

## CHAPTER FOUR ALTERNATIVES

## *ED CARLSON MEMORIAL FIELD- SOUTH LEWIS COUNTY AIRPORT MASTER PLAN UPDATE*

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In this chapter, documentation of Lewis County’s identification and evaluation process for alternative ways to develop the Ed Carlson Memorial Field-South Lewis County Airport is presented.

These development alternatives incorporate the airport facility needs for the 20-year planning window, but also consider more distant future development needs for prudent planning purposes. This process will conclude with the County’s selection of a preferred airport development plan with consideration for Planning Advisory Committee (PAC) and public input. It’s important to note that the preferred development alternative is most often a composite of the most favorable features among the various alternatives and not the single selection of one of the illustrated alternatives presented for discussion and evaluation.

Community outreach is an important component in the evaluation of development alternatives since the Airport serves the community as well as the air transportation system.

This chapter provides the necessary information to the community and other stakeholders in preparation for upcoming meetings about the possible development options. These meetings

will serve as opportunities for discussion, questions, and feedback so Lewis County may obtain input prior to selecting a long-term development plan. All information about the Airport Master Plan meetings and associated materials are posted online at:

[www.lewiscountywa.gov/airports/ed-carlson-memorial-field-south-lewis-county-airport-tdo](http://www.lewiscountywa.gov/airports/ed-carlson-memorial-field-south-lewis-county-airport-tdo)

## OVERVIEW OF PROCESS

To properly address the near- to long-term improvement needs of the Airport, this chapter analyzes three build alternatives for airside and landside as well as a no action/no build alternative for comparison. These alternatives will be presented to the Planning Advisory Committee (PAC) for review and discussion during an April 2014 meeting. A public open house will follow the PAC meeting so the public may review the alternatives, ask questions, provide comments, and be presented with the PAC's preliminary recommendations. Following the PAC and public open house review, the County will consider all input and select a future long-term development alternative for the Airport. This selection is anticipated in May 2014.

The selected alternative, referred to as the preferred alternative, is the basis for updating the Airport Layout Plan drawing set and the Airport's Capital Improvement Plan to be addressed in subsequent chapters. It's important to note that all proposed development, including possible land acquisition, must be shown on the Airport Layout Plan to be eligible for federal funding.

*It's important for development alternatives to consider a full spectrum of possibilities with an open and well-informed discussion. Then, an ideal development plan may evolve that documents the rationale for selecting and rejecting various ideas. For South Lewis County Airport, the various development alternatives consider improvement needs within the 20-year planning window as well as beyond. Development beyond 20 years includes a longer runway and greater expansion of facilities such as aircraft storage hangars and aircraft apron parking, which would require land acquisition. Consequently, the County may consider land acquisition when opportunities arise to purchase available land in the coming years.*

Four key steps comprise the development alternatives element of the master planning process:

1. Site analysis to include the identification of opportunities and challenges for development
2. Identification of development concepts/scenarios to guide the layout of development alternatives

3. Comparative evaluation of the development alternatives
4. Selection of a preferred alternative

## SITE ANALYSIS

The site analysis task involves assessing the various opportunities and challenges to development at the Airport. This is necessary to provide the additional framework for identifying potential airside and landside development alternatives. Development opportunities refer to the site conditions that offer flexibility and possibility in development such as undeveloped land. Development challenges are limitations or constraints at or around the Airport that may restrict or prohibit development and/or would require substantial cost, mitigation, and/or complex engineering solutions to overcome. Also notable is that some site conditions may represent both opportunities and challenges. An example of this includes existing roadways adjacent to airport property which may offer opportunities for additional access, but might also limit an airport's ability to expand and/or protect airspace and other surfaces depending on roadway location.

The physical development opportunities and challenges with the greatest influence on the Airport's future growth are outlined here:

### Opportunities

- Large undeveloped area within airport property on the south side of the airfield.
- Undeveloped land outside but adjacent to the southern airport property boundary.
- Undeveloped land on the north side adjacent to existing hangar development.
- Existing utility infrastructure on the north side of the airport. Additionally, the expansion of the utility infrastructure to the south side of the airfield is feasible as most utility service lines are less than a mile away. These include potable water, sewer, phone, power and fiber optic service lines.
- Roadways (Jackson Highway, Buckley Road) to provide additional airport access and potentially attract aviation-compatible businesses interested in close proximity to Jackson Highway.

### Challenges

- Known/possible presence of wetlands within and near the Airport, particularly to the south of the airfield.
- Existing development near the Airport or lack of available land that could be acquired to support future expansion.

- Close proximity of Jackson Highway to the west and Buckley Road to the west and southwest. Both roads are within the Runway Protection Zone (RPZ) of Runway 06.
- Lack of utilities on undeveloped property on south side. Also, any development east of the existing north side development would require the extension of utilities to serve such development.

#### WETLAND/WATERWAY RECONNAISSANCE

As previously mentioned, the known presence of wetlands and waterways within the airport property and their possible presence in the airport vicinity present a challenge to development. The presence of wetlands in a project site will trigger the need for an Environmental Assessment (EA) and may lead, depending on the EA findings, to the need for mitigation to replace the lost aquatic resource functions and area.

A site wetland/waterway reconnaissance was conducted as part of this Master Plan to help the County and the PAC in determining the approximate location of wetlands, waterways, and/or their buffers. The findings of the wetland/waterway reconnaissance will be included as **Appendix 4A** in the Master Plan. These findings are preliminary and an Environmental Assessment (EA) will be necessary at the time a project affecting an area identified as wetland and/or waterway is initiated.

#### AIRPORT REFERENCE CODE (ARC)

The Airport's ARC is referenced throughout the chapter. As discussed in the Forecasts, the Airport's current ARC is B-I and this ARC is expected to be upgraded to B-II by 2017. The ARC corresponds to the most demanding aircraft that uses or is forecast to use the airport on a regular basis, where regular basis is defined as a minimum of 500 annual operations.

The terms "small aircraft" and "large aircraft" are also used throughout the chapter. The FAA defines a small aircraft as an aircraft with a maximum gross takeoff weight of 12,500 lbs. A large aircraft is defined as one with a maximum weight greater than 12,500 lbs. but less than 60,000 lbs.

**Exhibit 4A** illustrates sample aircraft by ARC.

#### IDENTIFICATION OF DEVELOPMENT ALTERNATIVES

Prior to identifying each development concept to accommodate future demand, a list of basic improvements needed by the Airport and included in all alternatives is outlined. These improvements are identified as common features.

## COMMON FEATURES

While common features are in all build alternatives, there may be variations in the way they are integrated into the alternatives. Common features for the alternatives include:

- Parallel taxiway width increase to 35 feet to comply with FAA design standards for B-II.
- The realignment of the Airport's main access road to enhance safety for vehicles accessing, circulating, and leaving the Airport.
- Fencing of, at a minimum, the aircraft operations areas and the provision of vehicular and pedestrian access gates thus improving the safety of the Airport.
- Removal/relocation of tiedowns that are in the Runway Object Free Area (OFA).

## ALTERNATIVES

The identification of long-term development alternatives followed the site analysis and identification of common features. These alternatives address the facility requirements outlined in the previous chapter as well as potential development beyond the 20-year Master Plan period. This ensures that the future Airport property needed and the Airport environs are protected now. This would be accomplished through a combination of land acquisition and County zoning strategies.

Three individual plans or alternatives were prepared for the landside as well as the airside development. Although these plans do not necessarily exhaust all the variations and development design that may be applied to the Airport, they do provide the appropriate base to produce the "preferred alternative" for the development of the Airport. It's important to point out that the "preferred alternative" often proves to be a blend or a composite of the various alternatives with the most favorable points from each selected.

In addition to the alternatives previously mentioned, a "no-build alternative" is presented for the purpose of comparison. While no major physical development is proposed, the alternative does not preclude any operational improvements that may enhance capacity.

All proposed improvements and developments are consistent with the applicable FAA design standards and FAR Part 77 airspace planning standards. Airside facilities proposed, including the runway, major taxiways, aircraft parking apron and access taxiways used by business aircraft, are designed for Airplane Design Group (ADG) II. Aircraft tiedown aprons and hangar taxilanes used exclusively by smaller aircraft are typically designed based on Airplane Design Group I standards. For hangar areas with a variety of hangar sizes, the largest hangar door width determines the maximum size of aircraft to be accommodated.

The alternatives presented below represent the first step in a multi-step process that involves the public and the PAC and leads to Lewis County selecting a “preferred alternative” to be shown on the Airport Layout Plan (ALP). Also notable is that some of the alternatives include elements of the 2004 ALP proposed development.

The following sections describe the No-Build Alternative, various airside alternatives identified as A1 through A3, and the landside alternatives identified as L1 through L3.

#### NO-BUILD ALTERNATIVE

The No-Build alternative, commonly referred to as the No Action alternative, establishes a baseline from which the alternatives can be developed and compared. The No-Build alternative preserves the current configuration of the airport by providing maintenance of existing facilities where needed.

The No-Build Alternative, illustrated in **Exhibit 4B**, is inconsistent with the management and development policies of Lewis County and their long-term commitment to providing an efficient and safe public air transportation facility. As previously mentioned, this alternative is presented for the sole reason of providing a baseline from which the alternatives can be developed and compared.

#### AIRSIDE ALTERNATIVES

This section examines the airside needs, mainly those of Runway 06-24.

As mentioned in the requirements chapter, the required runway width for a Runway Design Code (RDC) of B-I is 60 feet and for a RDC of B-II is 75 feet. Runway 06-24 is 150 feet wide and based on the County’s past actions, including the decision to maintain the 150-foot width made in the last ALP update and the funding of the additional width as part of the last pavement maintenance project, the County supports maintaining the current runway width. The County understands that the FAA will likely not fund the pavement maintenance or improvement of the runway beyond the 75-foot width required for B-II. All alternatives presented show a runway width of 150 feet consistent with the County’s vision. However, this does not preclude the County from reducing the width in the future to 75 or 100 feet. Ultimately the County’s decision to maintain the current width or to reduce it to the recommended 75 feet must be based on a Cost-Benefit Analysis that accounts for the benefits associated with maintaining the 150-foot width and the additional cost of pavement maintenance and rehabilitation.

The Requirements chapter discussed the fact that two roads, Jackson Highway and Buckley Road, are within the RPZ for Runway 06. On September 27, 2012, the FAA issued a Memorandum titled “Interim Guidance on Land Uses within a Runway Protection Zone.” The guidance states that “Regional and ADO<sup>1</sup> staff must consult with the National Airport Planning and Environmental Division, APP-400 (who will coordinate with the Airport Engineering Division, AAS-I OO), when any of the land uses described in Table 1 would enter the limits of the RPZ as the result of:

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

Among the uses described in Table 1 of the Memorandum are transportation facilities such as public roads and highways. The guidance means that any airfield project or any project involving the portion of Buckley Road and Jackson Highway that are within the RPZ would require coordination with the FAA. The required coordination is to focus on finding a solution that addresses the incompatible use within the RPZ. The guidance also states that “This interim policy only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location. Therefore, at this time, the RO and ADO staff shall continue to work with sponsors to remove or mitigate the risk of any existing incompatible land uses in the RPZ as practical.”

Airside Alternatives A1 and A2 presented in this section address the issue of the existing roads in the RPZ. Additionally, the FAA has been engaged in the discussion to determine the best approach to handle this incompatible land use.

#### AIRSIDE ALTERNATIVE A1

Airside Alternative A1 provides for a 1,721-foot extension of the runway to the east, resulting in a runway length of 6,200 feet. The 6,200-foot length was identified in the Requirements chapter as the length necessary to serve 75 percent of large airplanes (over 12,500 pounds but under 60,000 pounds) at 90 percent useful payload.

**Exhibit 4C** illustrates the runway extension and the necessary land acquisition to accommodate it. It should be noted that the land acquisition would also include the area covered by the future

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<sup>1</sup> Airports District Office

RPZ of Runway 24. Further, the exhibit shows the full-length extension of Taxiway A and the provision of a holding apron at the Runway 24 entrance.

As discussed in the previous chapter, the aviation demand forecasts for the Airport do not support the need for a runway extension in the 20-year planning period. However, serving 75 percent of large airplanes at 90 percent useful load is one of a few scenarios the County is considering for the distant future (beyond 20 years). Additionally, a 6,200 foot runway aligns with the Airport Business Plan developed in 2010. The County recognizes that inclusion of such an extension on the ALP drawing would help the County protect for it through zoning strategies and land acquisition. Additionally, such an extension to the east might prove necessary and needed in light of a possible decision to mitigate the risk of roadways passing through Runway 06 RPZ.

Possible alternatives that address the incompatible land use in Runway 06 RPZ are discussed in Airside Alternative A2 and A3.

## AIRSIDE ALTERNATIVE A2

In developing Airside Alternative A2, relocating or displacing Runway 06 threshold to the east to fully remove Jackson Highway and Buckley Road from the RPZ was examined. While this concept eliminates one issue, it creates another—as the RPZ shifts to the east, the aircraft parking apron and the airport office fall within the new RPZ. Consequently, this idea was deemed unacceptable and eliminated from further consideration. However, an alternative that considered a reduced shift in the RPZ would strike a balance between the roadways within the RPZ while avoiding any overlay of the airport office and apron.

This concept requires a Runway 06 threshold relocation a distance of 379 feet from the existing threshold. Both Jackson Highway and Buckley Road are still inside the RPZ but they only occupy the outer third. This alternative does not provide a complete solution to the incompatible land use within the RPZ, but does reduce the risk to people and property on the ground. Vehicles traveling on either Jackson Highway or Buckley Road would spend considerably less time inside the RPZ and thus would be subjected to less risk.

**Exhibit 4D** illustrates Alternative A2.

## AIRSIDE ALTERNATIVE A3

Airside Alternative A3, illustrated in **Exhibit 4E**, still shows Runway 06 threshold relocated 379 feet to the east. Additionally, it shows Buckley Road ending in a cul-de-sac prior to entering the RPZ. Also, Jackson Highway is realigned to go around the outer boundary of the RPZ, without entering it.

Although this alternative shows the Runway 06 threshold relocated to the east, the same alternative could be applied with Runway 06 threshold remaining where it currently is. This would require the realignment of a larger portion of Jackson Highway, thus increasing the cost associated with such diversion.

## AIRSIDE COMPARATIVE EVALUATION

Here, a comparison of the airside alternatives is presented in **Table 4A**. This table highlights the key features of each alternative to include runway length and RPZ land use compatibility. A discussion of the cost associated with the alternatives and the possible required wetland mitigation is addressed separately.

### **Table 4A. Airside Alternatives Comparative Evaluation**

<b>Feature</b>	<b>No Build</b>	<b>Alternative A1</b>	<b>Alternative A2</b>	<b>Alternative A3</b>
Runway Length	4,479 feet	6,200 feet	4,100 feet	4,100 feet
Aircraft Served by Runway Length	B-II	B-II large aircraft	B-II small aircraft	B-II small aircraft
Incompatible Land Use in RPZ	Yes	Yes, roadways	Yes, roadways in outer third of RWY 06 RPZ	No

#### ASSOCIATED COST – ORDER OF MAGNITUDE

Although detailed cost estimates were not prepared for each alternative, the alternatives' costs are compared in order of magnitude.

The closure of Buckley Road and the realignment of Jackson Highway, as shown in Alternative A3, are also costly propositions. The realignment of Jackson Highway would require land acquisition associated with the new alignment and right of way. The closure of Buckley Road would require the provision of alternate access to the residential neighborhood served by the road.

An extension to the east, as shown in Alternative A1 would require land acquisition to accommodate the extension as well as the associated future RPZ.

Alternative A3 is the most expensive airside alternative followed by Alternative A1. Alternative A2 has the least associated cost of all airside alternatives as it does not require the acquisition of land or major road realignments and closure.

As discussed in the Requirements chapter, a runway extension is not justified in the planning period and therefore would not be eligible for FAA funding. The inclusion of the runway extension as an alternative is to allow the County to plan for the distant future, beyond the 20-year period.

## LANDSIDE ALTERNATIVES

The landside alternatives presented below provide the facilities necessary to not only accommodate the demand forecast for the 20-year planning period, but beyond. Factors that influence and drive the demand may change in the future, leading to a change in the facilities and improvements needed to accommodate the aeronautical demand. It is a good practice to develop a plan that goes beyond accommodating the forecast demand for the planning period and aims at identifying and protecting for the County's long term vision.

The development of additional facilities must be driven and justified by the aeronautical demand.

### LANDSIDE ALTERNATIVE L1

As previously identified in this master plan, the current Airport Reference Code is B-I. Activity by aircraft in the B-II family does take place at the Airport and is expected to lead to an upgrade in the ARC to B-II by 2017.

Alternative L1 provides B-II corporate and T-hangar development as well as a parking apron south of the airfield. This alternative (**Exhibit 4F**) would also require an Airport access road to serve this development area. The land where the access is placed on the south side is not currently owned by the Airport so an easement would be required. However, the road could be placed inside the airport property line with size reduction to the hangars to maintain the proper separation between buildings and the runway. Further, Alternative L1 does not provide for vehicular parking to serve the development to the south of the Airport. Such space could be provided at the expense of losing aircraft parking space.

It should be noted that all alternatives showing development south of the airfield would require the provision of utilities such as power and water to that part of the airfield.

Alternative L1 also includes the provision of a future FBO building, realigned auto access, and additional vehicular parking area to serve the current as well as future needs of the airport users to the north of the airfield.

The requirements chapter identified the need for an AWOS system. Alternative L1 shows two possible locations for such a system as well as the clearance area that each of these locations would require.

As with all other alternatives, Alternative L1 includes the common features identified earlier.

### LANDSIDE ALTERNATIVE L2

The main objective of Alternative L2 is to avoid the costly development of the 14 acres south of the airfield that would require substantial off-airport wetland mitigation and the extension of utilities to that side of the airfield. In this alternative, illustrated in **Exhibit 4G**, all development is kept to the north of the airfield. This requires the acquisition of land to the north and northeast of the current hangar development.

Alternative L2 provides the additional B-I and B-II hangar space needed to accommodate the forecast demand for the planning period and beyond. The alternative also provides an aircraft parking apron to both accommodate the future demand and remedy the loss of tiedown space resulting from the removal of the current tiedown spaces that are within the runway OFA.

Further, an additional access road to serve the new development on the north side is included. A new vehicular parking area, to the north of the existing hangar development, is provided to accommodate the existing as well as future demand. Additionally, all the previously mentioned common features are shown in this alternative.

### LANDSIDE ALTERNATIVE L3

Alternative L3 provides B-I hangars and parking apron development to the east of the existing hangar development and north of the runway (**Exhibit 4H**) while B-II hangar development is proposed on the south side. Features of previous alternatives such as the vehicular parking area to the north of the existing hangar development are also included in this alternative.

South of the runway, the B-II hangar development would accommodate a combination of hangars and apron area. While acquisition of additional land is not specifically identified on the south side, the County could acquire land in the future if land becomes available. Additional land on the south side that is contiguous to the airport property could be acquired and reserved for long-term aviation development of aircraft storage hangars, support facilities, and potentially some aviation business tenants.

As with all other alternatives, common features are included.

## LANDSIDE COMPARATIVE EVALUATION

**Table 4B** provides a comparative evaluation summary of the various landside alternatives described earlier. This table highlights key features associated with each alternative such as the scenario or main theme of each as well as land acquisition, known and possible wetland presence, expansion potential, and phasing and flexibility considerations. The order-of-magnitude cost associated with the various alternatives is discussed separately.

All build alternatives propose safe and efficient facilities in compliance with FAA design standards. However, various components of each alternative may offer incremental to substantial enhancement in factors such as capacity, functionality, flexibility, expandability, timely phasing, cost savings, and environmental impact deterrence. While some of these factors can be quantitatively measured (e.g. number of future hangars), others may be more subjective and require discussion among the PAC members, County staff, and public as part of the comparative evaluation process.

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### ASSOCIATED COST – ORDER OF MAGNITUDE

Although detailed cost estimates were not prepared for each alternative, the alternatives are compared in order of magnitude. The No Build Alternative has the least associated cost as it represents a scenario where no new development takes place and existing facilities are maintained. Therefore, the comparison will focus on the build alternatives L1, L2 and L3.

Prior to discussing the cost associated with the development of the various landside alternatives, it must be noted that the development shown in most alternatives, with the possible exception of Alternative L1, is beyond that needed for the 20-year planning period.

Alternatives L1 and L3 provide for the development of the 14 acres to the southwest of the runway, requiring the extension of utility lines to serve the new development in the area. Additionally, the 14 acres of property to the southwest of the runway, shown as developed in Alternatives L1 and L3, is known to have wetlands that may require mitigation. Development to the northeast of the runway may or may not require wetland mitigation. Even if wetland mitigation is required to the northeast, its extent is expected to be well below that of the 14-acre property on the southwest side. Regarding the possible costs with wetland and waterway mitigation, Alternatives L1 and L3 would have the highest associated cost while L2 would have a significantly lower associated cost.

As for the land acquisition associated costs, Alternative L2 has the highest associated cost as it includes the cost of land acquisition of parcels to the north and northeast of the runway. Alternative L3 has the second highest cost as it also includes land acquisition, of a smaller parcel, to the northeast of the runway. Alternative L1 does not include any land acquisition and therefore has the lowest cost.

#### PREFERRED ALTERNATIVE

The preferred alternative will be selected following the presentation of the various development alternatives to the PAC and the public in April 2014. Following discussion, the PAC will recommend a preferred alternative to the County. The County will review the recommendation and consider the public's input prior to the official selection of a preferred alternative.

**Table 4B. Landside Alternatives Comparative Evaluation**

Feature	No Build	Alternative L1	Alternative L2	Alternative L3
Scenario	Do nothing but maintain the existing facilities so there will be no new investment in facilities development (this alternative for comparison)	B-I aircraft accommodated on north side and B-II on south side. All development within Airport property. Development is sufficient for 20-year planning period but within the airport's current boundaries will restrict future expansion.	All development is on the north side of the airfield. Avoids development of the wetlands south of the airfield by mixing B-I and B-II aircraft on the north side.	Expands B-I areas to the east of the existing development. South side is developed to serve B-II development.
Airport Reference Code	B-II, however the hangars and access taxilanes are all B-I	B-II	B-II	B-II
Requires Land Acquisition	No	No	Yes (north, northeast)	Yes (northeast)
Requires Wetland Mitigation	No	Yes	Yes - Minor	Yes
Provides for Future Expansion beyond the 20-year period	No	Yes – Limited	Yes – Limited	Yes - Limited
Phasing & Flexibility Considerations	N/A	Near-term south side development on airport property, but fuel, utility, and vehicle accessibility also required; B-II facilities could serve both B-I and B-II.	Near-term north side land acquisition needed for B-I and B-II (fuel available, existing utilities); secondary access for B-II.	Near-term development on north side serves B-I (limited); future development on south side serves B-II, but can serve both B-I and B-II.