



## 5.1 INTRODUCTION

The objective of Chapter Five, Development Alternatives, is to identify and evaluate a set of alternatives for the Airport that not only meet the demand levels identified in Chapter 3, Forecasts, but are also constructible, financially feasible, and environmentally sustainable. Figure 5A depicts the typical process flow to develop the preferred alternative. A number of realistic airport layouts that incorporate the facility needs and recommendations identified in Chapter 4, Facility Requirements, are presented and reviewed in the following chapter.

Although the master plan update is limited to a 20-year planning period, the ODA's vision for the development of Cottage Grove State Airport extends well beyond this planning period. To account for and protect the long-term vision and to ensure flexibility in planning and development to respond to unforeseen needs, the alternatives presented consider the maximum development of the airport property.

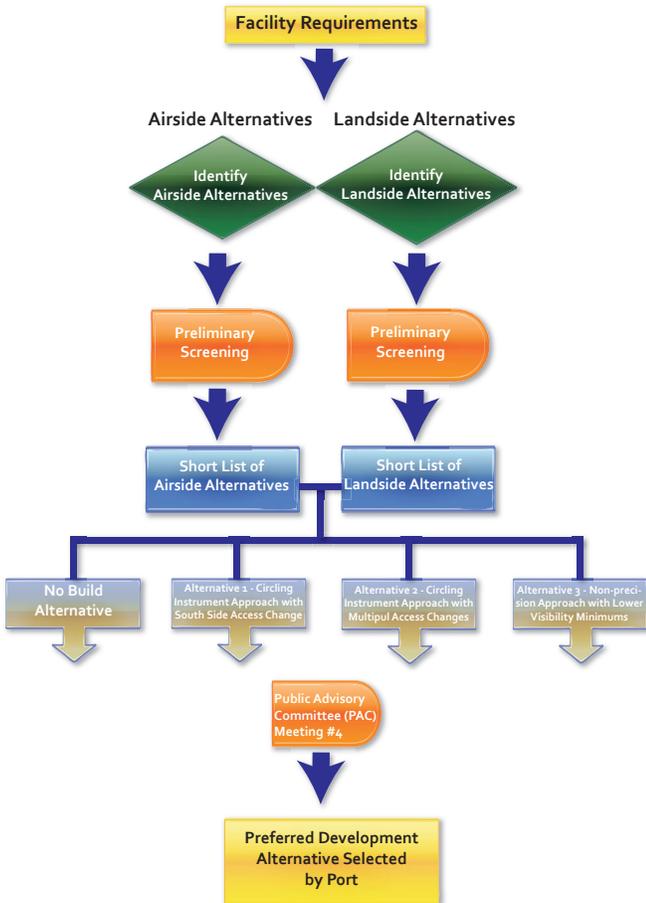
The development alternatives presented address the facility requirements outlined in the previous chapter and also investigate potential development beyond the 20-year Master Plan period. The identification of development possibilities in the distant future and beyond the planning period is important for the evolution of a well-defined vision for the airport. This in turn helps prioritize and focus the planning, policy making, and essential actions necessary to achieve the vision and protect the long-term viability of the Airport.

Acquiring land and implementing land use controls are examples of steps to protect the Airport over the long-term and its future development. Otherwise, development around the Airport could occur in a way that would prohibit, limit, or make financially unattainable the proposed future improvements that would best meet the needs of local airport private and business users as well as the state and regional air transportation system.

The constraints, opportunities, constructability, economic feasibility and environmental impacts associated with each of the alternatives are discussed and a comparative evaluation of the alternatives is presented.

Two build alternatives and a single No-Build Alternative were prepared to discuss the advantages and disadvantages of each alternative. The build alternatives presented include both the airside and landside development concepts combined in to a single exhibit.

FIGURE 5A-  
DEVELOPMENT ALTERNATIVES PROCESS FLOW CHART



Although these alternatives do not necessarily exhaust all the variations and development design concepts that may be applied to the Airport, they do provide the appropriate base to produce the “preferred alternative” for the development of the Airport. The selection of a “preferred alternative” most often represents a composite of the alternatives with the most favorable elements from each alternative included. The No-Build Alternative is presented for comparison. While no new development is proposed in the No-Build Alternative, existing facilities are maintained so costs are limited to maintenance and upkeep of existing facilities.

These alternatives were reviewed and discussed with the PAC and the public, so ODA could consider comments and recommendations prior to the official selection of a “preferred alternative”.

## 5.2 SUMMARY OF FACILITY REQUIREMENTS

The following section summarizes some of the development recommendations provided in Chapter 4, Facility Requirements, needed to accommodate forecast aeronautical activity. The requirements identified below are requisite to accommodate forecast aeronautical activity as well as to correct existing nonstandard conditions.

### 5.2.1 Landside Requirements

Landside facilities are those facilities necessary for handling aircraft on the ground, and those facilities that provide an interface between the air and ground transportation modes. Landside facility requirement recommendations relevant to the development alternatives chapter include:

#### Hangars/Airport Buildings

Hangars - It is recommended that the Airport plan for 1 additional hangar to be constructed over the planning period.

#### Vehicle Parking

Future Parking Areas - The current parking configuration is sufficient for the Airport and should be maintained through the planning period. However, addition parking facilities should be considered with any future development.

#### Aviation Services/Support Facilities

Alternative Fuels - Further inquiry into the interest and feasibility of offering MoGas at the Airport is recommended.

#### Airport Fencing

Boundary Fencing - It is recommended that the Airport construct additional chain-link fencing along the entire property boundary. The Airport should work with the City of Cottage Grove to assure that any additional fence constructed meets city code requirements.

#### Utilities

Fire Suppression - In addition to the existing domestic water system, a dedicated fire suppression water supply should be considered. The Airport will likely need additional capacity from the City's water system to supply a dedicated system.

### 5.2.2 Airside Requirements

Airside facilities are those that are related to the arrival, departure and ground movement of aircraft. Airside facility requirement recommendations relevant to the development alternatives chapter include:

#### Pavement Condition Index

Airfield Pavement - As these PCI values are nearing the end of the planned three-year assessment cycle, it is recommended that a new pavement assessment be performed in 2019. Any pavement found to have PCI values less than 70 should be rehabilitated and any with values less than 40 should be considered for reconstruction. All remaining pavement should receive preventative maintenance in accordance with the Airport's pavement management plan.

#### Taxiways and Taxilanes

Hangar Row - The Hangar Row Taxiway width should be increased to 25 feet.

#### Airfield Lighting and Signage

Taxiway Lighting - It is recommended that the existing reflectors be replaced with either LITL or MITL on the parallel taxiway.

#### Weather Observation System (AWOS)

AWOS - It is recommended that the Airport install an AWOS on the property.

#### Airfield Design Standards

RPZ Protection - It is recommended that the Airport either acquire all property under the RPZs or work with

City and County officials to create aviation easements in order to properly control all land use in those areas.

### **Airspace**

Airspace Obstacles - At the completion of the Part 77 analysis, all reasonable efforts should be taken to clear or mitigate all obstructions identified.

### **Protection of Airport Airspace**

Overlay Zoning - It is recommended that the Airport continue to work with the City and County to protect the Airport and airspace through enforcement of the Airport Overlay Zoning.

## **5.2.3 Airport Administration Requirements**

ODA State Airports Division is responsible for the administration and management of all aspects of Cottage Grove State Airport, including hangar lease agreements, access/egress, financial record keeping, and the continuing maintenance of facilities. Below are the general administrative requirements relevant to the development alternatives.

### **Airport Administration and Maintenance**

Regulatory Standards - It is recommended that ODA continue to work with FAA officials to assure that all federal grant assurances and regulatory standards are met.

### **Airport Financials**

Financials Records - It is recommended the ODA continue to keep financial records and logs of activity at the Airport

Revenue - The Airport should continue to make every effort increase efficiencies and operate in a manner to reduce or eliminate annual losses.

## **5.2.4 Environmental Requirements**

Environmental factors, both natural and human, should be considered as part of the development alternatives process. Below are the environmental facility requirements relevant to the development alternatives.

### **Human Environment**

Noise - Noise impacts should be considered for any future development at the Airport.

Social Impact/Induced Socioeconomic Issues - Future development projects should consider how the construction activities and implementation of

those projects will potentially impact residents and socioeconomic issues of the community.

Historic Properties and Cultural Resources - A formal cultural resources determination will need to be prepared, with a Section 106 consultation with applicable Native American tribes, local governments, and interested organizations or individuals for any future development projects.

### **Natural Environment**

Prime Farmland - Any future property acquisitions should be evaluated for prime farmland soil types. FAA guidance should be consulted for exemption criteria if protected soils are located within the acquired properties.

Light and Glare - Any additional facilities will need to consider the impact of light or glare, including the use of windows or roofing material, on aviation. With the proximity of residential uses, additional lighting or structures will need to be focused such that light or glare is not projected into the community.

Air Quality - Any future development projects will need to consider the presence of contaminants or pollutant substances in the air that interfere with health or welfare, or produce other harmful environmental effects.

Water Quality - Due to the proximity to the Row River, it would be difficult to add additional water filtration or impoundment measures between the paved surfaces and the river. However, any further development on the airport should consider the effects of impervious surface runoff on the water quality of nearby waterways and reasonable efforts to mitigate any issues should be made.

Bank Erosion - The bank stabilization issue at the north end of the Airport should be investigated and addressed in order to prevent erosion from encroaching further onto the airfield.

Endangered and Threatened Species - Any activity on the Airport, including future development, will need to consider impacts to these species under the Endangered Species Act as well as other legislation and policies that provide protection to endangered and threatened flora and fauna.

Wetlands - A formal wetland determination will need to be prepared to identify any changes in wetland condition or regulatory status prior to any future development.

**Floodplains** - Prior to future development, the project sites should be checked to identify any changes in flood zone classification or regulatory status.

**Hazardous Materials** - Any areas where construction is proposed will need to undergo some level of due diligence, such as a Phase I Environmental Site Assessment to identify any history of possible contamination.

**Construction Impacts** - Once construction activities are identified, construction timing, phasing and mitigation measures need to be considered.

## 5.3 CRITERIA ANALYSIS DISCUSSION

The criteria used in the analysis of development alternatives draws from FAA Advisory Circular 150/5070-6B, Airport Master Plans. These criteria provide a way to view strengths and weaknesses of alternative concepts while maintaining concise and consistent evaluation among them. Four main criteria were chosen from the FAA guidance circular and adapted to serve the needs of this airport master planning process. These criteria are discussed and presented in greater detail at the end of each development alternative, but for purposes of this evaluation are generally defined below.

### 5.3.1 Planning Principles

Best Planning Principles aim to identify concept elements that best conform to FAA guidance on safety, security, feasibility, and flexibility. Planning principles also pertain to conformance with local planning documents including, but not limited to the Cottage Grove Transportation System Plan, recommendations identified by ODA and other relevant local (and state) agencies, and the Airport's strategic vision determined in the early part of the planning process.

### 5.3.2 Operational Considerations

Operational Considerations review the performance of the airport as a system relative to capacity, capability, and efficiency. The planning process should result in realistic concepts that when individual elements are combined, capacity, capability, and efficiency of the airport as a system can be evaluated in its entirety to identify the best performing alternative.

### 5.3.3 Fiscal Factors

Fiscal Factors consider the overall cost to implement each alternative concept. Rough order of magnitude (ROM) cost estimates have been prepared for each

alternative. Additional analysis also considers the amount of funding potentially available to implement each alternative.

## 5.3.3 Environmental Considerations

Environmental Considerations assess the potential environmental effects resulting from each alternative. The methodology for this level of study differs from the more in-depth level of analysis performed in full environmental documentation. For this analysis, key environmental components will be highlighted for alternatives assessment only. A more rigorous environmental analysis will be required prior to design and construction of any future projects.

## 5.4 NO BUILD ALTERNATIVE

The No-Build Alternative assumes maintenance of existing facilities and no expansion of airside or landside facilities. By depicting the No-Build Alternative early in the development alternatives process the ODA can objectively assess the advantages and disadvantages of each of the development alternatives against the existing conditions. The No-Build Alternative is shown on Figure 5B.

In the information presented in Chapter 3, the Airport is expected to experience a slight increase in demand over the 20-year planning period. If no development were to take place, the airport would likely be able to support the forecasted aeronautical uses and demand, however it would not optimize the potential of the Airport.

### 5.4.1 Criteria Analysis

#### Planning Principles

The No-Build Alternative does not address important issues that are currently impacting the Airport. From a safety standpoint, the No-Build does not meet best practices for safety or conform to FAA design standards by allowing several known issues to remain. These include the substandard width of Hangar Row Taxilane, the elevated powerline that crosses Hangar Row Taxilane, non-airport-controlled land use in the RPZs, and lack of adequate fencing around the airport boundary.

#### Operational Considerations

The forecasted demands of the Airport will increase only slightly over the planning period, thus the existing operation considerations meet desired criteria.

### **Fiscal Factors**

While the No-Build Alternative is essentially a do-nothing option, it does have a financial impact. Most notably, there would still be a cost associated with maintaining the current pavements and facilities. The hidden costs associated with maintaining the existing facilities in this alternative are driven by continued basic maintenance of the Airport and may eventually outweigh the cost benefits of doing nothing now.

### **Environmental Considerations**

The No Build Alternative does not present a significant change with respect to land use compatibility concerns, noise concerns, changes to the social environment, or direct threats to plant and animal communities in relation to FAA levels of significance.

## **5.5 BUILD ALTERNATIVES**

This section describes the two build alternatives with each alternative addressing both airside and landside components of the Airport such as the runway, taxiways, apron, hangars, and roadways both on and off airport property.

### **5.5.1 Common Features**

While various development alternatives are presented in the following section to offer options for accommodating the anticipated demand at Cottage Grove State Airport, there are some basic improvements included in both of the build alternative scenarios. These basic improvements, which are displayed in Figure 5C, are identified as common features since they are inherent in both development alternatives.

Common Features Include:

#### **Property Acquisitions**

In both scenarios, a total of 20.3 acres will be purchased over the planning period. Land totaling 16.5 acres located in and around the RPZs and runway approaches would be purchased to allow the Airport to fully control the land use in those areas. A single, 0.9-acre non-airport-owned parcel located on the east side of the airport near the river would be acquired to better control access to the airport from the Row River. Three parcels, totaling 2.9 acres south of the west parking apron would be purchased for future aeronautical and compatible non-aeronautical development. The specific use of these parcels is discussed further in the following build alternatives.

### **Hangar Row Taxilane**

The east/west taxiway, commonly known as Hangar Row Taxilane is currently 20 feet wide. Both alternatives widen the taxilane to 25 feet, the FAA design standard for TDG 1A and 1B.

### **Install AWOS**

Both build alternatives propose an AWOS to the Airport, which would be installed on the side of the runway to provide real-time weather reporting to airport users. As part of the installation process, trees and other vegetation within the AWOS Critical Area that exceed height limits will be mitigated and appropriate ground cover vegetation would be installed to prevent potential erosion issues.

### **Fencing**

Approximately 3,000 feet of wildlife fencing would be installed on the east side of the runway and 2,000 feet of security fence would be installed on the west side of the property between the parallel taxiway, and the adjacent neighborhood and golf course. The design and construction of this fence will be done in careful coordination with the City of Cottage Grove to assure that all requirements for erecting a fence in or near flood zones and/or floodways are followed.

### **Powerline**

Approximately 2,700 feet of high-voltage powerline that is suspended over Hangar Row Taxiway and the adjacent neighborhood, near the airport boundary, would be buried from Row River Road to Middlefield Golf Course to increase the safe utilization of the airport.

### **Hangars**

Additional Hangars are planned on the terminal apron, along the Hangar Row Taxiway and west side apron area. As hangars at Cottage Grove State Airport are user-owned but built on lots leased from the Airport, the alternatives simply identify locations available for development as the need arises. Although the current forecast does not anticipate a need for additional hangar space, it is appropriate to identify potential sites for long term planning purposes.

### **Welcome Area**

Construct general site improvements to the welcome center area. These improvements include relocating fuel tanks and pumps to the north of the welcome center, planting grass areas, and installing walkways with decorative landscaping. A preliminary concept sketch is depicted in **Figure 5D**.

## 5.5.2 Alternative 1: Terminal Apron Expansion and Helicopter Facilities

As discussed above, the two development alternative scenarios share several common features. In addition to those common features, Alternative 1 introduces the construction of a helipad, taxiway, and apron with hangar sites to be located on purchased property south of the west apron. A non-precision GPS approach and appurtenant departure procedure are also introduced.

The need for helicopter GPS approach/departure procedures was suggested in the 2nd PAC meeting to allow local medevac flights to access the neighboring hospital in inclement weather. Constructing the facilities on Airport property will serve the hospital, the greater helicopter pilot community, and provide a source of revenue for the Airport through hangar leases and facility use fees. The Heliprot Protection Zones (HPZ), Touchdown and Liffoff Area (TLOF), Final Approach and Takeoff Area (FATO), and safety area associated with the helipad facility are located on the airport property allowing ODA to fully control the land use in each of these areas. A portion of the property (0.96 acre) is not occupied by the helipad or associated facilities. This area is reserved for future development capable of generating further revenue for the Airport.

Alternative 1 also recommends the purchase of a 1.2-acre piece of property to the south of the existing terminal apron. The primary reason for purchasing this property is for boundary and approach protection. While the current forecast does not support the need for additional apron space, a 3,900 sq. yd. apron and adjacent hangar space is depicted in this scenario as a long-term planning item.

Alternative 1, including all common features, is depicted in Figure 5E.

## 5.5.3 Alternative 1 Criteria Analysis

### Planning Principles

Alternative 1 addresses land use issues in Runways 15 through the purchase of all property within the RPZs that is not currently owned by ODA. The land use of the Runway 33 RPZ is addressed through purchasing unowned land within the RPZs. Additional property, surrounding the Airport's south boundary and the land-locked parcel along the Row River are also purchased in Alternative 1 for approach airspace and boundary protection. The HPZs associated with the proposed heliport are entirely located within either existing

ODA-owned property or within the property slated for purchase under Alternative 1.

### Operational Considerations

Alternative 1 meets the anticipated airfield capacity and capability requirements of the Airport. The based aircraft and operations counts at Cottage Grove State Airport are only expected to increase slightly over the planning period. The current conditions at the Airport can handle most of the anticipated growth of the airport over the next 20 years with the exception of hangar space. Chapter 4, Facility Requirements indicates that 1 additional hangar will be built over the planning period. Alternative 1 can accommodate 18 new box hangars and 7 new large commercial hangars, exceeding the forecasted need.

### Fiscal Factors

The primary costs required to implement Alternative 1 are associated with land acquisitions along Row River for boundary and land use protection and the purchase of the property along Row River Road needed to construct the helipad and associated facilities. The purpose of the latter property is especially of interest because of its higher cost per acre due to its commercial zoning, location along Row River Road, and the current commercial real estate market. While the investment in this commercial property is a significant expense, revenue generated in the form of lease fees from aeronautical and other compatible uses of the property would allow the Airport to recover those fees over time. Construction of the helipad facilities on the west side, as well as the expansion of the current terminal apron would also significantly impact costs. The costs of burying the powerline, where it runs over or adjacent to Airport property, are unknown, but would likely be significant. The total ROM cost estimate for Alternative 1 is \$3,967,000.

### Environmental Considerations

Construction of the helipad facilities on the west side, and the terminal apron expansion will involve adding pavement to previously unpaved plots of land. Paving operations may include building embankments to prevent erosion, alteration of existing drainage systems, and remediation of wetlands impacted by construction. Construction of the terminal apron and perimeter fencing may also involve construction in flood zones/floodways and impacts to existing wetlands along Row River. The clearing of vegetation in the 500-foot AWOS critical area could lead to erosion issues unless appropriate

compatible vegetative land cover is installed at the time of clearing, which is included in the alternative scenario. The introduction of helicopter operations to the west side apron has the potential to generate increased social and environmental impacts, most notably noise issues, to the neighboring commercial businesses along Row River Road.

#### **5.5.4 Alternative 2: Hangar Area Expansion and AWOS Installation**

In addition to the previously discussed common features, Alternative 2 again recommends the purchase of three parcels (2.9 acres) south of the west apron. However, in this scenario the purchased property is intended for the construction of a new taxiway and leased hangar sites. While the current forecast does not show a need for additional hangars over the 20-year planning period, the Airport is nearly completely constrained by the river to the east and south, and by existing development to the west. The properties identified are some of the few remaining undeveloped parcels that abut the Airport. It would be advisable for ODA to acquire the property for long term planning purposes while the properties are vacant and available. Much like in Alternative 1, a portion of the property (0.8 acre) does not lend itself geometrically to additional hangar and taxiway sites. This area is instead reserved for future non-aeronautical development capable of generating additional revenue for the Airport.

Alternative 2 also recommends the purchase of a 1.2-acre piece of property to the south of the existing terminal apron. The primary reason for purchasing this property is for boundary and approach protection, but this scenario also holds it in reserve for long-term future aeronautical development use.

Alternative 2, including all common features, is depicted in Figure 5F.

#### **Planning Principles**

Much like the previous concept, Alternative 2 addresses land use issues in Runways 15 through the purchase of all property within the RPZs that is not currently owned by ODA. Additional property, surrounding the Airport's south boundary and the land-locked parcel along the Row River are again purchased in Alternative 2 for approach airspace, and boundary protection.

#### **Operational Considerations**

Alternative 2 meets the anticipated airfield capacity and capability requirements of the Airport. The facility requirements, discussed in Chapter 4 specify that 1 additional hangar will be built over the planning period. No additional apron area is needed to accommodate growth. Alternative 2 proposes 30 new box hangars and 770 square yards of new apron, exceeding the forecasted need.

#### **Fiscal Factors**

The most substantial costs of Alternative 2 are associated with land acquisitions along Row River for boundary and land use protection, and the purchase of the property along Row River Road for the construction of the new hangar area. The price of the Row River Road properties is heavily influenced by commercial zoning, location along Row River Road, and the current commercial real estate market. It should be noted that since the forecasted activity does not support the need for more hangar sites, it is unlikely that the FAA would participate in the purchase of the property for that purpose.

While the investment in this commercial property is a significant expense, the return on the investment in the form of lease fees generated from aeronautical and other compatible uses of the property have the potential to offset those costs over time. Construction of the taxiway on the west side, as well as the expansion of the west parking apron would also significantly impact costs. The costs of burying the powerline, where it runs over or adjacent to Airport property, are unknown, but would likely be significant. The ROM cost estimate for Alternative 2 is \$2,920,000.

#### **Environmental Considerations**

Construction of the apron and taxiway on the west side will involve adding pavement to previously unpaved plots of land. Paving operations may include building embankments to prevent erosion, the alteration of existing drainage systems, and the remediation of wetlands impacted by construction. Construction of the perimeter fencing may involve work within flood zones/floodways and possibly impact existing wetlands along Row River. The clearing of vegetation in the 500-foot AWOS critical area could create erosion issues unless appropriate compatible vegetative land cover is installed at the time of clearing. While the introduction of new hangars and taxiways would likely have less social impacts than the helipad facilities proposed in Alternative 1, the increase in aeronautical activity in the

proposed hangar area would likely generate increased noise to the area, impacting the neighboring businesses along Row River Road.

### 5.5.5 PAC Discussion Summary

The development alternatives were presented at the third PAC Meeting. As described previously, the two alternatives featured many similar features. The primary differences between the two are related to the intended use of the development areas off the west apron, and south of the terminal apron. Most commenters, PAC and public, did not have a strong preference for either of the presented scenarios. However, many were strongly in favor of purchasing the property to the south of the west apron for event auto parking and boundary protection. There was also strong support by most in attendance for the construction of additional security fence, as well as general site improvements at the Welcome Center. Of those who expressed a preference, alternative 1 was preferred by most, as the helipad development would likely serve a greater need for the community, including the neighboring hospital.

A representative from the City of Cottage Grove Planning Department offered several comments of note during the discussion. First it was pointed out that a portion of the city-owned property in the Runway 33 RPZ was purchased with funds from the U.S. Department of Interior (DOI) Land and Water Conservation Fund (LWCF). As federal grant funds were used for the purchase, the City is unable to sell any of the property without repaying the grant. Next the planning team was informed that the derelict house on a parcel identified for acquisition had recently been purchased and was being renovated by the new owner. During the alternatives process, it had been assumed that this property had not and would not be improved and was available for acquisition. Third, it was pointed out that the proposed location of the helipad conflicted with the routing of a planned multi-use path proposed in the City's Transportation System Plan.

## 5.6 PREFERRED ALTERNATIVE

The alternatives were presented at the third PAC meeting and a public open house. ODA selected a preferred alternative that incorporates the key concepts of Alternative 1, while also including specific feedback from the FAA, PAC members, ODA and members of the community. Figure 5G depicts the features of the preferred alternative, which in addition to the features presented in Alternative 1, include a slightly repositioned

helipad and associated facilities, changes to the planned land acquisitions, and restricting the powerline to be buried to that only between Row River Road and Jim Wright Way.

The siting of the helipad in Alternative 1 conflicts with the planned route of the Eastern Trail Connection, a multi-use trail connection between Jim Wright Way and Palmer Avenue that was proposed in the City of Cottage Grove's 2015 Transportation System Plan. By moving the proposed helipad location approximately 50 feet to the north, the preferred alternative provides enough space to route the Eastern Trail Connection between the HPZs and Row River Road. Routing the trail in such a manner will keep trail users off Row River Road, a primary objective of the proposed project as it was initially proposed by the City.

The preferred alternative does not recommend the acquisition of the City-owned property in the Runway 33 RPZ. This property is part of the Row River Nature Park. Discussions with City of Cottage Grove Planning staff indicated that the park was purchased with funds from the U.S. Department of Interior (DOI) Land and Water Conservation Fund (LWCF). The LWCF requires that property be used for conservation related uses for a period of 99 years from the purchase. In the case of Cottage Grove's grant, the property is used to create Row River Nature Park. The park is compatible with ODA's land use compatibility standards and, based on the terms of the LWCF funding, it is considered to be adequately protected from future incompatible land uses over the planning period.

Following discussions with ODA, it was decided that it is only necessary for the State to participate in a project to bury the powerlines that directly impact the Airport's property. So, the preferred alternative proposes that the powerline be routed underground between Jim Wright Way and Row River Road, where it either crosses or abuts the property.

## 5.7 SUMMARY

With the selection of the preferred alternative completed there are several steps remaining in the airport master planning process. The next phase is the development of a Recycling and Solid Waste Management Plan to help the community minimize generation of solid waste at the airport. Then, the Airport Layout Plan (ALP) drawing set will be completed, followed by the development of a Capital Improvement and Financial Plan, which will be

produced to depict the 20-year development plan for the airport as well as to provide the cost estimates and phasing scenario over the planning period.