Chapter 5 – Airport Development Alternatives

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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.

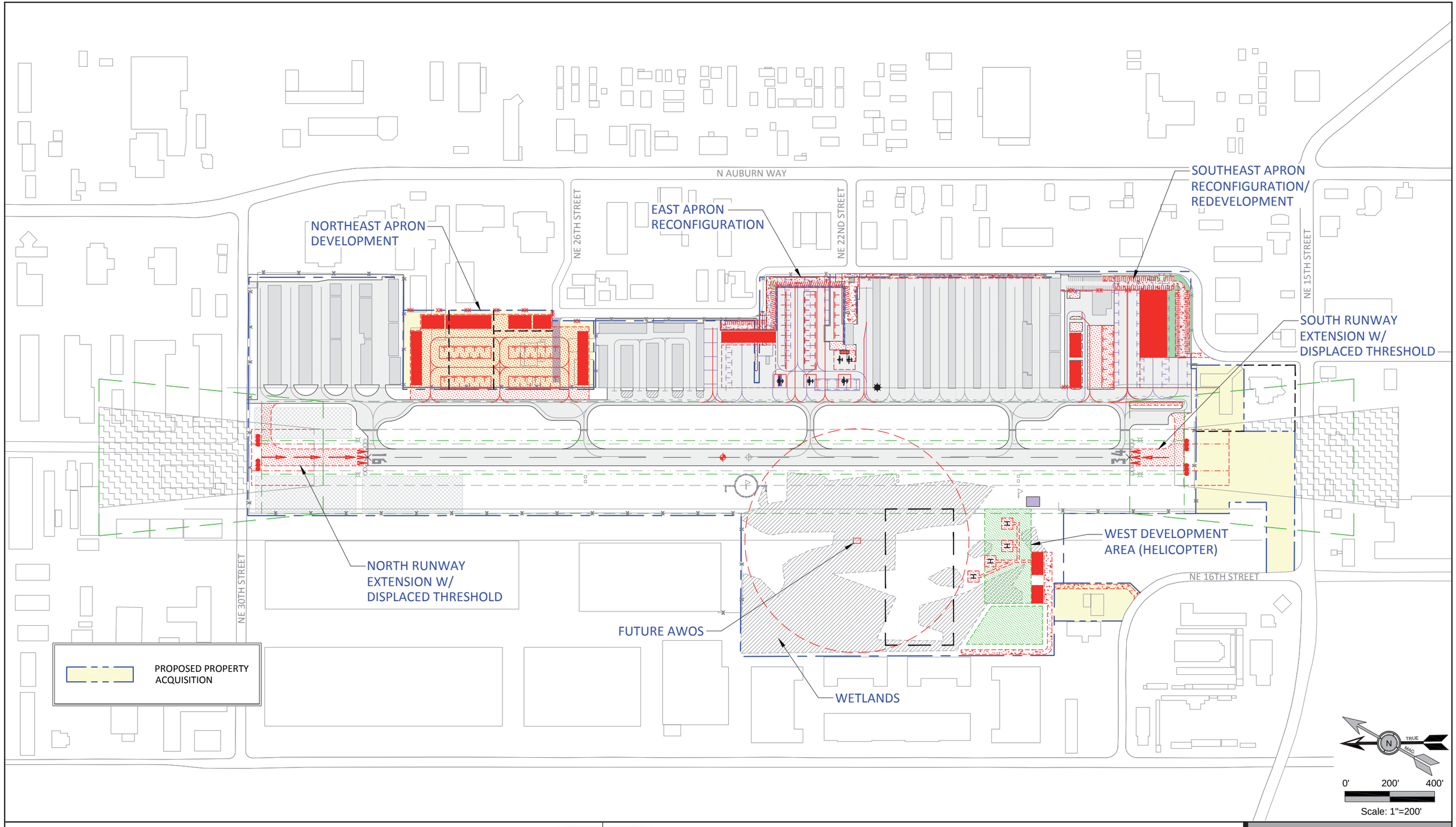
The preliminary alternatives will be evaluated to identify general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined. From this evaluation 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**

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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.

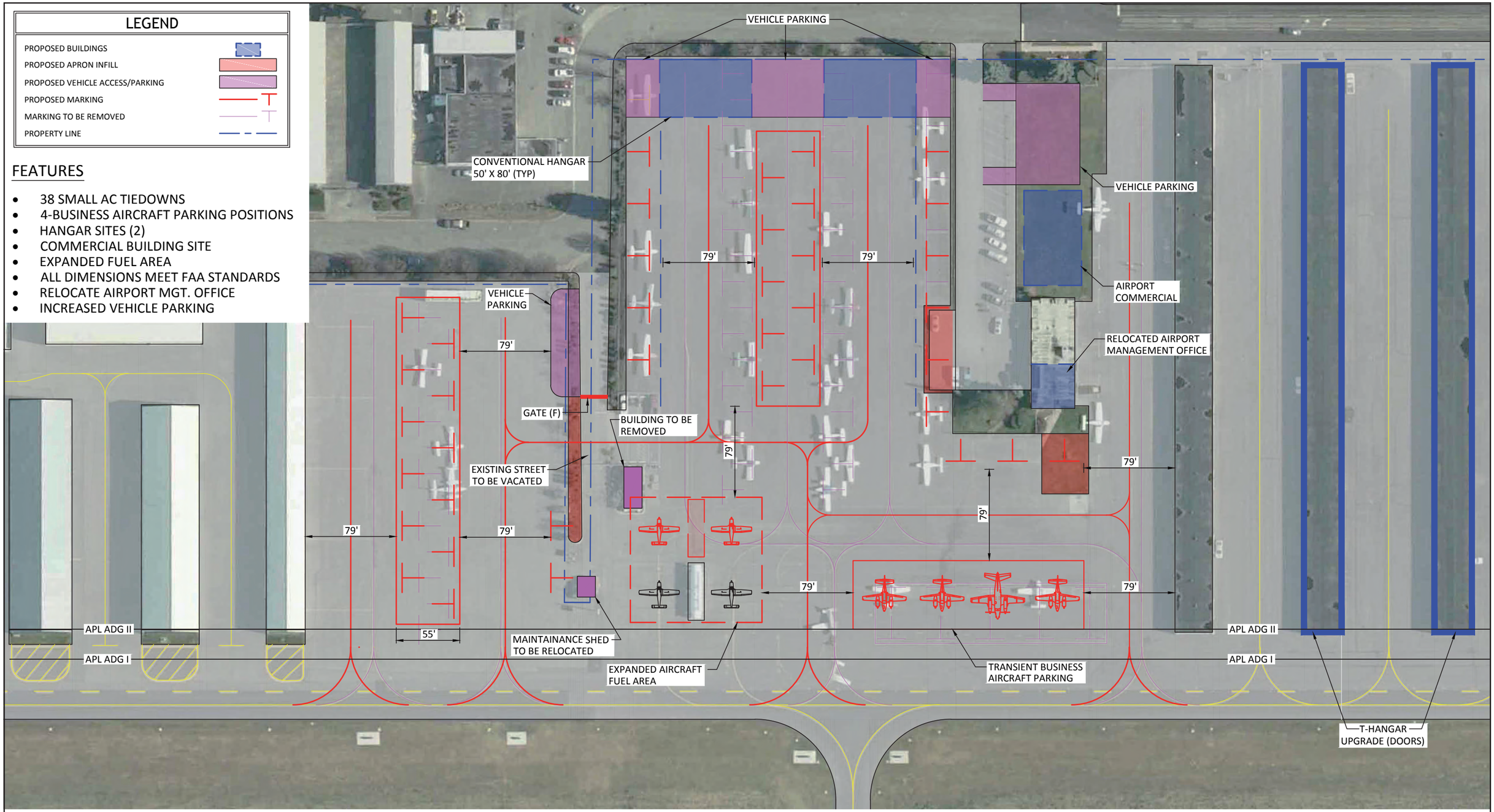
The proposed upgrade (doors) to City-owned open T-hangars identified in Option A is maintained in this option.

LEGEND

- PROPOSED BUILDINGS
- PROPOSED APRON INFILL
- PROPOSED VEHICLE ACCESS/PARKING
- PROPOSED MARKING
- MARKING TO BE REMOVED
- PROPERTY LINE

FEATURES

- 38 SMALL AC TIEDOWNS
- 4-BUSINESS AIRCRAFT PARKING POSITIONS
- HANGAR SITES (2)
- COMMERCIAL BUILDING SITE
- EXPANDED FUEL AREA
- ALL DIMENSIONS MEET FAA STANDARDS
- RELOCATE AIRPORT MGT. OFFICE
- INCREASED VEHICLE PARKING



TERMINAL AREA OPTION A

CITY OF AUBURN WASHINGTON

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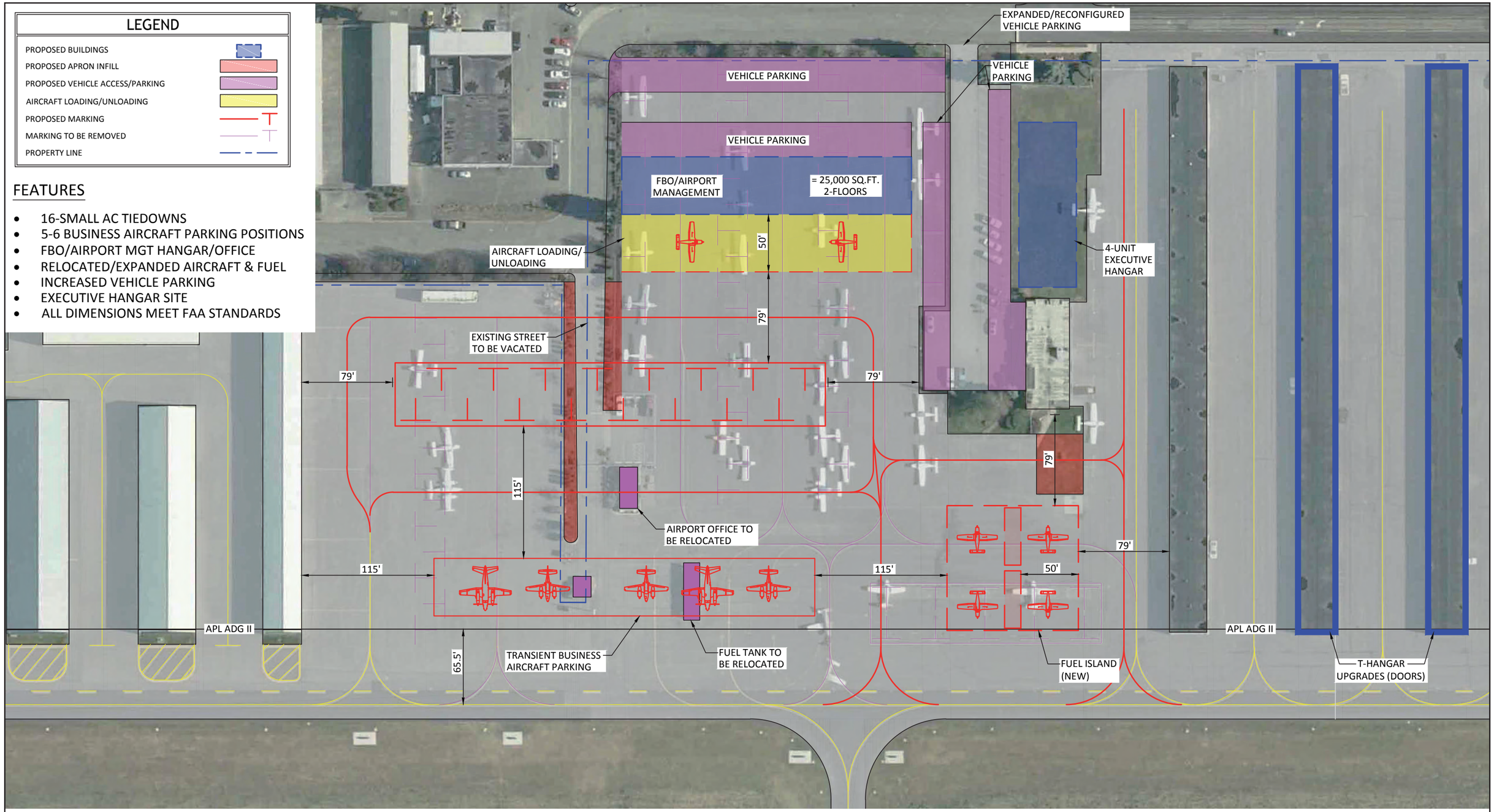
LEGEND

- PROPOSED BUILDINGS
- PROPOSED APRON INFILL
- PROPOSED VEHICLE ACCESS/PARKING
- AIRCRAFT LOADING/UNLOADING
- PROPOSED MARKING
- MARKING TO BE REMOVED
- PROPERTY LINE

FEATURES

- 16-SMALL AC TIEDOWNS
- 5-6 BUSINESS AIRCRAFT PARKING POSITIONS
- FBO/AIRPORT MGT HANGAR/OFFICE
- RELOCATED/EXPANDED AIRCRAFT & FUEL
- INCREASED VEHICLE PARKING
- EXECUTIVE HANGAR SITE
- ALL DIMENSIONS MEET FAA STANDARDS



TERMINAL AREA OPTION B

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.

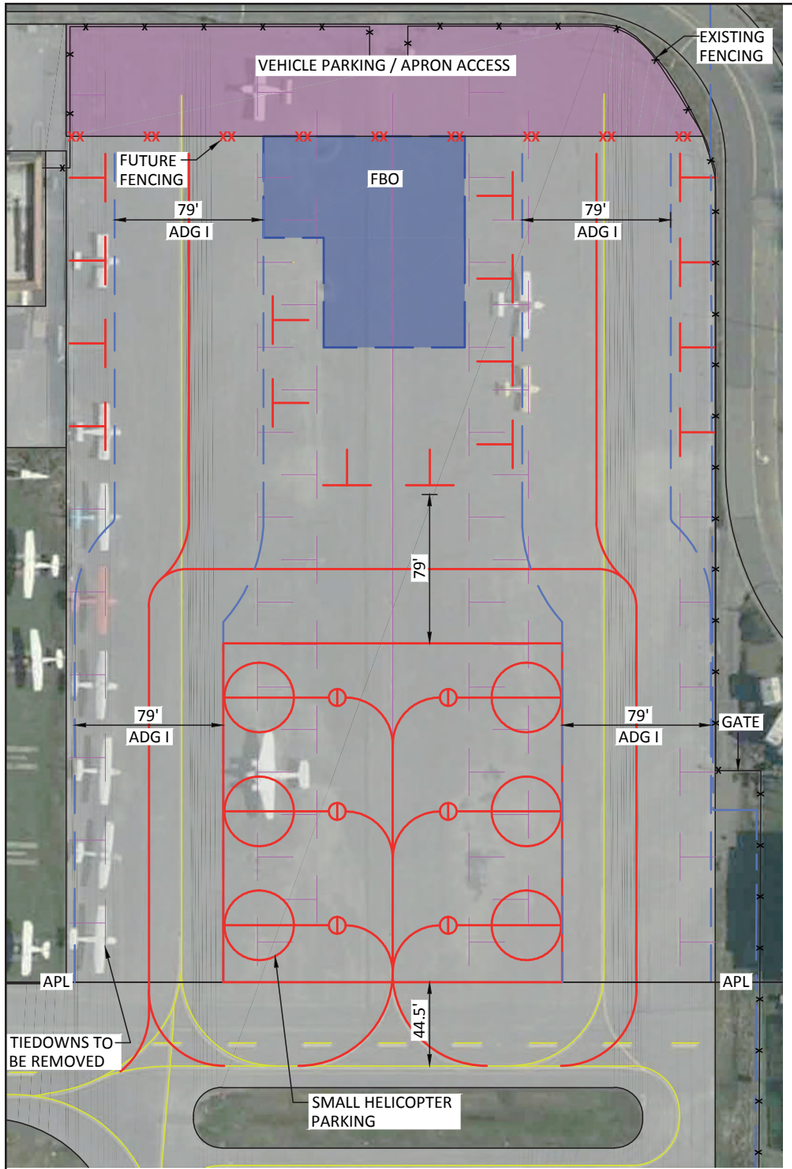
Apron Option C – Small Airplane Tiedowns

The elements of Option C include:

- 44 Small Airplane Tiedowns
- Vehicle Parking

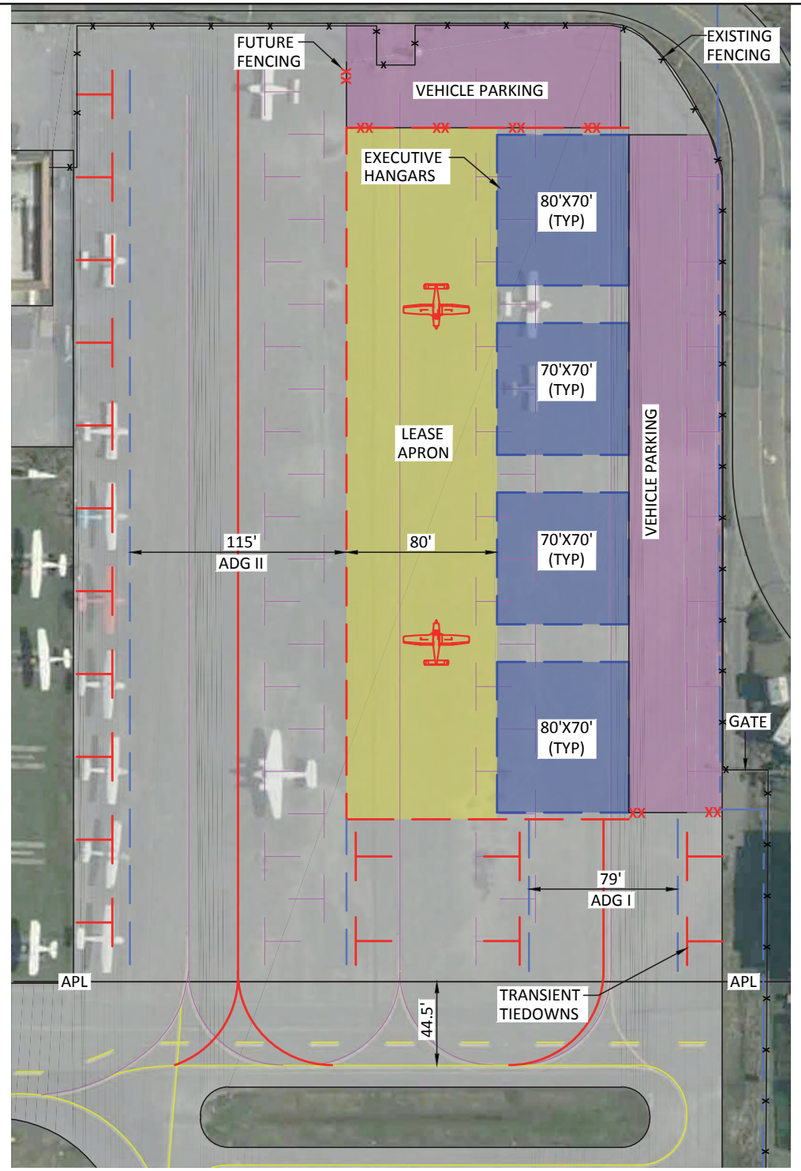
The focus of Option C is to maximize small airplane parking, while meeting FAA taxilane clearance standards.

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.



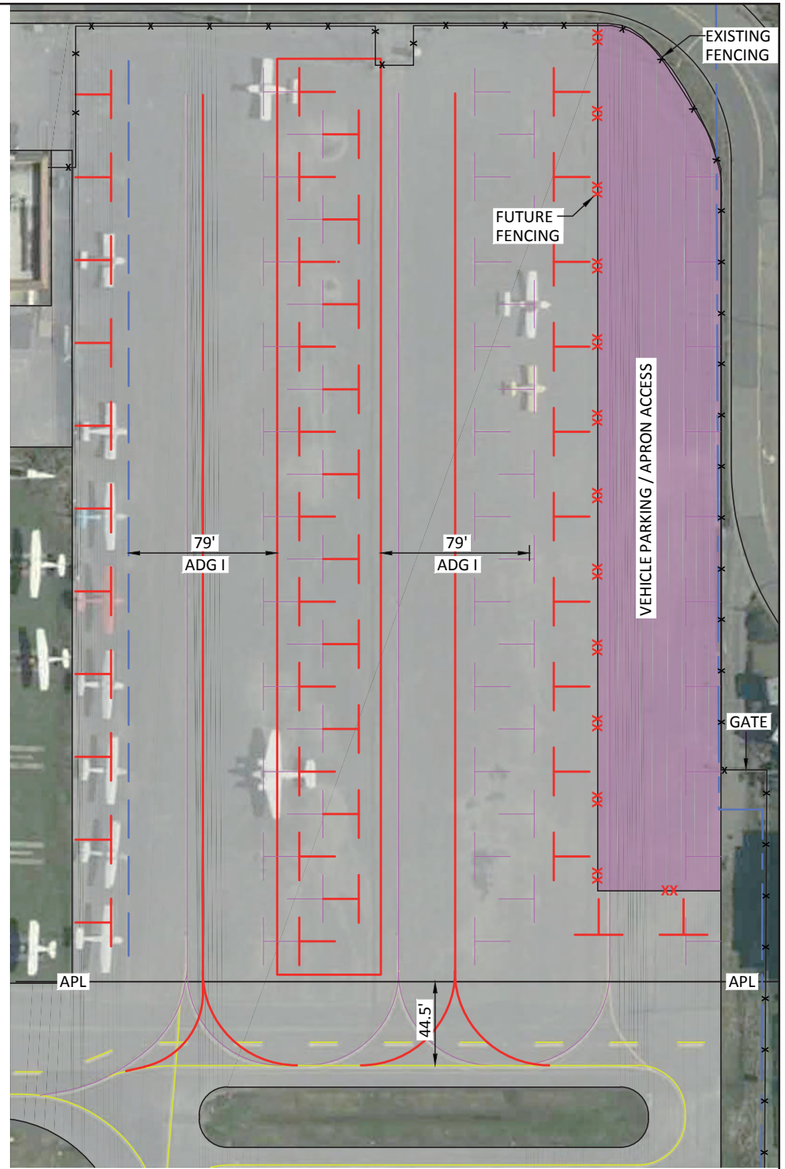
APRON OPTION A

- 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

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S.E. APRON REDEVELOPMENT OPTIONS | **FIG. 5-3**

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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.

West Development Option A – Helicopter Apron

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

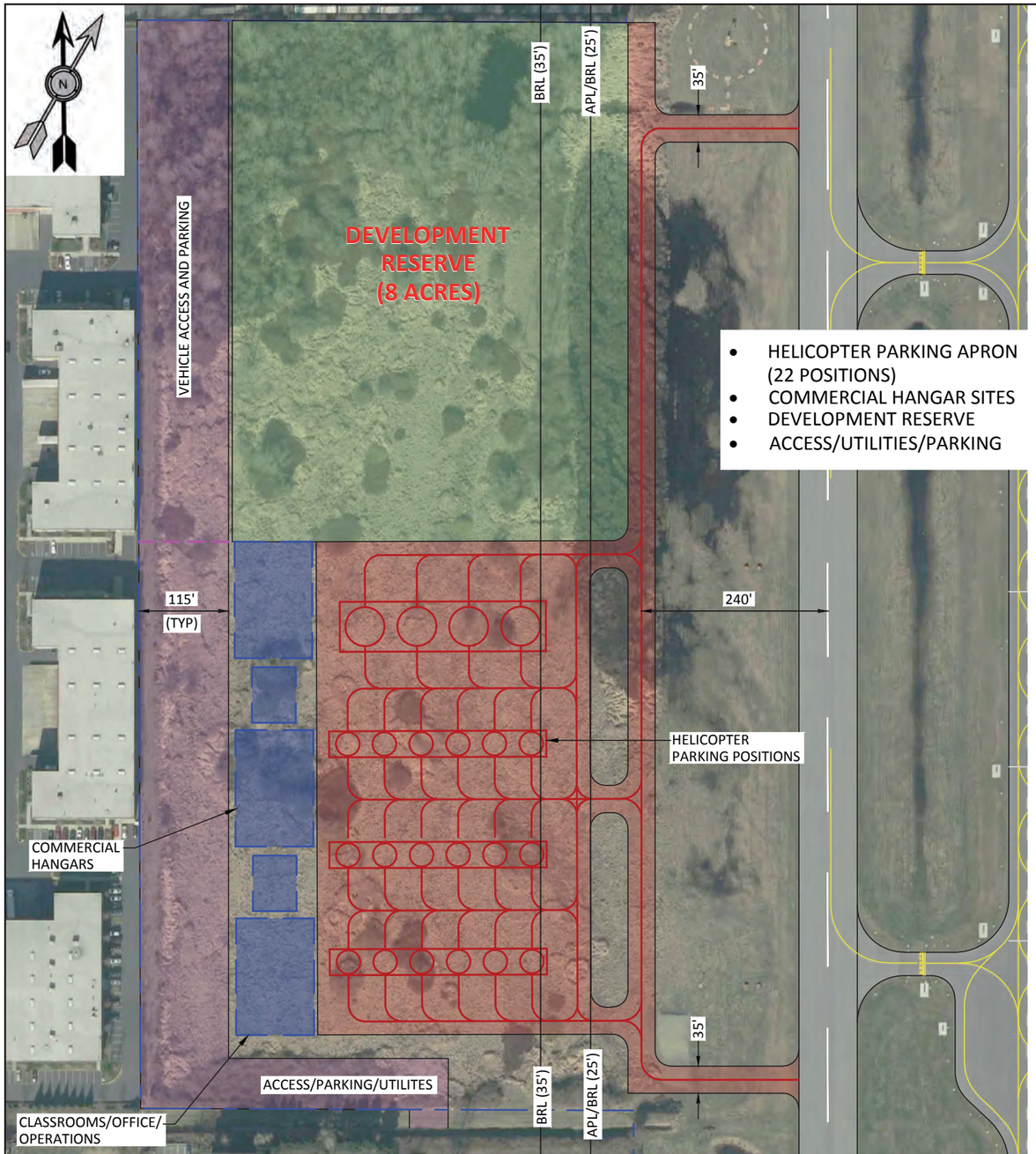
Option C provides a moderate development concept that reduces wetland impact and mitigation requirements by concentrating development in areas with less wetland coverage. It is anticipated that the cost of extending surface access and utilities to the site will make the smaller scale development more 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

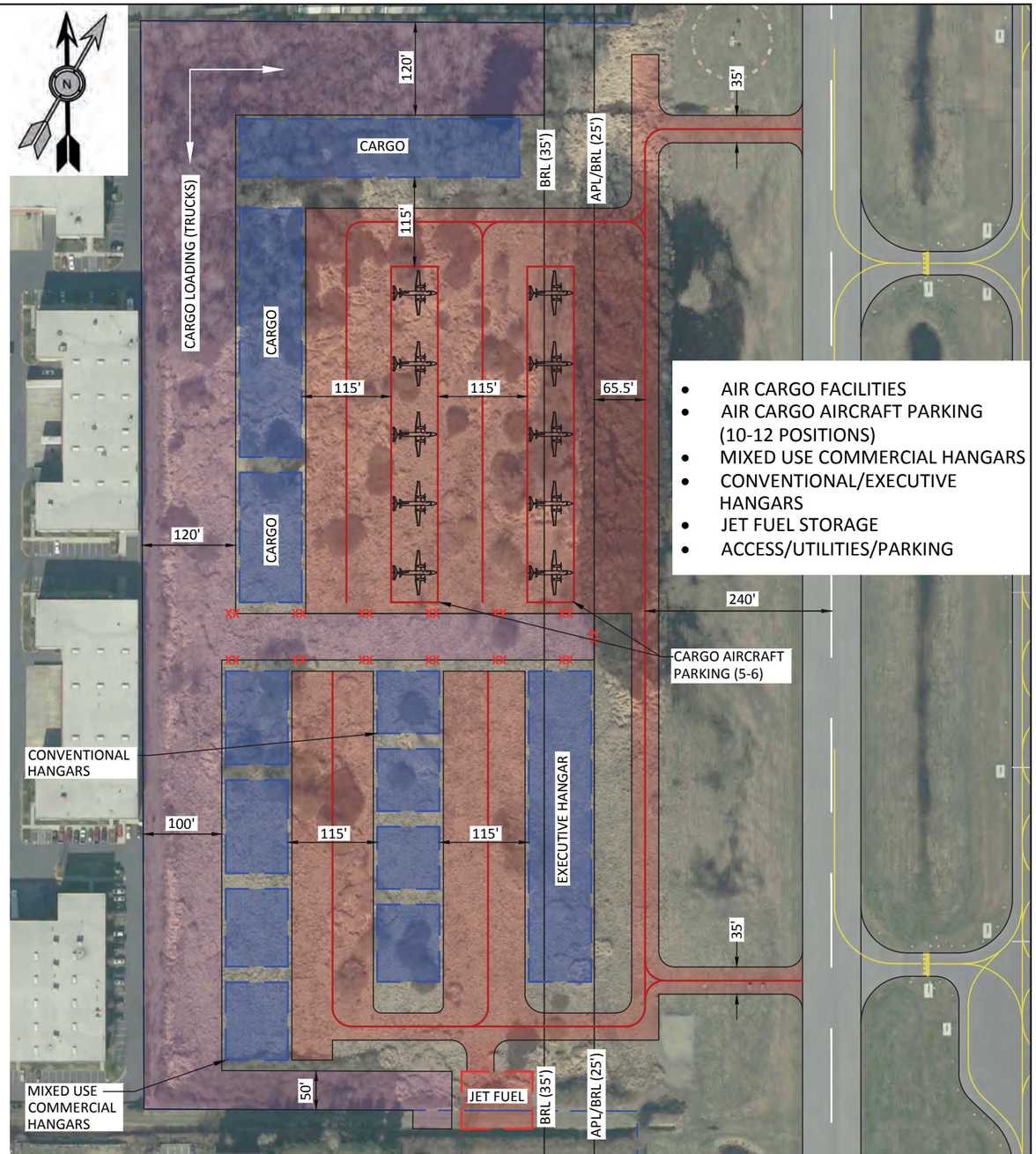
The elements of Option D include:

- 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

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

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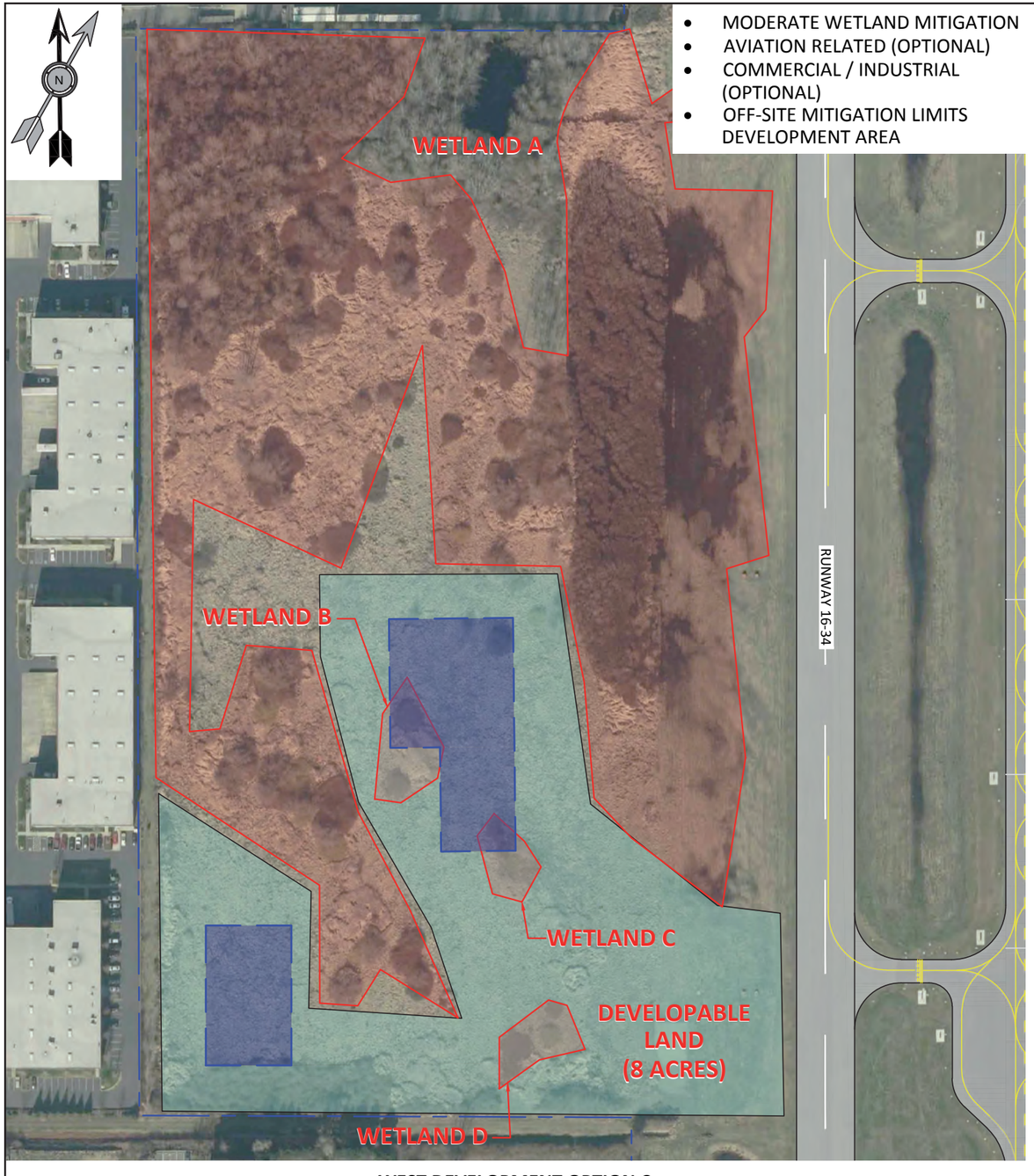
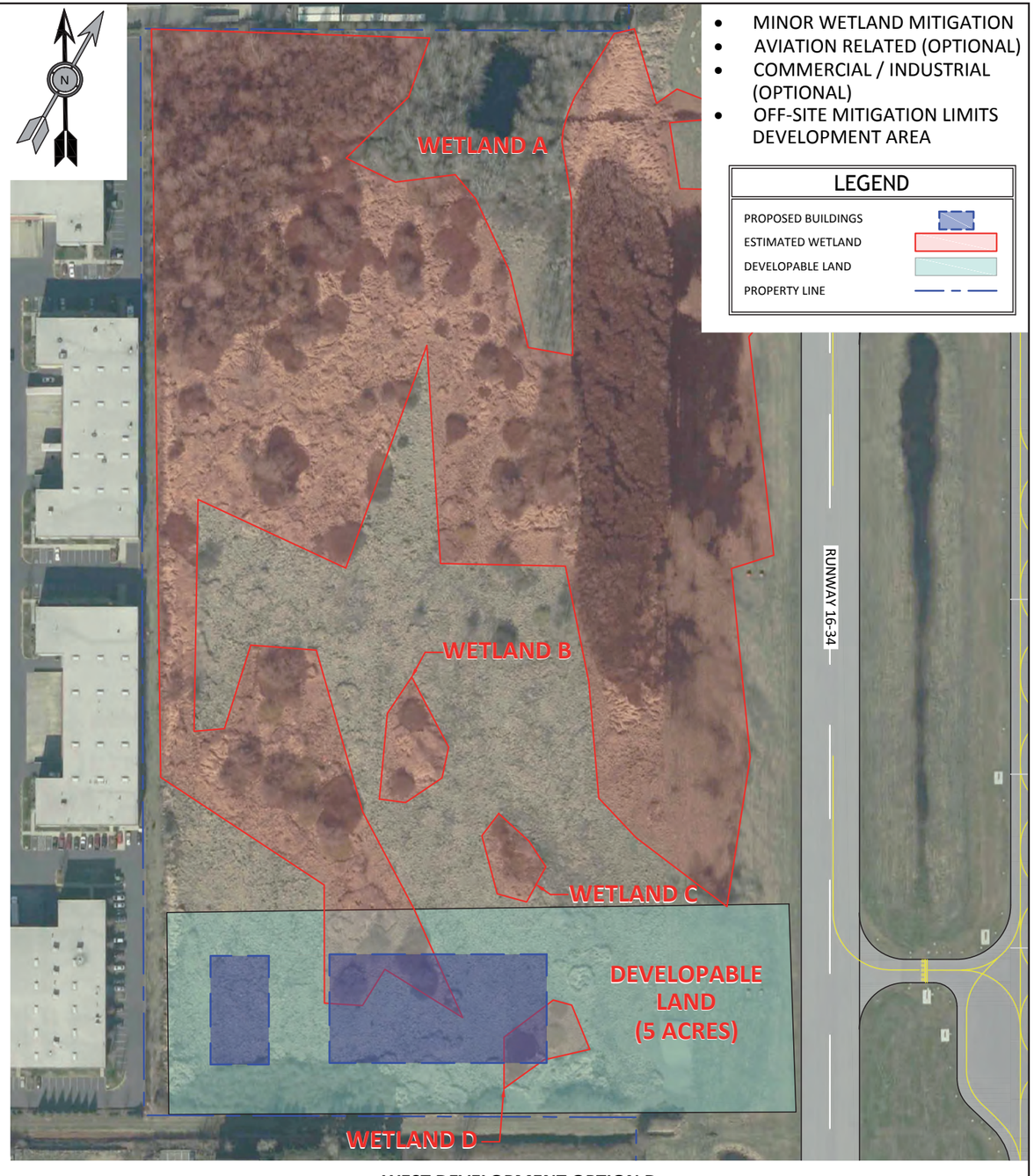


WEST DEVELOPMENT OPTION C



WEST DEVELOPMENT OPTION D

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.


N
POTENTIAL PROPERTY ACQUISITION
(AIRPORT LANDSIDE DEVELOPMENT)
(12 ACRES)
RUNWAY 16-34
N AUBURN WAY
NE 26TH STREET
NE E STREET
0'
200'
400'
Scale: 1"=200'

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%)

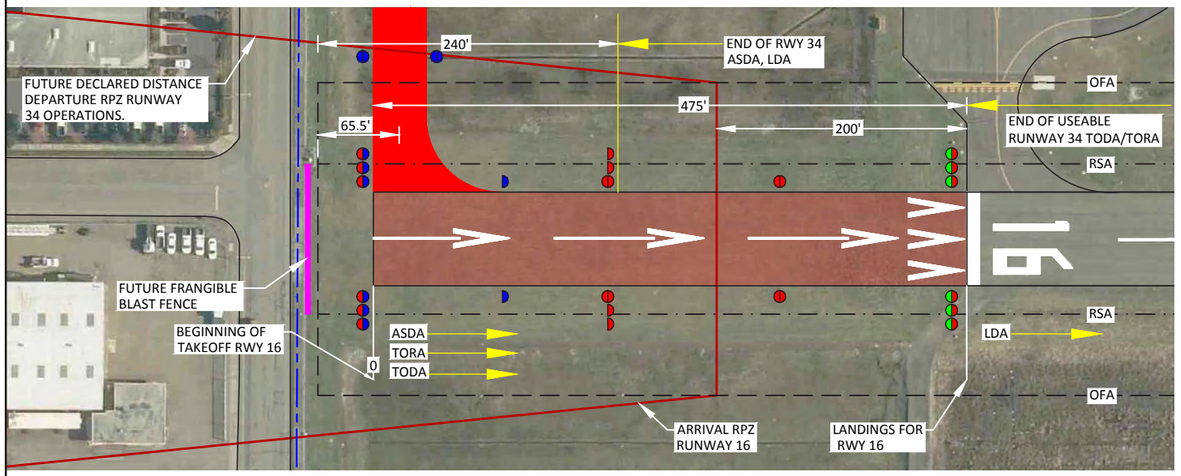
South End: Same physical pavement configuration and dimensions as Option A. Shifting the departure RPZs outward, increases takeoff distance dimensions (declared distances) compared to Option A. The approximate runway lengths available (to be verified during survey and design) for Runway 34 operations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

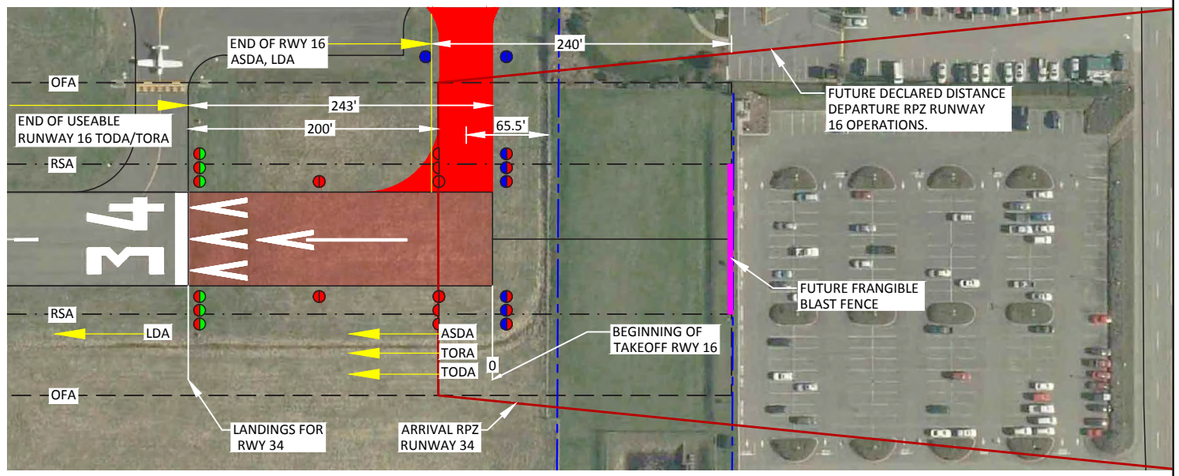
OPTION B - DECLARED DISTANCE SUMMARY (RWY 34)

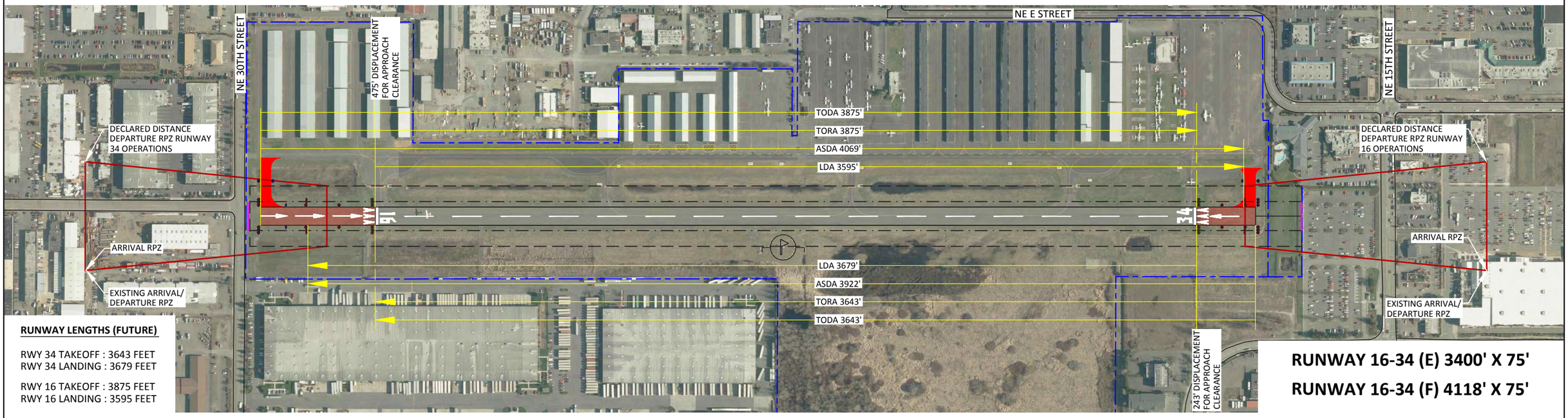
RUNWAY 34	CURRENT USEABLE RUNWAY	OPTION B	INCREASE IN USEABLE RUNWAY
Takeoff	3,401 feet	3,922 feet	521 feet (+15.3%)
Landing	3,401 feet	3,679 feet	278 feet (+8.2%)
Accelerate-Stop (emergency)	3,401 feet	3,922 feet	521 feet (+15.3%)

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'

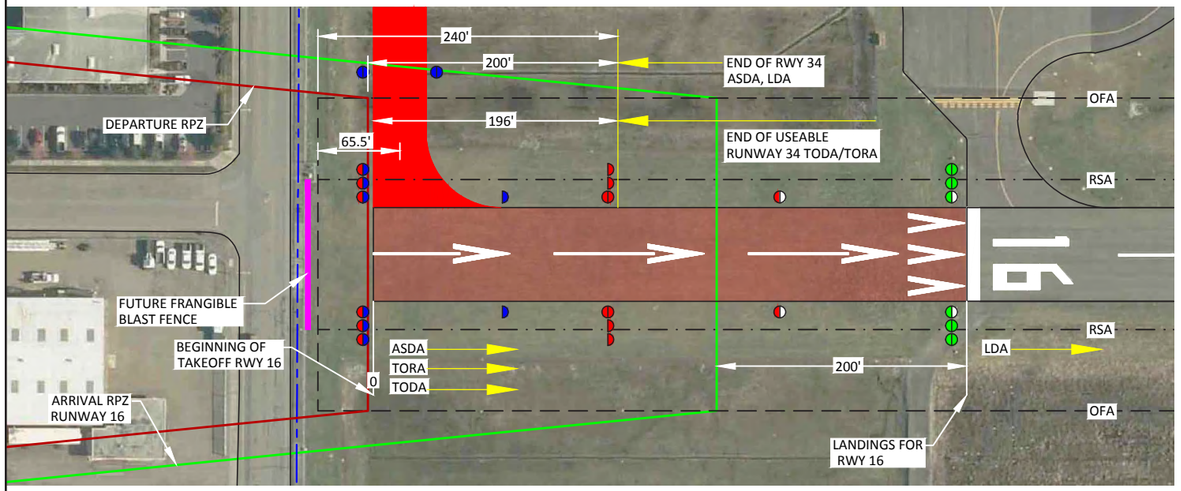
KEY FEATURES

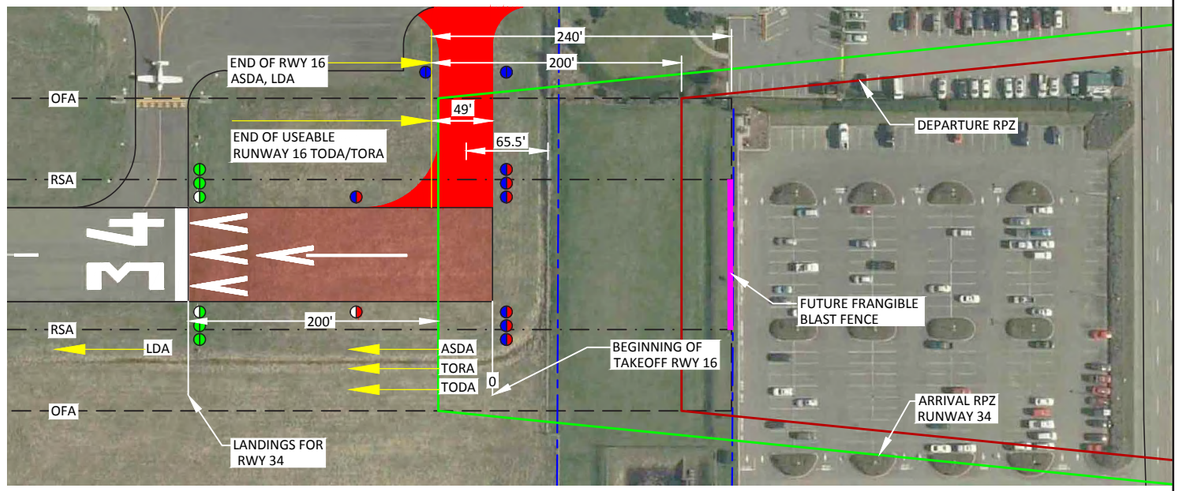
- **NO CHANGE IN EXISTING RPZ LOCATIONS (THROUGH USE OF DECLARED DISTANCES)**
- **NO CHANGE IN CURRENT ROAD/RPZ CONFIGURATION**

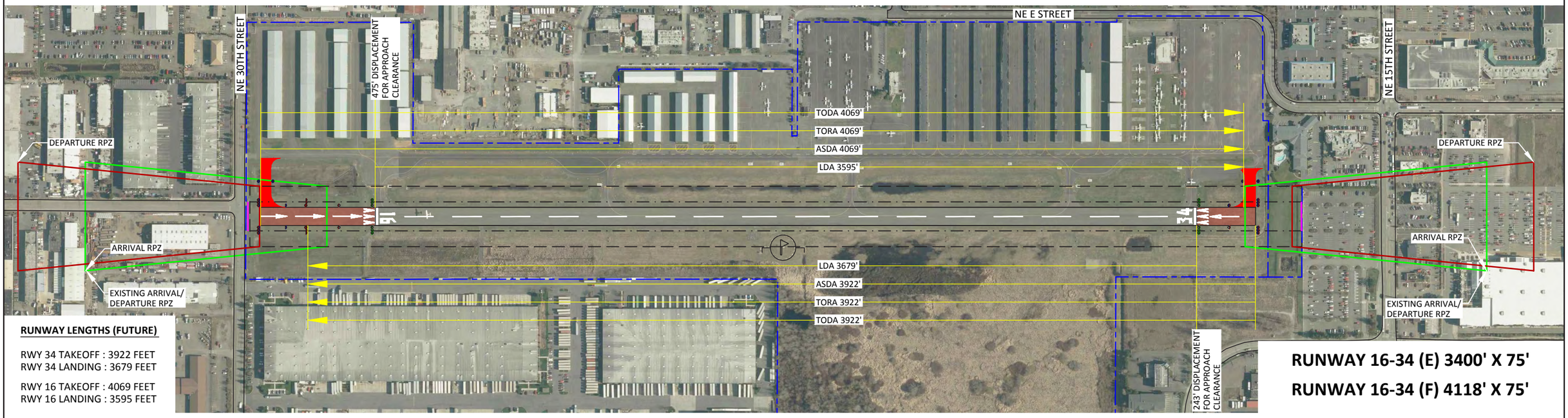
DISPLACED THRESHOLDS WITH DECLARED DISTANCES

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

DISPLACED THRESHOLDS WITH DECLARED DISTANCES

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

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

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).

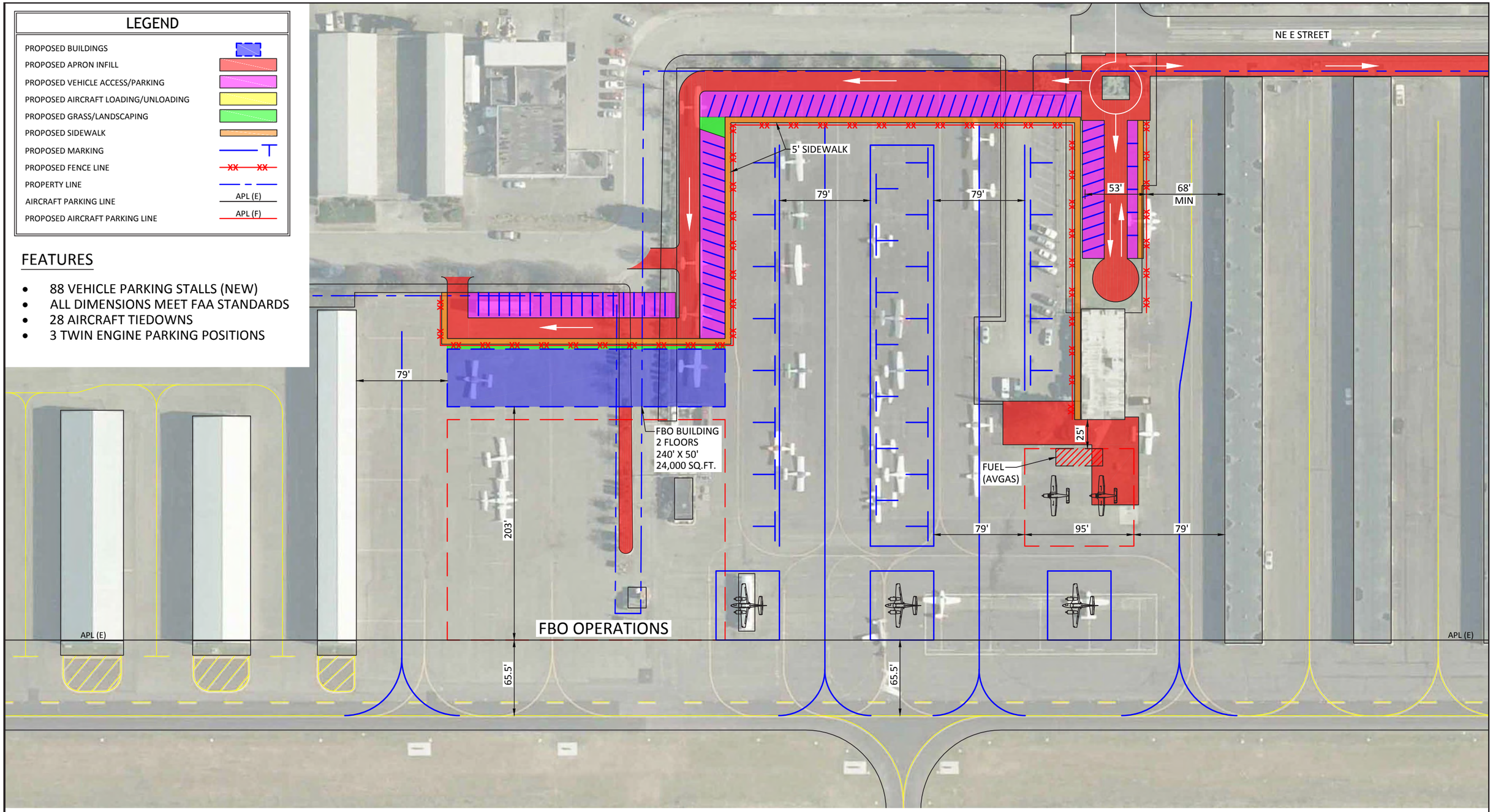
No taxiway connections between the helicopter facilities and the runway are anticipated in the initial development, although taxiway and apron facilities could be added in the future, which may require wetland mitigation. A separate helicopter practice area is identified north of the parking pad. This 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.

LEGEND

- PROPOSED BUILDINGS
- PROPOSED APRON INFILL
- PROPOSED VEHICLE ACCESS/PARKING
- PROPOSED AIRCRAFT LOADING/UNLOADING
- PROPOSED GRASS/LANDSCAPING
- PROPOSED SIDEWALK
- PROPOSED MARKING
- PROPOSED FENCE LINE
- PROPERTY LINE
- AIRCRAFT PARKING LINE — APL (E)
- PROPOSED AIRCRAFT PARKING LINE — APL (F)

FEATURES

- 88 VEHICLE PARKING STALLS (NEW)
- ALL DIMENSIONS MEET FAA STANDARDS
- 28 AIRCRAFT TIEDOWNS
- 3 TWIN ENGINE PARKING POSITIONS



TERMINAL AREA

CITY OF AUBURN WASHINGTON

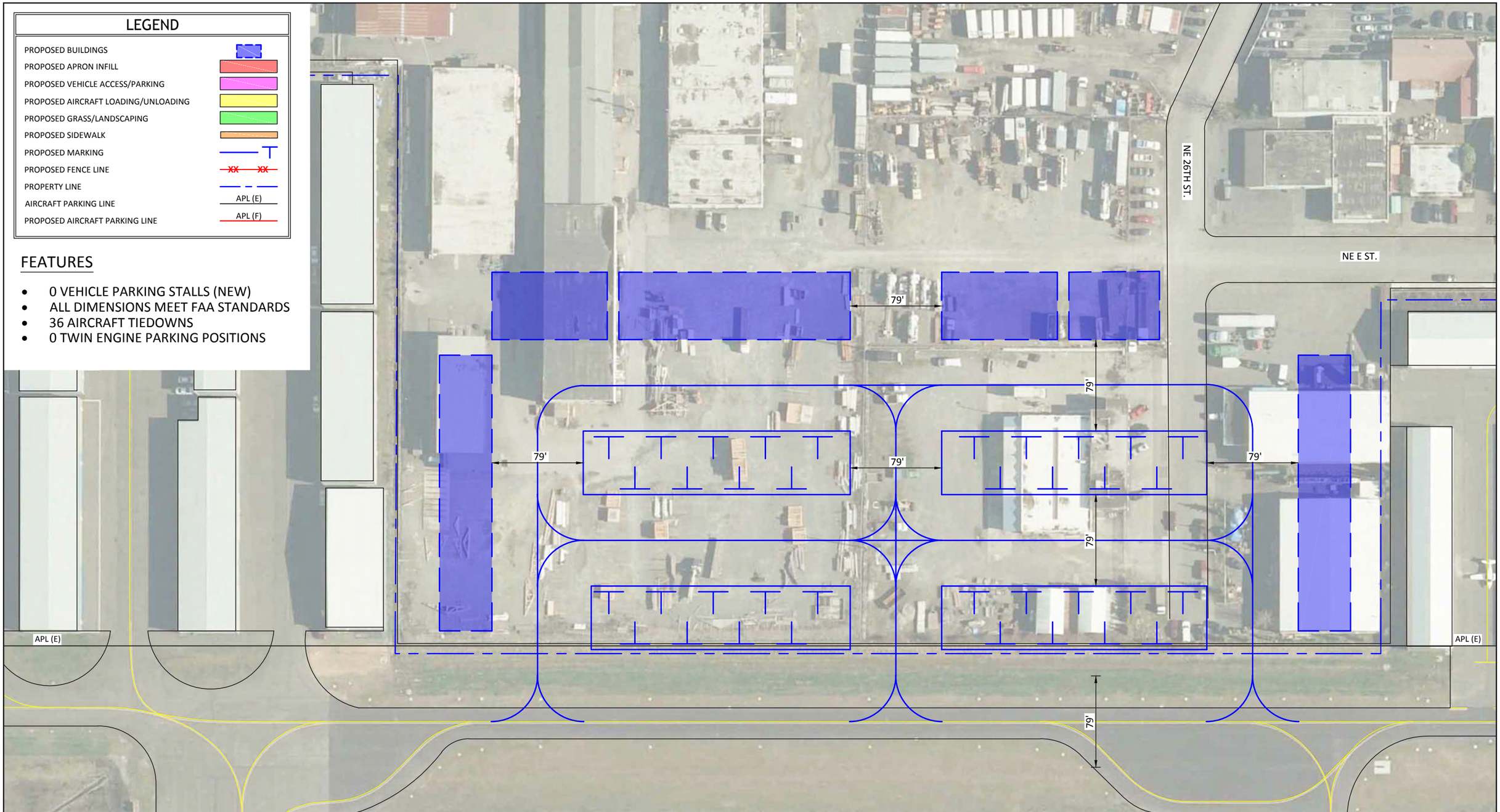
CENTURY WEST ENGINEERING CORPORATION

LEGEND

- PROPOSED BUILDINGS
- PROPOSED APRON INFILL
- PROPOSED VEHICLE ACCESS/PARKING
- PROPOSED AIRCRAFT LOADING/UNLOADING
- PROPOSED GRASS/LANDSCAPING
- PROPOSED SIDEWALK
- PROPOSED MARKING
- PROPOSED FENCE LINE
- PROPERTY LINE
- AIRCRAFT PARKING LINE — APL (E)
- PROPOSED AIRCRAFT PARKING LINE — APL (F)

FEATURES

- 0 VEHICLE PARKING STALLS (NEW)
- ALL DIMENSIONS MEET FAA STANDARDS
- 36 AIRCRAFT TIEDOWNS
- 0 TWIN ENGINE PARKING POSITIONS



AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

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

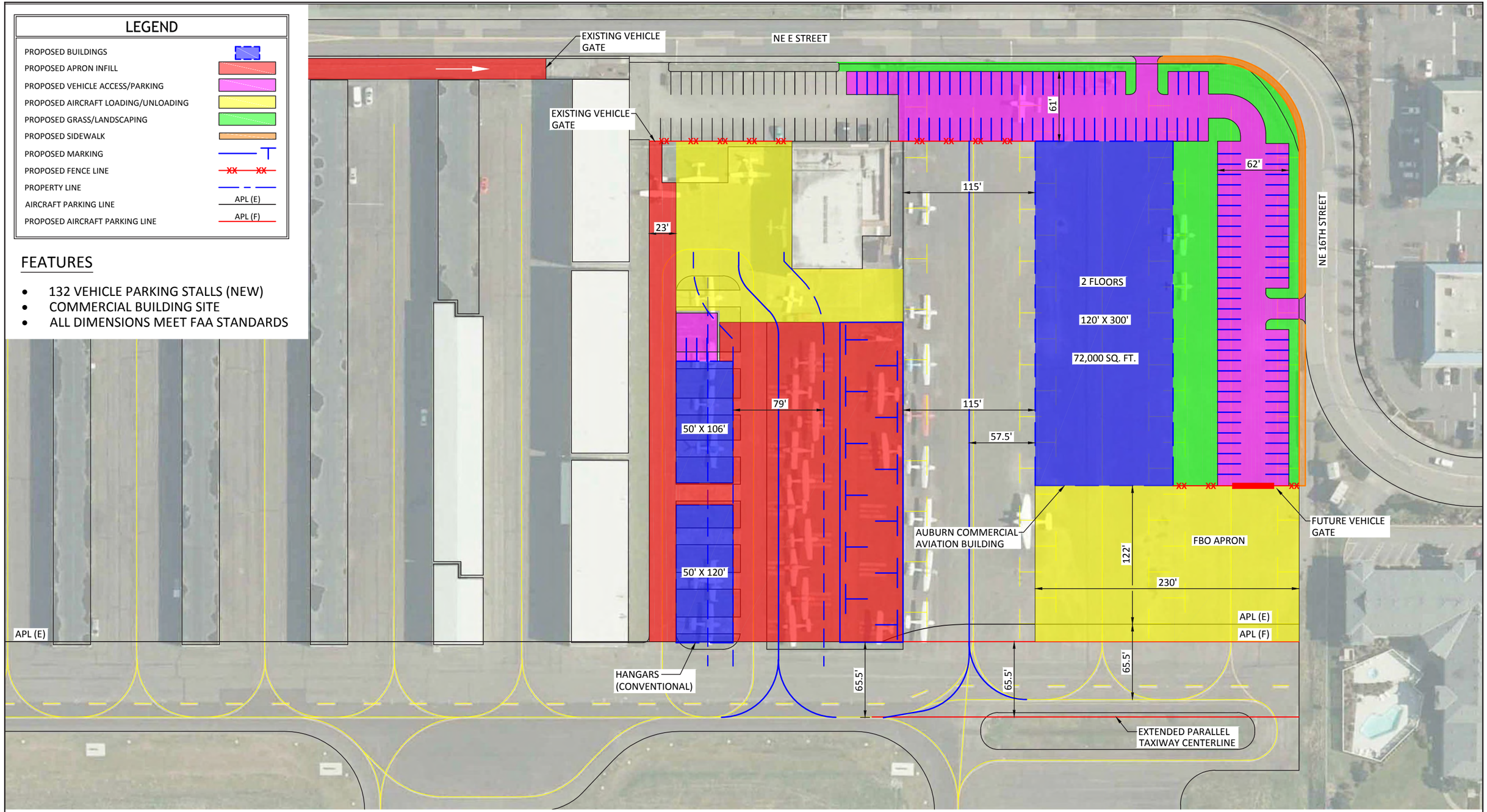
CENTURY WEST ENGINEERING CORPORATION

LEGEND

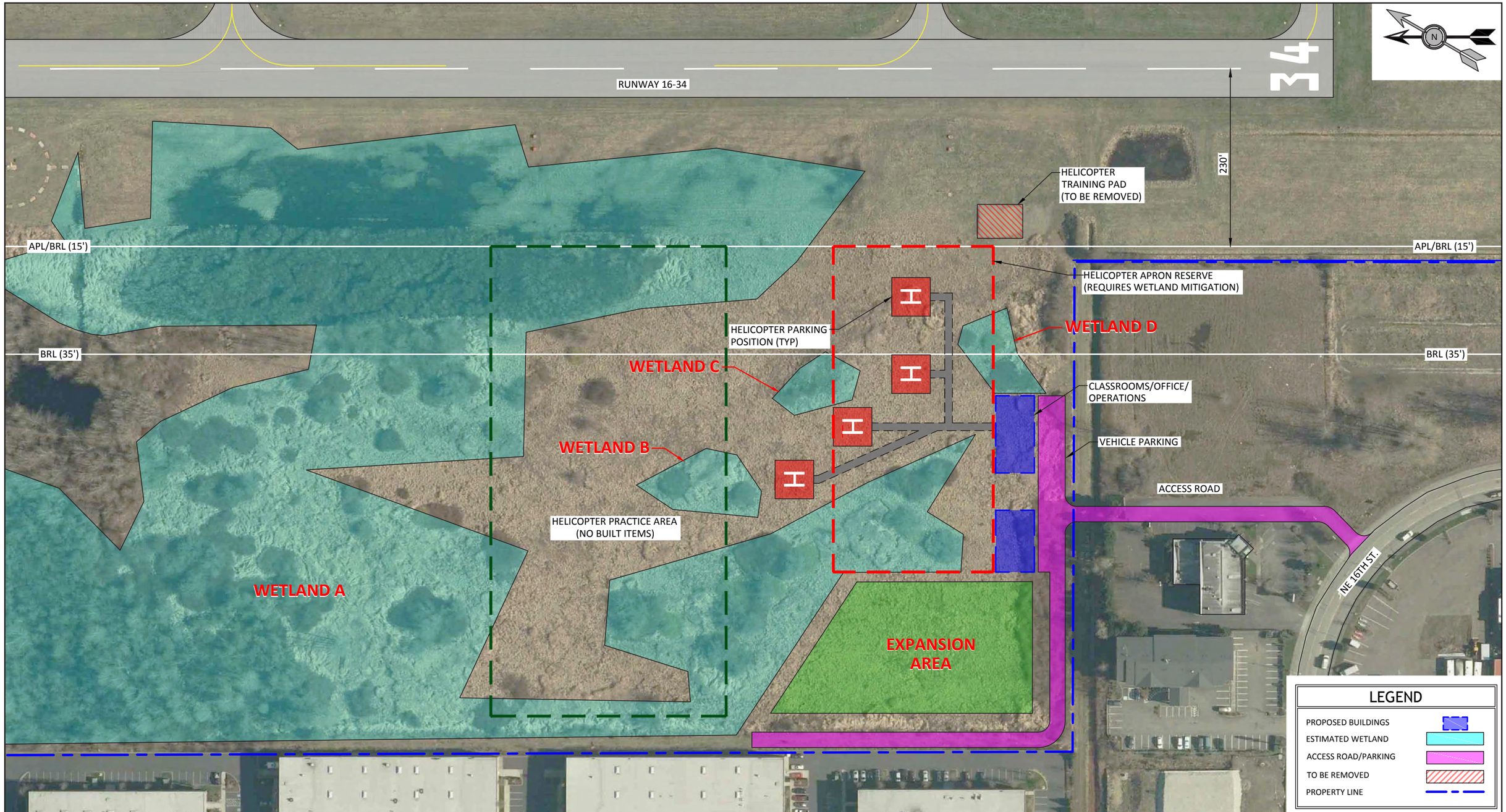
- PROPOSED BUILDINGS
- PROPOSED APRON INFILL
- PROPOSED VEHICLE ACCESS/PARKING
- PROPOSED AIRCRAFT LOADING/UNLOADING
- PROPOSED GRASS/LANDSCAPING
- PROPOSED SIDEWALK
- PROPOSED MARKING
- PROPOSED FENCE LINE
- PROPERTY LINE
- AIRCRAFT PARKING LINE — APL (E)
- PROPOSED AIRCRAFT PARKING LINE — APL (F)

FEATURES

- 132 VEHICLE PARKING STALLS (NEW)
- COMMERCIAL BUILDING SITE
- ALL DIMENSIONS MEET FAA STANDARDS



SOUTH TERMINAL AREA



AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

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.

Noise Contours Overview

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.

LEGEND

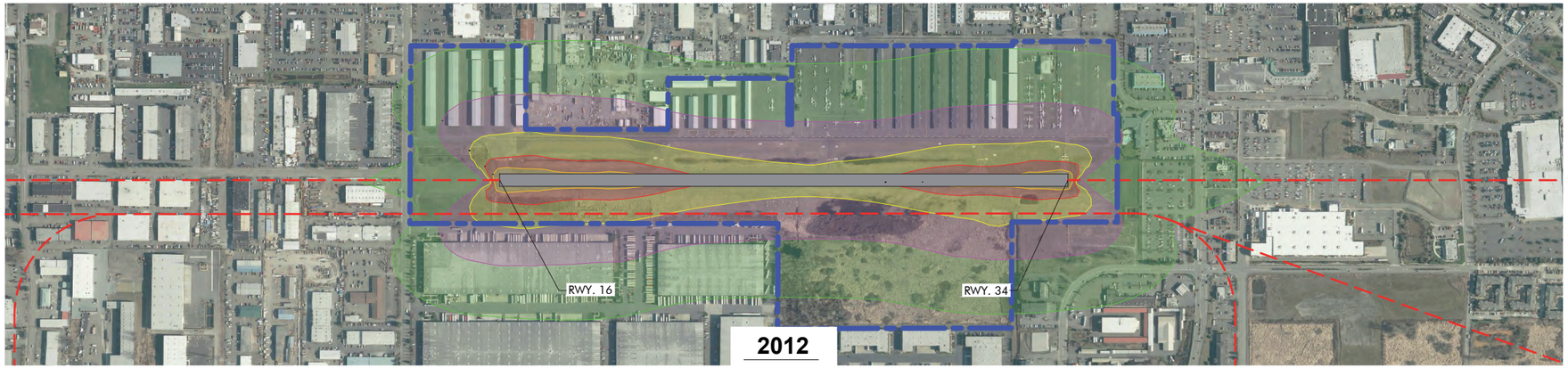
- 65 DNL
- 70 DNL
- 75 DNL
- 80 DNL
- 85 DNL
- FLIGHT TRACKS
- PROPERTY LINE

DAY-NIGHT LEVEL (DNL)

N

0' 400' 800'

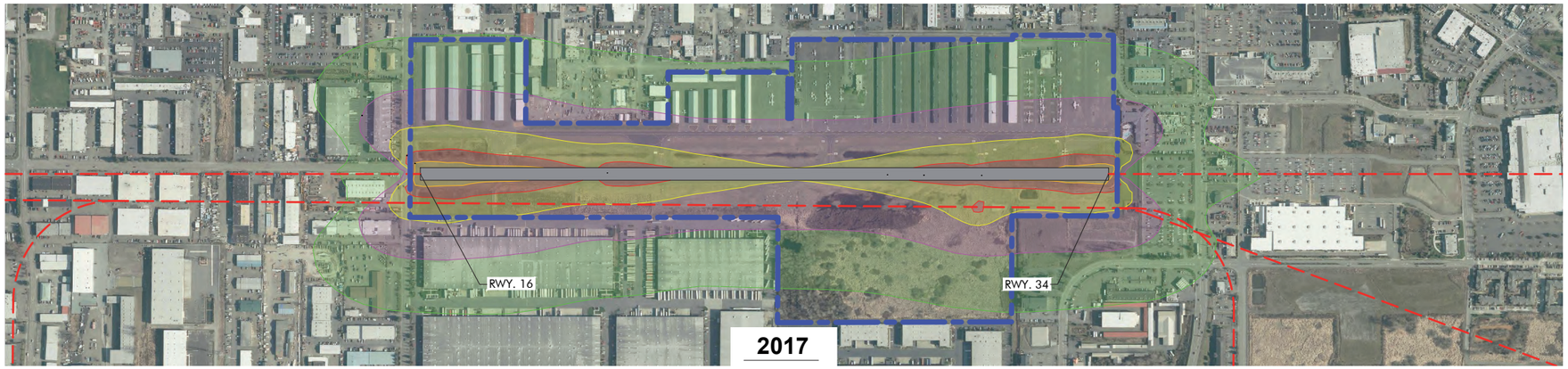
Scale: 1"=400'



N

0' 400' 800'

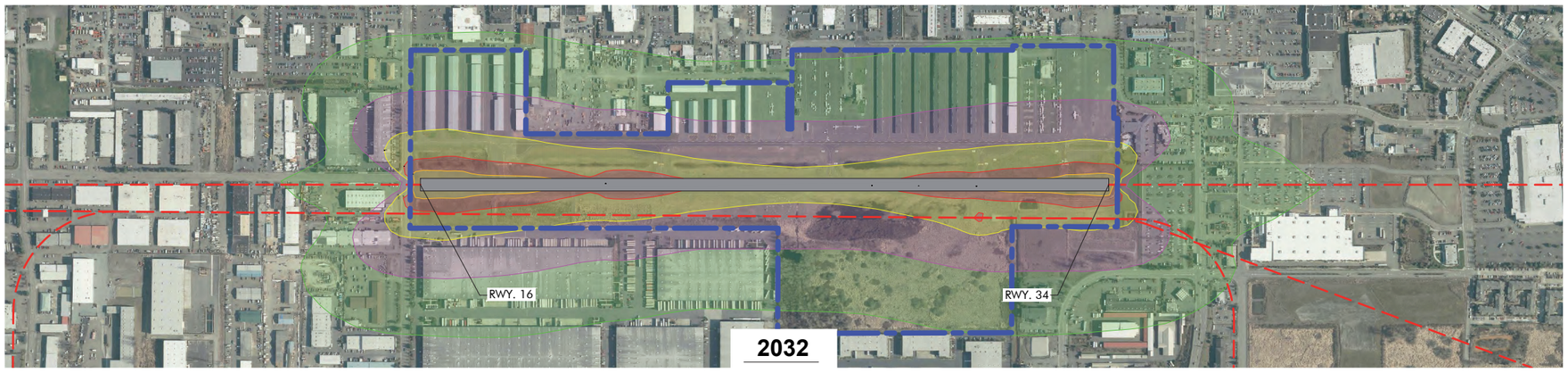
Scale: 1"=400'



N

0' 400' 800'

Scale: 1"=400'



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

AUBURN MUNICIPAL AIRPORT | AIRPORT MASTER PLAN

CITY OF AUBURN WASHINGTON

2012, 2017, AND 2032 NOISE CONTOURS | **FIG. 6-1**

CENTURY WEST ENGINEERING CORPORATION

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.

Short Term Projects:

- 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**
** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.							**20 Yr Total**	$29,095,923	$11,587,169	$40,683,092	$3,450,000	$27,923,863	$8,623,229

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.

State Capital Improvement Program (SCIP)

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