DER, 688' right of centerline, 46' AGL/174' MSL. Trees beginning 1.2 NM from DER, left and right of centerline, up to 127' AGL/486' MSL. **Rwy 16,** tree 1240' from DER, 723' left of centerline, 47' AGL/174' MSL. Trees beginning 1289' from DER, 713' right of centerline, up to 87' AGL/214' MSL. **Rwy 29,** trees beginning 897' from DER, 548' right of centerline, up to 97' AGL/229' MSL. **Rwy 34,** trees beginning 1557' from DER, left and right of centerline, up to 96' AGL/236' MSL. Trees beginning 2379' from DER, 196' right of centerline, up to 84' AGL/224' MSL.

ASTORIA, OR
ASTORIA RGNL (AST)
AMDT 5 99364 (FAA)

TAKEOFF MINIMUMS: **Rwy 8**, 800-3 or std. with a min. climb of 320' per NM to 900. **Rwy 13**, 700-2 or std. with a min. climb of 350' per NM to 800.

DEPARTURE PROCEDURE: **Rwys 8,31,** turn left. **Rwy 13**, climb runway heading to 800 then climbing right turn. **Rwy 26**, turn right. Aircraft departing northwestbound climb via AST R-290 on course. **All other aircraft** climb to 1500 or above via AST R-290 then left turn to AST VOR/DME and continue climbing on course.

AUBURN, WA
AUBURN MUNI (S50)
ORIG 07298 (FAA)

DEPARTURE PROCEDURE: Use AUBURN DEPARTURE.

AURORA, OR
AURORA STATE (UAO)
AMDT 3 11349 (FAA)

TAKEOFF MINIMUMS: **Rwy 17,** std. w/min. climb of 292'per NM to 2100 or 1500-2½ for climb in visual conditions. **Rwy 35,** std. w/min. climb of 312'per NM to 2100 or 1500-2½ for climb in visual conditions.

DEPARTURE PROCEDURE: **Rwy 17,** climbing right turn, thence ... Or for climb in visual conditions cross Aurora State airport at or above 1500 thence... **Rwy 35,** climbing left turn, thence ... Or for climb in visual conditions cross Aurora State airport at or above 1500 thence ...

... Aircraft departing on V23 intercept BTG R-175 and climb on course. All others proceed direct UBG VOR/DME and Hold (hold South, left turns, 003° Inbound) continue climb in hold to cross UBG VOR/DME at or above MEA for direction of flight before proceeding on course.

NOTE: **Rwy 17,** trees beginning 31' from DER, 246' right of centerline, up to 87' AGL/316' MSL. Tree 2270' from DER, 836' left of centerline, 87' AGL/303' MSL. Vehicle on road 254' from DER, 349' left of centerline, 16' AGL/209' MSL. **Rwy 35,** trees beginning 30' from DER, 163' left of centerline, up to 65' AGL/329' MSL. Vehicle on road 212' from DER, 390' left of centerline, 16' AGL/212' MSL. Trees 973' from DER, 281' right of centerline, up to 65' AGL/253' MSL.

BAKER, MT
BAKER MUNI (BHK)
ORIG-A 14037 (FAA)

TAKEOFF MINIMUMS: **Rwy 13,** NA-Environmental.
NOTE: **Rwy 31,** fence and vertical structure 168' from DER, 498' left of centerline, up to 10' AGL/2974' MSL. Wind sock on building 1015' from DER, 727' left of centerline, 36' AGL/2998' MSL. Antenna 3832' from DER, 136' left of centerline, 111' AGL/3073' MSL.

24 JUL 2014 to 21 AUG 2014

Appendix C

Chapter 18.38
LF AIRPORT LANDING FIELD DISTRICT[1]

Sections:

18.38.010 Intent.

The intent of this chapter is to provide for the operation and management of the Auburn Municipal **Airport**. It is found that an **airport hazard** endangers the lives and property of users of the municipal **airport** and of occupants of land or property in its vicinity, and also, if of the obstruction type, in effect reduces the size of the area available for the landing, taking off and maneuvering of aircraft, thus tending to destroy or impair the utility of the municipal **airport** and the public investment therein. Accordingly, it is declared that:

A. The creation or establishment of an **airport hazard** is a public nuisance and an injury to the region served by the municipal **airport**;

B. It is necessary in the interest of the public health, public safety and general welfare that the creation or establishment of **airport hazards** be prevented; and

C. The prevention of these hazards should be accomplished, to the extent legally possible, by the exercise of the police power without compensation. It is further declared that both the prevention or the creation or establishment of **airport hazards** and the elimination, removal, alteration, mitigation or marking and lighting of existing **airport hazards** are public purposes for which political subdivisions **may** raise and expend public funds and acquire land or interests in land. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.020 Permitted uses.

Hereafter all **buildings**, **structures**, or parcels of land **shall** only be **used** for the following, unless otherwise provided for in this title:

A. Landing, taking off and flying of aircraft, excluding ultralights as defined by ACC 8.36.010;

B. Businesses **incidental** to and necessary or convenient for **airport** operations, including offices, eating establishments, restrooms, hangars, shops for light repairs, gasoline and oil sales and accessory **structures** therefor;

C. Other **uses** as determined by the hearing examiner to be related to operation and **use** of the **airport**. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.030 Restricted uses.

Restricted **uses** shall be as follows: no **use** may be made of land within any **airport** zone in such a manner as to create electrical interference with radio communication between the **airport** and aircraft, making it difficult for fliers using the **airport**, impair visibility in the vicinity thereof, or otherwise endanger the landing, taking off or maneuvering of aircraft. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.040 Zones established generally.

In order to carry out the provisions of this chapter, there are created and established certain **zones** which include all of the land lying within the noninstrument approach **zone**, transition **zone**, horizontal **zone**, conical **zone** and obstacle free areas. Such areas and **zones** are shown on the "City of Auburn Municipal **Airport** Master Plan Update, 1993-2013, dated February 1995, and Federal Air Regulations (FAR) Part 77 as amended, which is on file in the city clerk's office. The various **zones** are established and defined as follows in ACC 18.38.050 through 18.38.085. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.050 Approach zone.

A noninstrument approach surface is established at each end of all noninstrument runways for landings and takeoffs. The inner width of the approach surface is 250 feet at a distance of 200 feet beyond the physical end of the runway, and it expands uniformly to a width of 1,250 feet. This approach surface extends for a horizontal distance of 5,000 feet at a slope of twenty to one (20:1). The elevation of the inner width of the approach surface is the same as the elevation of the nearest point on the runway centerline. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.060 Transitional zone.

The transitional surface extends outward and upward at right angles to the runway centerline and the runway centerline extends at a slope of seven to one (7:1) from a line 125 feet from the runway centerline or runway end and from the sides of the approach surfaces. The elevation of the line 125 feet from the runway centerline or runway centerline extended for 200 feet beyond each runway end is the same as the elevation of the nearest point on the runway centerline. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.070 Horizontal zone.

A horizontal surface is established above the **airport**. This horizontal surface is a plane 150 feet above the established **airport elevation**, the perimeter of which is constructed by swinging arcs 5,000 feet in a radius from the center of each end of the primary surface of the runway and connecting the adjacent arcs by lines tangent to those arcs. The primary surface is longitudinally centered on the runway with a width of 250 feet and extends 200 feet beyond each end of the runway. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.080 Conical zone.

A conical surface is established which extends outward and upward from the periphery of the horizontal surface at a slope of twenty to one (20:1) for a horizontal distance of 4,000 feet. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.085 Obstacle free area.

An area extending 250 feet either side of the runway and 600 feet off either end of the runway. The obstacle free area (OFA) must be kept clear of any **structures**, fencing, **landscaping**, parking, or vehicular circulation not directly related to aircraft operations at the Auburn Municipal **Airport**. (Ord. 5026 § 1, 1997.)

18.38.090 Height limitations – Generally.

Except as otherwise provided in this chapter, no **structure** or tree **shall** be erected, altered, allowed to grow or maintained in any **zone** created in this chapter to a height in excess of the height limit established in ACC 18.38.100 through 18.38.130 for such **zone**. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.100 Height limitations – Noninstrument approach zone.

The height limitations for noninstrument approach surfaces begin at a point 200 feet from and at the centerline elevation of the end of the runway and extend for a horizontal distance of 5,000 feet at a slope of twenty to one (20:1). (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.110 Height limitations – Transition zones.

The height limitations for transition **zones** shall be as follows: One foot in height for each seven feet in horizontal distance beginning at any point 125 feet normal to and at the elevation of the centerline of noninstrument runways, extending 200 feet beyond each end thereof, extending to a height of 150 feet above the **airport elevation** which is 59 feet above mean sea level. In addition to the foregoing, there are established height limits of one foot vertical height for each seven feet horizontal distance measured from the edges of all approach **zones** for the entire length of the approach **zones** and extending upward and outward to the points where they intersect the horizontal or conical surfaces. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.120 Height limitations – Horizontal zones.

The height limitation for a horizontal **zone** shall be as follows: 150 feet above the **airport elevation** or a height of 209 feet above mean sea level. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.130 Height limitations – Conical zones.

The conical surface involves a slope of twenty to one (20:1) for a horizontal distance of 4,000 feet. The relative difference in elevation between the inner and outer edge of the conical surface is 200 feet. The elevation of the outer edge of the conical surface is 300 feet above the established **airport elevation**. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.140 Nonconforming structures and trees – Continuation allowed when.

The regulations prescribed by this chapter **shall** not be construed to require the removal, lowering or other change or alteration of any **structure** or tree not conforming to the regulations as of March 22, 1969, or otherwise interfere with the continuance of any **nonconforming use**. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.150 Nonconforming structures and trees – Marking and lighting.

Notwithstanding the provisions of ACC 18.38.140, the owner of any nonconforming **structure** or tree is required to permit the installation, operation and maintenance thereon of such markers and lights as are deemed necessary by the **airport** manager to indicate to the operators of aircraft in the vicinity of the **airport** the presence of such aircraft hazards. Such markers and lights **shall** be installed and operated and maintained by the city. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.160 Structure and use permits.

Except as specifically provided in subsections A, B and C of this section, no material change **shall** be made in the **use** of land and no **structure** or tree **shall** be erected, altered, planted or otherwise established in any **zone** created by this chapter unless a permit has been applied for and granted by the **building** department of the city. Each application for a permit **shall** indicate the purpose for which the permit is desired, with sufficient information to permit it to be determined whether the resulting **use**, **structure** or tree would conform to the regulations therein prescribed. If such determination is in the affirmative, the permit **shall** be granted.

A. In the area lying within the limits of the horizontal **zone** and the conical **zone**, no permit **shall** be required for any tree or **structure** less than 75 feet of vertical height above the ground, except when because of terrain, land contour or topographic features such tree or **structure** would extend above the height limits prescribed for such **zone**.

B. In the area lying within the limits of the noninstrument approach surface but at a horizontal distance of not less than 5,000 feet from a point 200 feet from each end of the runway, no permit **shall** be required for any tree or **structure** less than 75 feet of vertical height above the ground, except when such trees or **structures** would extend above the height limit prescribed for such noninstrument approach **zone**.

C. The transitional surface does not extend beyond the perimeter of the horizontal surface. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.170 Nonconforming structures or trees – Alteration.

A. Before any nonconforming **structure** or tree **may** be replaced, substantially altered or repaired, rebuilt, allowed to grow higher or replanted, a permit must be secured from the **airport** manager and, if applicable, the **building** official.

B. No permit **shall** be granted that would allow the establishment or creation of an **airport hazard** or permit a **nonconforming use**, **structure** or tree to be made or become higher, or become a greater hazard to air navigation, than it was on March 22, 1969, or than it is when the application for a permit is made. Except as indicated, all applications for such a permit **shall** be granted. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.180 Nonconforming structures or trees – Abandoned or destroyed – Permit prohibited.

Whenever the **airport** manager determines that a nonconforming **structure** or tree has been abandoned or more than 80 percent torn down, physically deteriorated or decayed, no permit **shall** be granted that would allow such **structure** or tree to exceed the applicable height limit or otherwise deviate from the zoning regulations. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.190 Requirements for variances.

Any **person** desiring to erect or increase the height of any **structure**, or permit the growth of any tree, or **use** his property, not in accordance with the regulations prescribed in this chapter, **may** apply to the hearing examiner for a **variance** from such regulation. Such **variances** shall be allowed where it is duly found that a literal application or enforcement of the regulation should result in practical difficulty or unnecessary hardship and the relief granted would not be contrary to the public interest but will do substantial justice and be in accordance with the spirit of this chapter. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.200 Variance – Grant conditions.

Any **variance** granted **may**, if such action is deemed advisable to effectuate the purpose of this chapter and is reasonable in the circumstances, be so conditioned as to require the owner of the **structure** or tree requesting a **variance** to install, operate and maintain at **his** own expense such markers and lights as **may** be necessary to indicate to fliers the presence of an **airport hazard**. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.210 Decision appeals – Generally.

Any **person** aggrieved, or any taxpayer affected, by any decision of the city made in its administration of this chapter **may** appeal to the hearing examiner. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.220 Conflicting regulations.

Where there exists a conflict between any of the regulations or limitations prescribed in this chapter and any other regulations applicable to the same area, whether the conflict is with respect to the height of **structures** or trees, the **use** of land, or any other matter, the more stringent limitation or requirement **shall** govern and prevail. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.230 Enforcement.

It **shall** be the duty of the **airport** manager and **building** official to administer and enforce the regulations prescribed in this chapter. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.240 Violation – Penalty.

Each violation of this chapter or of any regulation, order or ruling promulgated under this chapter constitutes a misdemeanor and is punishable as provided in ACC 1.24.010. Each day a violation continues to exist constitutes a separate offense. (Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

18.38.250 Development standards.

Development standards in a LF district are as follows:

A. Minimum **lot** area: none required;

B. Minimum **lot** width: none required;

C. Minimum **lot** depth: none required;

D. Maximum **lot** coverage: none required;

E. Maximum **building** height: 45 feet, except as restricted elsewhere by this chapter;

F. Minimum **yard** setbacks:

1. Front: 20 feet,
2. Side, interior: none required,
3. Side, street: 15 feet,
4. Rear: none required;

G. Fences and hedges: see Chapter 18.31 ACC;

H. Parking: see Chapter 18.52 ACC;

I. Landscaping: see Chapter 18.50 ACC;

J. Signs: see Chapter 18.56 ACC. (Ord. 5777 § 1, 2003; Ord. 5026 § 1, 1997; Ord. 4229 § 2, 1987.)

Appendix D

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TECHNICAL MEMORANDUM

Date:	April 29, 2014
To:	W. Matt Rogers
From:	Paul Fendt, P.E.
Subject:	Stormwater Management Evaluation
cc:	Jennifer Lundberg, CEP Julie Brandt, P.E.
Project Number:	553-2694-006
Project Name:	Auburn Airport Master Plan

INTRODUCTION

This technical memorandum assesses potential stormwater management needs to implement the Auburn Airport Master Plan Update Alternatives. Master Plan elements that could require revised stormwater facilities include:

- New impervious surfaces
- Replaced impervious surfaces or existing impervious surfaces requiring a retrofit to pre-development conditions
- New industrial activities or existing areas under the Industrial Stormwater Permit requiring corrective actions
- Modifications to the drainage system or hydrologic changes (i.e. added or removed impervious surface)
- Development in the floodplain
- New or modified stormwater facilities that require adjustments to limit wildlife attraction

As each new area develops or redevelops, stormwater could be managed through several different approaches. New and modified stormwater management facilities could be constructed to provide flow control and/or water quality treatment at site-specific locations throughout the airport. In addition to or in place of individual facilities, larger joint stormwater facilities could be constructed that serve multiple areas and would be associated with a discharge point from the airport to surrounding receiving streams.

This Technical Memorandum provides background on the drainage areas at the airport; existing available information on the Airport's drainage system and stormwater management facilities; briefly outlines the potential regulatory drivers for stormwater requirements; outlines proposed Master Plan projects by drainage basin; and proposes approaches to managing stormwater from the proposed Master Plan Update.

EXISTING ENVIRONMENT

The majority of the Airport lies in the Green River Basin in King County (Basin “I” in the City’s Comprehensive Stormwater Drainage Plan). A small portion of the south end of the airport, which includes some minor Master Plan improvements areas, is located in the Mill Creek basin (Basin “O”). Most of the existing airport and runways drains north to several ponds in the northerly portion of the airport, then directly east in the 30th Street trunk line to the Brannon Park Pump Station, where it is discharged to the Green River. The south end of the airport drains north and west to a small pond that discharges into the storm sewer system draining west and north to Mill Creek outfall at 29th St NW.

The existing drainage system for the majority of the existing airport, including the runway, taxiways, hangars, and related airport facilities, flows north in a storm sewer trunk line to the east of the runway and taxiway and in a bioswale between the runway and taxiway. The storm sewer trunk line drains land via storm sewer lines from the trunk line east to a north-south line approximately following E Street, including all of the hangars and related pavement. The bioswale drains the runway, taxiway, and infield between. Four detention ponds are located at the north end of the airport. Pond “I” lies at the north end of the runway and taxiway, collecting stormwater from the hangar area in the northest portion of the airport and discharging it to 30th Street trunk line. Ponds “F”, “G”, and “H” collect stormwater from the warehouses located to the west and offsite of the airport and discharge to the 30th Street trunk line. No stormwater from the airport uses Ponds F, G, and H.

Stormwater in the south, Basin O, is collected from the runway, taxiway, parking, buildings, maintenance shop, and hangars in an east-west trunk line and drains west to a small pond located west of the runway. This pond discharges west to a storm sewer which then flows north and west to the Mill Creek outfall.

The purpose and service area of the existing stormwater ponds is not known, nor is it apparent if the ponds have additional available capacity for new development. Ponds F, G, and H appear to serve the warehouses not in the airport property. Pond I appears to serve the north hangars, and the small pond at the outlet of Basin O serves all of the developed areas at the south end of the airport.

The grassy infields are an effective recognized runoff water quality treatment and dispersion area, provided there is sufficient flow travel distance and adequate soils type to meet the Ecology standards for filter strip dispersion. Areas can often be readily enhanced or modified to achieve this effective stormwater management strategy. The bioswale between the runway and taxiway would provide additional treatment and it is likely that those areas of the airport would require no additional stormwater controls, provided that minimum design standards are met and that all runoff from the runway and taxiway are directed to the filter strips and bioswale. There are no other known stormwater management facilities at the Airport.

There are existing flooding problems at the airport and in the drainage system draining the airport. A summary of the problem area is described in the Comprehensive Stormwater Drainage Plan (Brown and Caldwell 2011). As described in the Comprehensive Plan, 30th St. NE experiences significant flooding “…once every few years” that inundates the street near C St. NE and threatens local businesses. The segment of the storm sewer from the airport to the Brannan Park Pump Station does not have enough capacity and surcharges frequently, thus causing drainage backups at the airport (Brown and Caldwell 2011). The proposed solution includes an upgrade of the storm sewer from the airport to the pump station from a 30-inch storm sewer to a new 42-inch storm sewer.

Portions of the north end or the airport property are mapped as Zone AE or Zone X on the FEMA floodplain maps. No portion of runway or taxiway is included in the floodplain.

APPLICABLE STORMWATER MANAGEMENT REGULATIONS

The City of Auburn is a Phase 2 community with a permit under the National Pollutant Discharge Elimination System (NPDES) Municipal Separated Storm Sewer System (MS4) program administered by Ecology. One requirement of the permit is to manage and control stormwater at new development and redevelopment sites, which the City regulates through Chapter 13.48 of the Auburn City Code and the 2009 Surface Water Management Manual (2009 City of Auburn). Additional or replaced impervious surfaces exceeding minimum areas defined in the code are required to provide water quality treatment and stormwater flow control. Flow control requirements include matching stormwater runoff flows for pre-development conditions, which means the apparent site conditions that existed prior to European settlement (e.g. a forested site). This generally means that the proposed Master Plan projects will be required to retrofit to existing water quality control standards and stormwater flow to pre-development flow rates. Existing problem areas, such as those described above at 30th Street NE, may require additional controls or upgrades to those systems before developing in those basins to those outfalls.

Industrial activities at the airport are regulated under an NPDES Industrial Stormwater General Permit, Number WAR000399. Industrial sites are required to prepare and implement Stormwater Pollution Prevention Plans, monitor stormwater outfalls and report results, and engage in corrective actions if stormwater benchmarks are exceeded. It is often difficult to separate stormwater from industrial sites located at airports, therefore co-permitting is not uncommon and collective stormwater facilities serving multiple sites are often constructed and operated by the airport. Source controls and operational controls are usually applied by tenants, if any. The permit-required Stormwater Pollution Prevention Plan (City of Auburn 2012) has been prepared for the Airport. The SWPPP shall contain a site map, a detailed assessment of the facility, a detailed description of the BMPs, Spill Prevention and Emergency Cleanup Plan, and a sampling plan. These reports may require updates when new development or operational changes occur at the airport.

The airport is also monitoring Outfall A, as required by the permit, located at 30th Street NE. Discharge Monitoring Reports (DMR) filed with Ecology indicate that no benchmarks have been exceeded in the past four quarters and there are no Action Levels in effect.

PROJECT EVALUATION

The proposed Master Plan projects will require measures to minimize the potential impact of stormwater runoff to the area receiving waters and local drainage systems. In addition, retrofitting existing impervious areas and development may be required. The Airport may decide to consolidate stormwater improvements by catchment area, normally near the fringes of the Airport property, before discharging to local receiving waters (i.e. the Green River or Mill Creek), or require individual projects to construct stormwater facilities related to the individual project's footprint and retrofit obligation. The City of Auburn uses design guidelines outlined in the 2009 Storm Water Management Manual (City of Auburn 2009).

For the purpose of this evaluation, consolidated stormwater facilities will be evaluated. If individual site stormwater improvements are proposed, that evaluation would be made as part of the site design and no further coordinated planning would be needed. Master Plan projects are grouped by the existing outfall locations as follows:

- Pond I - 30th Street NE outfall
- Ponds F, G, H – 30th Street NE outfall
- Central hangars – 30th Street NE outfall
- Runway/Taxiway bioswale outfall
- Basin O SW outfall

Table 1 shows the Master Plan projects by drainage catchment and provides a brief description of consolidated facilities. Future reserve areas could be included in the detailed design or considered when sizing to either include additional storage or set aside land to accommodate future system enlargements.

Table 1. Master Plan Projects by Drainage Catchment

Facility Catchment	Master Plan Projects	Proposed Facility(s)
Pond I – 30th Street NE outfall	• Runway extension • New taxiway	• Filter strips for runway and taxiway • Pond I modification (with wildlife deterrents and safety modifications) • Additional shallow detention storage may be required (with wildlife deterrents)
Ponds F, G, H – 30th Street NE outfall	None	• Additional storage for runway extension or lost Pond I storage
Central hangars – 30th Street NE outfall	• New hangars • Airfield pavement • Roads and parking • New buildings • New or replaced pavement	• Shallow detention facility (with wildlife deterrents) – space not shown or available
Runway/Taxiway bioswale outfall	None	• Confirm filter strip design and modify as needed
Basin O SW outfall	• Runway extension • New taxiway • New buildings • Airfield pavement • New or replaced pavement • Roads and parking	• Filter strips for runway and taxiway • Shallow detention facility (with wildlife deterrents) – space available south of existing facility

Note that all surface facilities would require consideration of the Airport Runoff Manual procedures for wildlife deterrents. Site-specific conditions may facilitate the use of potentially preferred infiltration facilities. Use of Low Impact Design (LID) techniques may be required where feasible.

DATA SOURCES USED FOR EVALUATION

Brown and Caldwell. 2011. City of Auburn 2009 Comprehensive Stormwater Drainage Plan, Amended 2011. Prepared for City of Auburn Public Works Department, Auburn, WA.

City of Auburn. 2012. Stormwater Pollution Prevention Plan for Auburn Municipal Airport. Prepared for Auburn Municipal Airport, Auburn, WA.

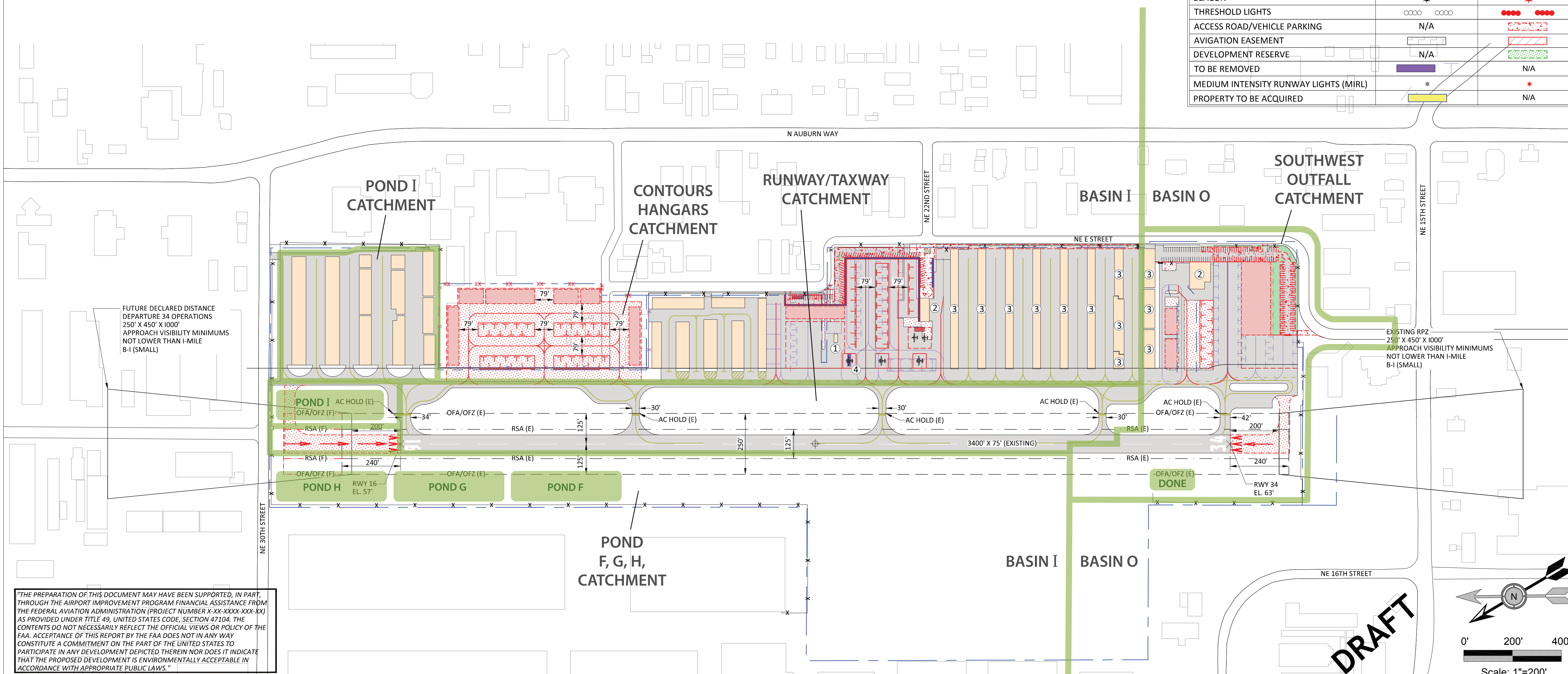
City of Auburn. 2009. Storm Water Management Manual. Prepared for City of Auburn Public Works Department, Auburn, WA.

FEMA. 2011 Flood hazard maps for Auburn, WA. Green River form SR 18 to the Duwamish River, Panel 7.

WSDOT. 2008 Aviation Stormwater Design Manual. Prepared for WSDOT Aviation Division, Arlington, WA

LEGEND

	EXISTING	FUTURE
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	10'	SAME
AIRPORT REFERENCE POINT (ARP)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
VISUAL GUIDANCE INDICATORS (PAPI)		
WIND INDICATOR		
SEGMENTED CIRCLE WIND INDICATOR		
FENCE		
BEACON		
THRESHOLD LIGHTS		
ACCESS ROAD/VEHICLE PARKING	N/A	
AVIGATION EASEMENT		
DEVELOPMENT RESERVE	N/A	
TO BE REMOVED		N/A
MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)		
PROPERTY TO BE ACQUIRED		N/A



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AUBURN MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN

FIGURE NO. -

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TECHNICAL MEMORANDUM

Date:	April 29, 2014
To:	W. Matt Rogers, Century West Engineering
From:	Jennifer Lundberg and Michael Hall, Parametrix
Subject:	Auburn Airport – Master Plan Project Environmental Conditions Inventory
cc:	Julie Brandt
Project Number:	553-2694-006
Project Name:	Auburn Municipal Airport – Airport Master Plan

The Auburn Municipal Airport (Airport) is located at 506 23rd Street NE in Auburn, WA. The Airport is within the Auburn city limits in King County, Washington, in Sections 6 and 7 of Township 21 North, Range 5 East, and Section 12 of Township 21 North, Range 4 East, Willamette Meridian. The land where the Airport is located falls within the Mill Creek-Green River watershed, ultimately draining to the Puget Sound.

The purpose of this memorandum is to summarize the findings of the environmental conditions inventory and identify any environmental regulations that would need to be addressed before the implementation of proposed airport improvements in the Master Plan. This overview is not intended to provide environmental review in accordance with the National Environmental Policy Act (NEPA) and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*; those requirements will be met before the implementation of any improvements described in the Master Plan. This overview focuses on those environmental resources and conditions considered to have the greatest potential to be adversely affected by development alternatives. The resources addressed in this memorandum are land use (including zoning; noise; geological hazards and flood hazards that may limit development; and parks and recreation); utilities; water resources including stormwater, wetlands, and streams; air quality; species of concern; and wildlife hazards.

LAND USE

The Airport is located within the city limits and the Urban Growth Area (UGA) of the City of Auburn. Neighboring properties to the west, south, and east are zoned for heavy commercial uses, and those to the north and east are zoned for heavy industrial uses. The nearest residential areas are approximately 1,000 feet away, to the east and southeast of the Airport and outside of the designated flight paths.

Based on a review of the City of Auburn's noise regulations (AMC 8.28), current and proposed uses of the airport are compatible with the standards for adjacent land uses. Additionally, the City of Auburn has an Auburn Municipal Airport Rules and Regulations document (Finance 100-80, effective 10/2/10) that includes the noise abatement policies and procedures for the airport. The document is available at https://auburnmunicipalairport.com/uploads/Rules_and_Regulations_Website_Version_10-02-2010.pdf. In general, all aircraft must follow the prescribed approach and take off patterns for the airport landing areas and climb to 1,000 feet as soon as possible. Pilots must also reduce their engine RPMs when it is safe to do so to also minimize noise over sensitive receptors including residential areas, schools and hospitals, and densely populated areas.

Sensitive receptors within 1 mile of the airport facilities include, but may not be limited to:

- Emerald Downs 0.3 miles west of the airport runway
- Dick Scobee Elementary School 0.3 miles south east
- Cascade Middle School 0.3 miles east
- Brannan Park 0.3 miles east
- White River Buddhist Temple 0.4 miles north
- Victory Fellowship 0.5 miles south
- Auburn Municipal Golf Course 0.6 miles east
- Isaac Evans Park 0.6 miles east
- Dystra Park 0.6 miles east
- Auburn High School and Veteran's Memorial Park 0.7 miles south
- The Church of Jesus Christ of Latter-Day Saints 0.7 miles southeast
- Messiah Lutheran Church 0.8 miles southeast
- Frank Fulmer Field 0.8 miles southeast
- Scootie Brown Park 0.8 miles southeast
- Multi-Care Auburn Medical Center 0.9 miles south

Additional information about land use planning and zoning in the vicinity of the Airport is provided below. This information was drawn (with minor editorial adjustments) from the February 2013 Inventory of Existing Conditions prepared by Century West.

Land use planning and zoning for the Airport and in the immediate vicinity are administered by the City of Auburn. Areas north, south, west and east of the Auburn city limits are under the jurisdiction of King County or adjacent municipalities of Kent, Algona, Pacific, and Federal Way.

Comprehensive Plan Land Use Designation

The Comprehensive Plan is a guidance document which expresses the way in which the city seeks to grow and develop. The City of Auburn Comprehensive Plan land use designation for Auburn Municipal Airport is "Public and Quasi-Public." The stated purpose of this land use designation is to reflect the coordinated effort of local officials to designate an area of significant size needed to provide public or quasi-public services to the community, and which are not more appropriate for inclusion in another designation. The "Public and Quasi-Public: designation of the Airport is consistent with the community-serving transportation and economic development function of the Airport. Examples of other uses also encompassed by the "Public and Quasi-Public" designation elsewhere in the City include large churches, large private schools, and similar uses. Industrial and commercial uses affiliated with or managed by educational institutions may also be classified as a public use and permitted on a conditional basis.

The land use designations in the vicinity of the Auburn Municipal Airport include Light Industrial, Heavy Industrial, and Heavy Commercial. Properties to the west of the Airport are designated Light Industrial; the purpose of this designation is specifically to reserve quality lands for the City's economic development goals while providing a location attractive for manufacturing, processing and assembling land use activities that benefit from quality surroundings and appropriate commercial retail uses that benefit from the location, access, physical configuration, and building types of these properties. Lighter industrial and heavy commercial uses may be permitted in this land use designation. In contrast, the Heavy Industrial land use designation of properties located to the north and east provides for a wide range of heavier accommodate a wide range of heavier commercial uses involving extensive storage or heavy vehicular movement meeting both a local and regional need for such services.

Airport Zoning

Auburn Municipal Airport is zoned "Airport Landing Field District (LF)" by the City of Auburn. The LF district zoning is intended to accommodate the operation and management of the Auburn Municipal Airport. Inherent in the operation and management of the Airport is avoiding actions that endanger the lives and property of users of the Auburn Municipal Airport and of occupants of land or property in its vicinity, and actions that have the effect of reducing the size of the area available for the landing, taking off and maneuvering of aircraft and that tend to impair the utility of the municipal airport and the public investment. This zoning classification establishes certain zones which include all of the land lying within the non-instrument approach zone, transition zone, horizontal zone, conical zone and obstacle free areas consistent with Federal Air Regulations (FAR) Part 77 as amended. The LF District accounts for approximately 112 acres in the City of Auburn, or 0.57% of the total city area. This LF District exists at only one location within the City and only implements the "Public and Quasi-Public" land use designation of the City's Comprehensive Plan.

Airport Vicinity Zoning

The zoning classification of properties in the vicinity of the Airport includes Light Industrial (M1), Heavy Industrial (M2) and Heavy Commercial (C3) districts. There are minimal land use restrictions on any of these land use zoning classifications.

Light Industrial Zone (M1) is intended for a variety of industrial, commercial, and limited residential uses in an industrial park setting. The uses are non-nuisance generating for air and water pollution, noise, vibration, glare and odor. Most uses should be carried out indoors including those that would degrade visual quality of the area, such as outdoor storage.

Heavy Industrial Zone (M2) is intended to accommodate a broad range of manufacturing and industrial uses. Adjacent land uses may not discourage or interfere with a properties heavy industrial use or produce traffic in conflict with industrial uses.

Heavy Commercial Zone (C3) is intended to allow for medium to high intensity uses consisting of a wide range of retail, commercial, entertainment, office, services, and professional uses. The zone is oriented towards automobiles but fostering pedestrian use. This is the least restrictive commercial use zone.

Airport Overlay Zone

The City of Auburn zoning ordinances do not include the convention of an airport overlay zoning but achieve the same effect according to city planning staff. Specific protective elements within the basic zoning designations in the vicinity of the airport will be described in the land use compatibility section of the master plan. Airport overlay zoning is intended to prevent airspace obstructions around airports by establishing height limitations based on an airport's FAR Part 77 airspace surfaces. Airport overlay zoning may also limit land use and densities, as outlined in airport land use compatibility guidelines created by WSDOT Aviation Division.

Flood Hazard Areas

Portions of the northern end of the Airport property have been identified as special flood hazard areas by the Federal Emergency Management Agency (FEMA), indicating that they are subject to inundation by a 100-year flood (FEMA Zone AE). These include the three stormwater detention ponds, as well as some of the lands underlying the hangars in the northeastern corner of the property, immediately south of 30th Street NE. Some adjoining areas have been identified as being subject either to inundation by a 500-year flood or with average depths of less than 1 foot (FEMA Zone X). These include some areas identified for potential off-airport terminal development near the northeastern corner of the Airport property. In addition, King County has identified the northern portion of the Airport property (generally, north of 22nd Street NE) as an area at risk for possible flood inundation if flows in the Green River exceed the capacity of the containing levees by a factor of approximately 2.

Geological Hazard Areas

The Auburn Municipal Code (AMC) places restrictions on constructing structures or impervious surface near critical geologic hazard areas, which are defined as lands subject to high or severe risks of geologic hazard, including critical erosion hazard areas, critical landslide hazard areas, and critical seismic hazard areas. Based on a review of geologic hazard maps developed by the Washington Department of Natural Resources, no such areas have been identified in or near the Airport property. In addition, no soils identified by the U.S. Department of Agriculture Natural Resource Conservation Service as having a severe or very severe erosion hazard have been mapped in or near the Airport property. The Airport is not within a potential lahar inundation zone but is within an area potentially subject to erosion and sedimentation following a volcanic eruption.

Parks and Recreation Resources

Several parks and recreational facilities are located within 1 mile of the Airport. Most of these are owned and operated by the City of Auburn and are east of the Airport property. Moving from north to south, these include the following:

- **Auburn Golf Course**—A full-service 18-hole facility operated by the City of Auburn Parks, Arts, and Recreation Department. The facility includes putting and chipping greens, a pro shop, and restaurant facilities.
- **Isaac Evans Park**—A riverfront park with a grassy space featuring picnic tables, picnic shelters, restroom facilities and playground equipment. The park is connected to Dykstra Park by a footbridge over the Green River.
- **Brannan Park**—The location of one of Auburn's most heavily used sports complexes. The park features lighted baseball fields, a basketball court, and a soccer field, as well as a skate park, play structures, picnic facilities, restrooms, and a concession stand.
- **Dykstra Park**—A neighborhood park with picnic facilities and a play structure, and a footbridge connection to Isaac Evans Park.
- **Scootie Brown Park**—A small park featuring play structures, picnic tables, a softball field, a pickleball court, and a basketball court.
- **Fulmer Field**—An active sports facility with two softball fields, a play structure, and restrooms.
- **Veteran's Memorial Park**—A popular community park that includes a play structure, basketball court, lawn area, and community building.

The most prominent private recreational facility in the vicinity of the Airport is Emerald Downs, a thoroughbred racing facility featuring a 1-mile race track, grandstand, barns, a sales pavilion, equine hospital, and a wetland mitigation site.

None of the recreational and park facilities located within 1 mile of the Airport appears to limit master planning efforts.

UTILITIES

Utilities that support the airport operations include water, sanitary sewer, stormwater, power, and gas. The following discussion was drawn (with minor editorial adjustments) from the February 2013 Inventory of Existing Conditions prepared by Century West.

Water

Water service for the airport property is provided by the City of Auburn. The water system enters the property at several locations and provides service to the north hangar area, the central hangar area, the airport office, and south hangar area.

The north hangar area is served with an 8" looped water main connected in two locations on 30th Street NE. Two hydrants are located along 30th Street NE and three hydrants are located on the east side of the east drive aisle.

The central hangar area is served with an 8" water main connected through 26th Street NE and then extending south along the east taxiway to the hangar area. The main loops through the hangars, providing water services. There are two fire hydrants located in front of the hangar area along the east taxiway.

The small office adjacent to the center tiedown apron (formerly the airport management office) is served with an 8” main extending from 23rd Street NE. There are two fire hydrants along the entrance road to the office and just north of the central tie down area.

An 8” water main parallels the southern hangar area in the E Street NE right of way. There are service lines for Building 506 (formerly Northwest Aviation College) and the wash rack. Fire hydrants are evenly spaced in the E Street NE right of way.

The southern tiedown area and fixed-base operator (FBO) is served from the 8” main in E Street NE where it transitions onto the airport property just south of the southern hangar where there is a fire hydrant. The main then extends south to 16h Street NE. There is one fire hydrant located just west of the FBO providing service to the tie down area.

Water mains of various sizes (8", 12", and 16") have been extended just outside the western perimeter of the airport property and currently serve the warehouses and business to the west.

Fire protection is provided by the Valley Regional Fire Authority.

Sanitary Sewer

The City of Auburn owns and operates the sanitary sewer system serving the airport property and serves the same buildings that have water service.

The northern hangar area is served by a sewer main that is extended from 30th Street NE along the eastern hangar access road.

The central east side of the airport property is served by a sewer main the parallels the north section of the east parallel taxiway along the frontage of the central hangar area, to the airport office. This main serves the central hangars and the office. The sewer main crosses the runway in two locations between Exits E and F at approximately the midpoint of the runway. The sewer then extends to the north along the western airport boundary and connects to the sewer main in 30th Street NE.

The FBO in the south tiedown area and the wash rack located in the NE corner of the south hangar area are both served by the sewer main in E Street NE. This main flows north and connects to the main crossing runway 16/34 at midfield.

Stormwater

The stormwater management system is more fully described in the Stormwater Management Evaluation prepared by Parametrix in April 2014. The airport has a stormwater drainage system that utilizes a series of building roof drains, catch basins, swales, and culverts. Three detention points are located on the airport property in the northwest corner. The City of Auburn maintains a Stormwater Pollution Prevention Plan (SWPPP) for Auburn Municipal Airport that complies with the Industrial Stormwater General Permit (ISWGP) Condition S3.A.1 through 3. The best management Practices (BMPs) outlined in these sections provide adequate methods to control and treat stormwater pollution. They are also consistent with the 2005 Stormwater Management Manual for Western Washington (SWMM). Examples of the BMPs include providing proper disposal of waste oil and fuel, having an emergency spill response and cleanup plan, and adequate monitoring of the aircraft fuel tanks to ensure no leakage is unnoticed.

The airport property is divided into two drainage basins. Basin 0 is located at the south end of the airport and includes the south aircraft tie down apron, the FBO office and parking lot, the southernmost row of hangars in the south hangar area, the adjacent portion of Taxiway A, and approximately 250 feet of Runway 34. Stormwater runoff from Basin 0 is collected in a series of catch basins, pipes, swales, and ponds that ultimately join together to flow west approximately 200 feet north of the end of Runway 34. The stormwater then enters a swale that continues west, off the airport property, and joins the City stormwater system along B Street NW. There is a small area along the southern fence line routinely floods and encroaches on the southernmost Taxiway and run up area. It should also be noted that D Street NE and the southern end of E Street NE are also connected to the storm system as it passes through the airport.

Basin 1 contains the entire airport area north of Basin 0. This basin also is a series of catch basins, pipes, swales, and ponds. The entire basin flows to the north. The runoff from the hangar areas, aprons, and taxiways are collected in a pipe that runs along the east side of parallel Taxiway A and discharges to the City stormwater system in 30th Street NE. The runoff from runway 16/34 is collected in underdrains that parallel both sides if the runway. These underdrains are routed to the swales between the runway and parallel Taxiway. The swales ultimately flow to the north and also discharge to the City stormwater system in 30th Street NE.

The three large ponds along the northwest property line primarily collect and treat stormwater from the large warehouse area west of the airport. The ponds are connected with culverts and drain to the City stormwater system in 30th Street NE. The three ponds are covered with netting so they do not attract birds.

The swale between the 30th Street NE and the northernmost hangar experiences flooding that encroaches on the hangar taxiway. Also the small grassy area at the west end of the northernmost hangar experiences flooding that encroaches on Taxiway A.

Power

Electrical service is provided by Puget Sound Energy and enters the airport on the east side. Most electrical service lines located on the airport are underground with some overhead lines serving buildings along the east side of the airport.

Gas

Natural gas service is provided by Puget Sound Energy and enters the airport on the east side.

WATER RESOURCES

Stormwater

The Airport's stormwater drainage system involves a series of building roof drains, catch basins, swales, and culverts, along with three detention ponds at the northwest corner of the property. The direction of flow and basin information is available in the Stormwater Management Evaluation technical memorandum for the Auburn Airport Master Plan. For purposes of this section, the system involves a series of above ground features including swales and ponds. The stormwater that does not infiltrate is collected and piped to the City of Auburn storm sewer where it is discharged into either Mill Creek or the Green River. Three of the pond features, Ponds "F", "G", and "H", collect stormwater from an offsite location to the west but do not collect stormwater from the airport facility.

Wetlands

Wetlands and waters of the U.S. are regulated under the Clean Water Act, as amended in 1977, and Executive Order 11990, Protection of Wetlands, as implemented by DOT Order 5660.1A, Preservation of the Nation's Wetlands. In addition, the City of Auburn's critical areas ordinance places restrictions on development activities in and near streams and wetlands. Wetlands have been documented on and near Airport property, indicating that development activities in some portions of the Airport would require mitigation of wetland impacts. Potential development projects affecting wetlands require permits from the U.S. Army Corps of Engineers and appropriate in-kind mitigation as required by federal, state, and local regulations.

A reconnaissance-level field investigation was conducted in 2013 to verify wetland delineations performed in 2007 and to identify potential mitigation opportunities if wetlands on Airport property were to be impacted by future development. The study area for that review was an approximately 27-acre portion of King County Parcel Number 0000800009, at the southwestern corner of the Airport property.

The 2013 field investigation confirmed the presence of four wetlands in the study area. The largest of these is classified as a Category II wetland (partially forested, partially scrub/shrub/emergent) by the City of Auburn (AMC 16.10.080); the others are Category IV wetlands. Any development activities that impact wetlands or wetland buffers would be required to implement mitigation measures, including the creation of new wetlands or the enhancement of existing wetlands. The amount of wetland creation or enhancement is determined by replacement ratios established in the critical areas ordinance.

Table 1 identifies the City of Auburn's replacement ratios for direct impacts to wetlands. Mitigation for impacts to forested Category II wetlands entails the highest replacement ratios. If new wetlands are created to mitigate for impacts, the replacement ratios are one-half the ratios that would be required if existing wetlands are enhanced.

Table 1. City of Auburn wetland replacement ratios, per AMC 16.10.110 C.3

Wetland Category	Wetland Creation Ratio	Wetland Enhancement Ratio
Category II – Forested Category II – Scrub/Shrub/Emergent	3:1 2:1	6:1 4:1
Category IV	1.25:1	2.5:1

A range of options for development in the study area was reviewed in 2013, along with estimated costs for mitigation for wetland impacts associated with each option. The estimated costs ranged from approximately $250,000 for a minimal development option (entailing approximately 2.5 acres of on-site enhancement of wetlands and wetland buffers) to more than $5 million for a scenario involving full development of the property and the construction and enhancement of off-site wetlands. Actual costs of mitigation and permitting for any proposed development activities would of course vary, depending on the amount and type of wetland and buffer impacts, as well as the existing conditions of any proposed mitigation sites.

Streams

No streams or rivers run through the Airport property. In general, surface water runoff sheet flows to the City of Auburn's stormwater system west and north of the Airport. The Airport site falls within the Mill Creek-Green River watershed, ultimately draining to the Puget Sound. Mill Creek, a tributary to the Green River, is approximately 0.5 mile west of the Airport, and the Green River is approximately 0.5 mile east of the Airport.

The quality of surface waters is protected through the implementation of water quality standards pursuant to the Clean Water Act. The water quality standards are established to sustain public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife. When surface water features clearly do not meet their established standards, they are identified as impaired under Section 303(d) of the Clean Water Act. The Washington State Department of Ecology regularly reviews and determines the water quality status of polluted water bodies within Washington and publishes them in a 303(d) list. For each water body listed, Ecology then develops a pollutant management plan where total maximum daily loads (TMDLs) are established to rectify and maintain water quality within standards for those exceeded parameters.

Segments of Mill Creek closest to the Airport are on the most recent 303(d) list, based on low levels of dissolved oxygen and high levels of bacteria. A TMDL has been established to address high temperatures in the portion of the Green River closest to the Airport. In addition, the Green River where it is joined by Mill Creek is on the 303(d) list for low levels of dissolved oxygen.

WDFW has documented the presence of several salmonid fish species in Mill Creek and the Green River. Mill Creek provides spawning habitat for coho salmon, and Chinook salmon, steelhead, and cutthroat trout are known to be present in the stream. The Green River provides spawning habitat for Chinook, chum, coho, pink, and sockeye salmon, as well as steelhead and cutthroat trout; bull trout may also be present in the river.

AIR QUALITY

Three agencies have jurisdiction over ambient air quality in the analysis area: the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). These agencies establish regulations that govern both the concentrations of pollutants in the outdoor air and contaminant emissions from air pollution sources. Although their regulations are similar in stringency, each agency has established its own standards. Unless the state or local jurisdiction has adopted more stringent standards, the EPA standards pertain.

Areas that have experienced persistent air quality problems are designated by EPA as nonattainment areas. The federal Clean Air Act requires additional air pollution controls in these areas. After air monitoring shows that a nonattainment area is meeting health-based air quality standards, EPA redesignates the area as an attainment area. To be redesignated, an area must both meet air quality standards and have a 10-year plan for continuing to meet and maintain air quality standards and other requirements of the Clean Air Act. Areas that are redesignated to attainment are called maintenance areas.

The portions of King County surrounding the Airport have been designated as a maintenance area for carbon monoxide and ozone. EPA approved a 10-year maintenance plan for carbon monoxide and ozone in the central Puget Sound area in 2004. The plan relies on control strategies that focus on motor vehicle emissions but also includes emissions associated with the Seattle-Tacoma International Airport in the area-wide emissions inventory through the maintenance period. EPA's general conformity guidance for airports encourages airport operators to 1) develop comprehensive emissions inventories for their facilities, 2) generate estimates of future activities and associated emissions, and then 3) work with local and state air quality agencies to ensure that any corresponding maintenance plans accurately reflect and account for all emissions at the airport and growth rates for operations at the airport.

Piston-engine aircraft operating on leaded aviation gasoline have been identified as a potential source of lead emissions. Auburn Municipal Airport was included in a recent airport monitoring study conducted by EPA, assessing concentrations of lead in the air. Draft results of the study found that the maximum 3-month rolling average of lead concentrations near the Airport were less than 50 percent of the air quality standard, indicating a low level of concern.

SPECIES OF CONCERN

For this analysis, species of concern are defined as those protected by environmental regulations that would need to be addressed before the implementation of proposed airport improvements in the Master Plan. Such species include those listed or proposed for listing under the federal Endangered Species Act (ESA), as well as species for which wildlife habitat areas have been established in the City of Auburn's critical areas ordinance (AMC Chapter 16.10). Per AMC 16.10.080, wildlife habitat areas include those where the presence of species or habitat listed by federal or state agencies as endangered, threatened, or sensitive has been documented, as well as areas with unusual nesting or resting sites, such as heron rookeries. Critical wildlife habitat also includes Category I wetlands and Class I streams; neither of which are located on or adjacent to the study area.

Table 2 identifies ESA-listed or proposed species and state-listed endangered, threatened, or sensitive fish and wildlife species that could occur in King County. Discussions in this document focus on fish and wildlife species because there are no known populations of ESA-listed plants in the county, and state listing status confers no regulatory authority concerning the management of plant species. The table also summarizes information about the potential for each species to occur in the area addressed by the Master Plan, based on the presence of documented observations or potentially suitable habitat within or near Airport property. The Washington Department of Fish and Wildlife (WDFW) database of priority habitats and species was reviewed for documented observations of endangered, threatened, or sensitive species within a 2 mile radius of the Airport.

Table 2. Fish and wildlife species of concern that may occur in the Auburn Airport Master Plan analysis area

Species	Status (Federal / State)	Occurrence in Analysis Area
Bull trout (*Salvelinus confluentus*)	Threatened / Candidate	No suitable habitat or documented occurrences, but potential effects on downstream water quality need to be assessed
Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened / Candidate	No suitable habitat or documented occurrences, but potential effects on downstream water quality need to be assessed
Puget Sound steelhead (*Oncorhynchus mykiss*)	Threatened / Candidate	No suitable habitat or documented occurrences, but potential effects on downstream water quality need to be assessed
Olympic mudminnow (*Novumbra hubbsi*)	None / Sensitive	No suitable habitat or documented occurrences
Pygmy whitefish (*Prosopium coulterii*)	Species of Concern / Sensitive	No suitable habitat or documented occurrences
Larch Mountain salamander (*Plethodon larselli*)	Species of Concern / Sensitive	No suitable habitat or documented occurrences
Oregon spotted frog (*Rana pretiosa*)	Proposed Threatened / Endangered	No suitable habitat or documented occurrences
Pacific (Western) pond turtle (*Actinemys marmorata*)	Species of Concern / Endangered	No suitable habitat or documented occurrences
Common loon (*Gavia immer*)	None / Sensitive	No suitable habitat or documented occurrences
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened / Threatened	No suitable habitat or documented occurrences

Table 2. Fish and wildlife species of concern that may occur in the Auburn Airport Master Plan analysis area

Species	Status (Federal / State)	Occurrence in Analysis Area
Northern spotted owl (*Strix occidentalis caurina*)	Threatened / Endangered	No suitable habitat or documented occurrences
Bald eagle (*Haliaeetus leucocephalus*)	Species of Concern / Sensitive	No suitable habitat or documented occurrences
Peregrine falcon (*Falco peregrinus*)	Species of Concern / Sensitive	No suitable nesting habitat or documented occurrences
Yellow-billed cuckoo (*Coccyzus americanus*)	Proposed Threatened / Candidate	No suitable habitat or documented occurrences
Canada lynx (*Lynx canadensis*)	Threatened /	No suitable habitat or documented occurrences
Gray wolf (*Canis lupus*)	Endangered / Endangered	No suitable habitat or documented occurrences
Grizzly bear (*Ursus arctos horribilis*)	Threatened / Endangered	No suitable habitat or documented occurrences
Fisher (Pekania pennanti)	Candidate / Endangered	No suitable habitat or documented occurrences
North American wolverine (*Gulo gulo luscus*)	Proposed Threatened / Candidate	No suitable habitat or documented occurrences

No species that are listed or proposed for listing under the ESA are known or expected to occur in the Master Plan analysis area, and no critical habitat for ESA-listed species has been proposed or designated in the analysis area. The nearest locations where ESA-listed or proposed species are known to occur are Mill Creek and the Green River, which support populations of Chinook salmon and steelhead, and where bull trout may be present. Although both streams are several hundred feet away from the Airport, fish in the streams could be affected by stormwater runoff from Airport lands.

According to information provided by WDFW, no documented observations of state-listed endangered, threatened, or sensitive species have been made within 2 miles of the Airport. The following paragraphs briefly summarize each species' potential to use habitats in the analysis area.

Bull trout require cold water temperatures in low-gradient stream reaches with loose, clean gravel for successful egg incubation and juvenile rearing. These conditions are not present in the Green River or Mill Creek near the Airport. However, the lower Green River provides foraging, migration, and overwintering habitat for subadult and adult bull trout. Although pollutants in stormwater from the Airport are unlikely to reach the Green River in concentrations that would affect fish, individual projects may be required to analyze potential effects related to water quality.

Puget Sound Chinook salmon are known to spawn in the Green River and may be present in Mill Creek. The National Marine Fisheries Service (NMFS) has designated critical habitat for Puget Sound Chinook salmon in the Green River. Although pollutants in stormwater from the Airport are unlikely to reach Mill Creek or the Green River in concentrations that would affect fish, individual projects may be required to analyze potential effects related to water quality.

Steelhead are known to spawn in the Green River and may be present in Mill Creek. NMFS has proposed designating critical habitat for Puget Sound steelhead in the Green River. Although pollutants in stormwater from the Airport are unlikely to reach Mill Creek or the Green River in concentrations that would affect fish, individual projects may be required to analyze potential effects related to water quality.

Olympic mudminnows are found in the southern and coastal drainages of the Olympic Peninsula and the southern Puget Sound basin. There is no evidence to suggest that historical sightings from streams in King County represent naturally occurring populations. No observations of Olympic mudminnows have been reported within 5 miles of the Airport. For this reason, improvements proposed in the Master Plan would have no effect on Olympic mudminnows.

Pygmy whitefish are found in coldwater lakes and streams in mountainous areas. The Airport is in the lower Green River valley, where no such habitat is present. No observations of pygmy whitefish have been reported within 5 miles of the Airport. For this reason, improvements proposed in the Master Plan would have no effect on pygmy whitefish.

Larch Mountain salamanders are found on steep slopes with talus and other rocky substrates. No such habitat is present near the Airport, and no observations of Larch Mountain salamanders have been reported within 5 miles. For this reason, improvements proposed in the Master Plan would have no effect on Larch Mountain salamanders.

Oregon spotted frogs are known to occur in Washington State only at large wetland complexes in Klickitat, Skamania, and Thurston Counties. Oregon spotted frogs depend on perennial bodies of water and associated wetlands. No such habitat is present near the Airport, and no observations of spotted frogs have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on Oregon spotted frogs.

Pacific (Western) pond turtles require shallow bodies of water with sufficient basking surfaces and vegetative cover. Female turtles dig nests and deposit eggs in compact, dry soil on upland sites, generally within 300 feet of suitable water bodies. No such habitat is present near the Airport, and no observations have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on Pacific (western) pond turtles.

Common loons nest on secluded shorelines of lakes larger than 30 acres and winter on lakes and marine waters. No such habitat is present within 2 miles of the Airport, and no observations of common loons have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on common loons.

Marbled murrelets nest in old-growth forest and forage in marine areas. No such habitat is present within 2 miles of the Airport, and no observations of marbled murrelets have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on marbled murrelets.

Northern spotted owls nest, roost, and forage in old-growth forest. No such habitat is present within 2 miles of the Airport, and no observations of spotted owls have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on marbled murrelets.

Bald eagles use large trees for nesting, roosting, and perching. In Washington, nearly all bald eagle nests are within 1 mile of a lake, river, or marine shoreline. Bald eagles typically forage over open water and use riparian trees (often cottonwood) for perching. No large water bodies likely to provide suitable foraging habitat are present within or near the Airport property, and the nearest known nesting area is approximately 4 miles away. For these reasons, improvements proposed in the Master Plan would have no effect on bald eagles.

Peregrine falcons typically nest on cliffs that are at least 150 feet tall, although they will also use buildings and bridges. No suitable nesting cliffs occur within 2 miles of the Airport, and no observations of peregrine falcons have been reported within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on peregrine falcons.

Yellow-billed cuckoos require large blocks of riparian habitat for breeding. No such habitat is present within 2 miles of the Airport and no observations of yellow-billed cuckoos have been reported within 5 miles. The last confirmed breeding record of yellow-billed cuckoos in Washington State was from the 1930s; it is probable that the species no longer nests in the state. For these reasons, improvements proposed in the Master Plan would have no effect on yellow-billed cuckoos.

Canada lynx, gray wolf, grizzly bear, and **North American wolverine** require remote areas with low levels of human activity. The Airport is in a lowland setting with relatively high levels of human activity no nearby roadless areas and does not, therefore, provide suitable habitat for any of these species. No observations of any of these species have been documented within 5 miles of the project action area. For these reasons, improvements proposed in the Master Plan would have no effect on Canada lynx, gray wolves, grizzly bears, or North American wolverines.

Fishers require forests with diverse successional stages containing a high proportion of mid- and late-successional characteristics. No such habitat is present near the Airport and no observations of this species have been documented within 5 miles. For these reasons, improvements proposed in the Master Plan would have no effect on fishers.

In addition to the species discussed above, WDFW also identified several state- and/or federally listed species of fish and marine mammals with the potential to occur in marine waters of King County; none of these species is expected to use any habitats that could be affected by any airport improvements proposed in the Master Plan.

Other statutes and regulations that may result in analysis requirements or project restrictions are the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The Migratory Bird Treaty Act makes it unlawful to take migratory birds or their nests, eggs, and feathers. Nearly all bird species that may occur in the analysis area are protected under this act, which can result in the imposition of timing restrictions on activities with the potential to harm bird nests. The Bald and Golden Eagle Protection Act prohibits activities that may disturb bald or golden eagles. Proposals for ground-disturbing activities within 660 feet of bald eagle nests, roost sites, or foraging areas may be required to comply with federal guidelines for bald eagle management[1].

WILDLIFE HAZARDS

Most airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. However, these areas can also encourage wildlife to enter an airport's airspace. Constructed or natural areas around airports can provide wildlife with ideal locations for feeding, reproduction, and escape. Many airports have been required to develop Wildlife Hazard Assessments and/or Wildlife Hazard Management Plans in accordance with 14 CFR Part 139.337. Information from such documents can help identify current wildlife challenges, available habitat, and recommendations for habitat mitigation, thereby decreasing instances of wildlife interaction with airport operations. One of the most commonly identified challenges is the risk of bird strikes. The three stormwater detention ponds at the northwest corner of the Airport property are covered with netting to discourage use by birds.

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[1] Until recently, WDFW also required bald eagle management plans for proposed development projects. Following the removal of bald eagles from the federal list of endangered species in 2007, the Washington State Fish and Wildlife Commission amended state bald eagle protection rules so that such plans are no longer required.

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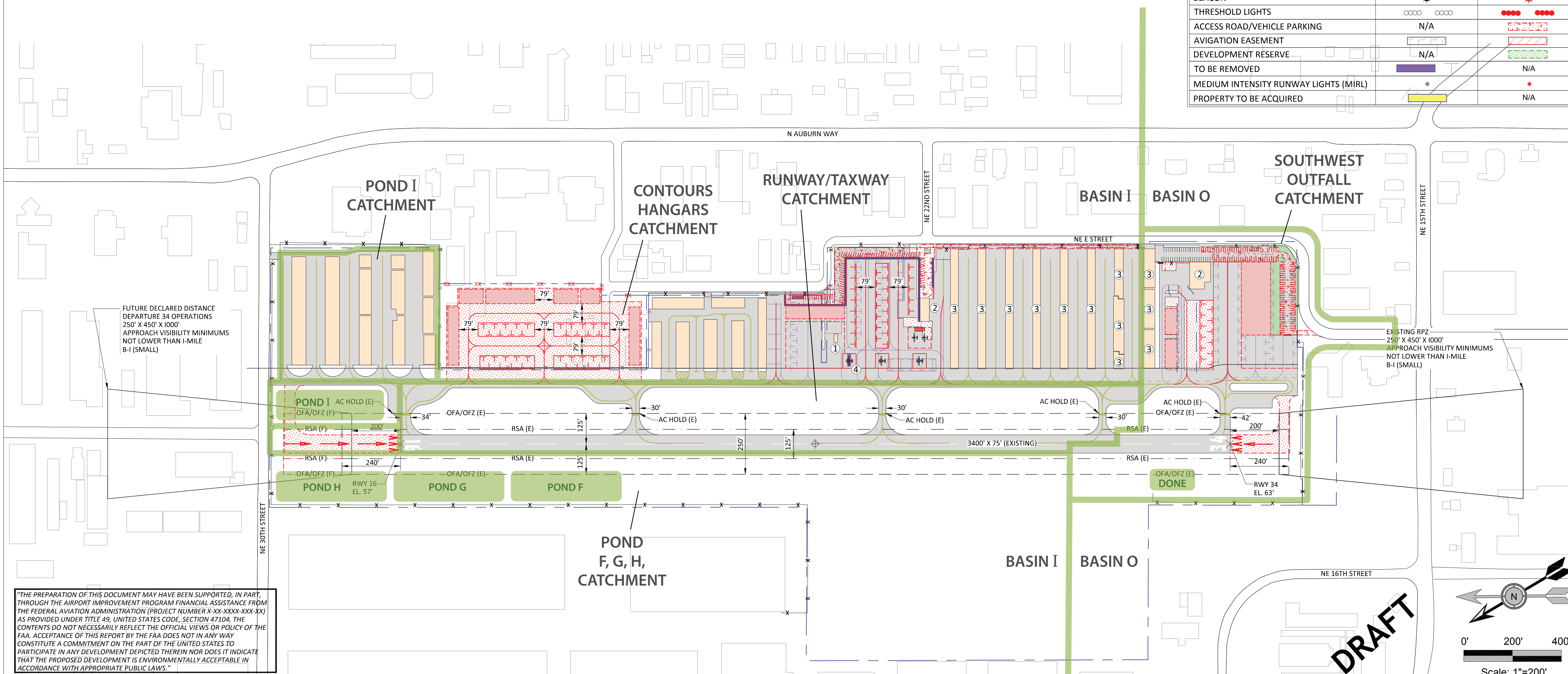
LEGEND

	EXISTING	FUTURE
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	10'	SAME
AIRPORT REFERENCE POINT (ARP)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
VISUAL GUIDANCE INDICATORS (PAPI)		
WIND INDICATOR		
SEGMENTED CIRCLE WIND INDICATOR		
FENCE		
BEACON		
THRESHOLD LIGHTS		
ACCESS ROAD/VEHICLE PARKING	N/A	
AVIGATION EASEMENT		
DEVELOPMENT RESERVE	N/A	
TO BE REMOVED		N/A
MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)		
PROPERTY TO BE ACQUIRED		N/A



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NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE:

SIGNATURE

CITY OF AUBURN APPROVAL

APPROVAL DATE:

SIGNATURE

CENTURY WEST ENGINEERING CORPORATION

BEND OFFICE
1020 SW EMKAY DRIVE #100
BEND, OR 97702
541.322.8962
541.382.2423 (FAX)
WWW.CENTURYWEST.COM

DESIGNED BY: DM	DRAWN BY: JLS	CHECKED BY: SLK	SCALE: AS SHOWN
DATE: -		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN

FIGURE NO. -

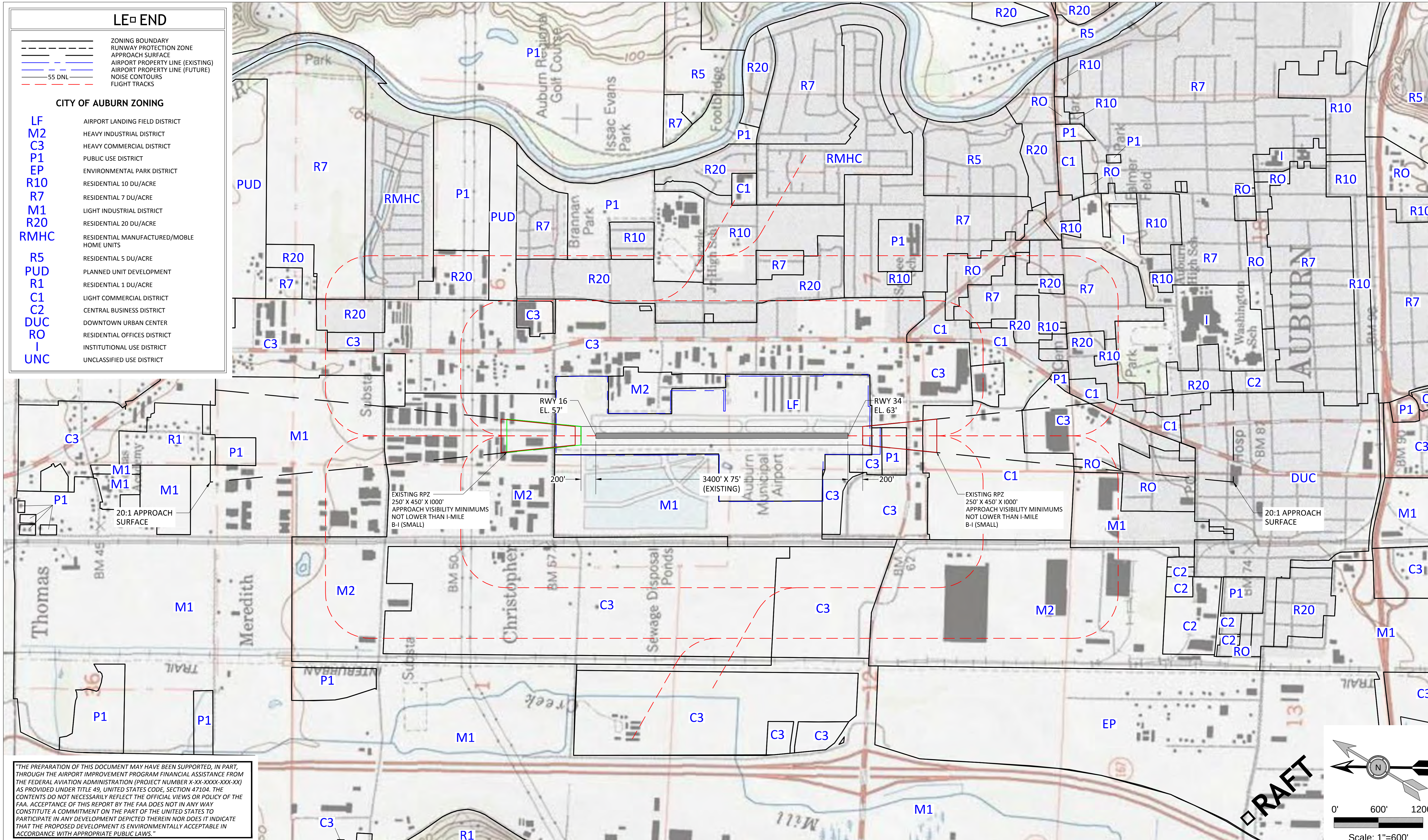
SHEET NO. 3 OF X

LE□END

ZONING BOUNDARY	
RUNWAY PROTECTION ZONE	
APPROACH SURFACE	
AIRPORT PROPERTY LINE (EXISTING)	
AIRPORT PROPERTY LINE (FUTURE)	
55 DNL	NOISE CONTOURS
FLIGHT TRACKS	

CITY OF AUBURN ZONING

LF	AIRPORT LANDING FIELD DISTRICT
M2	HEAVY INDUSTRIAL DISTRICT
C3	HEAVY COMMERCIAL DISTRICT
P1	PUBLIC USE DISTRICT
EP	ENVIRONMENTAL PARK DISTRICT
R10	RESIDENTIAL 10 DU/ACRE
R7	RESIDENTIAL 7 DU/ACRE
M1	LIGHT INDUSTRIAL DISTRICT
R20	RESIDENTIAL 20 DU/ACRE
RMHC	RESIDENTIAL MANUFACTURED/MOBLE HOME UNITS
R5	RESIDENTIAL 5 DU/ACRE
PUD	PLANNED UNIT DEVELOPMENT
R1	RESIDENTIAL 1 DU/ACRE
C1	LIGHT COMMERCIAL DISTRICT
C2	CENTRAL BUSINESS DISTRICT
DUC	DOWNTOWN URBAN CENTER
RO	RESIDENTIAL OFFICES DISTRICT
I	INSTITUTIONAL USE DISTRICT
UNC	UNCLASSIFIED USE DISTRICT



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NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: ______

SIGNATURE

CITY OF AUBURN APPROVAL

APPROVAL DATE: ______

SIGNATURE

CENTURY WEST
ENGINEERING CORPORATION
BEND OFFICE
1020 SW EMKAY DRIVE #100
BEND, OR 97702
541.322.8962
541.382.2423 (FAX)
WWW.CENTURYWEST.COM

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS	SLK	AS SHOWN
DATE: -		PROJECT NO: 12446001.01	

AUBURN MUNICIPAL AIRPORT

LAND USE PLAN
W□□□□□ NOISE CONTOURS

FIGURE NO.
-

SHEET NO.
11 OF X

Appendix E

CITY OF AUBURN WASHINGTON

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

411 108th AVENUE NE, SUITE 1800
BELLEVUE, WA 98004-5571
T. 425.458.6200 F. 425.458.6363
www.parametrix.com

TECHNICAL MEMORANDUM

Date:	May 14, 2013
To:	Matt Rogers
From:	Matthew Maynard
Subject:	Development/Mitigation Options
cc:	Gary Maynard
Project Number:	553-2689-006 (01/05)
Project Name:	Auburn Airport

The purpose of this memorandum is to provide potential development/mitigation options and the approximate costs associated with those options to offset impacts that could occur to wetlands located on an undeveloped portion of the Auburn Airport, should the site be developed in the future. The subject property is a 27-acre portion of King County Parcel Number 0000800009 (Auburn Airport), located immediately west of the runway. Three potential options are presented below.

The first option is to optimize the on-site upland areas for development, and utilize a portion of the site to provide on-site compensatory mitigation for the associated impacts. This option would keep wetland impacts below 0.5 acre, the threshold for an individual permit from the U.S. Army Corps of Engineers (Corps). Under this option, the development would likely qualify for a Corps nationwide permit (Nationwide Permit 39 - Commercial and Institutional Developments). This would provide an irregular shaped area to be developed, but would allow for approximately 7.9 acres of land for development (Figure 1). It would impact all of Wetlands B, C, and D, but these would be mitigated for using the remaining wetland area on the site.

The second option is similar to the first, but would provide a more regular shaped area for development (Figure 2). Like the first option, this would keep impacts below 0.5 acre and allow for on-site compensatory mitigation. This option would impact all of Wetland D and a portion of Wetland A and would likely impact less wetland buffer than the first option. The total developable area would be approximately 4.8 acres.

The costs associated with these first two options would be similar, as the permitting and mitigation needs would be approximately the same. Both options would require environmental documentation and permits. A SEPA environmental checklist would be necessary to obtain a determination of non-significance or a mitigated determination of non-significance from the City of Auburn (as the SEPA lead agency). If federal funds are involved then documentation for NEPA would also apply (FAA would the lead agency), as well as compliance with other federal regulations such as the Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act. Permits would likely include the Corps Nationwide Permit 39, Ecology NPDES General Construction Stormwater permit, FAA Notice of Construction, and City of Auburn critical areas approval and site development permits (these may include a right-of-way, grading, and construction permits). The costs for the environmental review process would be in the range of $15,000-$25,000.

The cost of mitigation installation would vary, because it's dependent upon the needs of the individual site. However, $75,000 per acre is a relatively conservative cost estimate. Thus, the estimated costs of Options 1 and 2 range from $90,000 to $105,000.

The third option would be for the City of Auburn to purchase mitigation credits from King County to fully satisfy compensatory mitigation obligations. King County has an in-lieu fee mitigation program that could be used to compensate for any unavoidable impacts to wetlands on the study area. Typically, an agreement between the County and any interested City would need to be reached to utilize the program outside of un-incorporated King County (an incorporated city). This would be the most costly option. Although prices have not been officially set yet, the costs would range from $600,000 to $1,000,000 per acre. Therefore, costs would be dependent upon the amount of impacts that occur to the wetlands and buffers.

Currently, there are no other mitigation banks with a service area near the study area. However, if the City of Auburn (or other entity) were to establish a mitigation bank that would include the study area in its service area, that would be another potential option to consider.

Document Path: U:\Bell\Projects\Clients\2694-CenturyWest\553-2694-006 Auburn Airport\99Svcs\GIS\Ph01 Ta05 Airport Wetlands\Fig1 Developable.mxd

Parametrix

Source: (Parametrix GPS 2013)

Estimated Wetland

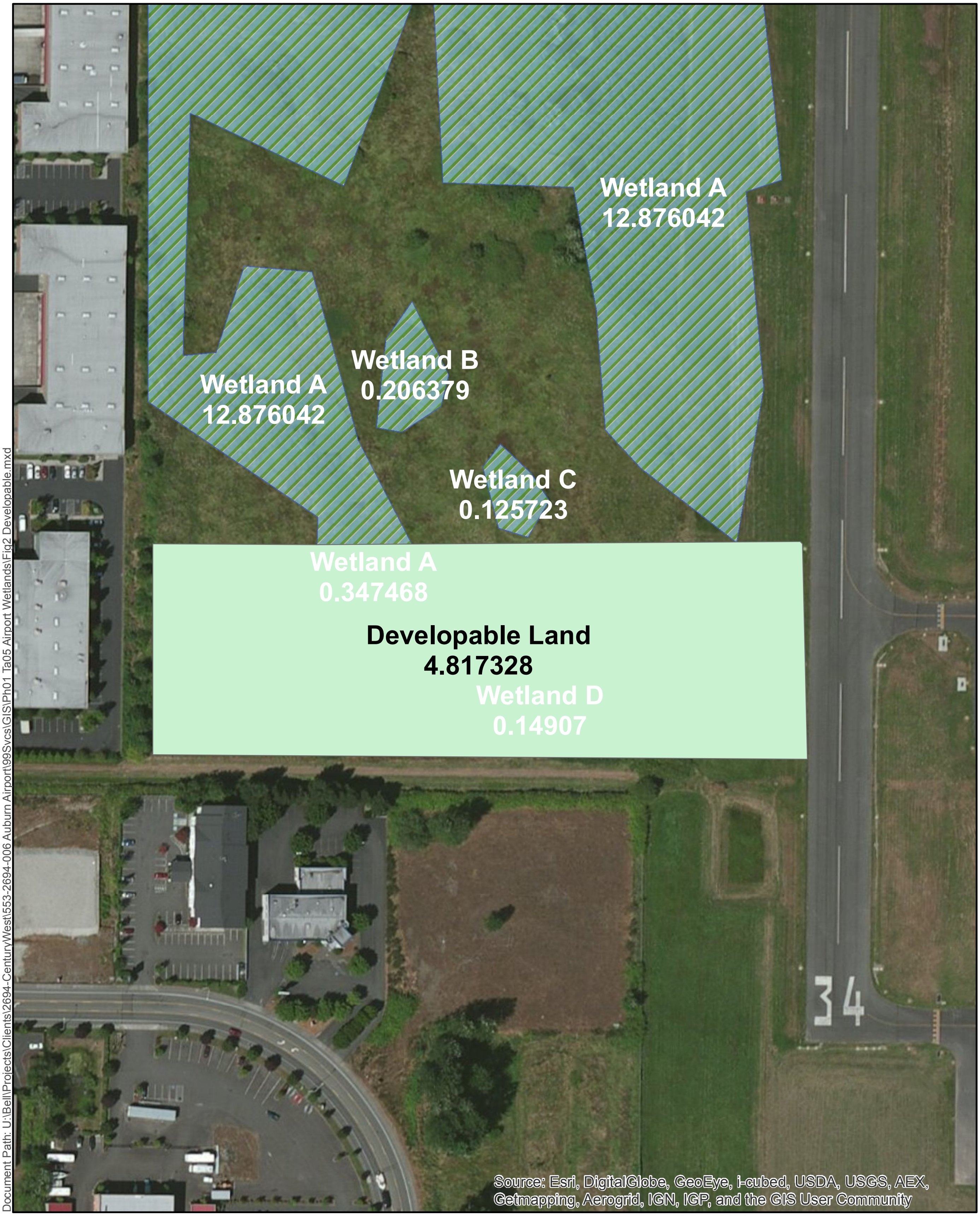
N

0 200

Feet

Figure 1
Auburn Airport
Developable Area

Auburn Airport Master Plan



Document Path: U:\Bell\Projects\Clients\2694-CenturyWest\553-2694-006 Auburn Airport\99Svcs\GIS\Ph01 Ta05 Airport Wetlands\Fig2 Developable.mxd

Parametrix

Source: (Parametrix GPS 2013)

N

0 200

Feet

Developable Land

Estimated Wetland

Figure 2
Auburn Airport
Developable Land

Auburn Airport Master Plan

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

411 108th AVENUE NE, SUITE 1800
BELLEVUE, WA 98004-5571
T. 425.458.6200 F. 425.458.6363
www.parametrix.com

TECHNICAL MEMORANDUM

Date:	April 9, 2013
To:	Matt Rogers
From:	Matthew Maynard
Subject:	Estimated Wetland Boundary Verification
cc:	Gary Maynard
Project Number:	553-2694-006 (01/05)
Project Name:	Auburn Airport Master Plan

The purpose of this technical memorandum is to provide the results of a reconnaissance level verification of a wetland delineation performed by ESA Adolfson in January of 2007 and to provide some potential mitigation opportunities should wetlands on the study area be impacted by future development. The verification was performed on an undeveloped area (study area), immediately west of the Auburn Airport runway. The study area is an approximately 27-acre portion of King County Parcel Number 0000800009 (Auburn Airport), owned by the City of Auburn.

At the request of Century West, Parametrix performed a reconnaissance level field investigation to verify the 2007 wetland delineation and determine if site conditions have changed. The results of the Auburn Airport Property Wetland Report (ESA Adolfson 2007) indicated the presence of four wetlands (Wetlands A through D) within the study area. The wetlands included one large shallow depressional wetland with multiple vegetation communities (Wetland A), including a forested community, and three shallow depressional wetlands primarily dominated by shrubs (Wetlands B, C, and D) (see Attachment A).

METHODS

Parametrix performed the reconnaissance level verification of the 2007 wetland delineation on April 1, 2013. The wetland verification was generally performed in accordance with the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers 2010). Wetlands were classified according to the U.S. Fish & Wildlife Service (Cowardin et al. 1979) and hydrogeomorphic (Brinson 1993) classification systems. Because this was a reconnaissance-level field investigation, data were collected at informal sample plots to distinguish wetland areas from non-wetland areas and wetland boundaries were approximated. The approximated wetland boundaries were surveyed with a hand-held GPS unit (Trimble Geo XH 6000 Series) (not flagged).

The 2007 wetland delineation was not surveyed, but a hand sketch was provided in the Wetland Report (Attachment A). This sketch map was used to visually compare the 2007 results to the 2013 verification map in order to determine if changes have occurred to the wetland boundaries.

RESULTS

Generally, current site conditions and wetland boundaries appear to be similar to those documented for the 2007 wetland delineation. Four wetlands (Wetlands A-D) were observed on the site. The boundary of Wetland A appears to have changed slightly since the previous delineation, primarily in the southeast portion of the wetland, which appears to now extend further to the south, and in the center of the wetland which now has an upland lobe extending to the north. Wetland D, previously noted as a palustrine emergent (PEM) wetland, now appears to be either dominated by shrubs, or no longer appears to meet wetland criteria and a new palustrine scrub-shrub (PSS) wetland, consistent with the conditions of Wetlands B and C, is in the same vicinity.

Wetland A is a depressional, palustrine forested (PFO), palustrine scrub-shrub (PSS), and PEM wetland that covers nearly half of the study area. Wetland A is dominated by black cottonwoods (*Populus balsamifera*), reed canarygrass (*Phalaris arundinacea*), red-osier dogwood (*Cornus sericea*), and Douglas' meadowsweet (*Spiraea douglasii*). It encompasses approximately 13 acres, primarily throughout the northern half of the study area (Figure 1).

Wetland B is a depressional, PSS and PEM wetland located near the center of the study area (Figure 1). It is dominated by Douglas' meadowsweet and reed canarygrass and encompasses approximately 0.21 acre.

Wetland C is a depressional, PSS and PEM wetland located in the southeastern quadrant of the study area (Figure 1). It is dominated by red-osier and yellow-twig dogwood and reed canarygrass. It encompasses approximately 0.12 acre.

Wetland D is a depressional, PSS and PEM wetland located near the southern boundary of the study area (Figure 1). It is dominated by yellow-twig dogwood and Douglas' meadowsweet and encompasses approximately 0.15 acre.

A stormwater pond is present near the northern study area boundary. As discussed in Attachment A, it was not included as part of the 2007 delineation per Auburn Municipal Code 16.10.020, but further information may be needed to determine if the pond would be regulated by the Washington Department of Ecology or the United State Corps of Engineers.

POTENTIAL MITIGATION OPPORTUNITIES

The first potential mitigation opportunity is associated with land located to the west of the study area. Based on aerial imagery, two parcels west of B Street and south of the Emerald Downs race track appear to potentially contain wetlands and may be dominated by invasive emergent vegetation. Further investigation would be required to determine if the property owner would be open to a land purchase agreement and to determine if the area has already been used as compensatory mitigation for past development. It would also need to be reviewed to see if sufficient land would be available to compensate for any proposed impacts to wetlands and their buffers on the study area.

Another option that would likely be available to the City of Auburn is to purchase mitigation credits from King County to fully satisfy compensatory mitigation obligations. King County has an in-lieu fee mitigation program that could be used to compensate for any unavoidable impacts to wetlands on the study area. Typically, an agreement between the County and any interested City would need to be reached to utilize the program outside of un-incorporated King County (an incorporated city).

Document Path: U:\Bell\Projects\Clients\2694-CenturyWest\553-2694-006 Auburn Airport\99Svcs\GIS\Ph01 Ta05 Airport Wetlands\Fig1_Estimated Wetlands.mxd

Parametrix

Source: (Parametrix GPS 2013)

N

0 200

Feet

Estimated Wetland

Study Area

Figure 1
Auburn Airport
Estimated Wetland Boundaries

Auburn Airport Master Plan

REFERENCES

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Wetlands Research Program Technical Report WRP-DE-4. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Corps (U.S. Army Corps of Engineers). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. U.S. Army Corps of Engineers Engineer Research and Development Center, Vicksburg, Mississippi.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Government Printing Office, Washington, D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1, Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi.

ESA Adolfson. 2007. Auburn Airport Property Wetland Report. Seattle, Washington.

Appendix F

Noise Complaint

Is there a legal minimum altitude that airplanes can fly over residential areas?

Federal Aviation Regulations specify a minimum altitude of 1,000 feet over congested areas and 500 feet over non-congested areas. The exception to this rule are helicopters and aircraft that are in the process of taking off or landing.

What can the Airport Authority do to keep airplanes from flying over my neighborhood?

In an odd "Catch 22,", the Airport Authority is responsible for airport noise but has absolutely no control over how and where the aircraft fly. Once the wheels of the aircraft leave the pavement, the aircraft is under the control of the Federal Aviation Administration.

Federal Aviation Administration Flight Standards District Office
425-227-1813
(weekdays only-leave message evenings/weekends)

Why is there airplane traffic during the middle of the night?

Auburn Municipal Airport is open 24 hours a day. A large portion of our overnight flights are also air-ambulance flights transporting patients, blood, or organs to points throughout the state and country. Additionally, law enforcement and news media also use the airport regularly at night.

Auburn Airborne & Noise Complaint Form

Please use this from regarding complaints of aircraft noise in and around the Auburn area and airport.

What type of aircraft was causing the problem?

- [ ] Helicopter
- [ ] Single Engine Airplane
- [ ] Jet Aircraft

Twin Engine Airplane

Military

Police/Rescue

Unknown

Please give the exact time of day and date.

What was the aircraft doing at the time of the incident?

Flying low

Remaining in local area, circling

Both

Has this happen before?

Yes

No

Please give an address of the
incident and direction of flight.

Color of aircraft and registration number if able,
please be accurate as possible.

Is this the first complaint you have made regarding aircraft noise?

Yes

No

ny other information that you feel would benefit airport management in researching this complaint.

ould we have further questions regarding this incident please leave your name and email address?

Name:

E-mail Address

hank you for your time. Airport management will use this information to help inform both based and
rrounding pilots to have a fly friendly attitude while flying in the area. If we suspect a specific FAA violation
happened we will forward this form to the local FAA office, which may or may not result in an investigation.

Submit Reset

Appendix G

```
INM 7.0d SCENARIO RUN INPUT REPORT  16-Dec-13 14:04

STUDY: C:\PROGRAM FILES (X86)\INM7.0D\AUBURN 2012\
  Created     : 18-Nov-13 08:47
  Units       : English
  Airport     : S50
  Description :
    Your description

SCENARIO: CURRENT
  Created      : 10-Dec-13 14:20
  Description  :
  Last Run     : 11-Dec-13 09:02
  Run Duration :  000:00:06

STUDY AIRPORT
  Latitude    : 47.327684 deg
  Longitude   : -122.226654 deg
  Elevation   : 63.0 ft


CASES RUN:

CASENAME: EXISTING
  Temperature : 58.8 F
  Pressure    : 29.92 in-Hg
  AverageWind : 8.0 kt
  ChangeNPD   : No

STUDY RUNWAYS
  16
    Latitude  : 47.332340 deg
    Longitude : -122.226600 deg
    Xcoord    : 0.0022 nmi
    Ycoord    : 0.2795 nmi
    Elevation : 57.0 ft
    OtherEnd  : 34
    Length    : 3399 ft
    Gradient  : 0.18 %
    TkoThresh : 0 ft
    AppThresh : 0 ft

CASENAME: EXISTING
    RwyWind   : 8.0 kt
  34
    Latitude  : 47.323020 deg
    Longitude : -122.226610 deg
    Xcoord    : 0.0018 nmi
    Ycoord    : -0.2800 nmi
    Elevation : 63.0 ft
    OtherEnd  : 16
    Length    : 3399 ft
    Gradient  : -0.18 %
    TkoThresh : 0 ft
    AppThresh : 0 ft

CASENAME: EXISTING
    RwyWind   : 8.0 kt

CASENAME: EXISTING
    RwyWind   : 8.0 kt

STUDY HELIPADS
  HELI
    Latitude  : 47.324199 deg
    Longitude : -122.227413 deg
    Xcoord    : -0.0310 nmi
    Ycoord    : -0.2092 nmi

---------------------------------------------------------------------

STUDY TRACKS
  RwyId-OpType-TrkId
   Sub  PctSub   TrkType   Delta(ft)
  16-APP-23
    0   100.00   Vectors        0.0
  16-APP-25
    0   100.00   Vectors        0.0
  16-DEP-4
    0   100.00   Vectors        0.0
  16-DEP-6
```

```
   0   100.00   Vectors        0.0
  16-TGO-51
   0   100.00   Vectors        0.0
  34-APP-20
   0   100.00   Vectors        0.0
  34-APP-22
   0   100.00   Vectors        0.0
  34-DEP-1
   0   100.00   Vectors        0.0
  34-DEP-3
   0   100.00   Vectors        0.0
  34-TGO-50
   0   100.00   Vectors        0.0
  HELI-APP-550
   0   100.00   Vectors      180.0
  HELI-APP-551
   0   100.00   Vectors        0.0
  HELI-APP-552
   0   100.00   Vectors      180.0
  HELI-DEP-501
   0   100.00   Vectors        0.0
  HELI-DEP-502
   0   100.00   Vectors      180.0
  HELI-DEP-503
   0   100.00   Vectors        0.0
  HELI-DEP-504
   0   100.00   Vectors      180.0

STUDY TRACK DETAIL
  RwyId-OpType-TrkId-SubTrk
     #  SegType      Dist/Angle     Radius(nmi)
  16-APP-23-0
     1  Straight       0.2000 nmi
     2  Left-Turn      60.0000 deg     0.1000
     3  Straight       1.3317 nmi
     4  Right-Turn      90.0000 deg     0.1000
     5  Straight       0.5571 nmi
     6  Right-Turn      90.0000 deg     0.1000
     7  Straight       1.0519 nmi
  16-DEP-4-0
     1  Straight       1.2823 nmi
     2  Right-Turn      90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn      90.0000 deg     0.1000
     5  Straight       1.0025 nmi
     6  Left-Turn      60.0000 deg     0.1000
     7  Straight       0.2000 nmi
  16-DEP-6-0
     1  Straight       1.2823 nmi
     2  Right-Turn      20.0000 deg     0.1000
     3  Straight       1.0000 nmi
  16-TGO-51-0
     1  Straight       1.2824 nmi
     2  Right-Turn      90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn      90.0000 deg     0.1000
     5  Straight       2.3342 nmi
     6  Right-Turn      90.0000 deg     0.1000
     7  Straight       0.5571 nmi
     8  Right-Turn      90.0000 deg     0.1000
     9  Straight       1.0519 nmi
  34-APP-20-0
     1  Straight       0.2000 nmi
     2  Right-Turn      60.0000 deg     0.1000
     3  Straight       1.0025 nmi
     4  Left-Turn      90.0000 deg     0.1000
     5  Straight       0.5571 nmi
     6  Left-Turn      90.0000 deg     0.1000
     7  Straight       0.7227 nmi
  34-DEP-1-0
     1  Straight       1.6114 nmi
     2  Left-Turn      90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Left-Turn      90.0000 deg     0.1000
     5  Straight       1.3316 nmi
     6  Right-Turn      60.0000 deg     0.1000
     7  Straight       0.2000 nmi
  34-DEP-3-0
     1  Straight       3.0000 nmi
  34-TGO-50-0
     1  Straight       1.6114 nmi
     2  Left-Turn      90.0000 deg     0.1000
```

3	Straight	0.5571 nmi	
4	Left-Turn	90.0000 deg	0.1000
5	Straight	2.3342 nmi	
6	Left-Turn	90.0000 deg	0.1000
7	Straight	0.5571 nmi	
8	Left-Turn	90.0000 deg	0.1000
9	Straight	0.7227 nmi	
HELI-APP-550-0			
1	Straight	0.2000 nmi	
2	Left-Turn	60.0000 deg	0.1000
3	Straight	0.6628 nmi	
4	Right-Turn	90.0000 deg	0.1000
5	Straight	0.2766 nmi	
6	Right-Turn	90.0000 deg	0.1000
7	Straight	0.8665 nmi	
HELI-APP-551-0			
1	Straight	0.2000 nmi	
2	Right-Turn	60.0000 deg	0.1000
3	Straight	0.3440 nmi	
4	Left-Turn	90.0000 deg	0.1000
5	Straight	0.2766 nmi	
6	Left-Turn	90.0000 deg	0.1000
7	Straight	0.1354 nmi	
HELI-APP-552-0			
1	Straight	2.0000 nmi	
HELI-DEP-501-0			
1	Straight	0.8647 nmi	
2	Left-Turn	90.0000 deg	0.1000
3	Straight	0.2766 nmi	
4	Left-Turn	90.0000 deg	0.1000
5	Straight	0.6628 nmi	
6	Right-Turn	60.0000 deg	0.1000
7	Straight	0.2000 nmi	
HELI-DEP-502-0			
1	Straight	0.1354 nmi	
2	Right-Turn	90.0000 deg	0.1000
3	Straight	0.2766 nmi	
4	Right-Turn	90.0000 deg	0.1000
5	Straight	0.3440 nmi	
6	Left-Turn	60.0000 deg	0.1000
7	Straight	0.2000 nmi	
HELI-DEP-503-0			
1	Straight	2.0000 nmi	
HELI-DEP-504-0			
1	Straight	0.1354 nmi	
2	Right-Turn	20.0000 deg	0.1000
3	Straight	1.0000 nmi	

AIRCRAFT GROUP ASSIGNMENTS

STUDY AIRPLANES

BEC58P	Standard data
CNA208	Standard data
CNA441	Standard data
CNA510	Standard data
GASEPF	Standard data
GASEPV	Standard data

STUDY SUBSTITUTION AIRPLANES

USER-DEFINED NOISE CURVES

USER-DEFINED METRICS

USER-DEFINED PROFILE IDENTIFIERS

USER-DEFINED PROCEDURAL PROFILES

USER-DEFINED FIXED-POINT PROFILES

USER-DEFINED FLAP COEFFICIENTS

USER-DEFINED JET THRUST COEFFICIENTS

USER-DEFINED PROP THRUST COEFFICIENTS

USER-DEFINED GENERAL THRUST COEFFICIENTS

STUDY MILITARY AIRPLANES

USER-DEFINED MILITARY NOISE CURVES

USER-DEFINED MILITARY PROFILE IDENTIFIERS

USER-DEFINED MILITARY FIXED-POINT PROFILES

STUDY HELICOPTERS
R22 Standard data
S70 Standard data

USER-DEFINED HELICOPTER PROFILE IDENTIFIERS

USER-DEFINED HELICOPTER PROCEDURAL PROFILES

USER-DEFINED HELICOPTER NOISE CURVES

USER-DEFINED HELICOPTER DIRECTIVITY

CASE FLIGHT OPERATIONS - [EXISTING]

Acft	Op	Profile	Stg	Rwy	Track	Sub	Group	Day	Evening	Night
BEC58P	APP	STANDARD	1	16	23	0	---	0.5314	0.0000	0.0221
BEC58P	APP	STANDARD	1	34	20	0	---	0.3545	0.0000	0.0148
BEC58P	DEP	STANDARD	1	16	4	0	---	0.2657	0.0000	0.0111
BEC58P	DEP	STANDARD	1	16	6	0	---	0.2657	0.0000	0.0111
BEC58P	DEP	STANDARD	1	34	1	0	---	0.1773	0.0000	0.0074
BEC58P	DEP	STANDARD	1	34	3	0	---	0.1773	0.0000	0.0074
BEC58P	TGO	STANDARD	1	16	51	0	---	0.2656	0.0000	0.0111
BEC58P	TGO	STANDARD	1	34	50	0	---	0.1772	0.0000	0.0074
CNA208	APP	STANDARD	1	16	23	0	---	0.0005	0.0000	0.0000
CNA208	APP	STANDARD	1	34	20	0	---	0.0003	0.0000	0.0000
CNA208	DEP	STANDARD	1	16	4	0	---	0.0002	0.0000	0.0000
CNA208	DEP	STANDARD	1	16	6	0	---	0.0002	0.0000	0.0000
CNA208	DEP	STANDARD	1	34	1	0	---	0.0002	0.0000	0.0000
CNA208	DEP	STANDARD	1	34	3	0	---	0.0002	0.0000	0.0000
CNA441	APP	STANDARD	1	16	23	0	---	0.0008	0.0000	0.0000
CNA441	APP	STANDARD	1	34	20	0	---	0.0005	0.0000	0.0000
CNA441	DEP	STANDARD	1	16	4	0	---	0.0004	0.0000	0.0000
CNA441	DEP	STANDARD	1	16	6	0	---	0.0004	0.0000	0.0000
CNA441	DEP	STANDARD	1	34	1	0	---	0.0003	0.0000	0.0000
CNA441	DEP	STANDARD	1	34	3	0	---	0.0003	0.0000	0.0000
CNA510	APP	STANDARD	1	16	23	0	---	0.0012	0.0000	0.0001
CNA510	APP	STANDARD	1	34	20	0	---	0.0008	0.0000	0.0000
CNA510	DEP	STANDARD	1	16	4	0	---	0.0006	0.0000	0.0000
CNA510	DEP	STANDARD	1	16	6	0	---	0.0006	0.0000	0.0000
CNA510	DEP	STANDARD	1	34	1	0	---	0.0004	0.0000	0.0000
CNA510	DEP	STANDARD	1	34	3	0	---	0.0004	0.0000	0.0000
GASEPF	APP	STANDARD	1	16	23	0	---	34.9436	0.0000	1.4560
GASEPF	APP	STANDARD	1	34	20	0	---	23.3133	0.0000	0.9714
GASEPF	DEP	STANDARD	1	16	4	0	---	17.4718	0.0000	0.7280
GASEPF	DEP	STANDARD	1	16	6	0	---	17.4718	0.0000	0.7280
GASEPF	DEP	STANDARD	1	34	1	0	---	11.6566	0.0000	0.4857
GASEPF	DEP	STANDARD	1	34	3	0	---	11.6566	0.0000	0.4857
GASEPF	TGO	STANDARD	1	16	51	0	---	17.4631	0.0000	0.7276
GASEPF	TGO	STANDARD	1	34	50	0	---	11.6508	0.0000	0.4855
GASEPV	APP	STANDARD	1	16	23	0	---	23.2957	0.0000	0.9707
GASEPV	APP	STANDARD	1	34	20	0	---	15.5422	0.0000	0.6476
GASEPV	DEP	STANDARD	1	16	4	0	---	11.6479	0.0000	0.4853
GASEPV	DEP	STANDARD	1	16	6	0	---	11.6479	0.0000	0.4853
GASEPV	DEP	STANDARD	1	34	1	0	---	7.7711	0.0000	0.3238
GASEPV	DEP	STANDARD	1	34	3	0	---	7.7711	0.0000	0.3238
GASEPV	TGO	STANDARD	1	16	51	0	---	11.6420	0.0000	0.4851
GASEPV	TGO	STANDARD	1	34	50	0	---	7.7672	0.0000	0.3236
R22	APP	STANDARD	1	HELI	550	0	---	1.6360	0.0000	0.0485
R22	APP	STANDARD	1	HELI	551	0	---	1.5515	0.0000	0.0646
R22	APP	STANDARD	1	HELI	552	0	---	1.1636	0.0000	0.0485
R22	DEP	STANDARD	1	HELI	501	0	---	1.1636	0.0000	0.0485
R22	DEP	STANDARD	1	HELI	502	0	---	0.7757	0.0000	0.0323
R22	DEP	STANDARD	1	HELI	503	0	---	1.1636	0.0000	0.0485
R22	DEP	STANDARD	1	HELI	504	0	---	0.7757	0.0000	0.0323
S70	APP	STANDARD	1	HELI	550	0	---	0.0197	0.0000	0.0008
S70	APP	STANDARD	1	HELI	551	0	---	0.0263	0.0000	0.0011
S70	APP	STANDARD	1	HELI	552	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	501	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	502	0	---	0.0131	0.0000	0.0005
S70	DEP	STANDARD	1	HELI	503	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	504	0	---	0.0131	0.0000	0.0005

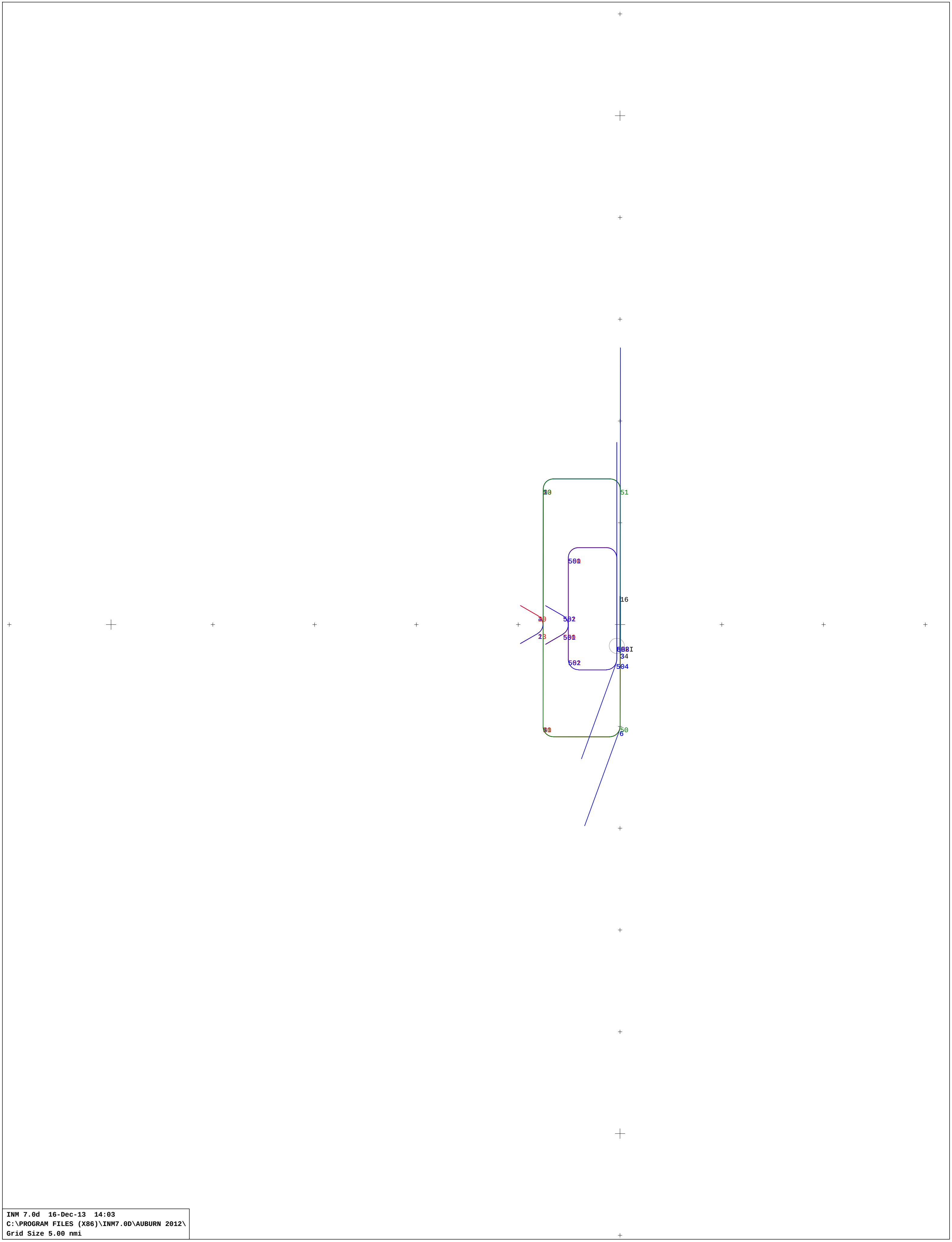
CASE RUNUP OPERATIONS - [EXISTING]

Acft	RunupId	X(nmi)	Y(nmi)	Head	Thrust	Dur(sec)	Day	Evening	Night
BEC58P	16	47.3319	-122.2259	0.0	80.0 %	30.0	0.5314	0.0000	0.0221
BEC58P	34	47.3228	-122.2260	0.0	80.0 %	30.0	0.3545	0.0000	0.0148
GASEPF	16	47.3319	-122.2259	0.0	80.0 %	30.0	34.9436	0.0000	1.4560
GASEPF	34	47.3228	-122.2260	0.0	80.0 %	30.0	23.3133	0.0000	0.9714
GASEPV	16	47.3319	-122.2259	0.0	80.0 %	30.0	23.2957	0.0000	0.9707
GASEPV	34	47.3228	-122.2260	0.0	80.0 %	30.0	15.5422	0.0000	0.6476

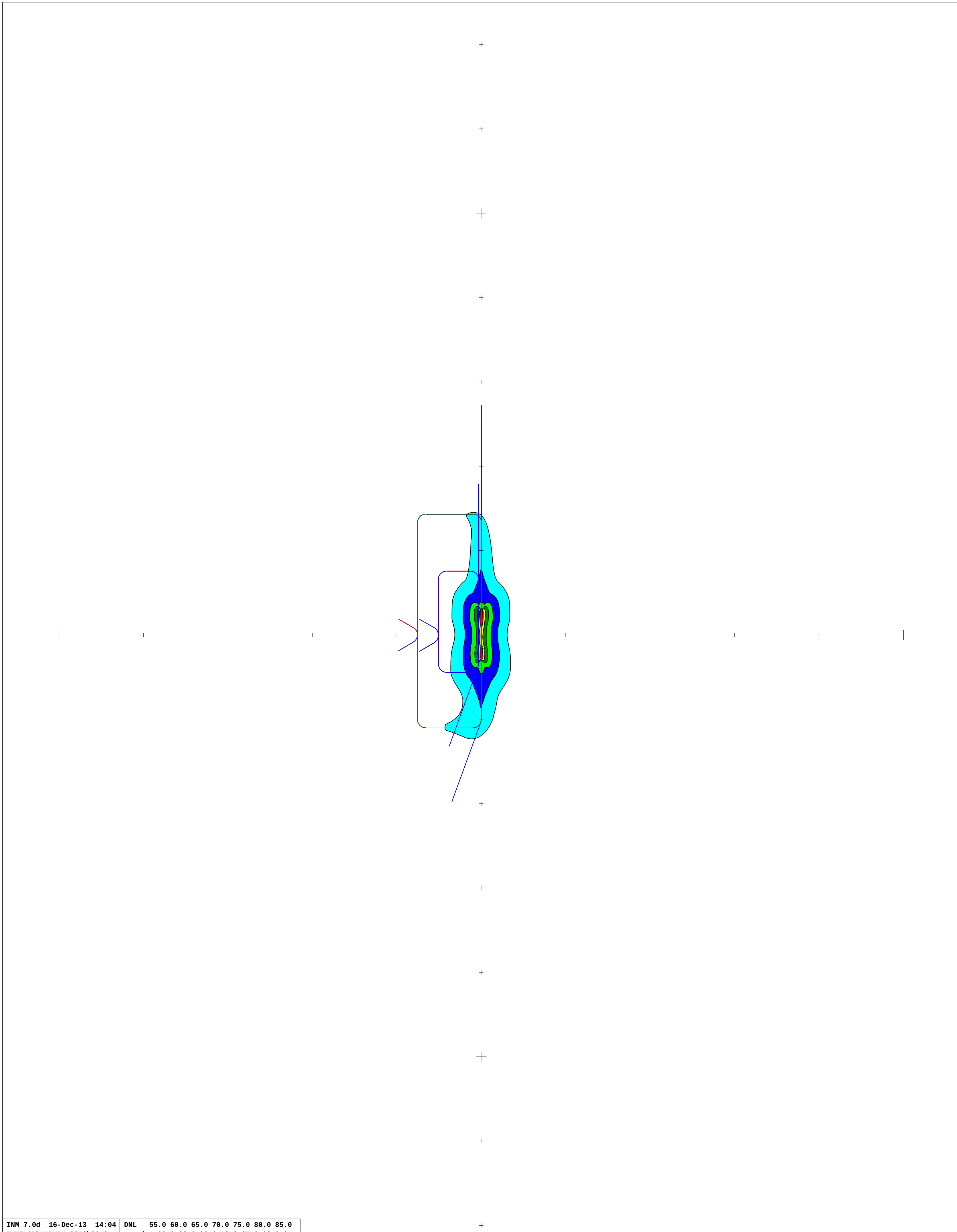
SCENARIO RUN OPTIONS
Run Type : Single-Metric
NoiseMetric : DNL
Do Terrain : No Terrain
Do Contour : Recursive Grid
Refinement : 11
Tolerance : 0.50
Low Cutoff : 55.0
High Cutoff : 85.0
Ground Type : All-Soft-Ground
Do Population : No
Do Locations : No
Do Standard : No
Do Detailed : No
Compute System Metrics:
DNL : No
CNEL : No
LAEQ : No
LAEQD : No
LAEQN : No
SEL : No
LAMAX : No
TALA : No
NEF : No
WECPNL : No
EPNL : No
PNLTM : No
TAPNL : No
CEXP : No
LCMAX : No
TALC : No

SCENARIO GRID DEFINITIONS

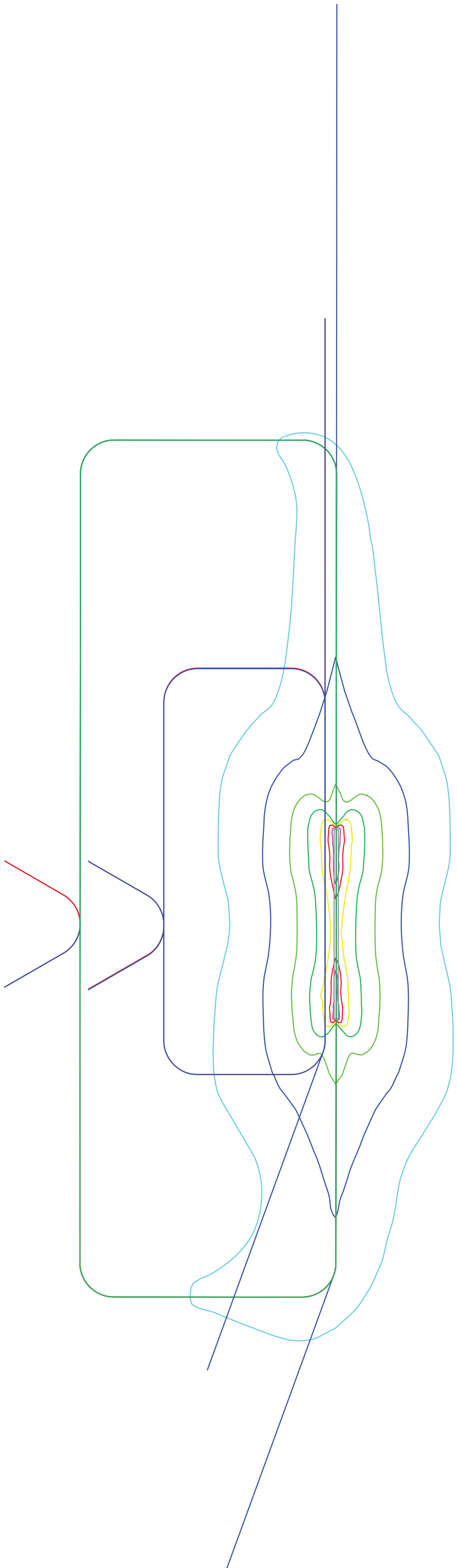
Name	Type	X(nmi)	Y(nmi)	Ang(deg)	DisI(nmi)	DisJ(nmi)	NI	NJ	Thrsh	dAmb	(hr)
CONTOUR	Contour	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
DETAILED	Detailed	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
STANDARD	Standard	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00



INM 7.0d 16-Dec-13 14:03
C:\PROGRAM FILES (X86)\INM7.0D\AUBURN 2012\
Grid Size 5.00 nmi



INM 7.0d 16-Dec-13 14:04	DNL	55.0	60.0	65.0	70.0	75.0	80.0	85.0
INM7.0D\AUBURN 2012\2012	sq.mi	1.69	0.62	0.26	0.12	0.05	0.02	0.01
Grid Size 5.00 nmi	color							



INM 7.0d SCENARIO RUN INPUT REPORT 16-Dec-13 13:56

STUDY: C:\PROGRAM FILES (X86)\INM7.0D\AUBURN 2017\
Created : 18-Nov-13 08:47
Units : English
Airport : S50
Description :
Your description

SCENARIO: 5 YEAR
Created : 05-Dec-13 12:49
Description :
Last Run : 16-Dec-13 08:24
Run Duration : 000:00:07

STUDY AIRPORT
Latitude : 47.327999 deg
Longitude : -122.226658 deg
Elevation : 63.0 ft

CASES RUN:

CASENAME: FIVE YEAR
Temperature : 58.8 F
Pressure : 29.92 in-Hg
AverageWind : 8.0 kt
ChangeNPD : No

STUDY RUNWAYS
16
Latitude : 47.333644 deg
Longitude : -122.226717 deg
Xcoord : -0.0024 nmi
Ycoord : 0.3389 nmi
Elevation : 57.0 ft
OtherEnd : 34
Length : 4117 ft
Gradient : 0.15 %
TkoThresh : 0 ft
AppThresh : 475 ft

CASENAME: FIVE YEAR
RwyWind : 8.0 kt
34
Latitude : 47.322355 deg
Longitude : -122.226599 deg
Xcoord : 0.0024 nmi
Ycoord : -0.3388 nmi
Elevation : 63.0 ft
OtherEnd : 16
Length : 4117 ft
Gradient : -0.15 %
TkoThresh : 0 ft
AppThresh : 243 ft

CASENAME: FIVE YEAR
RwyWind : 8.0 kt

CASENAME: FIVE YEAR
RwyWind : 8.0 kt

STUDY HELIPADS
HELI
Latitude : 47.324514 deg
Longitude : -122.227417 deg
Xcoord : -0.0310 nmi
Ycoord : -0.2092 nmi

STUDY TRACKS
RwyId-OpType-TrkId
Sub PctSub TrkType Delta(ft)
16-APP-23
0 100.00 Vectors 0.0
16-APP-25
0 100.00 Vectors 0.0
16-DEP-4
0 100.00 Vectors 0.0
16-DEP-6

```
   0   100.00   Vectors        0.0
  16-TGO-51
   0   100.00   Vectors        0.0
  34-APP-20
   0   100.00   Vectors        0.0
  34-APP-22
   0   100.00   Vectors        0.0
  34-DEP-1
   0   100.00   Vectors        0.0
  34-DEP-3
   0   100.00   Vectors        0.0
  34-TGO-50
   0   100.00   Vectors        0.0
  HELI-APP-550
   0   100.00   Vectors      180.0
  HELI-APP-551
   0   100.00   Vectors        0.0
  HELI-APP-552
   0   100.00   Vectors      180.0
  HELI-DEP-501
   0   100.00   Vectors        0.0
  HELI-DEP-502
   0   100.00   Vectors      180.0
  HELI-DEP-503
   0   100.00   Vectors        0.0
  HELI-DEP-504
   0   100.00   Vectors      180.0

STUDY TRACK DETAIL
  RwyId-OpType-TrkId-SubTrk
     #  SegType       Dist/Angle      Radius(nmi)
  16-APP-23-0
     1  Straight       0.2000 nmi
     2  Left-Turn      60.0000 deg     0.1000
     3  Straight       1.3127 nmi
     4  Right-Turn     90.0000 deg     0.1000
     5  Straight       0.5571 nmi
     6  Right-Turn     90.0000 deg     0.1000
     7  Straight       1.0519 nmi
  16-DEP-4-0
     1  Straight       1.3606 nmi
     2  Right-Turn     90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn     90.0000 deg     0.1000
     5  Straight       1.0218 nmi
     6  Left-Turn      60.0000 deg     0.1000
     7  Straight       0.2000 nmi
  16-DEP-6-0
     1  Straight       1.3606 nmi
     2  Right-Turn     20.0000 deg     0.1000
     3  Straight       1.0000 nmi
  16-TGO-51-0
     1  Straight       1.2824 nmi
     2  Right-Turn     90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn     90.0000 deg     0.1000
     5  Straight       2.3345 nmi
     6  Right-Turn     90.0000 deg     0.1000
     7  Straight       0.5571 nmi
     8  Right-Turn     90.0000 deg     0.1000
     9  Straight       1.0521 nmi
  34-APP-20-0
     1  Straight       0.2000 nmi
     2  Right-Turn     60.0000 deg     0.1000
     3  Straight       1.0218 nmi
     4  Left-Turn      90.0000 deg     0.1000
     5  Straight       0.5571 nmi
     6  Left-Turn      90.0000 deg     0.1000
     7  Straight       0.7229 nmi
  34-DEP-1-0
     1  Straight       1.6517 nmi
     2  Left-Turn      90.0000 deg     0.1000
     3  Straight       0.5571 nmi
     4  Left-Turn      90.0000 deg     0.1000
     5  Straight       1.3127 nmi
     6  Right-Turn     60.0000 deg     0.1000
     7  Straight       0.2000 nmi
  34-DEP-3-0
     1  Straight       3.0000 nmi
  34-TGO-50-0
     1  Straight       1.6117 nmi
     2  Left-Turn      90.0000 deg     0.1000
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```
    3  Straight       0.5571 nmi
    4  Left-Turn      90.0000 deg     0.1000
    5  Straight       2.3345 nmi
    6  Left-Turn      90.0000 deg     0.1000
    7  Straight       0.5571 nmi
    8  Left-Turn      90.0000 deg     0.1000
    9  Straight       0.7228 nmi
  HELI-APP-550-0
    1  Straight       0.2000 nmi
    2  Left-Turn      60.0000 deg     0.1000
    3  Straight       0.6252 nmi
    4  Right-Turn     90.0000 deg     0.1000
    5  Straight       0.2766 nmi
    6  Right-Turn     90.0000 deg     0.1000
    7  Straight       0.8480 nmi
  HELI-APP-551-0
    1  Straight       0.2000 nmi
    2  Right-Turn     60.0000 deg     0.1000
    3  Straight       0.3816 nmi
    4  Left-Turn      90.0000 deg     0.1000
    5  Straight       0.2766 nmi
    6  Left-Turn      90.0000 deg     0.1000
    7  Straight       0.1539 nmi
  HELI-APP-552-0
    1  Straight       2.0000 nmi
  HELI-DEP-501-0
    1  Straight       0.8480 nmi
    2  Left-Turn      90.0000 deg     0.1000
    3  Straight       0.2766 nmi
    4  Left-Turn      90.0000 deg     0.1000
    5  Straight       0.6252 nmi
    6  Right-Turn     60.0000 deg     0.1000
    7  Straight       0.2000 nmi
  HELI-DEP-502-0
    1  Straight       0.1539 nmi
    2  Right-Turn     90.0000 deg     0.1000
    3  Straight       0.2766 nmi
    4  Right-Turn     90.0000 deg     0.1000
    5  Straight       0.3816 nmi
    6  Left-Turn      60.0000 deg     0.1000
    7  Straight       0.2000 nmi
  HELI-DEP-503-0
    1  Straight       2.0000 nmi
  HELI-DEP-504-0
    1  Straight       0.1354 nmi
    2  Right-Turn     20.0000 deg     0.1000
    3  Straight       1.0000 nmi

AIRCRAFT GROUP ASSIGNMENTS

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STUDY AIRPLANES
  BEC58P      Standard data
  CNA208      Standard data
  CNA441      Standard data
  CNA510      Standard data
  GASEPF      Standard data
  GASEPV      Standard data

STUDY SUBSTITUTION AIRPLANES

USER-DEFINED NOISE CURVES

USER-DEFINED METRICS

USER-DEFINED PROFILE IDENTIFIERS

USER-DEFINED PROCEDURAL PROFILES

USER-DEFINED FIXED-POINT PROFILES

USER-DEFINED FLAP COEFFICIENTS

USER-DEFINED JET THRUST COEFFICIENTS

USER-DEFINED PROP THRUST COEFFICIENTS

USER-DEFINED GENERAL THRUST COEFFICIENTS

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STUDY MILITARY AIRPLANES

USER-DEFINED MILITARY NOISE CURVES

USER-DEFINED MILITARY PROFILE IDENTIFIERS

USER-DEFINED MILITARY FIXED-POINT PROFILES

STUDY HELICOPTERS

R22	Standard data
S70	Standard data

USER-DEFINED HELICOPTER PROFILE IDENTIFIERS

USER-DEFINED HELICOPTER PROCEDURAL PROFILES

USER-DEFINED HELICOPTER NOISE CURVES

USER-DEFINED HELICOPTER DIRECTIVITY

CASE FLIGHT OPERATIONS - [FIVE YEAR]

Acft	Op	Profile	Stg	Rwy	Track	Sub	Group	Day	Evening	Night
BEC58P	APP	STANDARD	1	16	23	0	---	0.6034	0.0000	0.0251
BEC58P	APP	STANDARD	1	34	20	0	---	0.4023	0.0000	0.0168
BEC58P	DEP	STANDARD	1	16	4	0	---	0.3017	0.0000	0.0126
BEC58P	DEP	STANDARD	1	16	6	0	---	0.3017	0.0000	0.0126
BEC58P	DEP	STANDARD	1	34	1	0	---	0.2011	0.0000	0.0084
BEC58P	DEP	STANDARD	1	34	3	0	---	0.2011	0.0000	0.0084
BEC58P	TGO	STANDARD	1	16	51	0	---	0.3020	0.0000	0.0126
BEC58P	TGO	STANDARD	1	34	50	0	---	0.2014	0.0000	0.0084
CNA208	APP	STANDARD	1	16	23	0	---	0.0223	0.0000	0.0009
CNA208	APP	STANDARD	1	34	20	0	---	0.0148	0.0000	0.0006
CNA208	DEP	STANDARD	1	16	4	0	---	0.0111	0.0000	0.0005
CNA208	DEP	STANDARD	1	16	6	0	---	0.0111	0.0000	0.0005
CNA208	DEP	STANDARD	1	34	1	0	---	0.0074	0.0000	0.0003
CNA208	DEP	STANDARD	1	34	3	0	---	0.0074	0.0000	0.0003
CNA441	APP	STANDARD	1	16	23	0	---	0.0414	0.0000	0.0017
CNA441	APP	STANDARD	1	34	20	0	---	0.0276	0.0000	0.0011
CNA441	DEP	STANDARD	1	16	4	0	---	0.0207	0.0000	0.0008
CNA441	DEP	STANDARD	1	16	6	0	---	0.0207	0.0000	0.0008
CNA441	DEP	STANDARD	1	34	1	0	---	0.0138	0.0000	0.0006
CNA441	DEP	STANDARD	1	34	3	0	---	0.0138	0.0000	0.0006
CNA510	APP	STANDARD	1	16	23	0	---	0.0012	0.0000	0.0001
CNA510	APP	STANDARD	1	34	20	0	---	0.0009	0.0000	0.0000
CNA510	DEP	STANDARD	1	16	4	0	---	0.0007	0.0000	0.0000
CNA510	DEP	STANDARD	1	16	6	0	---	0.0007	0.0000	0.0000
CNA510	DEP	STANDARD	1	34	1	0	---	0.0004	0.0000	0.0000
CNA510	DEP	STANDARD	1	34	3	0	---	0.0004	0.0000	0.0000
GASEPF	APP	STANDARD	1	16	23	0	---	36.5808	0.0000	1.5242
GASEPF	APP	STANDARD	1	34	20	0	---	24.3896	0.0000	1.0162
GASEPF	DEP	STANDARD	1	16	4	0	---	18.2904	0.0000	0.7621
GASEPF	DEP	STANDARD	1	16	6	0	---	18.2904	0.0000	0.7621
GASEPF	DEP	STANDARD	1	34	1	0	---	12.1948	0.0000	0.5081
GASEPF	DEP	STANDARD	1	34	3	0	---	12.1948	0.0000	0.5081
GASEPF	TGO	STANDARD	1	16	51	0	---	18.3103	0.0000	0.7629
GASEPF	TGO	STANDARD	1	34	50	0	---	12.2081	0.0000	0.5087
GASEPV	APP	STANDARD	1	16	23	0	---	24.4296	0.0000	1.0179
GASEPV	APP	STANDARD	1	34	20	0	---	16.2880	0.0000	0.6787
GASEPV	DEP	STANDARD	1	16	4	0	---	12.2148	0.0000	0.5090
GASEPV	DEP	STANDARD	1	16	6	0	---	12.2148	0.0000	0.5090
GASEPV	DEP	STANDARD	1	34	1	0	---	8.1440	0.0000	0.3393
GASEPV	DEP	STANDARD	1	34	3	0	---	8.1440	0.0000	0.3393
GASEPV	TGO	STANDARD	1	16	51	0	---	12.2281	0.0000	0.5095
GASEPV	TGO	STANDARD	1	34	50	0	---	8.1529	0.0000	0.3397
R22	APP	STANDARD	1	HELI	550	0	---	1.1929	0.0000	0.0497
R22	APP	STANDARD	1	HELI	551	0	---	1.5905	0.0000	0.0663
R22	APP	STANDARD	1	HELI	552	0	---	1.1929	0.0000	0.0497
R22	DEP	STANDARD	1	HELI	501	0	---	1.1929	0.0000	0.0497
R22	DEP	STANDARD	1	HELI	502	0	---	0.7953	0.0000	0.0331
R22	DEP	STANDARD	1	HELI	503	0	---	1.1929	0.0000	0.0497
R22	DEP	STANDARD	1	HELI	504	0	---	0.7953	0.0000	0.0331
S70	APP	STANDARD	1	HELI	550	0	---	0.0197	0.0000	0.0008
S70	APP	STANDARD	1	HELI	551	0	---	0.0263	0.0000	0.0011
S70	APP	STANDARD	1	HELI	552	0	---	1.1929	0.0000	0.0497
S70	DEP	STANDARD	1	HELI	501	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	502	0	---	0.0131	0.0000	0.0005
S70	DEP	STANDARD	1	HELI	503	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	504	0	---	0.0131	0.0000	0.0005

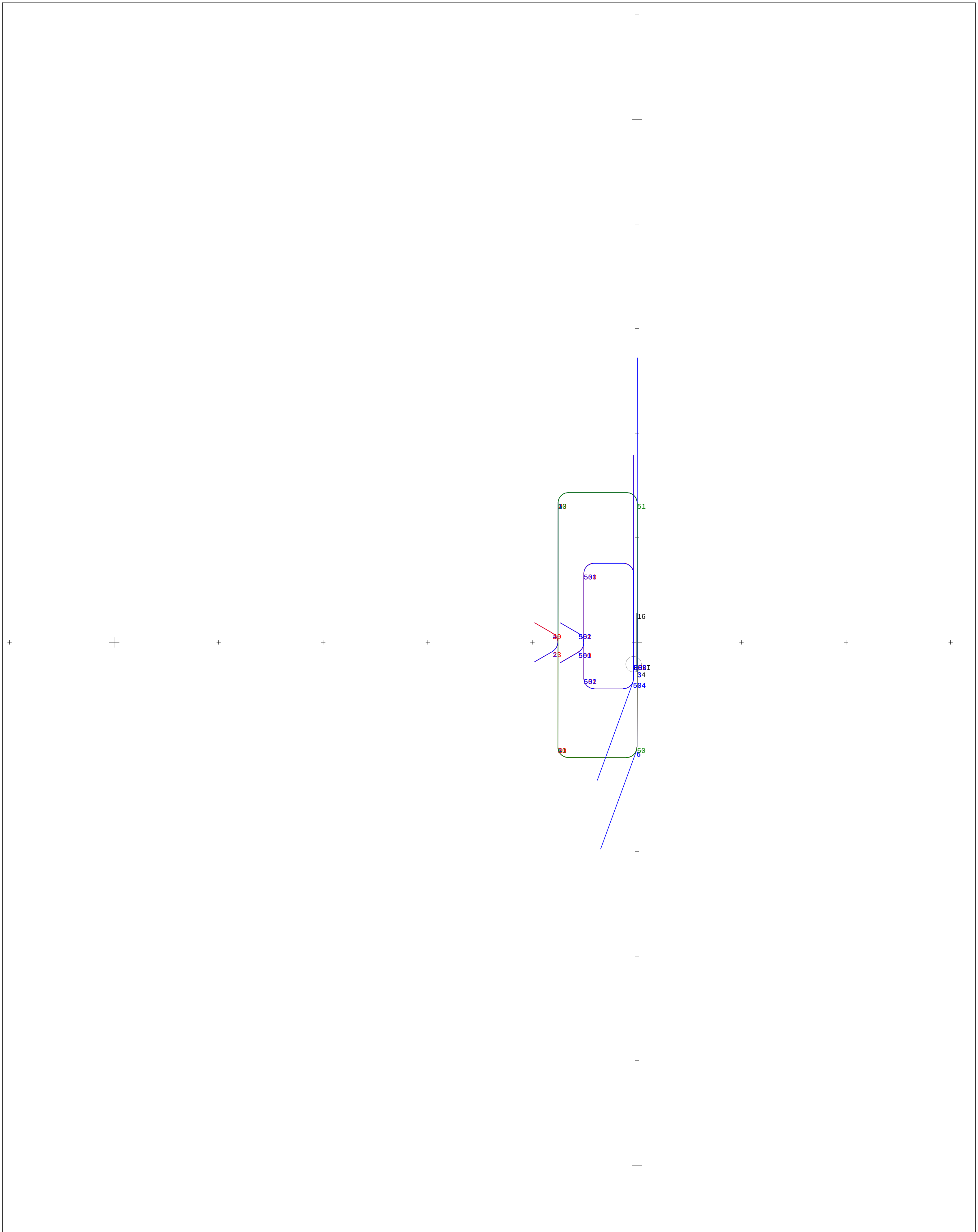
CASE RUNUP OPERATIONS - [FIVE YEAR]

Acft	RunupId	X(nmi)	Y(nmi)	Head	Thrust	Dur(sec)	Day	Evening	Night
BEC58P	16	47.3335	-122.2261	270.0	80.0 %	30.0	0.6034	0.0000	0.0251
BEC58P	34	47.3224	-122.2260	270.0	80.0 %	30.0	0.4023	0.0000	0.0168
GASEPF	16	47.3335	-122.2261	270.0	80.0 %	30.0	36.5808	0.0000	1.5242
GASEPF	34	47.3224	-122.2260	270.0	80.0 %	30.0	24.3896	0.0000	1.0162
GASEPV	16	47.3335	-122.2261	270.0	80.0 %	30.0	24.4296	0.0000	1.0179
GASEPV	34	47.3224	-122.2260	270.0	80.0 %	30.0	16.2880	0.0000	0.6787

SCENARIO RUN OPTIONS
Run Type : Single-Metric
NoiseMetric : DNL
Do Terrain : No Terrain
Do Contour : Recursive Grid
Refinement : 11
Tolerance : 0.50
Low Cutoff : 55.0
High Cutoff : 85.0
Ground Type : All-Soft-Ground
Do Population : No
Do Locations : No
Do Standard : No
Do Detailed : No
Compute System Metrics:
DNL : No
CNEL : No
LAEQ : No
LAEQD : No
LAEQN : No
SEL : No
LAMAX : No
TALA : No
NEF : No
WECPNL : No
EPNL : No
PNLTM : No
TAPNL : No
CEXP : No
LCMAX : No
TALC : No

SCENARIO GRID DEFINITIONS

Name	Type	X(nmi)	Y(nmi)	Ang(deg)	DisI(nmi)	DisJ(nmi)	NI	NJ	Thrsh	dAmb	(hr)
CONTOUR	Contour	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
DETAILED	Detailed	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
STANDARD	Standard	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00



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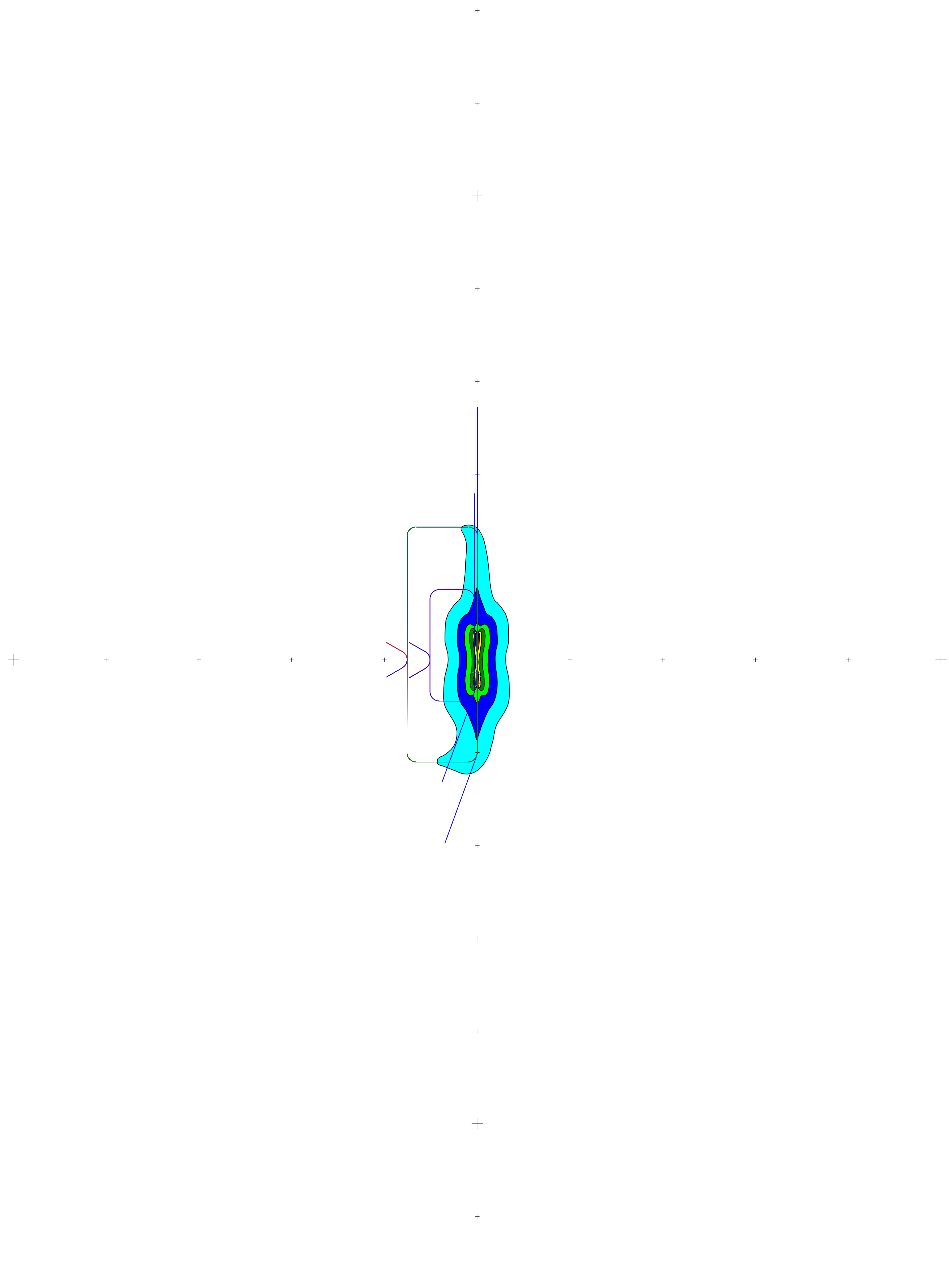
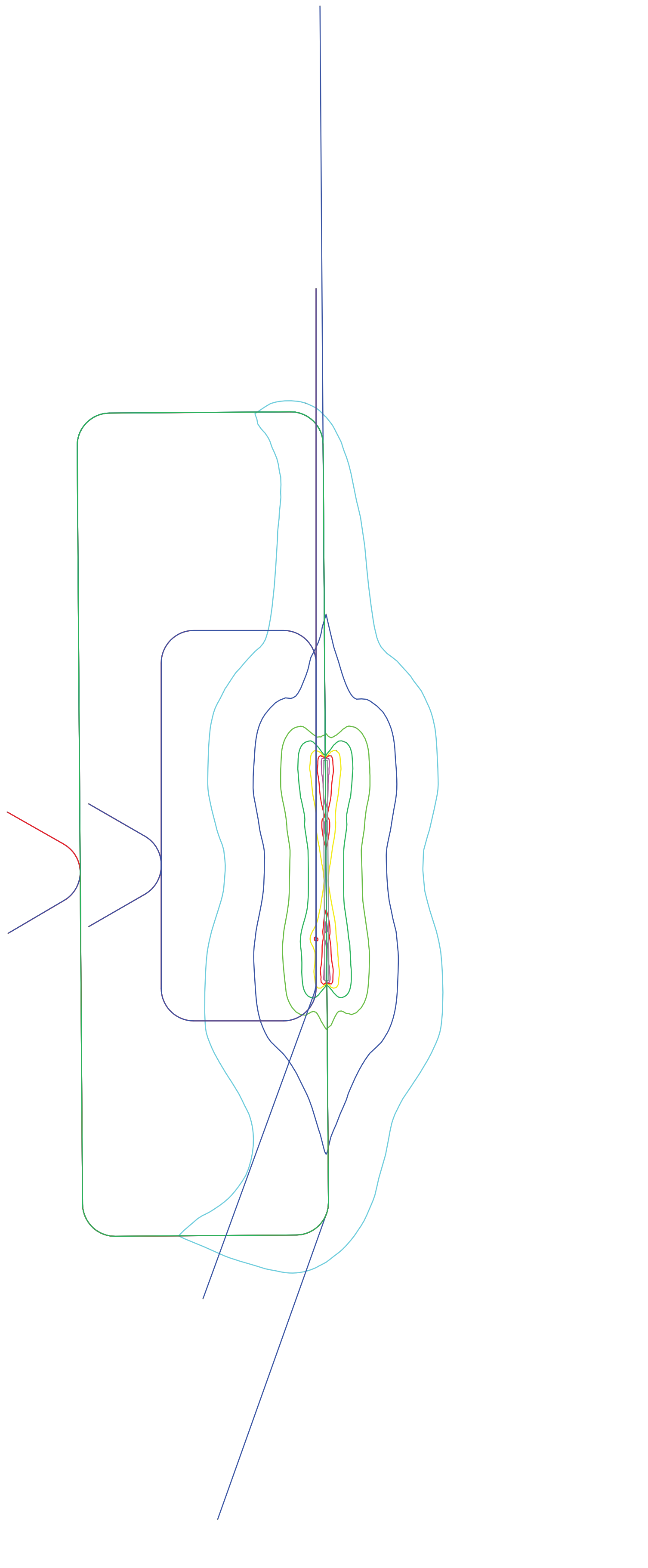
C:\PROGRAM FILES (X86)\INM7.0D\AUBURN 2012\
Grid Size 5.00 nmi



INM 7.0d 16-Dec-13 14:04	DNL	55.0	60.0	65.0	70.0	75.0	80.0	85.0
INM7.0D\AUBURN 2012\2012	sq.mi	1.69	0.62	0.26	0.12	0.05	0.02	0.01
Grid Size 5.00 nmi	color							



INM 7.0d SCENARIO RUN INPUT REPORT 16-Dec-13 13:46

STUDY: C:\PROGRAM FILES (X86)\INM7.0D\AUBURN 2032\
Created : 18-Nov-13 08:47
Units : English
Airport : S50
Description :
Your description

SCENARIO: 20 YEAR
Created : 10-Dec-13 10:17
Description :
Last Run : 16-Dec-13 12:35
Run Duration : 000:00:06

STUDY AIRPORT
Latitude : 47.327999 deg
Longitude : -122.226658 deg
Elevation : 63.0 ft

CASES RUN:

CASENAME: TWENTY YEAR
Temperature : 58.8 F
Pressure : 29.92 in-Hg
AverageWind : 8.0 kt
ChangeNPD : No

STUDY RUNWAYS
16
Latitude : 47.333644 deg
Longitude : -122.226717 deg
Xcoord : -0.0024 nmi
Ycoord : 0.3389 nmi
Elevation : 57.0 ft
OtherEnd : 34
Length : 4117 ft
Gradient : 0.15 %
TkoThresh : 0 ft
AppThresh : 475 ft

CASENAME: TWENTY YEAR
RwyWind : 8.0 kt
34
Latitude : 47.322355 deg
Longitude : -122.226599 deg
Xcoord : 0.0024 nmi
Ycoord : -0.3388 nmi
Elevation : 63.0 ft
OtherEnd : 16
Length : 4117 ft
Gradient : -0.15 %
TkoThresh : 0 ft
AppThresh : 243 ft

CASENAME: TWENTY YEAR
RwyWind : 8.0 kt

CASENAME: TWENTY YEAR
RwyWind : 8.0 kt

STUDY HELIPADS
HELI
Latitude : 47.324514 deg
Longitude : -122.227417 deg
Xcoord : -0.0310 nmi
Ycoord : -0.2092 nmi

STUDY TRACKS
RwyId-OpType-TrkId

Sub	PctSub	TrkType	Delta(ft)
16-APP-23			
0	100.00	Vectors	0.0
16-APP-25			
0	100.00	Vectors	0.0
16-DEP-4			
0	100.00	Vectors	0.0
16-DEP-6			

```
    0   100.00   Vectors         0.0
  16-TGO-51
    0   100.00   Vectors         0.0
  34-APP-20
    0   100.00   Vectors         0.0
  34-APP-22
    0   100.00   Vectors         0.0
  34-DEP-1
    0   100.00   Vectors         0.0
  34-DEP-3
    0   100.00   Vectors         0.0
  34-TGO-50
    0   100.00   Vectors         0.0
  HELI-APP-550
    0   100.00   Vectors       180.0
  HELI-APP-551
    0   100.00   Vectors         0.0
  HELI-APP-552
    0   100.00   Vectors       180.0
  HELI-DEP-501
    0   100.00   Vectors         0.0
  HELI-DEP-502
    0   100.00   Vectors       180.0
  HELI-DEP-503
    0   100.00   Vectors         0.0
  HELI-DEP-504
    0   100.00   Vectors       180.0

STUDY TRACK DETAIL
  RwyId-OpType-TrkId-SubTrk
     #  SegType       Dist/Angle      Radius(nmi)
  16-APP-23-0
     1  Straight       0.2000 nmi
     2  Left-Turn      60.0000 deg      0.1000
     3  Straight       1.3127 nmi
     4  Right-Turn      90.0000 deg      0.1000
     5  Straight       0.5571 nmi
     6  Right-Turn      90.0000 deg      0.1000
     7  Straight       1.0519 nmi
  16-DEP-4-0
     1  Straight       1.3606 nmi
     2  Right-Turn      90.0000 deg      0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn      90.0000 deg      0.1000
     5  Straight       1.0218 nmi
     6  Left-Turn      60.0000 deg      0.1000
     7  Straight       0.2000 nmi
  16-DEP-6-0
     1  Straight       1.3606 nmi
     2  Right-Turn      20.0000 deg      0.1000
     3  Straight       1.0000 nmi
  16-TGO-51-0
     1  Straight       1.2824 nmi
     2  Right-Turn      90.0000 deg      0.1000
     3  Straight       0.5571 nmi
     4  Right-Turn      90.0000 deg      0.1000
     5  Straight       2.3345 nmi
     6  Right-Turn      90.0000 deg      0.1000
     7  Straight       0.5571 nmi
     8  Right-Turn      90.0000 deg      0.1000
     9  Straight       1.0521 nmi
  34-APP-20-0
     1  Straight       0.2000 nmi
     2  Right-Turn      60.0000 deg      0.1000
     3  Straight       1.0218 nmi
     4  Left-Turn      90.0000 deg      0.1000
     5  Straight       0.5571 nmi
     6  Left-Turn      90.0000 deg      0.1000
     7  Straight       0.7229 nmi
  34-DEP-1-0
     1  Straight       1.6517 nmi
     2  Left-Turn      90.0000 deg      0.1000
     3  Straight       0.5571 nmi
     4  Left-Turn      90.0000 deg      0.1000
     5  Straight       1.3127 nmi
     6  Right-Turn      60.0000 deg      0.1000
     7  Straight       0.2000 nmi
  34-DEP-3-0
     1  Straight       3.0000 nmi
  34-TGO-50-0
     1  Straight       1.6117 nmi
     2  Left-Turn      90.0000 deg      0.1000
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   3  Straight        0.5571 nmi
   4  Left-Turn       90.0000 deg     0.1000
   5  Straight        2.3345 nmi
   6  Left-Turn       90.0000 deg     0.1000
   7  Straight        0.5571 nmi
   8  Left-Turn       90.0000 deg     0.1000
   9  Straight        0.7228 nmi
  HELI-APP-550-0
   1  Straight        0.2000 nmi
   2  Left-Turn       60.0000 deg     0.1000
   3  Straight        0.6252 nmi
   4  Right-Turn      90.0000 deg     0.1000
   5  Straight        0.2766 nmi
   6  Right-Turn      90.0000 deg     0.1000
   7  Straight        0.8480 nmi
  HELI-APP-551-0
   1  Straight        0.2000 nmi
   2  Right-Turn      60.0000 deg     0.1000
   3  Straight        0.3816 nmi
   4  Left-Turn       90.0000 deg     0.1000
   5  Straight        0.2766 nmi
   6  Left-Turn       90.0000 deg     0.1000
   7  Straight        0.1539 nmi
  HELI-APP-552-0
   1  Straight        2.0000 nmi
  HELI-DEP-501-0
   1  Straight        0.8480 nmi
   2  Left-Turn       90.0000 deg     0.1000
   3  Straight        0.2766 nmi
   4  Left-Turn       90.0000 deg     0.1000
   5  Straight        0.6252 nmi
   6  Right-Turn      60.0000 deg     0.1000
   7  Straight        0.2000 nmi
  HELI-DEP-502-0
   1  Straight        0.1539 nmi
   2  Right-Turn      90.0000 deg     0.1000
   3  Straight        0.2766 nmi
   4  Right-Turn      90.0000 deg     0.1000
   5  Straight        0.3816 nmi
   6  Left-Turn       60.0000 deg     0.1000
   7  Straight        0.2000 nmi
  HELI-DEP-503-0
   1  Straight        2.0000 nmi
  HELI-DEP-504-0
   1  Straight        0.1354 nmi
   2  Right-Turn      20.0000 deg     0.1000
   3  Straight        1.0000 nmi

AIRCRAFT GROUP ASSIGNMENTS

--------------------------------------------------------------------

STUDY AIRPLANES
  BEC58P      Standard data
  CNA208      Standard data
  CNA441      Standard data
  CNA510      Standard data
  GASEPF      Standard data
  GASEPV      Standard data

STUDY SUBSTITUTION AIRPLANES

USER-DEFINED NOISE CURVES

USER-DEFINED METRICS

USER-DEFINED PROFILE IDENTIFIERS

USER-DEFINED PROCEDURAL PROFILES

USER-DEFINED FIXED-POINT PROFILES

USER-DEFINED FLAP COEFFICIENTS

USER-DEFINED JET THRUST COEFFICIENTS

USER-DEFINED PROP THRUST COEFFICIENTS

USER-DEFINED GENERAL THRUST COEFFICIENTS

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STUDY MILITARY AIRPLANES

USER-DEFINED MILITARY NOISE CURVES

USER-DEFINED MILITARY PROFILE IDENTIFIERS

USER-DEFINED MILITARY FIXED-POINT PROFILES

STUDY HELICOPTERS

R22	Standard data
S70	Standard data

USER-DEFINED HELICOPTER PROFILE IDENTIFIERS

USER-DEFINED HELICOPTER PROCEDURAL PROFILES

USER-DEFINED HELICOPTER NOISE CURVES

USER-DEFINED HELICOPTER DIRECTIVITY

CASE FLIGHT OPERATIONS - [TWENTY YEAR]

Acft	Op	Profile	Stg	Rwy	Track	Sub	Group	Day	Evening	Night
BEC58P	APP	STANDARD	1	16	23	0	---	0.8611	0.0000	0.0359
BEC58P	APP	STANDARD	1	34	20	0	---	0.5741	0.0000	0.0239
BEC58P	DEP	STANDARD	1	16	4	0	---	0.4306	0.0000	0.0179
BEC58P	DEP	STANDARD	1	16	6	0	---	0.4306	0.0000	0.0179
BEC58P	DEP	STANDARD	1	34	1	0	---	0.2870	0.0000	0.0120
BEC58P	DEP	STANDARD	1	34	3	0	---	0.2870	0.0000	0.0120
BEC58P	TGO	STANDARD	1	16	51	0	---	0.4329	0.0000	0.0180
BEC58P	TGO	STANDARD	1	34	50	0	---	0.2886	0.0000	0.0120
CNA208	APP	STANDARD	1	16	23	0	---	0.0974	0.0000	0.0041
CNA208	APP	STANDARD	1	34	20	0	---	0.0649	0.0000	0.0027
CNA208	DEP	STANDARD	1	16	4	0	---	0.0487	0.0000	0.0020
CNA208	DEP	STANDARD	1	16	6	0	---	0.0487	0.0000	0.0020
CNA208	DEP	STANDARD	1	34	1	0	---	0.0325	0.0000	0.0014
CNA208	DEP	STANDARD	1	34	3	0	---	0.0325	0.0000	0.0014
CNA441	APP	STANDARD	1	16	23	0	---	0.1461	0.0000	0.0061
CNA441	APP	STANDARD	1	34	20	0	---	0.0974	0.0000	0.0041
CNA441	DEP	STANDARD	1	16	4	0	---	0.0730	0.0000	0.0030
CNA441	DEP	STANDARD	1	16	6	0	---	0.0730	0.0000	0.0030
CNA441	DEP	STANDARD	1	34	1	0	---	0.0487	0.0000	0.0020
CNA441	DEP	STANDARD	1	34	3	0	---	0.0487	0.0000	0.0020
CNA510	APP	STANDARD	1	16	23	0	---	0.1623	0.0000	0.0068
CNA510	APP	STANDARD	1	34	20	0	---	0.1082	0.0000	0.0045
CNA510	DEP	STANDARD	1	16	4	0	---	0.0812	0.0000	0.0034
CNA510	DEP	STANDARD	1	16	6	0	---	0.0812	0.0000	0.0034
CNA510	DEP	STANDARD	1	34	1	0	---	0.0541	0.0000	0.0023
CNA510	DEP	STANDARD	1	34	3	0	---	0.0541	0.0000	0.0023
GASEPF	APP	STANDARD	1	16	23	0	---	45.4921	0.0000	1.8955
GASEPF	APP	STANDARD	1	34	20	0	---	30.3291	0.0000	1.2637
GASEPF	DEP	STANDARD	1	16	4	0	---	22.7461	0.0000	0.9478
GASEPF	DEP	STANDARD	1	16	6	0	---	22.7461	0.0000	0.9478
GASEPF	DEP	STANDARD	1	34	1	0	---	15.1646	0.0000	0.6319
GASEPF	DEP	STANDARD	1	34	3	0	---	15.1646	0.0000	0.6319
GASEPF	TGO	STANDARD	1	16	51	0	---	22.8717	0.0000	0.9530
GASEPF	TGO	STANDARD	1	34	50	0	---	15.2484	0.0000	0.6353
GASEPV	APP	STANDARD	1	16	23	0	---	30.3051	0.0000	1.2627
GASEPV	APP	STANDARD	1	34	20	0	---	20.2041	0.0000	0.8418
GASEPV	DEP	STANDARD	1	16	4	0	---	15.1525	0.0000	0.6314
GASEPV	DEP	STANDARD	1	16	6	0	---	15.1525	0.0000	0.6314
GASEPV	DEP	STANDARD	1	34	1	0	---	10.1020	0.0000	0.4209
GASEPV	DEP	STANDARD	1	34	3	0	---	10.1020	0.0000	0.4209
GASEPV	TGO	STANDARD	1	16	51	0	---	15.2363	0.0000	0.6348
GASEPV	TGO	STANDARD	1	34	50	0	---	10.1579	0.0000	0.4232
R22	APP	STANDARD	1	HELI	550	0	---	2.5361	0.0000	0.1057
R22	APP	STANDARD	1	HELI	551	0	---	3.3814	0.0000	0.1409
R22	APP	STANDARD	1	HELI	552	0	---	2.5361	0.0000	0.1057
R22	DEP	STANDARD	1	HELI	501	0	---	2.5361	0.0000	0.1057
R22	DEP	STANDARD	1	HELI	502	0	---	1.6907	0.0000	0.0704
R22	DEP	STANDARD	1	HELI	503	0	---	2.5361	0.0000	0.1057
R22	DEP	STANDARD	1	HELI	504	0	---	1.6907	0.0000	0.0704
S70	APP	STANDARD	1	HELI	550	0	---	0.0197	0.0000	0.0008
S70	APP	STANDARD	1	HELI	551	0	---	0.0263	0.0000	0.0011
S70	APP	STANDARD	1	HELI	552	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	501	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	502	0	---	0.0132	0.0000	0.0005
S70	DEP	STANDARD	1	HELI	503	0	---	0.0197	0.0000	0.0008
S70	DEP	STANDARD	1	HELI	504	0	---	0.0132	0.0000	0.0005

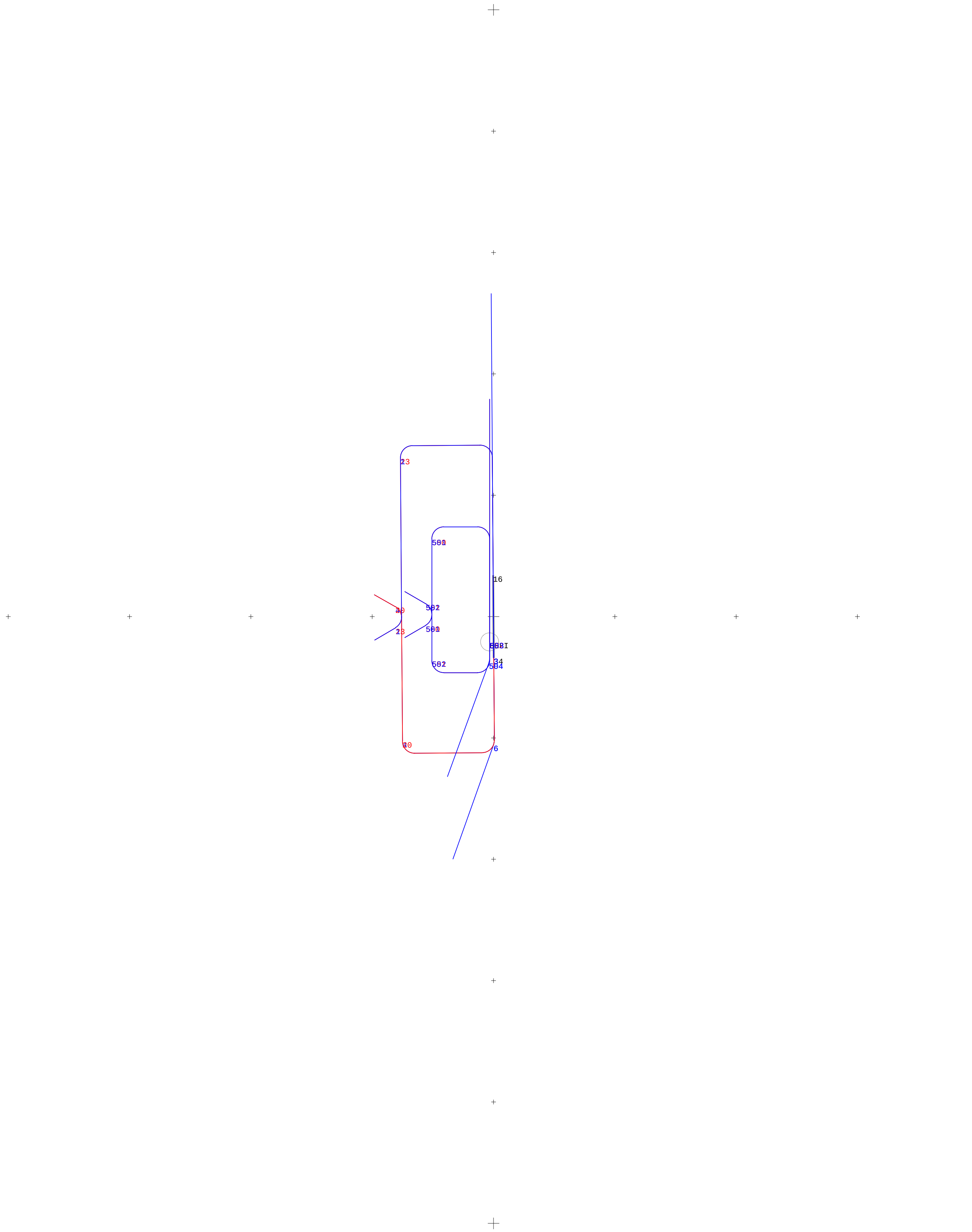
CASE RUNUP OPERATIONS - [TWENTY YEAR]

Acft	RunupId	X(nmi)	Y(nmi)	Head	Thrust	Dur(sec)	Day	Evening	Night
BEC58P	16	47.3335	-122.2261	270.0	80.0 %	30.0	0.8611	0.0000	0.0359
BEC58P	34	47.3224	-122.2260	270.0	80.0 %	30.0	0.5741	0.0000	0.0239
GASEPF	16	47.3335	-122.2261	270.0	80.0 %	30.0	45.4921	0.0000	1.8955
GASEPF	34	47.3224	-122.2260	270.0	80.0 %	30.0	30.3291	0.0000	1.2637
GASEPV	16	47.3335	-122.2261	270.0	80.0 %	30.0	30.3051	0.0000	1.2627
GASEPV	34	47.3224	-122.2260	270.0	80.0 %	30.0	20.2041	0.0000	0.8418

SCENARIO RUN OPTIONS
Run Type : Single-Metric
NoiseMetric : DNL
Do Terrain : No Terrain
Do Contour : Recursive Grid
Refinement : 11
Tolerance : 0.50
Low Cutoff : 55.0
High Cutoff : 85.0
Ground Type : All-Soft-Ground
Do Population : No
Do Locations : No
Do Standard : No
Do Detailed : No
Compute System Metrics:
DNL : No
CNEL : No
LAEQ : No
LAEQD : No
LAEQN : No
SEL : No
LAMAX : No
TALA : No
NEF : No
WECPNL : No
EPNL : No
PNLTM : No
TAPNL : No
CEXP : No
LCMAX : No
TALC : No

SCENARIO GRID DEFINITIONS

Name	Type	X(nmi)	Y(nmi)	Ang(deg)	DisI(nmi)	DisJ(nmi)	NI	NJ	Thrsh	dAmb	(hr)
CONTOUR	Contour	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
DETAILED	Detailed	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00
STANDARD	Standard	-8.0000	-8.0000	0.0	16.0000	16.0000	2	2	85.0	0.0	0.00



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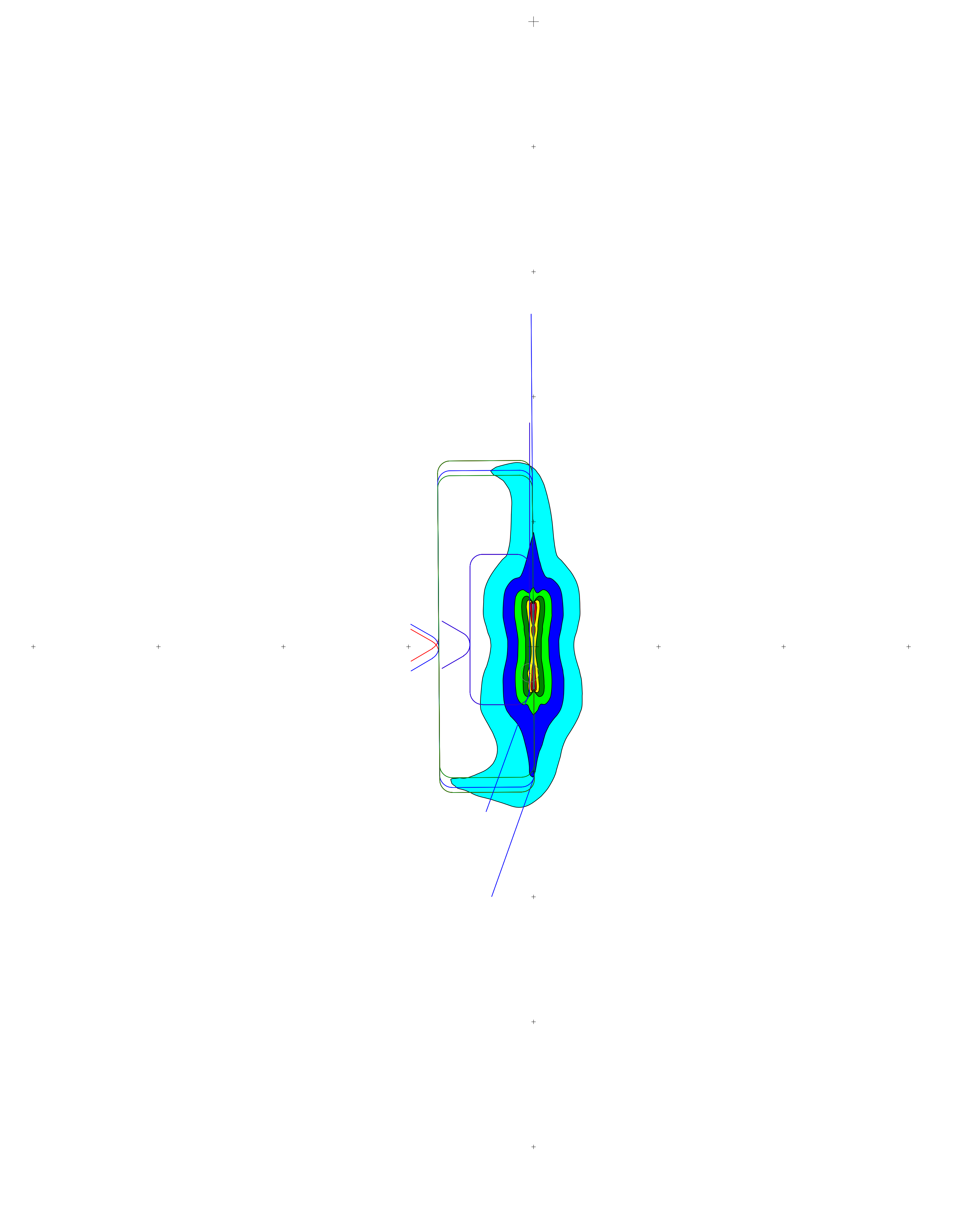
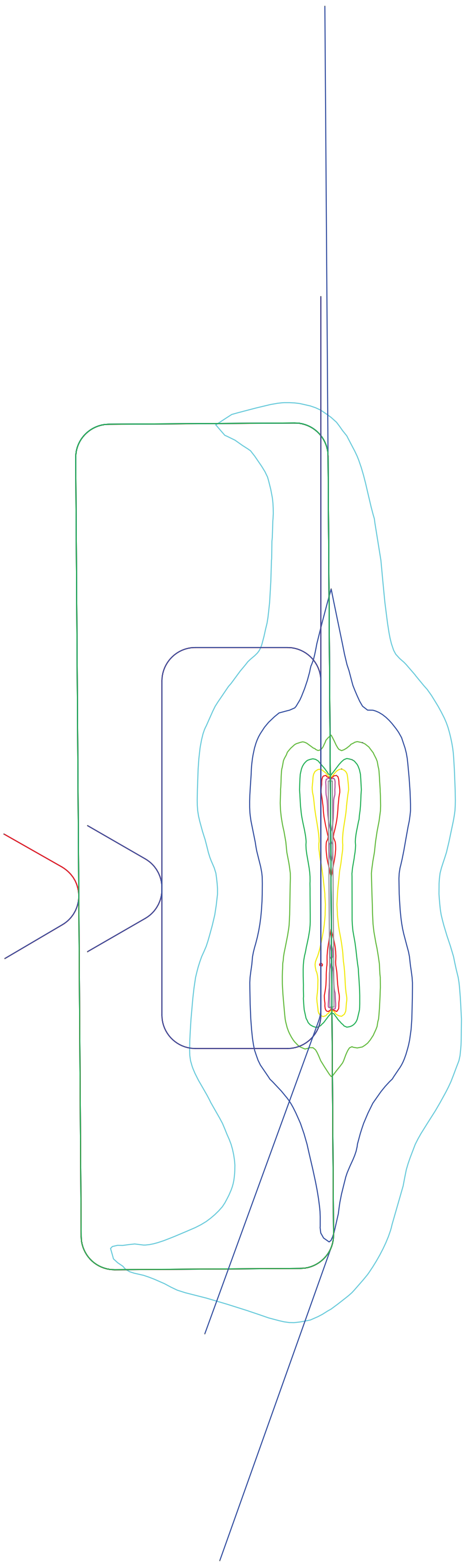
Grid Size 5.00 nmi



INM 7.0d 16-Dec-13 13:46	DNL	55.0	60.0	65.0	70.0	75.0	80.0	85.0
INM7.0D\AUBURN 2032\20 YR	sq.mi	2.10	0.79	0.33	0.16	0.07	0.02	0.01
Grid Size 5.00 nmi	color							



Appendix H

FAA
Airports

ASSURANCES

Airport Sponsors

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, U.S.C., subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of this grant offer by the sponsor, these assurances are incorporated in and become part of this grant agreement.

B. Duration and Applicability.

1. **Airport development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.**

   The terms, conditions and assurances of this grant agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a grant offer of Federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. **Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.**

   The preceding paragraph 1 also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of Federal aid for the project.

3. **Airport Planning Undertaken by a Sponsor.**

Unless otherwise specified in this grant agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 25, 30, 32, 33, and 34 in Section C apply to planning projects. The terms, conditions, and assurances of this grant agreement shall remain in full force and effect during the life of the project; there shall be no limit on the duration of the assurances regarding Airport Revenue so long as the airport is used as an airport.

C. Sponsor Certification.

The sponsor hereby assures and certifies, with respect to this grant that:

1. **General Federal Requirements.**

It will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance and use of Federal funds for this project including but not limited to the following:

Federal Legislation

a. Title 49, U.S.C., subtitle VII, as amended.
b. Davis-Bacon Act - 40 U.S.C. 276(a), et seq.[1]
c. Federal Fair Labor Standards Act - 29 U.S.C. 201, et seq.
d. Hatch Act – 5 U.S.C. 1501, et seq.[2]
e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C. 4601, et seq.[1 2]
f. National Historic Preservation Act of 1966 - Section 106 - 16 U.S.C. 470(f).[1]
g. Archeological and Historic Preservation Act of 1974 - 16 U.S.C. 469 through 469c.[1]
h. Native Americans Grave Repatriation Act - 25 U.S.C. Section 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended.
j. Coastal Zone Management Act, P.L. 93-205, as amended.
k. Flood Disaster Protection Act of 1973 - Section 102(a) - 42 U.S.C. 4012a.[1]
l. Title 49, U.S.C., Section 303, (formerly known as Section 4(f))
m. Rehabilitation Act of 1973 - 29 U.S.C. 794.
n. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
o. Americans with Disabilities Act of 1990, as amended, (42 U.S.C. § 12101 et seq.), prohibits discrimination on the basis of disability).
p. Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.
q. American Indian Religious Freedom Act, P.L. 95-341, as amended.
r. Architectural Barriers Act of 1968 -42 U.S.C. 4151, et seq.[1]
s. Power plant and Industrial Fuel Use Act of 1978 - Section 403- 2 U.S.C. 8373.[1]
t. Contract Work Hours and Safety Standards Act - 40 U.S.C. 327, et seq.[1]
u. Copeland Anti-kickback Act - 18 U.S.C. 874.1
v. National Environmental Policy Act of 1969 - 42 U.S.C. 4321, et seq.[1]
w. Wild and Scenic Rivers Act, P.L. 90-542, as amended.
x. Single Audit Act of 1984 - 31 U.S.C. 7501, et seq.[2]
y. Drug-Free Workplace Act of 1988 - 41 U.S.C. 702 through 706.

z. The Federal Funding Accountability and Transparency Act of 2006, as amended (Pub. L. 109-282, as amended by section 6202 of Pub. L. 110-252).

Executive Orders

a. Executive Order 11246 - Equal Employment Opportunity[1]
b. Executive Order 11990 - Protection of Wetlands
c. Executive Order 11998 – Flood Plain Management
d. Executive Order 12372 - Intergovernmental Review of Federal Programs
e. Executive Order 12699 - Seismic Safety of Federal and Federally Assisted New Building Construction[1]
f. Executive Order 12898 - Environmental Justice

Federal Regulations

a. 2 CFR Part 180 - OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement).
b. 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. [OMB Circular A-87 Cost Principles Applicable to Grants and Contracts with State and Local Governments, and OMB Circular A-133 - Audits of States, Local Governments, and Non-Profit Organizations].[4, 5, 6]
c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment
d. 14 CFR Part 13 - Investigative and Enforcement Procedures14 CFR Part 16 - Rules of Practice For Federally Assisted Airport Enforcement Proceedings.
e. 14 CFR Part 150 - Airport noise compatibility planning.
f. 28 CFR Part 35- Discrimination on the Basis of Disability in State and Local Government Services.
g. 28 CFR § 50.3 - U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964.
h. 29 CFR Part 1 - Procedures for predetermination of wage rates.[1]
i. 29 CFR Part 3 - Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States.[1]
j. 29 CFR Part 5 - Labor standards provisions applicable to contracts covering federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act).[1]
k. 41 CFR Part 60 - Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements).[1]
l. 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments.[3]
m. 49 CFR Part 20 - New restrictions on lobbying.
n. 49 CFR Part 21 – Nondiscrimination in federally-assisted programs of the Department of Transportation - effectuation of Title VI of the Civil Rights Act of 1964.
o. 49 CFR Part 23 - Participation by Disadvantage Business Enterprise in Airport Concessions.

p. 49 CFR Part 24 – Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs.[1 2]
q. 49 CFR Part 26 – Participation by Disadvantaged Business Enterprises in Department of Transportation Programs.
r. 49 CFR Part 27 – Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance.[1]
s. 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities conducted by the Department of Transportation.
t. 49 CFR Part 30 - Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors.
u. 49 CFR Part 32 – Governmentwide Requirements for Drug-Free Workplace (Financial Assistance)
v. 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).
w. 49 CFR Part 41 - Seismic safety of Federal and federally assisted or regulated new building construction.

Specific Assurances

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this grant agreement.

Footnotes to Assurance C.1.

[1] These laws do not apply to airport planning sponsors.

[2] These laws do not apply to private sponsors.

[3] 49 CFR Part 18 and 2 CFR Part 200 contain requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation and circular shall also be applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

[4] On December 26, 2013 at 78 FR 78590, the Office of Management and Budget (OMB) issued the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 CFR Part 200. 2 CFR Part 200 replaces and combines the former Uniform Administrative Requirements for Grants (OMB Circular A-102 and Circular A-110 or 2 CFR Part 215 or Circular) as well as the Cost Principles (Circulars A-21 or 2 CFR part 220; Circular A-87 or 2 CFR part 225; and A-122, 2 CFR part 230). Additionally it replaces Circular A-133 guidance on the Single Annual Audit. In accordance with 2 CFR section 200.110, the standards set forth in Part 200 which affect administration of Federal awards issued by Federal agencies become effective once implemented by Federal agencies or when any future amendment to this Part becomes final. Federal agencies, including the Department of Transportation, must implement the policies and procedures applicable to Federal awards by promulgating a regulation to be effective by December 26, 2014 unless different provisions are required by statute or approved by OMB.

[5] Cost principles established in 2 CFR part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.

[6] Audit requirements established in 2 CFR part 200 subpart F are the guidelines for audits.

2. **Responsibility and Authority of the Sponsor.**

   a. Public Agency Sponsor:

   It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

   b. Private Sponsor:

   It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this grant agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. **Sponsor Fund Availability.**

   It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this grant agreement which it will own or control.

4. **Good Title.**

   a. It, a public agency or the Federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

   b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which Federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. **Preserving Rights and Powers.**

   a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this grant agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

b. It will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in this grant agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this grant agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this grant agreement.

c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.

d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.

f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to insure that the airport will be operated and maintained in accordance Title 49, United States Code, the regulations and the terms, conditions and assurances in this grant agreement and shall insure that such arrangement also requires compliance therewith.

g. Sponsors of commercial service airports will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on airport. Sponsors of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. **Consistency with Local Plans.**

   The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the State in which the project is located to plan for the development of the area surrounding the airport.

7. **Consideration of Local Interest.**

   It has given fair consideration to the interest of communities in or near where the project may be located.

8. **Consultation with Users.**

   In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. **Public Hearings.**

   In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. **Metropolitan Planning Organization.**

    In projects involving the location of an airport, an airport runway, or a major runway extension at a medium or large hub airport, the sponsor has made available to and has provided upon request to the metropolitan planning organization in the area in which the airport is located, if any, a copy of the proposed amendment to the airport layout plan to depict the project and a copy of any airport master plan in which the project is described or depicted.

11. **Pavement Preventive Maintenance.**

    With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. **Terminal Development Prerequisites.**

    For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under section 44706 of Title 49, United States Code, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. **Accounting System, Audit, and Record Keeping Requirements.**

    a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.

    b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. **Minimum Wage Rates.**

    It shall include, in all contracts in excess of $2,000 for work on any projects funded under this grant agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor, in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. **Veteran's Preference.**

    It shall include in all contracts for work on any project funded under this grant agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. **Conformity to Plans and Specifications.**

    It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this grant agreement, and, upon approval of the Secretary, shall be incorporated into this grant agreement. Any modification to the approved plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this grant agreement.

17. **Construction Inspection and Approval.**

    It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. **Planning Projects.**

    In carrying out planning projects:

    a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.

    b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.

    c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.

    d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.

    e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.

    f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.

    g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.

    h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a Federal airport grant.

19. **Operation and Maintenance.**

    a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-

1) Operating the airport's aeronautical facilities whenever required;
2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

20. **Hazard Removal and Mitigation.**

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

21. **Compatible Land Use.**

It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

22. **Economic Nondiscrimination.**

a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-

1) furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and

2) charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non-tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non-tenants and signatory carriers and non-signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees [including, but not limited to maintenance, repair, and fueling] that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. **Exclusive Rights.**

It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. **Fee and Rental Structure.**

It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the Federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. **Airport Revenues.**

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:

1) If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or

operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

2) If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor's acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.

3) Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at Section 47102 of title 49 United States Code), if the FAA determines the airport sponsor meets the requirements set forth in Sec. 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

26. **Reports and Inspections.**

It will:

a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;

b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this grant agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:

1) all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and

2) all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. **Use by Government Aircraft.**

It will make available all of the facilities of the airport developed with Federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that –

a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or

b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. **Land for Federal Facilities.**

It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein, or rights in buildings of the sponsor as the Secretary considers necessary or desirable for construction, operation, and maintenance at Federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. **Airport Layout Plan.**

a. It will keep up to date at all times an airport layout plan of the airport showing

1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;

2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and

roads), including all proposed extensions and reductions of existing airport facilities;

3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon; and

4) all proposed and existing access points used to taxi aircraft across the airport's property boundary. Such airport layout plans and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.

b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. **Civil Rights.**

It will promptly take any measures necessary to ensure that no person in the United States shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any activity conducted with, or benefiting from, funds received from this grant.

a. Using the definitions of activity, facility and program as found and defined in §§ 21.23 (b) and 21.23 (e) of 49 CFR § 21, the sponsor will facilitate all programs, operate all facilities, or conduct all programs in compliance with all non-discrimination requirements imposed by, or pursuant to these assurances.

b. Applicability

1) Programs and Activities. If the sponsor has received a grant (or other federal assistance) for any of the sponsor's program or activities, these requirements extend to all of the sponsor's programs and activities.

2) Facilities. Where it receives a grant or other federal financial assistance to construct, expand, renovate, remodel, alter or acquire a facility, or part of a facility, the assurance extends to the entire facility and facilities operated in connection therewith.

3) Real Property. Where the sponsor receives a grant or other Federal financial assistance in the form of, or for the acquisition of real property or an interest in real property, the assurance will extend to rights to space on, over, or under such property.

c. Duration.

The sponsor agrees that it is obligated to this assurance for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the assurance obligates the sponsor, or any transferee for the longer of the following periods:

1) So long as the airport is used as an airport, or for another purpose involving the provision of similar services or benefits; or

2) So long as the sponsor retains ownership or possession of the property.

d. Required Solicitation Language. It will include the following notification in all solicitations for bids, Requests For Proposals for work, or material under this grant agreement and in all proposals for agreements, including airport concessions, regardless of funding source:

"The **(Name of Sponsor)**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises and airport concession disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award."

e. Required Contract Provisions.

1) It will insert the non-discrimination contract clauses requiring compliance with the acts and regulations relative to non-discrimination in Federally-assisted programs of the DOT, and incorporating the acts and regulations into the contracts by reference in every contract or agreement subject to the non-discrimination in Federally-assisted programs of the DOT acts and regulations.

2) It will include a list of the pertinent non-discrimination authorities in every contract that is subject to the non-discrimination acts and regulations.

3) It will insert non-discrimination contract clauses as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.

4) It will insert non-discrimination contract clauses prohibiting discrimination on the basis of race, color, national origin, creed, sex, age, or handicap as a

covenant running with the land, in any future deeds, leases, license, permits, or similar instruments entered into by the sponsor with other parties:

a) For the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and

b) For the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

f. It will provide for such methods of administration for the program as are found by the Secretary to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the acts, the regulations, and this assurance.

g. It agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this assurance.

31. **Disposal of Land.**

a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order, (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund. If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.

b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, (1) upon application to the Secretary, be reinvested or transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order: (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund.

c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or Federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.

d. Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. **Engineering and Design Services.**

It will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.

33. **Foreign Market Restrictions.**

It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. **Policies, Standards, and Specifications.**

It will carry out the project in accordance with policies, standards, and specifications approved by the Secretary including but not limited to the advisory circulars listed in the Current FAA Advisory Circulars for AIP projects, dated _____________ (the latest approved version as of this grant offer) and included in this grant, and in accordance with applicable state policies, standards, and specifications approved by the Secretary.

35. **Relocation and Real Property Acquisition.**

    a. It will be guided in acquiring real property, to the greatest extent practicable under State law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B.
    b. It will provide a relocation assistance program offering the services described in Subpart C and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24.
    c. It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. **Access By Intercity Buses.**

    The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. **Disadvantaged Business Enterprises.**

    The sponsor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract covered by 49 CFR Part 26, or in the award and performance of any concession activity contract covered by 49 CFR Part 23. In addition, the sponsor shall not discriminate on the basis of race, color, national origin or sex in the administration of its DBE and ACDBE programs or the requirements of 49 CFR Parts 23 and 26. The sponsor shall take all necessary and reasonable steps under 49 CFR Parts 23 and 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts, and/or concession contracts. The sponsor's DBE and ACDBE programs, as required by 49 CFR Parts 26 and 23, and as approved by DOT, are incorporated by reference in this agreement. Implementation of these programs is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the sponsor of its failure to carry out its approved program, the Department may impose sanctions as provided for under Parts 26 and 23 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1936 (31 U.S.C. 3801).

38. **Hangar Construction.**

    If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. **Competitive Access.**

a. If the airport owner or operator of a medium or large hub airport (as defined in section 47102 of title 49, U.S.C.) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that-

   1) Describes the requests;

   2) Provides an explanation as to why the requests could not be accommodated; and

   3) Provides a time frame within which, if any, the airport will be able to accommodate the requests.

b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

Appendix I

RESOLUTION NO. 3 0 7 7

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, GRANTING A RELEASE OF EASEMENT FROM THE CITY OF AUBURN STORMWATER UTILITY TO THE CITY OF AUBURN AIRPORT AND GRANTING A NEW EASEMENT FROM THE CITY OF AUBURN AIRPORT TO THE CITY OF AUBURN STORMWATER UTILITY.

WHEREAS, the City of Auburn adopted Short Plat No. SP-15-81, King County Recording No. 82-07299002; and

WHEREAS, Short Plat No. Sp-15-81 granted a 30-foot wide utility and drainage easement as depicted by cross hatch in Exhibit "A", attached hereto and by this reference made a part hereof; and

WHEREAS, the City of Auburn Stormwater Utility Enterprise Fund has been operating a stormwater detention pond on the City of Auburn Airport property within said easement at the Municipal Airport; and

WHEREAS, the City of Auburn Stormwater Utility will no longer make use of the existing utility and drainage easement as granted in Short Plat No. SP-15-81; and

WHEREAS, the City of Auburn Stormwater Utility Enterprise Fund desires to continue to develop and operate a regional stormwater detention pond on the City of Auburn

Airport property at the Municipal Airport to serve tributary areas within and adjacent to the Municipal Airport; and

WHEREAS, through mutual agreement between the City of Auburn Stormwater Utility and the City of Auburn Airport, a location for a regional stormwater detention facility has been agreed to, and said drainage easement is depicted by cross hatch in Exhibit "B", attached hereto and by this reference made a part hereof; and

WHEREAS, the City of Auburn Stormwater Utility will compensate the City of Auburn Airport in the final amount of $175,717.71, as determined in Exhibit "C", attached hereto and by this reference made a part hereof; and

WHEREAS, this arrangement is in the best interests of the City of Auburn Stormwater Utility and the City of Auburn Airport.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, IN A REGULAR MEETING DULY ASSEMBLED, HEREWITH RESOLVES THAT:

Section 1. There is herewith granted a release of easement from the City of Auburn Stormwater Utility to the

City of Auburn Airport the property legally described as follows:

A 30.00 ft. wide utility and drainage easement, beginning at the northeast corner of the J. A. Lake Donation Land Claim No. 41 T21N, R5E, W.M., King County, Washington; thence S 00° 52′ 25″ W along the east boundary of said Lake Claim, 30.00 feet; thence N 88° 49′ 52″ W along a line 30.00 feet south and parallel to the north boundary of said Lake Claim, 455.93 feet to the true point of beginning; thence S 00° 52′ 25″ W, 689.49 feet; thence N 88° 49′ 52″ W, 530.00 feet; thence N 00° 52′25″ E, 30.00 feet; thence S 88° 49′ 52″ E, 500.00 feet; thence N 00° 52′ 25″ E, 659.49 feet; thence S 88° 49′ 52″ E, 30.00 feet to the true point of beginning.

Said easement contains 0.812 acres, more or less.

Section 2. There is herewith granted an easement from the City of Auburn Airport to the City of Auburn Stormwater Utility legally described as follows:

A parcel of land located within the J. Brannan D.C. No. 38 and the J.A. Lake D.C. No. 41, Section 6 and Section 7, Township 21 North, Range 5 East, W.M., King County, Washington. More Particularly described as follows:

Commencing at a monument at the intersection of 30th Street NE and C Street NE; Thence N 89°03'18" W for a distance of 226.72 feet along the centerline of said 30th Street NE; Thence S 0°56'47" W for a distance of 51.82 feet to the POINT OF BEGINNING;

Thence S 89°19'51" E for a distance of 396.57 feet; Thence S 0°38'16" W for a distance of 436.00 feet; Thence N 89°21'44" W for a distance of 133.05 feet; Thence N 0°38'16" E for a distance of 406.00 feet; Thence N 89°21'44" W for a distance of 160.00 feet; Thence S 0°38'16" W for a distance of 915.00 feet; Thence N 89°21'44" W for a distance of 22.54 feet; Thence S 0°38'16" W for a distance of 958.37 feet; Thence N 89°21'44" W for a distance of 67.96 feet; Thence S 0°38'16" W for a distance of 397.63 feet; Thence S 89°21'44" E for a distance of 85.01 feet; Thence S 0°38'16" W for a distance of 144.00 feet; Thence N 89°21'44" W for a distance of 44.51 feet; Thence S 0°38'16" W for a distance of 60.00 feet; Thence S 89°21'44" E for a distance of 44.51 feet; Thence S 0°38'16" W for a distance of 364.35 feet; Thence N 89°21'44" W for a distance of 27.34 feet; Thence S 0°38'16" W for a distance of 17.08 feet; Thence S 89°21'44" E for a distance of 27.34 feet; Thence S 0°38'16" W for a distance of 423.56 feet; Thence N 89°21'44" W for a distance of 59.51 feet; Thence S 0°38'16" W for a distance of 60.00 feet; Thence S 89°21'44" E for a distance of 31.95 feet; Thence S 0°38'16" W for a distance of 54.42 feet; Thence S 89°21'44" E for a distance of 33.05 feet; Thence S 0°38'16" W for a distance of 785.15 feet to the south boundary of the City of Auburn Airport; Thence N 89°07'06" W for a distance of 162.19 feet along said south boundary to the west boundary of the City of Auburn Airport; Thence N 0°39'02" E for a distance of 624.47 feet along said west boundary; Thence S 89°21'44" E for a distance of 46.55 feet; Thence N 0°38'16" E for a distance of 214.41 feet; Thence S 89°21'44" E for a distance of 30.50 feet; Thence N 0°38'16" E for a distance of 60.00 feet; Thence N 89°21'44" W for a distance of 30.50 feet; Thence N 0°38'16" E for a distance of 805.00 feet; Thence S 89°21'44" E for a distance of 45.50 feet; Thence N 0°38'16" E for a distance of 60.00 feet; Thence N 89°21'44" W for a distance of 45.50 feet; Thence N 0°38'16" E for a distance of 144.00 feet; Thence S 89°21'44" E for a distance of 5.00 feet; Thence N 0°38'16" E for a distance of 264.00 feet; Thence N 89°22'22" W for a distance of 60.50 feet to the west boundary of the City of Auburn Airport; Thence N 0°38'02" E for a distance of 2037.00 feet along said west boundary; Thence S 89°33'25" E for a distance of 67.62 feet; To the true point of beginning.

Said easement contains 14.084 acres, more or less.

Section 3. Upon the passage and approval of this Resolution, the City of Auburn City Clerk is hereby authorized to record this Resolution with King County.

Section 4. The Mayor is hereby authorized to implement such administrative procedures as may be necessary to carry out the directives of this legislation.

DATED and SIGNED this 17th day of May, 1999.

Charles A. Booth

CHARLES A. BOOTH
MAYOR

ATTEST:

Danielle E. Daskam

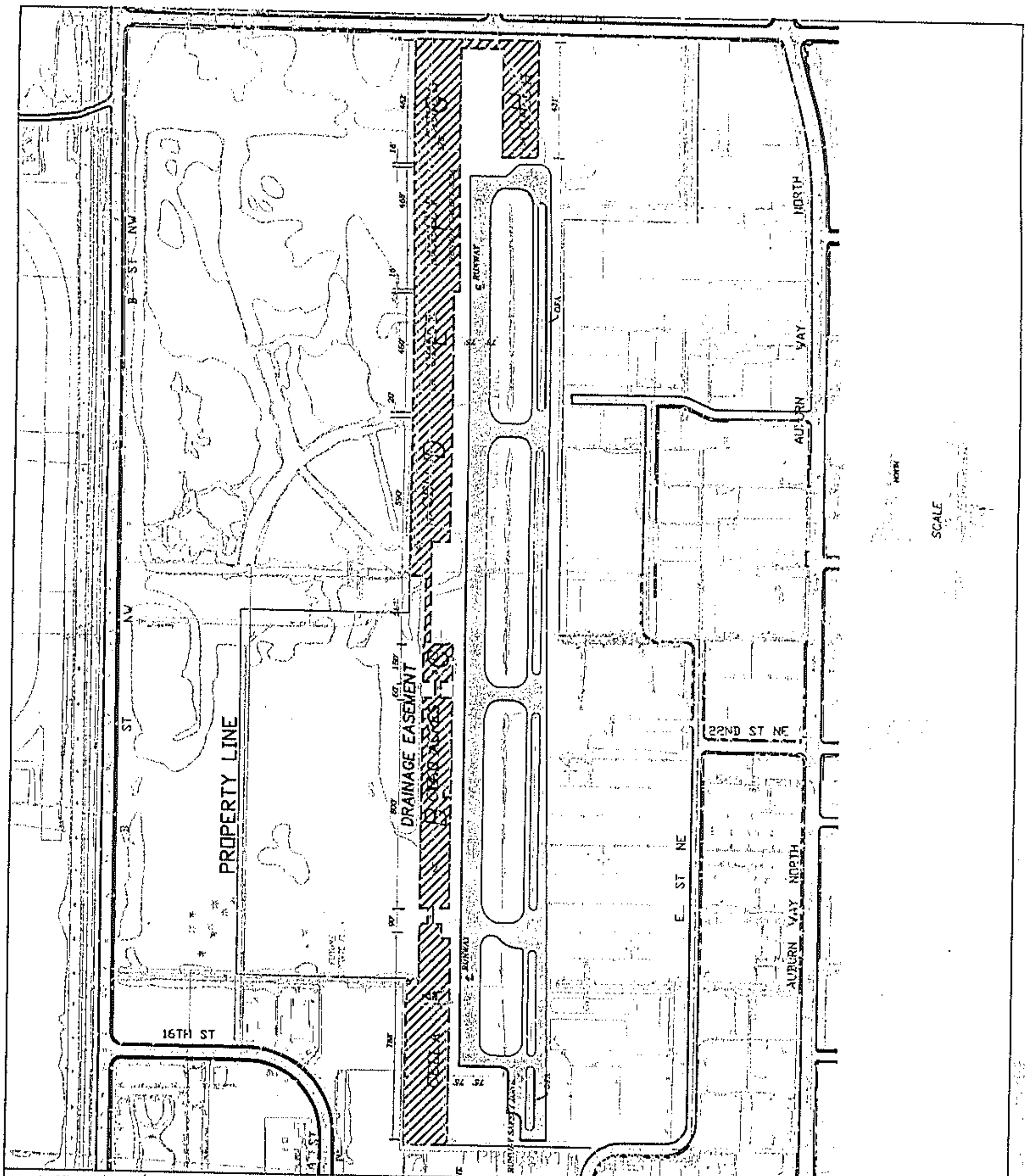
Danielle E. Daskam,
City Clerk

APPROVED AS TO FORM:

Michael J. Reynolds,
City Attorney

CITY OF AUBURN MISC 17.00

19990712000632
PAGE 007 OF 010
07/12/1999 10:14
KING COUNTY, WA



DATE	BY	REVISION	CHK

DRAWN BY: WLM
DESIGNED BY: WLM
CHECKED BY: MSV
APPROVED BY: MSV

W&H PACIFIC

CITY OF AUBURN
REGIONAL DETENTION FACILITY
DRAINAGE EASEMENTS
EXHIBIT B

AUBURN.DWG
SCALE: 1"=500'

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KING COUNTY, WA

CITY OF AUBURN MISC 17.00

EXHIBIT "C"

AUBURN AIRPORT STORM DRAINAGE AGREEMENT

Easement Value

Area	Ex. Easement	Fee Value/foot	New Easement	Encumbered Value/foot	(exp) / rev Airport
	35,389	$ 5.50		$ 0.825	$ (29,196)
		$ 5.50	613,499	$ 0.825	$ 506,137

Lost Volume Costs @ "L" Shaped Pond

Volume	Value/ac-ft	
3.5	$ 49,700	$ (173,950)

Volume Costs Required for Hanger Project

Volume	Value/ac-ft	
1.61	$ 49,700	$ (79,867)

Oversize

Item	Unit price*	Quantity	
30" RCP	$ 42	657	$ 27,594

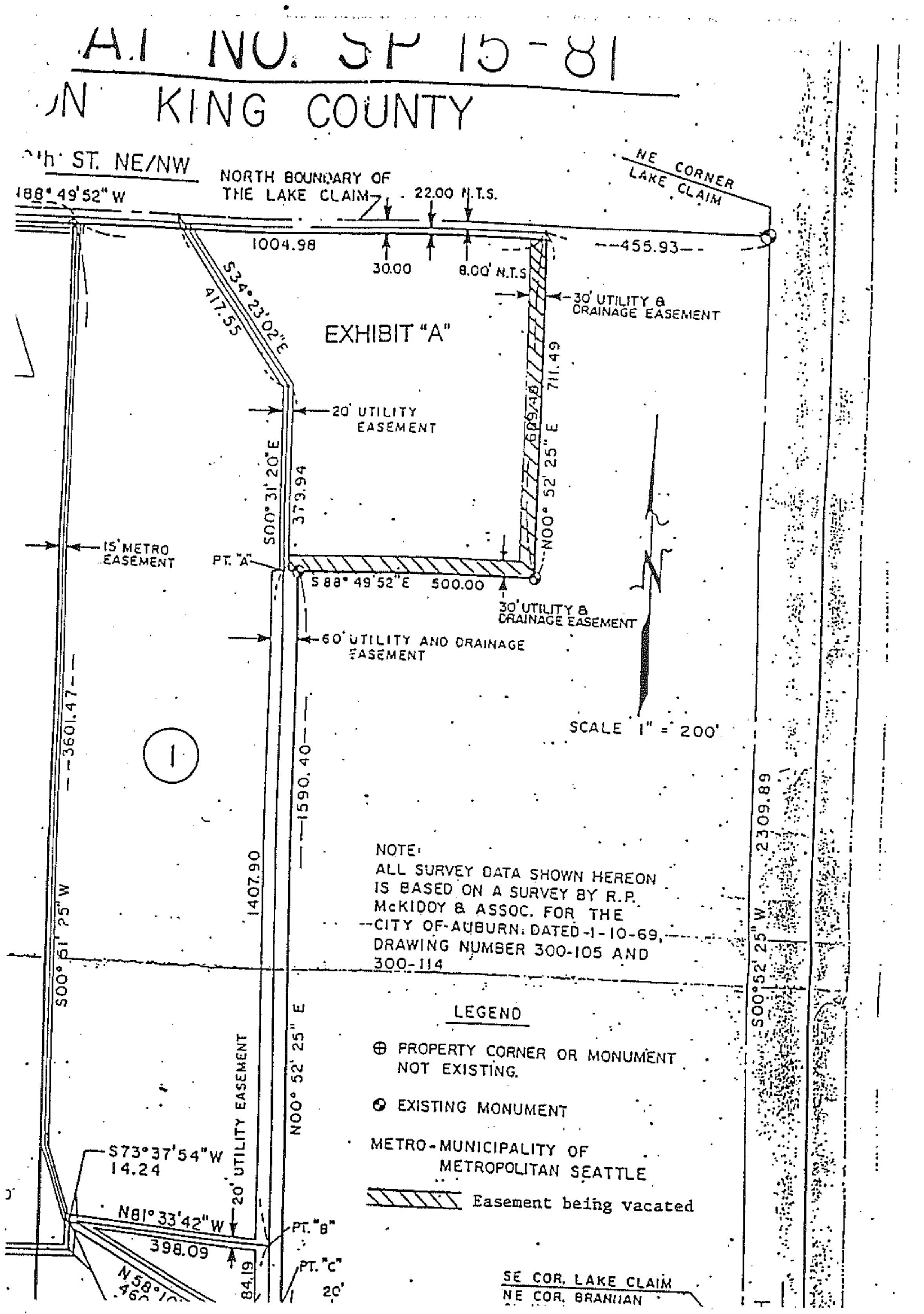
*Unit price based upon bid tab by W&H Pacific

TOTAL	$ 250,717.71

Storm Utility owes Airport Enterprise Fund	$ 250,717.71

Owed	$	250,717.71
less option previously paid	$	(75,000.00)
	$	**175,717.71**

h:/tjc/cip/airport/storm1d.xls
5/6/99 11:57 AM



CITY OF AUBURN MISC 17.00

19990712000632
PAGE 009 OF 010
07/12/1999 10:14
KING COUNTY, WA

Please Type or Print on This Form

KR625

Form Approved OMB NO. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

Notice of Proposed Construction or Alteration

Failure To Provide All Requested Information May Delay Processing Of Your Notice

Aeronautical Study Number: 99-SEA-159-NRA

1. Nature of Proposal

A. Type
- [X] New Construction
- [ ] Alteration *

B. Class
- [X] Permanent
- [ ] Temporary (Duration ______ months)

C. Work Schedule Dates
Beginning 8/6/99
End 11/30/99

* If Alteration, provide previous FAA Aeronautical Study Number, if available :

3A. **Name, address, and telephone number of individual, company corporation, etc. proposing the construction or alteration.** (Number, Street, City, State, and Zip Code)

CITY OF AUBURN
25 WEST MAIN ST.
AUBURN, WA 98001-4998
(253) 931-3010
Area Code / Telephone Number

3B. Name, address and telephone number of proponent's representative, if different than 3A. above.

W&H PACIFIC
3350 MONTE VILLA PARKWAY
BOTHELL, WA 98021
(425) 951-4800
Area Code / Telephone Number

2. Complete Description of Structure

Please describe the proposed construction or alteration.

A. For proposals involving transmitting stations, include effective radiated power (ERP) and assigned frequency. If not known, give frequency band and maximum ERP.

B. For proposals involving overhead wire, transmission lines, etc., include the size and the configuration of the wires and their supporting structures.

C. For buildings, include site orientation, dimensions, and construction materials.

D. **Optional**— Describe the type of obstruction marking and lighting system desired. The FAA will consider this in their study.

- REGIONAL DETENTION FACILITY INCLUDING 5 STORMWATER CELLS AND THE NECESSARY UNDERGROUND CONTROL STRUCTURES AND PIPING.

4. Location Of Structure

A. Coordinates (to hundredths of seconds, if known)

	°	'	"
Latitude	47	19	43.
Longitude	122	13	30.

B. Nearest City or Town and State: AUBURN, WA
(1). Distance to 4B: IN CITY LIMITS
(2). Direction to 4B: NORTH END OF LIMITS

C. Nearest public or military airport, heliport, flightpark, or seaplane base: AUBURN MUNICIPAL
(1). Distance from structure to nearest point of nearest runway: 75 FEET
(2). Direction from structure to airport: EAST

4D. Source for item 4A data.
- [ ] USGS 7.5' Quad Chart
- [X] Survey
- [ ] Other Specify

Indicate the reference datum.
- [ ] NAD 27
- [ ] NAD 83
- [ ] Other Specify

4E. **Description of site location with respect to highways, street, airports, prominent terrain, features, existing structures, etc.** Please attach a U.S. Geological Survey Map (or equivalent) showing the construction site. If available, attach a copy of a documented site survey with the surveyor's certification.

400 23RD NE ST., AUBURN, WA 98001 - SEE ATTACHED

5. Height and Elevation (to nearest foot)

A. Elevation of ground above mean sea level.	56
B. Height of structure including all appurtenances and lighting above ground or water.	0
C. Overall height above mean sea level	56

Notice is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958, as amended (49 U.S.C. app. § 1501). Persons who knowingly and willfully violate the Notice requirements of Part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to Section 901(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C app § 1471(a)) as well as the fine (criminal penalty) of not more than $500 for the first offense and not more than $2,000 for subsequent offenses, pursuant to Section 902(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C app § 1472(a)).

I HEREBY CERTIFY that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to obstruction mark and/or light the structure in accordance with established marking & lighting standards as necessary.

Date	Typed or Printed Name and Title of Person Filing Notice	Signature
6-29-99	JOHN ANDERSON AIRPORT DIR.	John Anderson

FOR FAA USE ONLY — *FAA will either return this form or issue a separate acknowledgement.*

The Proposal:
- [ ] Does not require a notice to FAA.
- [X] Is not identified as an obstruction under any standard of FAR, Part 77, Subpart C, and would not be a hazard to air navigation.
- [ ] Is identified as an obstruction under the standards of FAR, Part 77, Subpart C, but would not be a hazard to air navigation.
- [ ] Should be obstruction [ ] marked [ ] lighted per FAA Advisory Circular 70/7460-1, Chapters ______
- [ ] Obstruction marking and lighting are not necessary.

Supplemental Notice of Construction, FAA Form 7460-2, is required any time the project is abandoned, or
- [ ] At least 48 hours before the start of construction.
- [ ] Within five days after the construction reaches its greatest height.

This determination expires on ______ unless:
(a) extended, revised or terminated by the issuing office;
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit is made to the FCC on or before the above expiration date. In such cases the determination expires on the date prescribed by the FCC for completion of construction, or on the date the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be postmarked or delivered to the issuing office at least 15 days prior to the expiration date.

If the structure is subject to the licensing authority of the FCC, a copy of this determination will be sent to that agency.

Remarks: The proposal has been designed in consultation with USDA and every effort has been made to comply with our Wildlife Hazard Advisory Circular 150/5200-33. Should there be a bird problem, mitigation measures should be discussed with USDA and the Seattle ADO.

NAD 83 Coordinates (Use these coordinates for any future correspondence with the FAA) Latitude ° ' " Longitude ° ' "

Issued in	Signature	Date
Renton, WA	[signature]	7/2/99

FAA Form 7460-1 (5-94) Supersedes Previous Edition

NSN: 0052-00-012-0007

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W&H PACIFIC
3025 112th Ave., NE
Bellevue, WA 98009
(425) 827-0220

■ **FAX**
❐ **TRANSMITTAL**

To:	**Tim Carlaw, P.E.**		
Company:	**City of Auburn Public Works**	Date:	**July 24, 1998**
Address:	**25 West Main Street**	Project Number:	**3-0223-1201**
City/State:	**Auburn, WA 98001-4998**	Project Name:	**Auburn Airport Drainage**
Tel/Fax #s:	**(253) 804-506/(253) 931-3053**	Regarding:	

From:	**Mark S. Van Wormer, P.E.**
Phone No.	(425) 828-2839
Fax No.	(425) 822-5341

We are Sending:	These are Transmitted:	Copied To:
❐ Attached	❐ For Your Info/File	______
■ Facsimile	❐ As Requested	______
____ # of Pages Including Cover	■ For Review & Comment	______

Copies	Description
1	Memorandum summarizing meeting notes
1	**Memorandum justifying the use of the airport for a regional detention site**

Comments:

A copy of the two memos was also sent to John Anderson. Please call me after you have reviewed the meeting notes. I will incorporate any additional comments and send the memo to the FAA. Mark Napier and I plan to meet with you, John Anderson, Cayla Morgan and Jeff Young at the airport July 29 to review detention site alternative designs and wildlife protection methods.

As we discussed I prepared a memo to explain the justification for using the airport as a stormwater detention site. This draft memo can be used to formulate an explanation to the FAA.

Mark Van Wormer

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W&H PACIFIC
3025 112th Ave., NE
Bellevue, WA 98009
(425) 827-0220

MEMORANDUM

To:	Tim Carlaw, P.E.		
Company:	Auburn Public Works Department	Date:	July 24, 1998
Address:	25 West Main Street	Project Number:	3-0233-1201
City/State:	Auburn, Washington 98001-4998	Project Name:	Auburn Airport Drainage Review
Tel/Fax #s:	253-804-5060/253-931-3053	Regarding:	Notes from Meeting of 7-14-98

From:	Mark S. Van Wormer, P.E.	cc:	John Anderson
Phone No.:	(425) 828-2839		
Fax No.:	(425) 822-5341		

A meeting was held July 14, 1998 at the Federal Aviation Administration (FAA) to review proposed regional stormwater detention alternatives at the Auburn Municipal Airport. In attendance were Cayla Morgan (FAA), John Anderson (Auburn Airport), Tim Carlaw (City of Auburn Public Works), Rob Millar (W&H Pacific) and Mark Van Wormer (W&H Pacific). The following is a summary of notes from that meeting.

A general overview of the regional stormwater detention analysis and proposed alternatives was presented that included project goals, site selection and detention design alternatives. Flooding in the vicinity of the airport is common during extended rainy periods due, in large part, to runoff originating from the airport. The City of Auburn is evaluating potential solutions to this problem. A copy of the Stormwater Detention Alternative Review and the schematic drawings were presented to Cayla.

The FAA is concerned about stormwater detention facilities that may impair safety, function or future airport expansion. However, the FAA is interested in addressing existing and future stormwater detention needs of the airport. Cayla requested specific information on the quantity of stormwater detention needed for runoff originating from the airport.

The FAA will require the proposed airport stormwater detention system to comply with federal grant assurances and pertinent FAA Advisory Circulars. The FAA may participate in a drainage project that benefits the airport if funding is available.

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The FAA suggested consulting with Animal Damage Control (ADC) (Department of Agriculture) for recommendations on possible treatment of detention facilities that will prohibit wildlife from interfering with airport operations. Jeff Young, of ADC (tel. 425-753-9884) is the primary contact. Cayla will arrange a meeting at the airport to review the detention alternatives on site with Jeff Young, Cayla Morgan, the City of Auburn and W&H Pacific.

The City of Auburn is willing to allow the "L" shaped ditch located at the northeast end of the airport to be filled and developed to benefit airport growth. Provisions will be necessary to make up for this loss of stormwater detention elsewhere on the airport property.

The FAA requested information from the City of Auburn to provide justification for locating and proposed regional stormwater detention facilities on the airport property.

MSV:cya
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W&H PACIFIC
3025 112th Ave., NE
Bellevue, WA 98009
(425) 827-0220

MEMORANDUM

To:	Tim Carlaw, P.E.		
Company:	Auburn Public Works Department	Date:	July 24, 1998
Address:	25 West Main Street	Project Number:	3-0233-1201
City/State:	Auburn, Washington 98001-4998	Project Name:	Auburn Airport Drainage Review
Tel/Fax #s:	253-804-5060/253-931-3053	Regarding:	Detention Site Justification

From:	Mark S. Van Wormer, P.E.	cc:	John Anderson
Phone No.:	(425) 828-2839		
Fax No.:	(425) 822-5341		

During our meeting July 14th with the FAA, Cayla Morgan voiced concern regarding the decision to use the airport as the preferred site for a proposed regional stormwater detention facility. The FAA requested justification for not using other potential non-airport sites for detention facilities.

The sites available for a regional stormwater detention facility in the vicinity of the airport are limited due to industrial and commercial development surrounding the airport. The airport is the only large tract of land owned by the City in the vicinity. In an effort to maximize the benefits the property provides to the public, the City is investigating ways to convert areas within the airport property that are usable only for airfield operations (safety areas, runway protection zones, etc.) for use as stormwater detention facilities without restricting airport operations, safety and future expansion.

Further, the flat terrain and shallow groundwater table characteristic of the river valley make it difficult to find suitable sites for stormwater detention. Most of the area in the vicinity is privately owned. The area adjacent to the airport is currently developed or is planned for future airport facilities. The City of Auburn currently has plans to develop two off-site detention facilities. These sites, however, do not have the capacity to handle all the existing and future needs of this drainage basin.

Creative Solutions ... Superior Service

The airport currently does not have adequate stormwater detention facilities to satisfy its own demands. There are flooding problems throughout the area just north of the airport during extended rainy periods. The City of Auburn is reviewing opportunities at the airport to construct facilities that will satisfy the stormwater detention needs and not impair airport operations. Special attention will be given to construct facilities that do not attract wildlife and can be easily maintained.

Water currently ponds on airport property for extended periods during winter and spring months due to the flat terrain. Construction of more defined and efficient drainage facilities may, in fact, reduce the cumulative duration of the ponding and result in a lesser overall wildlife attraction. Additionally, the proposed stormwater detention facilities have been sited beyond runway and taxiway safety areas in locations that will not conflict with future aviation related development.

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Appendix J

WSDOT adopts new grant assurances

On March 13, 2013, the Washington State Department of Transportation (WSDOT) convened a public hearing to adopt new grant assurances in the Washington Administrative Code Chapter 468-260 WAC. Grant assurances are terms and conditions used to protect the public's investment in the aviation system. They require airport sponsors to maintain and operate their facilities safely, efficiently and in accordance with specified conditions.

WSDOT's Airport Aid Grant Program provides about $1 million to airports for crucial projects every year. The program also uses state and local match funds to leverage millions in federal dollars. Funding for the grant program comes from aviation users – an 11-cent fee on aviation fuel and a portion of the state aircraft registration and excise tax fees.

Aviation Division Director Tristan Atkins noted, "Grant Assurances are an important part of WSDOT's Airport Aid Grant program. We have limited state airport aid grant funds, and that means we have to choose airport investments wisely and be transparent to the public."

Implementing these new airport grant assurances will preserve and protect the State's investments in the aviation system. Developing new assurances was a recommendation of the Washington State Aviation Planning Council in July 2009.

Modeled after the Federal Aviation Administration (FAA) assurances, WSDOT grant assurances provide enhanced oversight of airport aid grant funds, and add benefits to airports receiving funds. The similarity of FAA and WSDOT grant assurances simplifies the grant process for the 64 National Plan of Integrated Airport Systems (NPIAS) airports that also abide by FAA grant assurances, reinforces the Aviation Division's policy to encourage Non-NPIAS (only state grant eligible) airports to strive to meet FAA standards, and demonstrates the WSDOT Aviation's continuing partnership with the FAA.

WSDOT's new grant assurances carry forward all the provisions of the previous grant agreement:

- Compliance with plans and specifications
- Real property acquisition procedures
- Local jurisdiction funds availability
- Maintain public access for useful life of a project, not to exceed 20 years
- Airport shall not charge state agencies for limited/reasonable use
- Inspections and Reporting

The new grant assurances add new components tied to compatible land-use planning, public hearings, pavement maintenance, non-discrimination, environmental stewardship, and a host of similar programmatic improvements:

- References to state RCWs, WACs and Executive Orders
- Good title
- Preserving rights and powers
- Consistency with local plans
- Consideration of local interest
- Consultation with users
- Public hearings
- Air and water quality standards
- Pavement preventive maintenance
- Accounting system, audit, and recordkeeping requirements
- Wage rates
- Nondiscrimination requirements
- Equal employment opportunity (EEO) responsibilities
- Veteran's preference
- Planning projects
- Operation and maintenance
- Hazard removal and mitigation
- Compatible land use
- Economic nondiscrimination
- Fee and rental structure
- Airport revenues
- Land for state facilities
- Airport layout plan
- Disposal of land
- Engineering and design services
- Foreign market restrictions
- Policies, standards, and specifications
- Disadvantaged business enterprises
- Hangar construction

Appendix K

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98055-4056

May 27, 2015

Ms. Shelley Coleman
Finance Director
City of Auburn
25 W. Main Street
Auburn, WA 98001

Dear Ms. Coleman:

The Auburn Municipal Airport S50 Airport Layout Plan (ALP), prepared by Century West, and bearing your signature, is approved and the master plan is accepted. A signed copy of the approved ALP is enclosed.

An aeronautical study (no. 2014-ANM-1473-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport.

Sincerely,

Carolyn T. Read, P.E.
Manager, FAA Seattle Airports District Office

Enclosure
cc: Jamelle Garcia, Airport Manager
David Miller, Century West

Glossary of Terms

GLOSSARY OF AVIATION TERMS

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

Above Ground Level (AGL) – As measured above the ground; used to identify heights of built items (towers, etc.) on aeronautical charts in terms of absolute height above the ground.

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

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

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

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

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

Aircraft Approach Category - Grouping of aircraft based on the speed they are traveling when configured for landing (typically 1.3 times the aircraft stall speed in landing configuration). As a rule of thumb, slower approach speeds mean smaller airport dimensions and faster approach speeds require larger dimensions. The aircraft approach categories are:

Category A - Speed less than 91 knots;

Category B - Speed 91 knots or more but less than 121 knots

Category C - Speed 121 knots or more but less than 141 knots

Category D - Speed 141 knots or more but less than 166 knots

Category E - Speed 166 knots or more

Aircraft Holding Area – An area typically located adjacent to a taxiway and runway end designed to accommodate aircraft prior to departure (for pre–takeoff engine checks, instrument flight plan clearances, etc.). Per FAA design standards, aircraft holding areas should be located outside the runway safety area (RSA) and obstacle free zone (OFZ) and aircraft located in the holding area should not interfere with normal taxiway use (taxiway object free area). Sometimes referred to as holding bays or "elephant ear." Smaller areas (aircraft turnarounds) are used to facilitate aircraft movement on runways without exit taxiways or where back-taxiing is required.

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

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

Aircraft Parking Line (APL) – A setback depicted on an ALP or other drawings that defines the minimum separation between aircraft parking areas and an adjacent runway or taxiway. The APL dimension reflects runway and taxiway clearances (object free area, etc.) and FAR Part 77 airspace surface clearance (transitional surface penetrations) for parked aircraft. Typically the tail height of the parked aircraft is used to determine adequate clearance for the transitional surface.

Airplane Design Group - A grouping of airplanes based on wingspan and tail height. As with Approach Category, the wider the wingspan, the bigger the aircraft is, the more room it takes up for operating on an airport. The Airplane Design Groups are:

Group I:	Up to but not including 49 feet or tail height up to but not including 20 feet.
Group II:	49 feet up to but not including 79 feet or tail height from 20 up to but not including 30 feet.
Group III:	79 feet up to but not including 118 feet or tail height from 30 up to but not including 45 feet.
Group IV:	118 feet up to but not including 171 feet or tail height from 45 up to but not including 60 feet.
Group V:	171 feet up to but not including 214 feet or tail height from 60 up to but not including 66 feet.
Group VI:	214 feet up to but not including 262 feet or tail height from 66 up to but not including 80 feet.

Airport - A landing area regularly used by aircraft for receiving or discharging passengers or cargo, including heliports and seaplane bases.

Airport Beacon (also Rotating Beacon) – A visual navigational aid that displays alternating green and white flashes for a lighted land airport and white for an unlighted land airport.

Airports District Office (ADO) - The "local" office of the FAA that coordinates planning and construction projects. The Seattle ADO is responsible for airports located in Washington, Oregon, and Idaho.

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

Airport Layout Plan (ALP) - The FAA approved drawing which shows the existing and anticipated layout of an airport for the next 20 years. An ALP is prepared using FAA design standards. Future development projects must be consistent with the ALP to be eligible for FAA funding. ALP drawings are typically updated every 7 to 10 years to reflect significant changes, or as needed.

Airport Reference Code (ARC) - An FAA airport coding system that is defined based on the critical or design aircraft for an airport or individual runway. The ARC is an alpha-numeric code based on aircraft approach speed and airplane wingspan (see definitions in glossary). The ARC is used to determine the appropriate design standards for runways, taxiways, and other associated facilities. An airport designed to accommodate a Piper Cub (an A-I aircraft) requires less room than an airport designed to accommodate a Boeing 747 (a D-V aircraft).

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

Aircraft Rescue and Fire Fighting (ARFF) - On airport emergency response required for certificated commercial service airports (see FAR Part 139).

Airside – The portion of an airport that includes aircraft movement areas (runways, taxiways, etc.)

Airspace - The area above the ground in which aircraft travel. It is divided into enroute and terminal airspace, with corridors, routes, and restricted zones established for the control and safety of air traffic.

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

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

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

Approach Light System (ALS) – Configurations of lights positioned symmetrically beyond the runway threshold and the extended runway centerline. The ALS visually augments the electronic navigational aids for the runway.

Approach Surface (Also FAR Part 77 Approach) - An imaginary (invisible) surface that rises and extends from the ends of a runway to provide an unobstructed path for aircraft to land or take off. The size and slope of the approach surface vary depending upon the size of aircraft that are accommodated and the approach capabilities (visual or instrument).

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

Aqueous Film Forming Foam (AFFF) – A primary fire fighting agent that is used to create a blanket that smothers flame or prevents ignition (fuel spills, etc.). AFFF is also used to foam runways during emergency landings.

Asphalt or Asphaltic Concrete (AC) – Flexible oil-based pavement used for airfield facilities (runways, taxiways, aircraft parking apron, etc.); also commonly used for road construction.

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

AVGAS – Highly refined gasoline used in airplanes with piston engines. The current grade of AVGAS available is 100 Octane Low Lead (100LL).

Avigation Easement - A grant of property interest (airspace) over land to ensure unobstructed flight. Typically acquired by airport owners to protect the integrity of runway approaches. Restrictions typically include maximum height limitations for natural (trees, etc.) or built items, but may also address permitted land uses by the owner of the underlying land that are compatible with airport operations.

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

Based Aircraft - Aircraft permanently stationed at an airport usually through some form of agreement with the airport owner. Used as a measure of activity at an airport.

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

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

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

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

Commercial Service Airport - An airport designed and constructed to serve scheduled or unscheduled commercial airlines. Commercial service airports are certified under FAR Part 139.

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

Complimentary Fire Extinguishing Agent – Fire extinguishing agents that provide rapid fire suppression, which may be used in conjunction with principal agents (e.g., foam). Examples include sodium-based and potassium-based dry chemicals, Halocarbons, and Carbon dioxide. Also recommended for electrical and metal fires where water-based foams are not used. Complimentary agents are paired with principal agents based on their compatibility of use.

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

Controlling Obstruction – The highest obstruction relative to a defined plane of airspace (i.e., approach surface, etc.).

Critical Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take off weight. The same aircraft may not be critical to all design items (i.e., runway length, pavement strength, etc.). Also referred to as "design aircraft."

Crosswind - Wind direction that is not parallel to the runway or the path of an aircraft.

Crosswind Runway – An additional runway (secondary, tertiary, etc.) that provides wind coverage not adequately provided by the primary runway. Crosswind runways are generally eligible for FAA funding when a primary runway accommodates less than 95 percent of documented wind conditions (see wind rose).

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

Declared Distances – The distances the airport owner declares available for airplane operations (e.g., takeoff run, takeoff distance, accelerate-stop distance, and landing distance). In cases where runways meet all FAA design criteria without modification, declared distances equal the total runway length. In cases where any declared distances are less than full runway length, the dimension should be published in the FAA Airport/Facility Directory (A/FD).

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

Design Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated takeoff weight. The same aircraft may not represent the design aircraft for all design items (i.e., runway length, pavement strength, etc.). Also referred to as "critical aircraft."

Displaced Threshold – A landing threshold located at a point other than on the runway end, usually provided to mitigate close-in obstructions to runway approaches for landing aircraft. The area between the runway end and the displaced threshold accommodates aircraft taxi and takeoff, but not landing.

Distance Measuring Equipment (DME) – Equipment that provides electronic distance information to enroute or approaching aircraft from a land-based transponder that sends and receives pulses of fixed duration and separation. The ground stations are typically co-located with VORs, but they can also be co-located with an ILS.

Distance Remaining Signs – Airfield signs that indicate to pilots the amount of useable runway remaining in 1,000-foot increments. The signs are located along the side of the runway, visible for each direction of runway operation.

DNL - Day-night sound levels, a mathematical method of measuring noise exposure based on cumulative, rather than single event impacts. Night time operations (10pm to 7AM) are assessed a noise penalty to reflect the increased noise sensitivity that exists during normal hours of rest. Previously referred to as Ldn.

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

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

Entitlements - Distribution of Airport Improvement Plan (AIP) funds by FAA from the Airport & Airways Trust Fund to commercial service airport sponsors based on passenger enplanements or cargo volumes and smaller fixed amounts for general aviation airports (Non-Primary Entitlements).

Experimental Aircraft – See homebuilt aircraft.

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

FAR Part 77 - Federal Air Regulations (FAR) which establish standards for determining obstructions in navigable airspace and defines imaginary (airspace) surfaces for airports and heliports that are designed to prevent hazards to air navigation. FAR Part 77 surfaces include approach, primary, transitional, horizontal, and conical surfaces. The dimensions of surfaces can vary with the runway classification (large or small airplanes) and approach type of each runway end (visual, nonprecision instrument, precision instrument). The slope of an approach surface also varies by approach type and runway classification. FAR Part 77 also applies to helicopter landing areas.

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

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

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

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

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

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

Flight Service Station (**FSS) –** FAA or contracted service for pilots to contact (on the ground or in the air) to get weather and airport information. Flight plans are also filed with the FSS.

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

Glide Slope (GS) – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic vertical guidance to aircraft.

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

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

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

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

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

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

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

Hold Line (Aircraft Hold Line) – Pavement markings located on taxiways that connect to runways, indicating where aircraft should stop before entering runway environment. At controlled airports, air traffic control clearance is required to proceed beyond a hold line. At uncontrolled airports, pilots are responsible for ensuring that a runway is clear prior to accessing for takeoff.

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

Home Built Aircraft - An aircraft built by an amateur from a kit or specific design (not an FAA certified factory built aircraft). The aircraft built under the supervision of an FAA-licensed mechanic and are certified by FAA as “Experimental.”

Horizontal Surface - One of the FAR Part 77 Imaginary (invisible) Surfaces. The horizontal surface is an imaginary flat surface 150 feet above the established airport elevation (typically the highest point on the airfield). Its perimeter is constructed by swinging arcs (circles) from each runway end and connecting the arcs with straight lines. The oval-shaped horizontal surface connects to other Part 77 surfaces extending upward from the runway and also beyond its perimeter.

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

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

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

Instrument Landing System (ILS) - An ILS is an electronic navigational aid system that guides aircraft for a landing in bad weather. Classified as a precision instrument approach, it is designed to provide a precise approach path for course alignment and vertical descent of aircraft. Generally consists of a localizer, glide slope, outer marker, and middle marker. ILS runways are generally equipped with an approach lighting system (ALS) to maximize approach capabilities. A Category I ILS allows aircraft to descend as low as 200 feet above runway elevation with ½ mile visibility.

Instrument Meteorological Conditions (IMC) - Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than minima specified for visual meteorological conditions.

Instrument Runway - A runway equipped with electronic navigational aids that accommodate straight-in precision or nonprecision instrument approaches.

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

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

Knot (Nautical Mile) – one nautical mile = 1.152 statute miles.

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

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

Landside – The portion of an airport that includes aircraft parking areas, fueling, hangars, airport terminal area facilities, vehicle parking and other associated facilities.

Larger than Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve large planes (aircraft with maximum takeoff weights greater than 12,500 pounds).

Ldn – Noise measurement metric (see DNL)

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

Large Aircraft - An aircraft with a maximum takeoff weight more than 12,500 lbs.

Light Sport Aircraft (LSA) – A basic aircraft certified by FAA that can be flown by pilots with limited flight training (Sport Pilot certificates), but also provide lower cost access to basic aircraft for all pilot levels. LSA design limits include maximum a gross takeoff weight of 1,320 pounds (land planes) and a maximum of two seats.

Local Area Augmentation System (LAAS) – GPS-based instrument approach that utilizes ground-based systems to augment satellite coverage to provide vertical (glideslope) and horizontal (course) guidance.

Local Operation - Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Localizer – The component of an instrument landing system (ILS) that provides electronic lateral (course) guidance to aircraft. Also used to support non-precision localizer approaches.

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

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

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

MALSR - **M**edium-intensity **A**pproach **L**ighting **S**ystem with **R**unway alignment indicator lights. An approach lighting system (ALS) which provides visual guidance to landing aircraft.

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

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

Microwave Landing System (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft with compatible equipment. Originally developed as the "next-generation" replacement for the ILS, the FAA discontinued the MLS program in favor of GPS-based systems.

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

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

Missed Approach Procedure – A prescribed maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. Usually requires aircraft to climb from the airport environment to a specific holding location where another approach can be executed or the aircraft can divert to another airport.

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

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

MSL - Elevation above Mean Sea Level.

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

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

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

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

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

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

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

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

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

Passenger Facility Charge (PFC) – A user fee charged by commercial service airports for enplaning passengers. Airports must apply to the FAA and meet certain requirements in order to impose a PFC.

Pavement Condition Index (PCI) – A scale of 0-100 that is used to rate airfield pavements ranging from failed to excellent based on visual inspection. Future PCIs can be predicted based on pavement type, age, condition and use as part of a pavement maintenance program.

Pavement Strength or Weight Bearing Capacity – The design limits of airfield pavement expressed in maximum aircraft weight for specific and landing gear configurations (i.e., single wheel, dual wheel, etc.) Small general aviation airport pavements are typically designed to accommodate aircraft weighing up to 12,500 pounds with a single-wheel landing gear.

Portland Cement Concrete (PCC) – Rigid pavement used for airfield facilities (runways, taxiways, aircraft parking, helipads, etc.).

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

Precision Instrument Runway (PIR) - A runway equipped with a "precision" instrument approach (descent and course guidance), which allows aircraft to land in bad weather.

Precision Instrument Approach – An instrument approach that provides electronic lateral (course) and vertical (descent) guidance to a runway end. A nonprecision instrument approach typically provides only course guidance and the pilot is responsible for managing defined altitude assignments at designated points within the approach.

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

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

Principal Fire Extinguishing Agent – Fire extinguishing agents that provide permanent control of fire through a fire-smothering foam blanket. Examples include protein foam, aqueous film forming foam and fluoroprotein foam.

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

Area Navigation (RNAV) - is a method of instrument flight navigation that allows an aircraft to choose a course within a network of navigation beacons rather than navigating directly to and from the beacons. Originally developed in the 1960, RNAV elements are now being integrated into GPS-based navigation.

Relocated Threshold – A runway threshold (takeoff and landing point) that is located at a point other than the (original) runway end. Usually provided to mitigate nonstandard runway safety area (RSA) dimensions beyond a runway end. When a runway threshold is relocated, the published length of the runway is reduced and the pavement between the relocated threshold and to the original end of the runway is not available for aircraft takeoff or landing. This pavement is typically marked as taxiway, marked as unusable, or is removed.

Required Navigation Performance (RNP) – A type of performance-based navigation system that that allows an aircraft to fly a specific path between two 3-dimensionally defined points in space. RNP approaches require on-board performance monitoring and alerting. RNP also refers to the level of performance required for a specific procedure or a specific block of airspace. For example, an RNP of .3 means the aircraft navigation system must be able to calculate its position to within a circle with a radius of 3 tenths of a nautical mile. RNP approaches have been designed with RNP values down to .1, which allow aircraft to follow precise 3 dimensional curved flight paths through congested airspace, around noise sensitive areas, or through difficult terrain.

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

Rotorcraft - A helicopter.

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

Runway Bearing – The angle of a runway centerline expressed in degrees (east or west) relative to true north.

Runway Designation Numbers – Numbers painted on the ends of a runway indicating runway orientation (in degrees) relative to magnetic north. “20” = 200 degrees magnetic, which means that the final approach for Runway 20 is approximately 200 degrees (+/- 5 degrees).

Runway End Identifier Lights (**REILs)** - Two high-intensity sequenced strobe lights that help pilots identify a runway end during landing in darkness or poor visibility.

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

Runway Protection Zone (RPZ) – A trapezoid-shaped area located beyond the end of a runway that is intended to be clear of people or built items. The geometry of the RPZ often coincides with the inner portion of the runway approach surface. However, unlike the approach surface, the RPZ is a defined area on the ground that does not have a vertical slope component for obstruction clearance. The size of the RPZ increases as runway approach capabilities or aircraft approach speeds increase. Previously defined as “clear zone.”

Runway Safety Area (RSA) – A symmetrical ground area extending along the sides and beyond the ends of a runway that is intended to accommodate inadvertent aircraft passage without causing damage. The dimensions for the RSA increase for runways accommodating larger or faster aircraft. FAA standards include surface condition (compaction, etc.) and absence of obstructions. Any items that must be located within an RSA because of their function (runway lights, airfield signage, wind cones, etc.) must be frangible (breakable) to avoid significant aircraft damage.

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

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

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

Statute Mile – 5,280 feet (a nautical mile = 6,080 feet)

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

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

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

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

Taxilane – A defined path used by aircraft to move within aircraft parking apron, hangar areas and other landside facilities.

Taxiway – A defined path used by aircraft to move from one point to another on an airport.

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

Threshold Lights – Components of runway edge lighting system located at the ends of runways and at displaced thresholds. Threshold lights typically have split lenses (green/red) that identify the beginning and ends of usable runway.

Through-the-Fence – Term used to describe how off-airport aviation users (private airparks, hangars, etc.) access an airport "through-the-fence," rather than having facilities located on airport property.

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

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

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

Traffic Pattern Altitude - The established altitude for a runway traffic pattern, typically 800 to 1,000 feet above ground level (AGL).

Transitional Surfaces - One of the FAR Part 77 Imaginary Surfaces, the transitional surface extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Universal Communications (UNICOM) is an air-ground communication facility operated by a private agency to provide advisory service at uncontrolled airports.

Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve small planes (aircraft with maximum takeoff weights of 12,500 pounds or less).

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

VOR - Very High Frequency Omnidirectional Range – A ground based electronic navigational aid that transmits radials in all directions in the VHF frequency spectrum. The VOR provides azimuth guidance to aircraft by reception of radio signals.

VORTAC – VOR collocated with ultra high frequency tactical air navigation (TACAN)

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

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

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

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

Wide Area Augmentation System (WAAS) – GPS-based instrument approach that can provide both vertical (glideslope) and horizontal (course) guidance. WAAS-GPS approaches are able to provide approach minimums nearly comparable to a Category I Instrument Landing System (ILS).

Wind Rose - A diagram that depicts observed wind data direction and speed on a 360-degree compass rose. Existing or planned proposed runway alignments are overlain to determine wind coverage levels based on the crosswind limits of the design aircraft.

Wind Cone – A device located near landing areas used by pilots to verify wind direction and velocity. Usually manufactured with brightly colored fabric and may be lighted for nighttime visibility. Also referred to as "wind sock."

List of Acronyms

AC – Advisory Circular
AC – Asphaltic Concrete
ADG – Airplane Design Group
ALP – Airport Layout Plan
ALS – Approach Lighting System
APL – Aircraft Parking Line
ARC – Airport Reference Code
ARP - Airport Reference Point
ASDA – Accelerate-Stop Distance Available
ASV – Annual Service Volume
ATCT – Air Traffic Control Tower
ASOS – Automated Surface Observation System
AWOS – Automated Weather Observation System
BRL – Building Restriction Line
CTAF – Common Traffic Advisory Frequency
FAA – Federal Aviation Administration
FAR – Federal Air Regulation
FBO – Fixed Base Operator
GPS – Global Positioning System
HIRL – High Intensity Runway Lighting
IFR – Instrument Flight Rules
IMC – Instrument Meteorological Conditions
LDA – Landing Distance Available
LDA - Localizer Directional Aid
LIRL – Low Intensity Runway Lighting
MIRL – Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
NAVAID – Navigational Aid
OCS – Obstacle Clearance Surface
OFA – Object Free Area
OFZ – Obstacle Free Zone
PAPI – Precision Approach Path Indicator
PCC – Portland Cement Concrete
PCI – Pavement Condition Index
REIL – Runway End Identifier Lights
RPZ – Runway Protection Zone
RSA – Runway Safety Area
RVZ – Runway Visibility Zone
TSA- Taxiway Safety Area
TSA – Transportation Security Administration
TODA – Takeoff Distance Available
TORA – Takeoff Run Available
UGA – Urban Growth Area
UGB – Urban Growth Boundary
UNICOM – Universal Communications
VASI – Visual Approach Slope Indicator
VFR – Visual Flight Rules
VGI - Visual Guidance Indicators

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