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CHAPTER SUMMARY

This chapter evaluates a series of alternative solutions to satisfy the Redmond Municipal Airport’s (RDM or “the Airport”) facility requirements, which are described in Chapter 3 – Facility Requirements. The purpose of this analysis is to enable development of airport facilities that can realistically accommodate forecasted demand. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and Airport development goals. The alternatives evaluation process is structured to systematically evaluate options and provide the technical basis for arriving at a preferred development concept. Criteria utilized to evaluate development alternatives include:

✓ Operational performance
✓ Environmental considerations
✓ Construction feasibility
✓ Financial impacts
✓ Stakeholder feedback

Various sets of improvement plans were developed for the Airport’s airside, landside and terminal areas to accommodate projected needs throughout the planning period. Although they do not exhaust all the variations, the developed alternatives form an appropriate base to produce a “preferred” plan of development for the airport. The preferred alternative serves as a guide for capital improvement planning and is the basis of the Airport Layout Plan (ALP). A summary of the recommended alternatives is included below. The analysis that led to the selection of a preferred alternative is described in this chapter.

✓ Runway Alternative – Alternative 1
  ○ The recommended alternative extends Runway 5-23 2,962 feet to the southwest for a total runway length of 10,000 feet, as shown in Figure 4-2. The runway extension of Runway End 5 would occur on airport-owned property, requires no additional land acquisition or easements, and does not require building demolition or relocation of existing highways and roads. It is assumed that Runway 5-23 would have an upgraded approach that supports area navigation (RNAV) and localizer performance with vertical guidance (LPV) approach capabilities.
✓ Taxiway Alternative – Alternative 1
  o The recommended alternative, as shown in Figure 4-8 identifies a new full-length parallel taxiway east of Runway 5-23, addresses Federal Aviation Administration (FAA) “Hot Spots” One and Two, and can be constructed in multiple phases as demand dictates. Improvements to Taxiway A and Taxiway F are identified to comply with FAA Advisory Circular (AC) 150/5300-13A, Change 1, Airport Design.

✓ Vehicle Parking Alternative – Alternative 1
  o The recommended alternative, as shown in Figure 4-10, adds 4,000 parking stalls and converts the existing hourly terminal parking lot in front of the terminal into a combination of hourly and premium long-term parking. The existing employee vehicle parking lot to the west of the passenger terminal would be reduced to accommodate expanded vendor vehicle parking. A second employee vehicle parking lot would be developed within the central passenger terminal area. Additional long-term vehicle parking would be developed west of SE Airport Way and a remote vehicle parking lot would be developed north of the Deschutes County Fairgrounds Expo Center, along the west side of SE Airport Way. Rental car facilities would be developed just north of the additional long-term vehicle parking lot.

✓ General Aviation Development Alternative – Alternative 2
  o The recommended alternative, as shown in Figure 4-15, identifies the expansion of aeronautical and non-aeronautical development north from the existing north development area. The resultant expansion would support a new flight school, hangar expansion for both corporate and general aviation users, and support non-aeronautical development.

✓ Passenger Terminal Alternative – Alternative 3
  o The recommended alternative, as shown in Figures 4-24, 4-25, and 4-26, identifies expansion of the existing terminal to the west and will expand passenger boarding and holdroom areas, outbound and inbound baggage operations, Transportation Security Administration (TSA) security screening, rental car counters and offices, ticket counters, queuing and airline ticketing offices, administration space, and mechanical support spaces. The terminal expansion supports seven new aircraft gates, with the ability to add an eighth gate, that accommodate Aircraft Design Group (ADG)-III aircraft (Airbus A320 or Boeing B737) served through passenger boarding bridges (PBBs). The proposed expansion stays clear of the Airport’s Runway Visibility Zone (RVZ).
4.0 INTRODUCTION

This chapter introduces a variety of alternatives related to the Airport’s runways, taxiways, vehicle parking, general aviation (GA) development, location of support facilities, passenger terminal and non-aeronautical development. Alternatives are analyzed using evaluation criteria developed for the Master Plan and were agreed upon during the initial scoping of the project. The outcome of the analysis and the public process is the selection of a preferred alternative for the Master Plan. Each alternative was evaluated according to five categories: alignment with operational performance, environmental considerations, constructability, financial impacts/cost to the Airport, and stakeholder feedback. Feedback was collected throughout the planning process from the Master Plan Planning Advisory Committee (PAC) and the public. The PAC is a diverse group made up of elected officials, on- and off-airport businesses, and members of the broader community. The PAC’s role is to help shape the Master Plan into a document that is reflective of community goals and interests while satisfying FAA requirements for airport development. The preferred alternative identified in Section 4.6 is used to prepare the implementation plan described in a subsequent chapter. The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development. The preferred alternatives will be shown on the ALP.

The chapter is organized as follows:

- 4.1 Airport Development Objectives
- 4.2 Alternatives Development Process
- 4.3 Evaluation Categories
- 4.4 Evaluation Process
- 4.5 Airport Development Alternatives
- 4.6 Alternatives Summary
4.1 AIRPORT DEVELOPMENT OBJECTIVES

The Master Plan is intended to produce a cohesive set of alternatives that position the Airport to accommodate the forecasted demand over the next 20 years. Prior to developing and evaluating specific alternatives, the Airport’s development objectives must be understood. Development objectives for this Master Plan include:

- Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses
- Increase revenue generation through the development of non-aeronautical land
- Provide development area for GA and United States Forest Service (USFS) activities
- Develop the passenger terminal and associated facilities to provide high levels of service
- Develop facilities in an environmentally compatible manner
- Develop facilities in accordance with all federal, state, and local regulations
- Develop facilities consistent with Stakeholder needs

Development to meet long-term demand requires consideration of both the airside and landside needs of the Airport. Airside facilities include runways, taxiways, support facilities, and non-terminal building areas, while landside facilities include vehicle parking areas, walkways, public access roads, rental car facilities, taxi and ground transportation, hotels, and any other areas accessible to the public. Those needs are presented in the following airside and landside planning sections.

4.1.1 AIRSIDE PLANNING

Airside needs include:

- Analyze the ability of the Airport to meet design standards identified in the FAA AC 150/5300-13A, Change 1, Airport Design
- Address FAA identified Hot Spots on the taxiways
- Analyze existing and future capacity constraints, which include an expanded passenger terminal and apron area, additional supporting taxiways, runway extension, and a future parallel runway
- Provide a variety of aircraft storage options including t-hangars, box hangars, and corporate hangars
- Identify location for a new fuel farm to support passenger airline and GA operations, and define fuel truck haul routes to minimize taxiway crossings
- Incorporate a flight school into proposed development
- Expand property available for development by GA and corporate aviation tenants
- Identify a storage location for emergency preparedness in support of the Federal Emergency Management Agency (FEMA) or other emergency responding agencies
✓ Identify strategic land acquisition to support airport operation and future development

4.1.2 LANDSIDE PLANNING

Landside needs include:

✓ Remove roadways within the existing and future runway protection zones (RPZs) when feasible
✓ Maximize buildable property for aeronautical and non-aeronautical development
✓ Analyze locations for expanded short- and long-term passenger vehicle parking, rental car operators and associated support facilities, Airport employee and vendor parking, and overflow parking
✓ Analyze existing landside access and roadway networks to support future development
✓ Identify strategic land acquisition to support proposed improvements
4.2 ALTERNATIVES DEVELOPMENT PROCESS

The framework for the alternatives development was established in Chapter 1 – Inventory, Chapter 2 – Forecast, and Chapter 3 – Facilities Requirements. Information contained in these chapters was used to develop layouts that support the Airport’s ability to accommodate forecasted demand and prepare a 20-year facility plan for the Airport moving forward. Developing the alternatives included examining:

✓ FAA Airport Design Standards
✓ Land Development Strategies
✓ Revenue Producing Opportunities
✓ Aircraft Operations
✓ Passenger Enplanements

These factors provide the framework necessary to formulate feasible development alternatives to meet future demand. The typical alternatives development and evaluation process is illustrated in the following Figure 4-1.

Figure 4-1. Typical Alternatives Development Process

4.2.1 AIRPORT MASTER PLAN ADVISORY COMMITTEE INPUT

Throughout this planning process, public involvement and stakeholder outreach has been a continuous process involving educational, listening, and collaborative components. Stakeholder groups include the PAC, Airport Committee, City of Redmond, and members of the public. The feedback received during the process is used to qualitatively compare the alternatives.
4.3 EVALUATION CATEGORIES

The following evaluation categories provide the basis of analysis for each alternative and support a fact-based comparison:

- Operational Capabilities (Specific to Functional Area)
- Performance Requirement Benchmarks (Ability to accommodate demand)
- Land Use Compatibility
- Environmental Impacts
- Stakeholder Feedback
- Constructability
- Financial Cost/Impacts

These categories were developed to ensure the selected alternative is consistent with the role of the Airport and are described in the following sections.

4.3.1 OPERATIONAL CAPABILITIES

This evaluation category is applied to the alternatives to determine their ability to satisfy the facility requirements identified in Chapter 3 – Facility Requirements. An analysis of the demand and capacity requirements, and geometric and other standards that govern the design of airport components, guided development of the facility requirements.

4.3.2 PERFORMANCE REQUIREMENTS BENCHMARKS

This evaluation category is applied to the alternatives to determine their ability to support demand identified in Chapter 2 – Aviation Activity Forecasts. Alternatives aligned with the forecasts if they provided the facilities necessary to meet identified demand through 2036.

4.3.3 LAND USE COMPATABILITY

This category evaluates alternatives based on compatible land use and the potential impacts to land or other environmental factors that could influence an alternative. These include noise exposure, wetlands or stream impacts, or other factors that might be unique to developed alternatives.
4.3.4 ENVIRONMENTAL IMPACTS

This category evaluates alternatives based on compatibility with existing environmental assets with the goal of developing in an environmentally sustainable manner. The following impacts to specific environmental elements were considered:

✓ Air Quality
✓ Biological Resources (including fish, wildlife, and plants)
✓ Climate
✓ Coastal Resources
✓ Department of Transportation Act, Section 4(f)
✓ Farmlands
✓ Hazardous Materials, Solid Waste, and Pollution Prevention
✓ Historical, Architectural, Archaeological, and Cultural Resources
✓ Land Use
✓ Natural Resources and Energy Supply
✓ Compatible Land Use
✓ Socioeconomic, Environmental Justice and Children’s Environmental Health and Safety Risks
✓ Visual Effects (Including Light Emissions)
✓ Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Early identification of these environmental factors may help avoid impeding future development plans. The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and FAA Order 5050.4B, National Environmental Policy Act.

4.3.5 STAKEHOLDER FEEDBACK

Stakeholder input was obtained from the PAC, Airport Advisory Committee, City of Redmond, FAA, various stakeholders, community members, and members of the public to assist in evaluating the alternatives. Public and committee meetings were held on the following dates:

✓ Stakeholder Interviews – September 26, 2016
✓ Redmond City Council – October 25, 2016
✓ PAC Meeting #1 – November 9, 2016
✓ Airport Committee – November 10, 2016
✓ Redmond City Council – February 7, 2017
✓ PAC Meeting #2 – February 8, 2017
✓ Redmond City Workshop – April 25, 2017
✓ PAC Meeting #3 – June 22, 2017
✓ FAA Teleconference – August 4, 2017
✓ PAC Meeting #4 and Open House – October 18, 2017
✓ Redmond City Council – January 9, 2018
✓ PAC Meeting #5 and Open House #2 – Scheduled for Winter 2018

These public meetings were supplemented with presentations, exhibits, and one-on-one interviews. Input was considered and incorporated into the development of the alternatives for RDM.

4.3.6 CONSTRUCTABILITY

This category evaluates alternatives based on implementing the alternative in logical phases. Timing and the sequence of construction can create delays, increase cost, and impact airport operations. Each alternative was examined to determine the degree of its impact on airport operations.

4.3.7 FINANCIAL COSTS/IMPACTS

This category evaluates alternatives based on cost factors to assess feasibility and form a relative basis of comparison. The analysis looks at the following for each alternative:

✓ Ability to fund the required capital expenditures
✓ Airport operating costs
✓ Potential revenues, operating and capital expenses, and potential funding sources for each alternative

Capital expenses include demolition costs, construction and site preparation costs, environmental costs and lease buyouts.
4.4 EVALUATION PROCESS

This section defines the alternatives analysis process utilized in accordance with FAA AC 150/5070-6B, *Airport Master Plans*. Developing multiple alternatives represents the first of a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved ALP identifies future improvements recommended in a prior master planning effort. The master planning process addresses facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they meet current needs.

Airport development alternatives are created to respond to defined facility needs, with the goal of identifying 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. Based on a wide range of input from multiple stakeholders, elements of the various alternatives will be consolidated into a preferred alternative that can be refined further as the City proceeds through the process of finalizing the remaining elements of the airport Master Plan. Throughout this process, public input and coordination with the PAC, FAA, and RDM will also help to shape the preferred alternative.

Once the preferred alternative is selected by RDM, 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 ALP drawings that will guide future improvements at the Airport.
4.5 AIRPORT DEVELOPMENT ALTERNATIVES

The initial airport development alternatives are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the Airport. The facility requirements identified in the previous chapter include a variety of airside, landside, passenger terminal, and other development needs. The airport development alternatives are organized into several groups:

- Runway Alternatives
- Taxiway Alternatives
- GA Development Alternatives
- Vehicle Parking Alternatives
- Support Facilities Alternatives
- Passenger Terminal Alternatives
- Non-Aeronautical Property Development Alternatives

The airport development alternatives are described below and depicted in Figures 4-2 through 4-32 to illustrate the key elements of each alternative.

4.5.1 RUNWAY ALTERNATIVES

Runway 5-23 is the Airport’s primary runway and is 7,038 feet long and 150 feet wide. The runway has pavement strength of 68,000 pounds for single-wheel gear (SWG) aircraft and 110,000 pounds for dual wheel gear (DWG) aircraft and is designed to C-III Standards. Runway 11-29 is the crosswind runway and is 7,006 feet long and 100 feet wide. The runway has pavement strength of 28,000 pounds for SWG and 40,000 pounds for DWG and is designed to B-III Standards. Additional airfield capacity is not required as the existing primary runway can accommodate future demand through 2036.

Chapter 3 – Facility Requirements explained the potential need for a 2,962-foot-runway extension to Runway 5-23 for a total runway length of 10,000 feet to serve markets in the Midwest. To examine the feasibility of an extension at RDM, six runway extension alternatives have been identified and are evaluated in the following sections. The alternatives assume an upgraded approach to Runway End 5 that supports RNAV and LPV approach capabilities, similar to the localizer and glideslope of an Instrument Landing System (ILS) approach into Runway End 23. The MALSR (Medium Approach Light System with Runway Alignment Indicator Lights) will remain within the RPZ and on airport property. Earthwork for the runway and supporting taxiway extension alternatives to the southwest requires significant fill due to the uneven terrain and requirements to match existing grades of the runway and taxiway.

None of the alternatives would impact night operations.
Runway extension alternatives consider RPZ requirements in FAA AC 150/5300-13A, Change 1, Airport Design and the 2012 memorandum Interim Guidance on Land Uses within a Runway Protection Zone (2012 RPZ Memo). Modifications to Runway End 23 will require evaluation of the relocation of Highway 126 to meet FAA design guidance. The alternatives comply with AC 150/5300-13A, Change 1, Airport Design standards for the runway safety area (RSA), runway object free area (ROFA), and taxiway object free area (TOFA).

ALTERNATIVE 1 – Extend Runway 5-23 Southwest

This alternative provides a 10,000-foot-long runway by extending Runway 5-23 to the southwest, as shown in Figure 4-2. The extension of Runway End 5 will occur on airport-owned property, requires no additional land acquisition or easements, and does not require building demolition or relocation of existing highways and roads. The construction of the proposed runway extension and supporting taxiways would require 79,092 cubic yards (CY) of material excavation and the supporting taxiway would require 10,792 CY of material excavation for 89,884 CY of total material excavation. This alternative would add 77,400 square yards (SY) of additional pavement. FAA runway and taxiway design criteria are met with this alternative.

This alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact on airport operations. The extension would increase the extent of the RVZ by 1,481 feet to the southwest. The RVZ should remain free and clear of obstructions to provide an unobstructed view of aircraft arriving to or from the intersections of the two runways.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface, however, these obstructions are on existing airport property and can be mitigated. The extension does not change any instrument approach capabilities and Navigational Aids (NAVAIDs) would be relocated appropriately.

This alternative is estimated at a total project cost of $48,450,000 and includes engineering, environmental compliance, construction management services, relocation of the aircraft rescue and firefighting (ARFF) building, and extension of Taxiway F to the new end of Runway 5.

ALTERNATIVE 2A – Extend Runway 5-23 Northeast

This alternative involves extending Runway 5-23 2,962 feet to the northeast with a parallel taxiway and separate exit and entrance connectors as shown in Figure 4-3. The extension of Runway 23 by 2,962 feet requires the relocation and realignment of Highway 126 by 1.75 miles, and 62 acres of additional property to comply with AC 150/5300-13A and the 2012 RPZ Memo. The required acquisition off the end of Runway 23 is located outside City Limits and outside the Redmond urban growth boundary (UGB) in unincorporated Deschutes County. The property is zoned Exclusive Farm Use (EFU), for which state law
severely restricts non-agricultural uses. As a result, extending the runway outside the UGB or rerouting a portion of Highway 126 outside the UGB would require seeking an Exception to Statewide Planning Goal 3 (Agricultural Lands) and receiving approval from the Board of County Commissioners. To obtain approval, the City would have to demonstrate that it performed an alternatives analysis demonstrating that other options within the UGB were not viable. This could subject the City and the County to potential appeals and project delays.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would also be located within the RPZ, and FAA may require potential mitigation measures such as the placement of a cap on the canal in the RPZ area. The extension would increase the extent of the RVZ by 1,481 feet to the northeast; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extension and supporting taxiway and connectors would require 1,693 CY of material excavation and the supporting taxiway would require 718 CY of material excavation for 2,411 CY of total material excavation. This alternative would add 77,400 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

No new obstructions to the 50:1 approach surface were identified with the proposed extension.

This alternative is estimated at a total project cost of $37,550,000 and includes engineering, environmental compliance, and construction management services.

**ALTERNATIVE 2B – Extend Runway 5-23 Northeast**

This alternative is a derivative of Alternative 2A and similarly involves extending Runway 5-23 2,962 feet to the northeast with a parallel taxiway and separate exit and entrance connectors as shown in Figure 4-4. Instead of relocating Highway 126 outside of critical runway geometric areas, such as the RPZ, Highway 126 would remain in its current alignment and a tunnel would be constructed underneath the Runway 23 to achieve the 2,962-foot extension. This alternative requires 63 acres of additional property to comply with AC 150/5300-13A and the 2012 memorandum 2012 RPZ Memo. The required acquisition off the end of Runway 23 is located outside City Limits and outside the Redmond UGB in unincorporated Deschutes County. The property is zoned EFU, for which state law severely restricts non-agricultural uses. As a result, extending the runway outside the UGB or rerouting a portion of Highway 126 outside the UGB would require seeking an Exception to Statewide Planning Goal 3 (Agricultural Lands) and receiving approval from the Board of County Commissioners. To obtain approval, the City would have to demonstrate that it performed an alternatives analysis of other options within the UGB that were not
viable. This would be a high bar to meet and could subject the City and the County to potential appeals and project delays.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would also be located within the RPZ, and FAA may require potential mitigation measures such as the placement of a cap on the canal in the RPZ area. The extension would increase the extent of the RVZ by 1,481 feet; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extension and supporting taxiway and connectors would require 1,693 CY of material excavation and the supporting taxiway would require 718 CY of material excavation for 2,411 CY of total material excavation. This alternative would add 77,400 SY of additional pavement. Construction associated with this project would be extremely complex due to the type of construction required to build a tunnel, associated phasing, and existing ground conditions.

The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

No obstructions were identified with this alternative.

This alternative is estimated at a total project cost of $58,440,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3A – Split Runway 5-23 Extension

This alternative involves extending Runway 5-23 by 400 feet to the northeast and by 2,562 feet to the southwest for a total runway length of 10,000 feet with a parallel taxiway and separate exit and entrance connectors as shown in Figure 4-5. This alternative assumes the FAA would not require RPZ compliance for the existing alignment of Highway 126 through Runway 23’s RPZ. Extending Runway End 23 to the northeast utilizes an existing avigation easement for a portion of the land that falls within Runway 23’s RPZ. Runway 5-23 extends 400 feet to the northeast in this alternative due to the extent of the OFA stopping prior to Highway 126. Extending Runway End 5 to the southwest would occur on existing airport property and requires no additional land acquisition or easements nor any building demolition or relocation of existing highways or roads.

The construction of the proposed split runway extension and supporting taxiway and connectors would require 72,092 CY of material excavation and the supporting taxiway would require 9,416 CY of material excavation for 81,508 CY of total material excavation. This alternative would add 85,300 SY of additional pavement. This extension would however increase the extent of the RVZ by 1,281 feet and include a portion of the existing passenger terminal aircraft apron and the ARFF building. The complexity of
constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface for the extended Runway 5; however, these obstructions are on existing airport property and could easily be mitigated. The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

This alternative is estimated at a total project cost of $29,319,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3B – Split Runway 5-23 Extension

This alternative involves equally extending Runway 5-23 by 1,500 feet to the northeast and by 1,462 feet to the southwest with a parallel taxiway and separate exit and entrance connectors as shown in Figure 4-6. The extension of Runway End 23 to the northeast requires relocating and realigning 0.8 miles of Highway 126 0.34 miles north and utilizes an existing avigation easement for a portion of the land that falls within Runway 23’s RPZ. The realignment of Highway 126 is 1.25 miles and is outside of the future RPZ for Runway End 23. Extending Runway End 5 to the southwest would occur on existing airport property and does not require additional land acquisition, easements, building demolition, or relocation of existing highways or roads.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would be located within the Runway End 23 RPZ, and FAA may require mitigation measures such as the placement of a cap on the canal in the RPZ. The extension would increase the extent of the RVZ to the southwest by 731 feet and to the northeast by 750 feet; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extensions and supporting taxiway and connectors would require 11,893 CY of material excavation, and the supporting taxiway would require 6,416 CY of material excavation for 18,309 CY of total material excavation. This alternative would add 81,600 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface for the extended Runway End 23; however, these obstructions are on existing airport property and could easily be mitigated. The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

This alternative is estimated at a total project cost of $31,555,000 and includes engineering, environmental compliance, and construction management services.
ALTERNATIVE 3C – Split Runway 5-23 Extension

This alternative is a derivative of Alternative 3B and similarly involves extending Runway 5-23 by 1,500 feet to the northeast and by 1,462 feet to the southwest with a parallel taxiway and separate exit and entrance connectors as shown in Figure 4-7. The extension of Runway End 23 to the northeast requires relocating and realigning 0.8 miles of Highway 126 0.50 miles north and utilizes an existing avigation easement for a portion of the land that falls within Runway 23’s RPZ. The realignment of Highway 126 is 3 miles and is outside of the avigation easement of Runway End 23. Extending Runway End 5 to the southwest would occur on existing airport property and does not require additional land acquisition, easements, building demolition, or relocation of existing highways or roads.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would be located within the Runway 23 RPZ, and FAA may require the placement of a cap on the canal in the RPZ. The extension would increase the extent of the RVZ to the southwest by 731 feet and to the northeast by 750 feet; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extensions and supporting taxiway and connectors would require 11,893 CY of material excavation, and the supporting taxiway would require 3,416 CY of material excavation for 15,309 CY of total material excavation. This alternative would 81,600 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface for the extended Runway 23; however, these obstructions are on existing airport property and could easily be mitigated. The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

This alternative is estimated at a total project cost of $36,850,000 and includes engineering, environmental compliance, and construction management services.
Figure 4-2
Alternative 1 - Extend Runway Southwest
LEGEND
- RDM Property Boundary
- Navigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Highway 126 Relocation
  Alignment Distance: 1.75 miles
- Highway 126 Removal
  Removal Distance: 0.75 miles
- Gravel Road Relocation
  Alignment Distance: 0.4 miles
- Tenant
- Future Land Acquisition (62 acres)
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
- Total Obstructions: 0

Figure 4-3
Alternative 2A - Extend Runway Northeast
Alternative 2B - Extend Runway Northeast
Figure 4-5

Alternative 3A - Split Runway Extension
Figure 4-6

Alternative 3B - Split Runway Extension
Figure 4-7
Alternative 3C - Split Runway Extension
SUMMARY EVALUATION OF RUNWAY ALTERNATIVES

Table 4-1 presents a summary and an evaluation of the various alternatives for a runway extension at RDM. Alternative 1 is the preferred alternative because the Airport owns the land on which the runway extension will be built.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2A</th>
<th>Alternative 2B</th>
<th>Alternative 3A</th>
<th>Alternative 3B</th>
<th>Alternative 3C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Extend Runway 5 2,962' to the southwest</td>
<td>Extend Runway 23 2,962' to the northeast</td>
<td>Extend Runway 23 2,962' to the northeast and Highway 126 tunnel under runway and taxiway</td>
<td>Extend Runway 5 2,562' to the southwest and extend Runway 23 400' to the northeast</td>
<td>Extend Runway 5 1,482' to the southwest and extend Runway 23 1,500' to the northeast</td>
<td>Extend Runway 5 1,462' to the southwest and extend Runway 23 1,500' to the northeast</td>
</tr>
<tr>
<td>Operability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attract Larger Airplanes and Operating Weights and Range</td>
<td>Potential with longer published runway length for 5-23</td>
<td>Potential with longer published runway length for 5-23</td>
<td>Potential with longer published runway length for 5-23</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
</tr>
<tr>
<td>Critical Airspace Approach and Departure Surface Considerations</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
<td>Instrument approach capabilities added to Runway 5</td>
</tr>
<tr>
<td>Effect on All-Weather Capabilities</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>NAVAIDS</td>
<td>Relocate with extension</td>
<td>Relocate with extension</td>
<td>Relocate with extension</td>
<td>Relocate with extension</td>
<td>Relocate with extension</td>
<td>Relocate with extension</td>
</tr>
<tr>
<td>Runway Protection Zone Conflicts</td>
<td>Highway 126 in Runway End 23 RPZ</td>
<td>None</td>
<td>None due to Highway 126 tunnel</td>
<td>Highway 126 in Runway End 23 RPZ</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Surface Transportation</td>
<td>Airport perimeter road in Runway 5 RPZ; Highway 126 in Runway 23 RPZ</td>
<td>None</td>
<td>None due to Highway 126 tunnel</td>
<td>Highway 126 in Runway End 23 RPZ</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Effect on Night Operations</td>
<td>Instrument lighting proposed for Runway 5</td>
<td>Instrument lighting proposed for Runway 5</td>
<td>Instrument lighting proposed for Runway 5</td>
<td>Instrument lighting proposed for Runway 5</td>
<td>Instrument lighting proposed for Runway 5</td>
<td>Instrument lighting proposed for Runway 5</td>
</tr>
<tr>
<td>Performance Requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting Taxiways</td>
<td>Extend Taxiway F southwest 2,962' to new end of Runway 5</td>
<td>Extend Taxiway F northeast 2,962' to new end of Runway 23</td>
<td>Extend Taxiway F northeast 400' to new end of Runway 23 and 2,562' southwest to new end of Runway 5</td>
<td>Extend Taxiway F northeast 1,500' to new end of Runway 23 and 1,462' southwest to new end of Runway 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obstructions</td>
<td>0 obstructions to NE; 4 obstructions to SW</td>
<td>No obstructions</td>
<td>4 obstructions to NE 0 obstructions to SW</td>
<td>4 obstructions to NE 0 obstructions to SW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Visual Zone</td>
<td>Extends southwest by 1,481', air carrier apron and ARFF bldg penetrate RVZ</td>
<td>Extends northeast by 1,481', no additional inclusions</td>
<td>Extends southwest by 1,281' and northeast by 200', air carrier apron and ARFF bldg penetrate RVZ</td>
<td>Extends southwest by 731' and northeast by 750', no additional inclusions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Off-Airport Land Use</td>
<td>Potential decreased compatibility to the southwest</td>
<td>Potential decreased compatibility to the northeast and relocation of business required</td>
<td>Potential decreased compatibility to the southwest and northeast</td>
<td>Potential decreased compatibility to the southwest and northeast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>Reduction in available building area southwest of relocated approach end of Runway 5 due to RPZ and approach surface shift</td>
<td>No Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 4-1. Summary Evaluation Matrix of Runway Alternatives

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2A</th>
<th>Alternative 2B</th>
<th>Alternative 3A</th>
<th>Alternative 3B</th>
<th>Alternative 3C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Extend Runway 5 2,962' to the southwest</td>
<td>Extend Runway 23 2,962' to the northeast</td>
<td>Extend Runway 23 2,962' to the southeast and Highway 126 tunnel under Runway and taxiway</td>
<td>Extend Runway 5 2,962' to the southwest and extend Runway 23 400' to the northeast</td>
<td>Extend Runway 5 1,462' to the southeast and extend Runway 23 1,500' to the northeast</td>
<td>Extend Runway 5 1,462' to the southeast and extend Runway 23 1,500' to the northeast</td>
</tr>
</tbody>
</table>

#### Environmental Impact Potential

<table>
<thead>
<tr>
<th>Property Acquisitions / Easements</th>
<th>None</th>
<th>62 acres (Runway 23 RPZ and property around RPZ)</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historic, Architectural, and Archaeological and Cultural Resources</td>
<td>None</td>
<td>The North Unit Main Canal (Historic Resource) would be located in the RPZ</td>
<td>None</td>
</tr>
<tr>
<td>Section 4(F) of the Department of Transportation Act</td>
<td>None</td>
<td>The North Unit Main Canal (Section 4(f) Resource) would be located in the RPZ</td>
<td>None</td>
</tr>
<tr>
<td>Impervious Surfaces (Runways and Associated Taxiways)</td>
<td>77,400 SY of additional pavement. (includes extension of Twy F)</td>
<td>77,400 SY of additional pavement. (includes extension of Twy F); 1.75 miles of relocated Highway 126</td>
<td>85,300 SY of additional pavement. (includes extension of Twy F)</td>
</tr>
</tbody>
</table>

#### Stakeholder Feedback

<table>
<thead>
<tr>
<th>On/Off Airport Related Impacts</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Risk</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Implementation Complexity</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

#### Constructability

<table>
<thead>
<tr>
<th>Impact to Airport Operations</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

#### Financial Costs/Impacts

| Project Cost | $48,450,000 | $37,650,000 | $58,440,000 | $29,319,000 | $31,555,000 | $36,850,000 |

#### ALTERNATIVE EVALUATION

<table>
<thead>
<tr>
<th>DETERMINATION</th>
<th>Favorable</th>
<th>Favorable</th>
<th>Not Favorable</th>
<th>Neutral</th>
<th>Not Favorable</th>
<th>Not Favorable</th>
</tr>
</thead>
</table>
AIRFIELD CAPACITY AND THIRD RUNWAY

As discussed in Chapter 3 – Facility Requirements, RDM is currently operating at 20 percent of its annual capacity, 27 percent of its Visual Flight Rules (VFR) hourly capacity and 36 percent of its Instrument Flight Rules (IFR) capacity with the existing runway configuration. Flight school operations are expected to double total operations at RDM but will not change the percentage of the mix index because of the weights of aircraft in the flight school fleet. All aircraft in the flight school fleet weigh below 12,500 pounds, and only aircraft that weigh greater than 12,500 pounds can be used in the mix index equation to determine maximum annual service volume (ASV). Total operations at RDM will approximate to 80,000, only 40 percent of its ASV of 200,000 operations. It is anticipated that the aviation activity forecasted through 2036 will not significantly change airfield capacity thus not justifying the need for additional runway capacity. However, a third parallel runway was identified in the previous April 2005 Airport Master Plan and is included on the FAA-approved current ALP (February 2005). The runway is parallel to Runway 5-23 with 3,700 feet centerline to centerline separation and is to initially be constructed 6,200 feet long and 100 feet wide with supporting taxiways and connectors. The ultimate runway was identified as 8,000 feet long and 100 feet wide.

Though it is not anticipated RDM will need a new third runway through 2036, this improvement will be preserved and carried forward into the preferred alternative. Land use controls are in place to protect the third runway from encroachment by incompatible development. Keeping the runway on the ALP preserves long-range flexibility for the Airport should operations require additional capacity, or airport development moves farther west.
4.5.2 TAXIWAY ALTERNATIVES

Airports should provide a safe and efficient taxiway system to expedite aircraft movements to and from the runways and apron areas. The purpose of taxiway improvements is to develop layouts that are operationally efficient, enhance safety, improve circulation, increase capacity and address needs identified in Chapter 3 – Facility Requirements. Alternatives are evaluated in this section and recommended improvements to the taxiway system are identified.

ALTERNATIVE 1 – Full-Length Parallel Taxiway

This alternative involves addressing FAA-identified Hot Spots 1 and 2 and refines the Airport’s taxiway system to resolve issues related to direct access to the runway from an aircraft apron area and non-standard pavement conditions, as shown in Figure 4-8, and as discussed in FAA AC 150/5300-13A, Change 1, Airport Design. A new parallel taxiway would be constructed in three phases on the eastside of Runway 5-23 with new taxiway connectors to the runway and Taxiway F. The first phase of construction would add 34,379 SY of additional pavement. The second phase would add 24,765 SY of additional pavement, and the third phase would add 26,067 SY of additional pavement. Pavement from Taxiways C and G between the new parallel taxiway and Taxiway F would be removed to address FAA Hot Spots 1 and 2 and eliminate the potential of a runway incursion. The existing Taxiway H and E intersections that facilitate direct access from the passenger apron to Runway 5-23 would be moved to a location that eliminates the potential for aircraft to accidentally cross Taxiway F and unintentionally enter the runway environment. An additional Taxiway connection to Taxiway F would be constructed to facilitate aircraft movement to and from the apron area. To resolve the non-standard pavement conditions, pavement would be added to both sides of the Taxiway A intersections to form a 90-degree turn and eliminate the wide-pavement areas.

Separately, in-fill pavement would be added to the existing aircraft apron area to increase the size of the apron and provide additional uses to include aircraft parking, ground service equipment staging, and storage or other as-needed storage or staging.

The phased approach to project construction allows the Airport to add additional taxiway pavement as needed and minimizes impact on airport operations during construction. The runways will need to be closed temporarily when connector taxiways are added, and when Phase 2 crosses Runway 11-29. Construction can be scheduled to minimize overall disruption.

This alternative is estimated at a total project cost of $20,400,00 and includes engineering, environmental compliance, and construction management services.
ALTERNATIVE 2 – Parallel Taxiway with Offset

This alternative, as shown in Figure 4-9, is a derivative of Alternative 1 and similarly addresses FAA identified Hot Spots 1 and 2 and resolves all pavement conditions identified in FAA AC 150/5300-13A, Change 1, Airport Design. The only difference between Alternatives 1 and 2 relate to designing the new parallel taxiway on the eastside of Runway 5-23 and eliminating the taxiway connectors between Taxiway C and G. New taxiway connectors would be constructed to prevent the creation of hot spots similar to the existing FAA identified Hot Spots 1 and 2 on the opposite side of the airfield. Other conditions remain the same.

This alternative is estimated at a total project cost of $10,913,000 and includes engineering, environmental compliance, and construction management services.
Figure 4-9
Alternative 2 - Parallel Taxiway with Offset
**SUMMARY EVALUATION OF TAXIWAY ALTERNATIVES**

Table 4-2 presents a summary and an evaluation of the various alternatives for taxiway improvements at RDM. Alternative 1 is the preferred alternative due to the taxiway connectors not being offset, resulting in a full length parallel taxiway.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Parallel taxiway on east side of RWY 5-23.</td>
<td>Parallel taxiway on east side of RWY 5-23.</td>
</tr>
<tr>
<td>Operational Capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airfield Operability &amp; Access</td>
<td>New east and west access to RWY 5-23.</td>
<td>New east and west access to RWY 5-23.</td>
</tr>
<tr>
<td>Presents Solution for FAA Identified Hot Spots 1 &amp; 2</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Airline and GA Aircraft Separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Performance Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduces Aircraft Taxi Times</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Increases Potential for Development</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Expansion Capabilities</td>
<td>Project can be completed in multiple phases</td>
<td>Project can be completed in multiple phases</td>
</tr>
<tr>
<td>AC 150/5300-13A Deficiencies Resolved</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Complies with Current Design Criteria</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>New airside or landside development area east of RWY 5-23</td>
<td>New airside or landside development area east of RWY 5-23</td>
</tr>
<tr>
<td>Aviation Compatible Use</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Environmental Impact Potential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Impervious Surfaces</td>
<td>Additional Pavement: Phase 1: +/- 34,379 SY</td>
<td>Additional Pavement: Phase 1: +/- 34,379 SY</td>
</tr>
<tr>
<td></td>
<td>Phase 2: +/- 24,765 SY</td>
<td>Phase 2: +/- 24,765 SY</td>
</tr>
<tr>
<td></td>
<td>Phase 3: +/- 26,067 SY</td>
<td>Phase 3: +/- 26,067 SY</td>
</tr>
<tr>
<td>Constructability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Financial Costs/Impacts</td>
<td>Project Cost: $20,400,000</td>
<td>$10,913,000</td>
</tr>
<tr>
<td>Alternative Evaluation</td>
<td>DETERMINATION: Favorable</td>
<td>Favorable</td>
</tr>
</tbody>
</table>
4.5.3 AIRPORT VEHICLE PARKING ALTERNATIVES

Chapter 3 – Facilities Requirements identified the need for additional vehicle parking. The airport reached the terminal parking lot capacity of 1,083 vehicles multiple times in 2016 and had to utilize overflow parking lots. An additional 1,100 parking stalls will be needed to meet demand through 2036. This section analyzes landside alternatives through options focused on adding hourly and premium vehicle parking, long-term vehicle parking, remote vehicle employee vehicle parking, vendor vehicle parking, and rental car facilities.

It is noted that the Airport has begun to see service by transportation network companies (TNCs) like Lyft and Uber. Service by TNCs could theoretically reduce future parking demand if passengers opt to take TNCs to and from the Airport rather than using their own vehicles. It is recommended that the Airport monitor how TNCs impact parking demand and adjust planning assumptions accordingly. Since each community is different and TNCs are a relatively new entrant to the RDM market, it is unknown how much impact they will have on parking demand.

A passenger vehicle parking garage was not considered as part of the alternatives analysis due to the abundance of available vacant land, operational impacts during construction, costs associated with long-term operations and maintenance, and impacts to the scenic views to and from the passenger terminal building.

ALTERNATIVE 1 – Southwest Development

This alternative adds an estimated 4,000 parking stalls, as shown in Figure 4-10, and involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

Additional hourly and premium long-term parking would be developed directly adjacent to the existing hourly terminal parking. This vehicle parking lot would require the relocation of existing tenants and building demolition. The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional long-term vehicle parking would be developed west of SE Airport Way, and a remote vehicle parking lot would be developed north of the Deschutes County Fair Grounds Expo Center, along the west side of SE Airport Way. Rental car facilities would be developed just north of the additional long-term vehicle parking lot.
For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot from the passenger terminal ranges from 1.2 to 1.5 miles. This would increase costs due to the need for procurement of a bus fleet, and the on-going costs for fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas and would have minimal impact to airport operations. Potential exists for the discovery of archaeological resources in the project area, and it is recommended that a field survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $21,400,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2A – SE Airport Way Development

This alternative adds an estimated 3,100 parking stalls, as shown in Figure 4-11, and involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional remote and long-term vehicle parking would be developed closer to the central passenger terminal area east of SE Airport Way and outside of critical Runway 5-23 design surfaces. Rental car facilities would be developed just north of the additional long-term vehicle parking lot adjacent to the central passenger terminal area.

For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot ranges from half a mile to one mile. This would increase costs due to the procurement of a bus fleet, fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $13,692,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.
ALTERNATIVE 2B – SE Airport Way Development

This alternative adds an estimated 1,600 parking stalls, as shown in Figure 4-12, and is derived from Alternative 2A. Alternative 2B involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building.

Additional long-term vehicle parking would be developed in multiple phases, with the first phase on property west of SE Airport Way on a vacant parcel within an industrial complex. The second phase would be on property east of SE Airport Way close to the terminal area. Additional remote vehicle parking and rental car facilities would be developed closer to the central passenger terminal area west of SE Airport Way and outside of critical Runway 5-23 design surfaces. These facilities would be adjacent to the second phase for long-term vehicle parking.

For the Airport to provide service to these new areas, a similar type of bus operation as Alternative 2A would need to be implemented by the Airport as the distance to the new passenger parking lot from the passenger terminal ranges from half a mile to one mile.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $10,678,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.

ALTERNATIVE 2C – SE Airport Way Development

This alternative adds an estimated 1,700 parking stalls, as shown in Figure 4-13, and is derived from Alternatives 2A and 2B. Alternative 2C involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.
The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional long-term vehicle parking would be developed in multiple phases with the first phase on property east of SE Airport Way. The second phase would require the relocation of existing tenants and building demolition; however, this parcel of land is close to the terminal area. Tenants would be relocated to a vacant parcel within an industrial complex. Additional remote vehicle parking and rental car facilities would be developed closer to the central passenger terminal area west of SE Airport Way and outside of critical Runway 5-23 design surfaces. These facilities would be adjacent to the initial phase for long-term vehicle parking.

For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot from the terminal building ranges from one half to one mile. This would increase costs due to the need for procurement of a bus fleet, and the on-going costs for fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $16,222,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.
Figure 4-10
Alternative 1 - Southwest Development
Alternative 2B - SE Airport Way Development
Alternative 2C - SW Airport Way Development
SUMMARY EVALUATION OF VEHICLE PARKING ALTERNATIVES

Table 4-3 presents a summary and an evaluation of the various alternatives for vehicle parking at RDM. Alternative 1 is the preferred alternative because of the increase in the amount of parking stalls (estimated increase of 4,000) and the minimal impact to airport operations.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2A</th>
<th>Alternative 2B</th>
<th>Alternative 2C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Reorganization of existing vehicle parking and additional long term/remote vehicle parking lots</td>
<td>Reorganization of existing vehicle parking and additional long term/remote vehicle parking lots</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational Capabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operability &amp; Access to Terminal</td>
<td>Increases existing parking stalls by 314%</td>
<td>Increases existing parking stalls by 287%</td>
<td>Increases existing parking stalls by 153%</td>
<td>Increases existing parking stalls by 161%</td>
</tr>
<tr>
<td>Surface Transportation</td>
<td>Passengers are transported via bus to/from the terminal.</td>
<td>Passengers are transported via bus to/from the terminal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation Cost</td>
<td>Increased cost for procurement of bus fleet, fuel and continued maintenance</td>
<td>Increased cost for procurement of bus fleet, fuel and continued maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addition or Subtraction of Vehicle Parking Stalls</td>
<td>Estimated 4,052 additional stalls</td>
<td>Estimated 3,109 additional stalls</td>
<td>Estimated 1,667 additional stalls</td>
<td>Estimated 1,744 additional stalls</td>
</tr>
<tr>
<td>Estimated Distance from Terminal to Vehicle Parking Lot</td>
<td>6,500’ to 8,000’</td>
<td>2,000’ to 5,000’</td>
<td>1,500’ to 4,000’</td>
<td>1,000’ to 4,000’</td>
</tr>
<tr>
<td>Conforms to FAA Standards</td>
<td>No Parking in RPZ.</td>
<td>Future parking in RPZ and no height conflicts with critical surfaces.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>Undeveloped property repurposed into vehicle parking.</td>
<td>None</td>
<td>Business relocation to repurpose land into vehicle parking.</td>
<td></td>
</tr>
<tr>
<td>Property Acquisition</td>
<td>None</td>
<td>None</td>
<td>Vacant property repurposed into vehicle parking.</td>
<td>Vacant property repurposed for Commercial/Industrial use.</td>
</tr>
<tr>
<td>Business Relocation</td>
<td>Yes</td>
<td>None</td>
<td>Vacant property repurposed into vehicle parking.</td>
<td>Vacant property repurposed for Commercial/Industrial use.</td>
</tr>
<tr>
<td>Impacts to Off-Airport Land Use</td>
<td>None</td>
<td>None</td>
<td>Vacant property repurposed into vehicle parking.</td>
<td>Vacant property repurposed for Commercial/Industrial use.</td>
</tr>
<tr>
<td>Environmental Impact Potential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Historic, Architectural, and Archaeological and Cultural Resources</td>
<td>Potential exists for discovery of archaeological resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threatened and Endangered Species</td>
<td>Requires Contact of USFWS - East Wolf Mgmt. Zone.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder Feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting Services</td>
<td>Required</td>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible w/Existing Development</td>
<td>Above Average</td>
<td>Excellent</td>
<td>Above Average</td>
<td>Above Average</td>
</tr>
<tr>
<td>Protection of Scenic View (Terminal)</td>
<td>No Impact</td>
<td>No Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Minimal</td>
<td>Construction near SE Airport Way and Central Terminal Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Demolition</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Costs/Impacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Cost</td>
<td>$21,400,000</td>
<td>$13,692,000</td>
<td>$10,678,000</td>
<td>$16,222,000</td>
</tr>
<tr>
<td>OVERALL EVALUATION</td>
<td>Favorable</td>
<td>Favorable</td>
<td>Not Favorable</td>
<td>Not Favorable</td>
</tr>
</tbody>
</table>
4.5.4 GENERAL AVIATION DEVELOPMENT ALTERNATIVES

As discussed in Chapter 4 – Facility Requirements, the existing GA facilities are constrained and lack easily developable areas with airfield access. Demand forecasts project additional based aircraft, corporate aviation related activities, and a potential flight school. This section analyzes GA development alternatives focused on accommodating anticipated demand with a maximum build potential.

ALTERNATIVE 1 – Central Development Area

This alternative, as shown in Figure 4-14, focuses on the development of a vacant 37.6-acre parcel of land southeast of the proposed taxiway parallel to Runway 5-23. This parcel has been identified for future aviation use and can be developed to accommodate many GA activities. This site does penetrate the existing RVZ and has direct access to Runway 5-23.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. Earthwork is a significant factor due to the significant grades and known presence of rock in the area that requires excavation and embankment quantities of 9,200 CY and 151,000 CY, respectively.

This alternative is estimated at a total project cost of $19,491,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2 – North Development Area

This alternative, as shown in Figure 4-15, focuses on the redevelopment of existing GA facilities on the northwest side of the Airport while maximizing the development of vacant land north and south of SE Veterans Way for a total of 60 acres.

Future aviation development would occur north of existing GA facilities and south of Highway 126. The development would require relocating segments of SE Airport Way, SW Sisters Avenue, and SE Sisters Avenue and provide new access to existing buildings, leasehold areas, and new facilities. The future aviation development would be the potential site for a new flight school, or fixed-base operator (FBO). A new single engine air tanker (SEAT) Base would be located adjacent to existing USFS buildings. New commercial development would surround proposed aviation development and border, but not impact, Highway 126.

This alternative is estimated at a total project cost of $72,000,000 and includes engineering, environmental compliance, and construction management services. Total project cost reflects the full buildout of this alternative.
Alternative 1 - Centralized Development Area
Figure 4-15
Alternative 2 - North Development Area
### SUMMARY EVALUATION OF GA DEVELOPMENT ALTERNATIVES

**Table 4-4** presents a summary and an evaluation of the various alternatives for GA development at RDM. Alternative 2 is the preferred alternative because development of the north area will have minimal impacts to airport operations and the airfield and will help meet demand for future based aircraft.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of Improvement</strong></td>
<td>Expand GA development east of RWY 5-23.</td>
<td>Expand north GA area for future based aircraft.</td>
</tr>
<tr>
<td><strong>Operational Capabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airfield Impacts</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Airline and GA Aircraft Separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Hangar and Building Facility Additions</td>
<td>Greenfield site - potential multiple uses.</td>
<td>New flight school, FBO and hangar facilities for corporate and general aviation users</td>
</tr>
<tr>
<td><strong>Performance Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion Capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increases Potential for Development</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Land Use Compatibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>Undeveloped land repurposed into aviation use.</td>
<td>Undeveloped land repurposed into aviation use.</td>
</tr>
<tr>
<td>Impact to Other Facilities</td>
<td>None</td>
<td>Demolition of older hangar facilities</td>
</tr>
<tr>
<td><strong>Environmental Impact Potential</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impervious Surfaces</td>
<td>Unknown</td>
<td>Estimated 46,350 SY of additional airfield pavement and 34,350 SY of additional roadway pavement</td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>None</td>
<td>Relocation of Veterans Way and 10th Street</td>
</tr>
<tr>
<td>Historic, Architectural, and Archaeological and Cultural Resources</td>
<td>None</td>
<td>Removal of two of four historic structures on airport property (Warehouse #1 and #2, circa 1940)</td>
</tr>
<tr>
<td>Section 4(f) of the Department of Transportation Act</td>
<td>None</td>
<td>Potential removal of an identified Section 4(f) resource</td>
</tr>
<tr>
<td>Tenant Relocation Required</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Threatened and Endangered Species</td>
<td>Requires Contact of USFWS - East Wolf Mgmt. Zone.</td>
<td>Requires Contact of USFWS - East Wolf Mgmt. Zone.</td>
</tr>
<tr>
<td><strong>Constructability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Grading/Soil Conditions</td>
<td>Complex</td>
<td>Complex</td>
</tr>
<tr>
<td>Facilities Demolition</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Financial Costs/Impacts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Cost</td>
<td>$19,491,000</td>
<td>$72,000,000</td>
</tr>
<tr>
<td><strong>OVERALL EVALUATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DETERMINATION</strong></td>
<td>Favorable</td>
<td>Favorable</td>
</tr>
</tbody>
</table>
4.5.5 AVIATION SUPPORT FACILITIES ALTERNATIVES

This section develops and evaluates alternatives for fuel farm expansion and the identification of fuel truck routes that minimize taxiway crossings. Aviation support facilities such as fuel farms are necessary to serve existing users but also encourage growth in aviation-related activities. Another important factor is the identification of a dedicated on-airport fuel truck haul route to expedite the delivery of fuel and provide for the highest level of safety by minimizing airfield crossings.

FUEL FARM

During the busiest times of the year, the Airport requires multiple Jet A fuel deliveries per day to keep up with demand. The lack of storage capacity is operationally inefficient and puts the Airport at risk of not being able to meet demand should the supply chain be disrupted by a fuel shortage or natural disaster. Analysis considers an expanded fuel farm location that would increase Jet A fuel storage capacity. For planning purposes, all fuel farm alternatives include five 20,000-gallon Jet A tanks. This order of magnitude increase in fuel storage would allow the Airport to have approximately fifteen days of fuel capacity during the very busiest times of year, which meets the needs projected in the demand forecasts, and is similar to the storage capacity of other airports with a similar amount of jet and turbo-prop operations. There is potential for the development of two fuel farm locations to expedite delivery and minimize the crossing of Runway 11-29, with one site to potentially serve the north GA users, and a second to support airline operations. All fuel farm alternatives can be expanded as demand dictates.

All alternatives are estimated at a total project cost of $5,200,000 that includes site work, concrete pad, containment, five 20,000 United States Gallon (USG) tanks, permitting, paved vehicle access, and other associated costs.

Each of the alternatives involve the construction of a fuel farm. The proposed fuel farm can accommodate five 20,000 USG Jet A fuel tanks to increase Jet A fuel capacity by 100,000 USG over the Airport’s existing capacity of 44,000 USG. The existing airfield perimeter fence will need to be reconfigured to account for two new access gates that allow the ingress and egress of fuel trucks to access the secure airside of the Airport, but with access limited to only the fuel farm. The fuel farm can be expanded to accommodate additional Jet A tanks or other types of fuel.

ALTERNATIVE 1 – SE Airport Way

This alternative, as shown in Figure 4-16, involves the construction of a fuel farm off Airport Way, south of the existing parking lots. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.
The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas and would have minimal impact to airport operations.

ALTERNATIVE 2 – North Development Area: Veterans Avenue

This alternative, as shown in Figure 4-17, involves the construction of a fuel farm off Veterans Avenue, on the north GA apron. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.

Construction of this alternative requires the demolition of an existing building that has been identified as a Section 4(f) historic resource (Warehouse #2, circa 1940). The method of construction is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

ALTERNATIVE 3 – North Development Area: Sisters Avenue

This alternative, as shown in Figure 4-18, involves the construction of a fuel farm off Sisters Avenue, on the north GA apron. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.
Alternative 2 - North Development Area: Veterans Ave.
Alternative 3 - North Development Area: Sisters Ave.
## SUMMARY EVALUATION OF FUEL FARM EXPANSION ALTERNATIVES

Table 4-5 presents a summary and an evaluation of the various alternatives for the expansion of the fuel farm at RDM. Alternative 1 is the preferred alternative because of the low impact to the airfield and airport operations. The location of the fuel farm is beneficial for commercial operations because fuel trucks will have a short commute time between the fuel farm and commercial apron, and the addition of Jet A fuel tanks near the commercial apron will negate the need for a fuel truck haul route.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)</td>
<td>Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)</td>
<td>Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)</td>
</tr>
<tr>
<td>Airfield Operability &amp; Access</td>
<td>Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Airport Way.</td>
<td>Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Veterans Ave.</td>
<td>Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Sisters Ave.</td>
</tr>
<tr>
<td>Operational Capabilities</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Performance Requirements</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Level of Service</td>
<td>15 day fuel reserve</td>
<td>15 day fuel reserve</td>
<td>15 day fuel reserve</td>
</tr>
<tr>
<td>Expansion Capabilities</td>
<td>Additional tanks can be added in the future.</td>
<td>Additional tanks can be added in the future.</td>
<td>Additional tanks can be added in the future.</td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td>None</td>
<td>Demolition of existing building</td>
<td>Demolition of older hangar buildings.</td>
</tr>
<tr>
<td>Environmental Impact Potential</td>
<td>Removal of one of four historic structures on airport property (Warehouse #2, circa 1940).</td>
<td>Potential exists for discovery of archaeological resources.</td>
<td>Potential exists for discovery of archaeological resources.</td>
</tr>
<tr>
<td>Section 4(F) of the Department of Transportation Act</td>
<td>None</td>
<td>Potential removal of an identified Section 4(f) resource</td>
<td>None</td>
</tr>
<tr>
<td>Tenant Relocation</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Constructability</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Facilities Demolition</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Financial Costs/Impacts</td>
<td>$5,200,000</td>
<td>$5,200,000</td>
<td>$5,200,000</td>
</tr>
<tr>
<td>Project Cost</td>
<td>$5,200,000</td>
<td>$5,200,000</td>
<td>$5,200,000</td>
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</table>

**OVERALL EVALUATION**

<table>
<thead>
<tr>
<th>Determination</th>
<th>Favorable</th>
<th>Favorable</th>
<th>Favorable</th>
</tr>
</thead>
</table>

REDMOND MUNICIPAL AIRPORT MASTER PLAN
ON-AIRPORT FUEL TRUCK HAUL ROUTES

Fuel trucks currently travel from the north GA apron to the commercial terminal apron to refuel aircraft because Jet A fuel is only stored at the north GA apron. Travel between both aprons requires fuel trucks to travel on taxiways that are in the movement area. Fuel truck haul route alternatives are designed to allow fuel trucks to deliver fuel from the north GA apron to the commercial apron and to stop fuel trucks from traveling on taxiways or runways.

Fuel truck haul route alternatives can be ignored if Jet A fuel tanks are built on both sides of Runway 11-29. If Jet A tanks are built south of Runway 11-29, in proximity to the commercial apron, fuel trucks will be able to deliver fuel to the commercial apron without having to travel on taxiways or runways.

ALTERNATIVE 1 – Inner Route

This alternative, as shown in Figure 4-19, involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The proposed road starts at the north GA apron and connects with the service road that exists around Runway 11 to avoid the TOFA. It then continues off the service road outside of the RPZ and crosses three taxiway connectors as the road avoids the TOFA. The road stays parallel with Runway 11-29 until it crosses in front of the segmented circle at the intersection of Runways 11-29 and 5-23, and then it turns running parallel with Runway 5-23, continuing straight to the commercial apron, and staying outside of the TOFA.

This alternative is estimated at a total project cost of $514,200 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2 – Central Route

This alternative, as shown in Figure 4-20, involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The road begins at the north GA apron and connects with the existing service road around Runway End 11 to avoid the TOFA. It then continues off the service road while in the RPZ and continues along the Airport’s perimeter to the south GA apron and parallels Runway 11-29 to the area of the segmented circle and follows the same route to the commercial apron that is shown for Alternative 1.

This alternative is estimated at a total project cost of $162,000 and includes engineering, environmental compliance, and construction management services.
ALTERNATIVE 3 – Outer Route

This alternative, as shown in Figure 4-21, involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The proposed road follows the same route as Alternative 2 until it reaches the ARFF. It then follows the existing perimeter fence to the commercial apron.

This alternative is estimated at a total project cost of $183,000 and includes engineering, environmental compliance, and construction management services.
Figure 4-19
Alternative 1 - Inner Route
Figure 4-20
Alternative 2 - Central Route
SUMMARY EVALUATION OF FUEL TRUCK HAUL ROUTE ALTERNATIVES

Table 4-6 presents a summary and an evaluation of the various alternatives for the construction of a fuel truck haul route at RDM. Alternative 1 is the preferred alternative because of the minimal impact to airport operations and facilities.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.</td>
<td>Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.</td>
<td>Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.</td>
</tr>
<tr>
<td>Operational Capabilities</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Airfield Operational Impacts</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Minimal</td>
</tr>
<tr>
<td>Performance Requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route Alignment</td>
<td>Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.</td>
<td>Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.</td>
<td>Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.</td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Impact to Other Facilities</td>
<td>None</td>
<td>Crosses South GA Apron</td>
<td>Crosses South GA Apron</td>
</tr>
<tr>
<td>Environmental Impact Potential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Tenant Relocation Required</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Constructability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Minimal</td>
</tr>
<tr>
<td>Facilities Demolition</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Phasing Complexity</td>
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<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Financial Costs/Impacts</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Project Cost</td>
<td>$514,200</td>
<td>$162,000</td>
<td>$183,000</td>
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<tr>
<td>OVERALL EVALUATION</td>
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<td></td>
</tr>
<tr>
<td>DETERMINATION</td>
<td>Favorable</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
4.5.6 PASSENGER TERMINAL ALTERNATIVES

As discussed in Chapter 3 – Facility Requirements, the existing passenger terminal was originally designed for smaller commuter aircraft with 35 to 50 seats. As airlines retired these aircraft to focus on more fuel-efficient aircraft with 65 to 90 seats, existing facilities have struggled to meet the existing passenger demand. The forecasted growth in passengers requires additional space in almost every functional terminal component. The following areas are specifically addressed in this chapter:

✓ Passenger boarding and holdrooms
✓ Outbound and inbound baggage operations
✓ TSA security screening
✓ Rental car counters and offices
✓ Ticket counters, queuing, and airline ticketing offices
✓ Administration space
✓ Mechanical support spaces

It is anticipated that airlines will operate even larger aircraft at the Airport within the 20-year forecast horizon to include variants of the Airbus A320 or Boeing 737, ADG-III aircraft. This section develops and evaluates alternatives for the expansion of the current passenger terminal to serve the anticipated demand in passengers and larger aircraft.

ALTERNATIVES 1 & 2 – WEST & EAST EXPANSIONS

PASSENGER BOARD BRIDGES AND HOLDROOMS

With the projected increase in passengers, and the airlines’ planned transition from regional aircraft to larger and more efficient jets, the terminal will need physical improvements to accommodate these changes. The use of passenger boarding bridges (PBBs) provides a more efficient and comfortable way to board the larger aircraft. Smaller regional jets, like the CRJ 200, can be accessed from the current boarding floor with bridges, but larger jets can only be served from the second floor waiting area. The holdrooms and associated support spaces (e.g., restrooms, concession, etc.) will need expansion to meet the larger passenger capacity of the aircraft.

By 2026 it is anticipated that five passenger boarding bridges will be needed, and by 2036, an additional three bridges will be needed. To handle this expansion, the first and second floor holdrooms will need to increase in size.

There is only one recommended boarding bridge layout for 2026. The second floor will be slightly expanded over the existing ground floor concourse to accommodate two boarding bridges. These PBBs
will service larger ADG-III aircraft such as the A320 or a 737. The lower level gates 3, 5, and 6 will be reconfigured to house PBBs that will service small regional aircraft. Gates 2, 4, and 7 will remain as ground floor boarding.

Two alternatives exist for the 2036 expansion. The first, identified in Figure 4-22, is to expand the terminal's second floor towards the west over an expanded baggage make-up area and the existing first floor passenger holdroom. In this alternative, five additional PBBs will be installed for aircraft boarding from the second floor. Gate 3 will remain as a first level accessed PPB.

A second alternative, identified in Figure 4-23, is to expand the terminal's second floor towards the east over an expanded first floor holdroom and incoming baggage. Four additional PBBs will be added to provide aircraft boarding from the second floor. Gates 5 and 6 will remain as first floor accessed PBBs.

The expansion of the gate and holdroom areas for both options is projected to be approximately 35,000 square feet (sf).

OUTBOUND AND INBOUND BAGGAGE OPERATIONS

By 2019, it is expected that the outbound baggage system will be at capacity due to the increased passenger enplanements. In addition to the increase in enplanements, the first floor holdroom expansion to the west will occupy a portion of the existing outbound baggage system. The outbound baggage system will require an expansion of approximately 3,500sf.

Inbound baggage operations will also need expansion. The existing baggage claim has two baggage carousels. It is anticipated that two additional carousels will be needed to meet the increased passenger load. This expansion will move towards the east. The expansion of the inbound baggage area is projected to be an additional 7,800sf.

TRANSPORTATION SECURITY ADMINISTRATION SECURITY SCREENING

The current Transportation Security Administration (TSA) screening area at the Airport consists of two screening lanes and will be at maximum capacity in five to six years. The expected need, by 2036, is for four lanes to provide uncongested screening. The increased area needed for this expansion will be accomplished by appropriating the area currently occupied by the rental car counters and offices. Future screening options may also provide a separate screening lane for security badged personnel.

The additional space required for the expanded TSA screening area will be 4,500sf.
RENTAL CAR COUNTERS AND OFFICES

To accommodate the expansion of TSA screening, the rental car counters and offices will require relocation. Rental car operations will expand to the northeast corner of the terminal. This area will be directly connected to baggage claim and sized to meet the future needs of the Rent-A-Car (RAC) operations.

TICKET AGENT POSITIONS, QUEUING, AND AIRLINE TICKET OFFICES

There are currently 20 agent positions at the ticketing counters with an anticipated need to add an additional four positions by 2026 and an additional nine positions by 2036, for a total of 33 positions. Additional queuing space will also be required for the 13 new positions. A westward expansion will allow for these future needs. To support the expanded ticketing operation, additional Airline Ticket Offices (ATOs) will be necessary.

The additional space required for the expanding ticketing operations and ATO offices is projected to be 10,800sf.

ADMINISTRATION SPACE

As the terminal expands, additional administrative space will be required to accommodate the growing staff. It is anticipated that a future administrative space would be provided on the second floor above the planned RAC expansion.

MECHANICAL, ELECTRICAL, IT, AND OTHER SUPPORT SPACE

To support the expansion of the terminal, additional space will be needed for mechanical, electrical, IT, and support space.

ALTERNATIVE 3 – NEW CONCOURSE EXPANSION

Development of Alternative 3 is based on comments about Alternative 1 from airport management and the general public from the open house meeting on October 18, 2017. Alternative 3 provides details on each phase of the terminal expansion.

To facilitate future passenger capacity and the ability to handle large jet aircraft, renovations to the existing terminal would proceed in three phases: 1) renovating the existing ground floor holdroom (identified in Figure 4-24); 2) expanding the terminal west and adding a new concourse adjacent to the
existing second floor holdroom (identified in Figure 4-25); and 3) expanding the remaining areas of the terminal (identified in Figure 4-26).

PASSENGER BOARD BRIDGES AND HOLDROOMS

Phase one will include reconfiguring the boarding corridor into extra passenger holdroom space to increase seating capacity. An expansion of the passenger holdroom will extend east past the exit lane. The ground floor of the passenger holdroom expansion will be 5 feet higher than the existing holdroom to facilitate PBBs. The extra 5 feet allows PBBs to reach the larger aircraft on the apron. Three PBBs are anticipated in the holdroom expansion. The exit lane will receive renovations to handle an increase in passengers. No renovations will occur on the second floor.

TERMINAL EXPANSION AND NEW CONCOURSE

Phase two will expand the terminal west and add a new concourse adjacent to the existing second floor holdroom. In the interest of fiscal responsibility, avoiding construction-related congestion, and alleviating space needs in the terminal, a new building will be built adjacent to and connected to the west side of the terminal. The new building will house the ticket hall and larger baggage handling area on the ground floor. The second floor of the new building will contain a new concourse that is adjacent to the existing second floor holdroom. Access to the concourse will be possible with escalators and elevators that will be in the ground floor holdroom. The new concourse will have four PBBs. Once the new ticket hall is operational, a portion of the existing ticket hall and ticket offices will be repurposed as the new security checkpoint to accommodate passenger capacity needs. Mechanical facilities will be relocated to the new building. Renovations will occur to the existing second floor holdroom to connect to the new concourse.

TERMINAL EXPANSION OF REMAINING AREAS

In Phase three, RAC operations will relocate to the existing airport administration area, baggage claim will expand into the area previously occupied by RAC operations, and the existing TSA security checkpoint will be reconfigured into a new exit lane. Completion of phase three of Alternative 3 will provide space for the expansion of program areas in order of emerging need in the future. There will be two possible configurations for aircraft boarding, the first being seven PBBs and three ground boarding positions, and the second being eight PBBs and one ground boarding position. Figure 4-26 shows the first configuration for boarding. This configuration, when upgrading to an eighth PBB, will remove two of the three ground boarding positions and allow for the additional PBB to facilitate boarding from the ground floor holdroom or from the second floor holdroom.
This alternative is estimated at a total project cost of 110,698,900 and includes engineering, environmental compliance, and construction management services. Total project cost includes the cost of the northeast terminal apron reconstruction alternative.
Alternative 1 - Forecast 2036 West Aircraft Boarding Expansion
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 1

Figure 4-24

REDMOND MUNICIPAL AIRPORT MASTER PLAN
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 2

Figure 4-25
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 3

Figure 4-26
SUMMARY EVALUATION OF PASSENGER TERMINAL ALTERNATIVES

Table 4-7 presents a summary and an evaluation of the various alternatives for improvements to the passenger terminal at RDM. Alternative 3 is the preferred alternative because expanding the existing terminal to the west provides greater flexibility for future growth.

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Improvement</td>
<td>Expansion of existing terminal facilities to the west</td>
<td>Expansion of existing terminal facilities to the east</td>
<td>Expansion of existing terminal facilities and new concourse</td>
</tr>
<tr>
<td>Operational Capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operability &amp; Access</td>
<td>Reconfiguration of internal building space and temporary placement of facilities</td>
<td>Reconfiguration of internal building space and temporary placement of facilities</td>
<td>Reconfiguration of internal building space and temporary placement of facilities</td>
</tr>
<tr>
<td>Operational Impacts</td>
<td>Runway 5 expansion to the SE increases extent of the RVZ but does not include aircraft parking positions</td>
<td>Runway 5 expansion to the SE increases extent of the RVZ to include aircraft parking</td>
<td>Runway 5 expansion to the SE increases extent of the RVZ to include aircraft parking</td>
</tr>
<tr>
<td>Performance Requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodates Anticipated Passenger Demand</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Accommodates Anticipated ADG-III Aircraft (A320 / B737)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Airport Property Use</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Impact to Other Facilities</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Environmental Impact Potential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Acquisitions / Easements</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Tenant Relocation Required</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constructability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Airport Operations</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Minimal</td>
</tr>
<tr>
<td>Facilities Demolition</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Phasing Complexity</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Financial Costs/Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Cost</td>
<td>In Progress</td>
<td>In Progress</td>
<td>$110,698,900</td>
</tr>
<tr>
<td>OVERALL EVALUATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DETERMINATION</td>
<td>Favorable</td>
<td>Not Favorable</td>
<td>Favorable</td>
</tr>
</tbody>
</table>
4.5.7 NON-AERONAUTICAL DEVELOPMENT ALTERNATIVES

The economic benefits generated from an airport’s commercial, industrial, and aviation-related tenants provide substantial tax revenues and employment opportunities for the surrounding communities. Thus, it is in the Airport’s best interest to develop future commercial/industrial uses, in addition to aviation-related activities, where feasible. Development around the Airport will diversify revenue streams and promote compatible development. Multiple subareas on and around the Airport were analyzed to examine their development potential to include the:

✓ Fairgrounds Industrial Subarea
✓ Airport Way Subarea
✓ West Business Park
✓ North Business Park
✓ North Apron
✓ South Apron
✓ North Development Parcel
✓ USFS Campus
✓ Terminal

Non-aeronautical alternatives were developed for the Fairgrounds Industrial and Airport Way Subareas in addition to the West and North Business Parks. The remaining potential development areas were excluded from non-aeronautical concept planning due to their planned aviation use or other exclusive uses (e.g., USFS use of its campus and potential emergency response training facility in the North Development Parcel).

Non-aeronautical landside alternatives were developed to illustrate the following potential uses:

✓ Accommodation and food services
✓ Industrial (which includes speculative light industrial buildings, construction firms, manufacturing, and wholesalers and warehousing)
✓ Gas station/ convenience store
✓ Office/flex (only in the North Business Park)

Conceptual building footprints were developed for the City-owned parcels within the Fairgrounds Industrial Subarea, Airport Way Subarea, West Business Park, and North Business Park. Additional buildings are likely to be constructed on privately held land as well, though those have not been illustrated within the development alternatives prepared for this Master Plan.
Table 4-8 summarizes the approximate size of the resulting non-aviation building floor areas that could be accommodated on City-owned land within each of the four subareas and further described in the subsequent alternatives.

<table>
<thead>
<tr>
<th>Use</th>
<th>Fairgrounds Industrial</th>
<th>Airport Way</th>
<th>West Business Park</th>
<th>North Business Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodations</td>
<td>0</td>
<td>130,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Food/restaurant</td>
<td>0</td>
<td>11,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gas station/convenience store¹</td>
<td>0</td>
<td>4,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industrial buildings²</td>
<td>70,000</td>
<td>299,500</td>
<td>123,000</td>
<td>0</td>
</tr>
<tr>
<td>Office/flex³</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>299,000</td>
</tr>
</tbody>
</table>

Notes:
¹ Gas station/convenience store is not a permitted use in the M-1 Light Industrial zone so a zone change or code amendment would be necessary to accommodate this use.
² Industrial buildings include light industrial buildings, construction firms, manufacturing uses, wholesalers, and warehouse use.
³ The illustrated portion of the North Business Park is zoned C-5 Tourist Commercial, which does not permit industrial uses. Office uses have been illustrated in this area as they are permitted in the zone.

As a subsequent effort to the Master Plan update, the City may wish to consider amending the zoning near the Airport to accommodate a wider range of airport-compatible uses, including commercial, industrial, and institutional uses. Currently, nearby zones include Airport, Light Industrial (M-1), Tourist Commercial (C-5), Open Space Park Reserve (OSPR), Park, and Public Facility (PF), each of which has its own set of permitted uses and development standards. Some communities have been able to capitalize on their public airports by applying zoning designations that allow for a wide range of uses so long as they do not affect aviation operations. Permitting a variety of uses and imposing regulations to limit impacts on aviation may be a way for the City to stimulate economic development while maintaining and enhancing the viability of the Airport. To implement this option, the City may need to amend the Comprehensive Plan and Comprehensive Plan Map, Development Code, and Zone Map.

FAIRGROUNDS INDUSTRIAL SUBAREA

The Fairgrounds Industrial Subarea is zoned Light Industrial (M1) and the majority is privately owned. The southernmost lot in this subarea is an 8-acre City-owned lot. The concept plan illustrates the potential for 70,000sf of industrial buildings on the City parcel. While not pictured on the diagrams, the privately owned land has the potential for up to 200,000sf of additional industrial buildings and 15,000-20,000sf of supporting commercial uses (e.g., restaurants).
AIRPORT WAY SUBAREA

The Airport Way Subarea is zoned Light Industrial (M1) and the land is owned by the City. The southern 9 acres are currently developed with Peterson Caterpillar’s facility. The concept plan illustrates nearly 300,000sf of industrial buildings, plus 15,500sf of supporting commercial (gas station and restaurants) and a five-story, 130,000sf hotel (hotels may require additional soundproofing measures due to proximity to the railroad and runway). Of this, a hotel, 4,000sf of restaurant, and 195,000sf of industrial buildings are depicted west of Airport Way. If the land west of Airport Way is needed for rental car facilities and airport parking as envisioned in some aviation alternatives, then some or all these non-aviation uses would not be possible at this location. East of Airport Way, the concept plan illustrates 7,000sf of restaurant, 4,500sf of gas station/convenience store, and 104,500sf of industrial buildings. Due to the large parcel size east of Airport Way, an internal circulation network with private roadways has also been illustrated.

WEST BUSINESS PARK

The West Business Park area contains multiple zoning designations, including Light Industrial (M1), Public Facility, and Park. The concept plan illustrates 123,000sf of industrial buildings on City-owned land within the M1 zone. Potential building locations were selected to avoid the future westward extension of Salmon Drive and the future realignment of the Airport Way-Veterans Way intersection. While not pictured on the diagrams, the privately owned land has the potential for up to 375,000sf of additional industrial buildings.

NORTH BUSINESS PARK

The North Business Park area contains multiple zoning designations, including Light Industrial (M1), Tourist Commercial (C5), and Open Space Park Reserve (OSPR). As the southern portion of this subarea is anticipated to be used for aviation purposes, only the northern portion by Highway 126 is available for non-aeronautical development. This northern portion is zoned C5 and industrial uses are not allowed, so the concept plan illustrates 289,000sf of office buildings. The C5 zone would also permit food services and accommodations, which have not been illustrated but may be considered if such uses are not developed along Airport Way south of the Airport.

SITE, TRANSPORTATION, AND UTILITY CONSTRUCTION COST ESTIMATES

Based on the illustrated non-aeronautical development, this section describes order-of-magnitude site preparation costs as well as transportation and utility costs that can be anticipated to serve the developments.
In general, the site preparation costs include site clearing and grading, stormwater management, installation of utilities, and construction of new roadways. Site development costs have been estimated on a square-foot basis and assume typical construction methods and design for commercial and industrial developments.

The overall public utility systems within the non-aeronautical development areas appear to have capacity to accommodate the proposed uses, so a need for upgrades to existing utilities are not expected to be necessary. Some of the study areas require public utility extensions to serve new development.

**FAIRGROUNDS INDUSTRIAL SUBAREA**

Site preparation for the Fairgrounds Industrial Subarea is expected to include extension of SW Elkhorn Avenue to connect to the southern terminus of SW Badger Way, which will include 8” sewer and 12” water public utility extensions within the new roadway.

Site preparation construction costs are expected to total over $4 million, as outlined below:

- On-site earthwork, parking, and private roadways .......................................................... $1,232,900
- On-site private utilities ........................................................................................................... $818,900
- Public roadways ......................................................................................................................... $960,000
- Public utilities ......................................................................................................................... $1,160,000
- **Total site development costs:** ....................................................................................... $4,171,800

**AIRPORT WAY SUBAREA**

Site preparation for the Airport Way Subarea is expected to include extension of 12” public water lines along Mt Hood Drive and within the southern on-site private roadway, as well as extension of 8” public sewer lines within the southern private roadway.

Site preparation construction costs are expected to total nearly $13 million, as outlined below:

- On-site earthwork, parking, and private roadways .......................................................... $6,536,800
- On-site private utilities ........................................................................................................... $5,528,200
- Public roadways ......................................................................................................................... $0
- Public utilities ........................................................................................................................... $855,000
- **Total site development costs:** ....................................................................................... $12,920,000
WEST BUSINESS PARK

Site preparation for the West Business Park Subarea is expected to include extension of SE Salmon Drive to the western edge of the subarea, which will include 12” water and 8” sewer public utility extensions within the new roadway. The proposed realignment of the intersection of SE Airport Way and SE Veterans Way is not included in the non-aeronautical site development roadway costs listed below.

Site preparation construction costs are expected to total over $8 million, as outlined below:

✓ On-site earthwork, parking, and private roadways .................................................. $3,277,700
✓ On-site private utilities ........................................................................................................... $2,651,600
✓ Public roadways .................................................................................................................. $850,000
✓ Public utilities ...................................................................................................................... $1,232,500
✓ Total site development costs ................................................................................................. $8,011,800

NORTH BUSINESS PARK

Site preparation for the North Business Park Subarea is expected to include upgrades of the existing SE 10th Street and SE Veterans Way to meet city standard road sections, which will include 12” water and 8” sewer public utility extensions within 10th Street. SE Veterans Way includes public utilities that do not need upgrades or extensions. The proposed realignment of the intersection of SE Airport Way and SE Veterans Way is not included in the non-aeronautical site development roadway costs listed below.

Site preparation construction costs are expected to total over $8 million, as outlined below:

✓ On-site earthwork, parking, and private roadways .......................................................... $3,045,400
✓ On-site private utilities ........................................................................................................... $2,396,200
✓ Public roadways .................................................................................................................. $470,000
✓ Public utilities ...................................................................................................................... $451,300
✓ Total site development costs ................................................................................................. $6,392,900
Figure 4-27
Alternatives - Fairgrounds Industrial & Airport Way Subareas
Figure 4-28
Alternatives - West & North Business Park Subareas
4.5.8 AIRCRAFT RESCUE & FIRE FIGHTING BUILDING ALTERNATIVES

The FAR Part 139 establishes certification requirements for airports serving scheduled air carrier operations. As an FAR Part 139 certified airport, RDM must provide Aircraft Rescue and Firefighting (ARFF) services in support of scheduled air carrier service. Part 139 requires that ARFF services must be able to meet a three-minute response time where an ARFF vehicle must reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or reach any other specified point of comparable distance on the movement area that is available to air carriers and begin application of an extinguishing agent. The existing ARFF building will lie within the future RVZ if Runway 5-23 extends to the southwest; in this scenario, the ARFF site would need to be relocated. The relocated site must remain clear of all FAR Part 77 surfaces, existing, and future RVZ and not impact FAA Air Traffic Control Tower (ATCT) line of site. Three possible locations were identified for the ARFF building, as described below.

ARFF RELOCATION SITE 1

This alternative, as shown in Figure 4-29, involves demolishing the existing ARFF facility and the construction of a new ARFF facility on a portion of the former footprint of the existing site, while shifting the future building a sufficient distance to remain clear of FAR Part 77 and the RVZ. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $3,250,000 and does not include demolition, engineering, environmental compliance, or construction management services.

ARFF RELOCATION SITE 2

This alternative, as shown in Figure 4-30, involves the construction of a relocated ARFF building on a vacant parcel of land, northeast of the ATCT, adjacent to the existing Snow Removal Equipment (SRE) building. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $2,877,280 and does not include engineering, environmental compliance, or construction management services.
ARFF RELOCATION SITE 3

This alternative, as shown in Figure 4-31, involves converting the existing SRE building into the ARFF building. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $2,877,280 and does not include engineering, environmental compliance, or construction management services.
LEGEND
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- ARFF Building Relocation Site 1
- Existing Runway Visibility Zone (RVZ)
- Future (RVZ)

Figure 4-29
Alternative 1A - ARFF Relocation Site 1
Figure 4-30
Alternative 1B - ARFF Relocation Site 2
Figure 4-31
Alternative 1C - ARFF Relocation Site 3
4.5.9 NORTHEAST PASSENGER TERMINAL APRON RECONSTRUCTIONALTERNATIVE

As part of the terminal expansion project, the northeast passenger terminal apron needs to be reconstructed with concrete to accommodate a parked regional jet Embraer ERJ-175 to have adequate support for the weight of the aircraft and tail height clearance of the FAR Part 77 transitional surface, and to remain clear of the future RVZ. The section of apron that would be reconstructed is located on the northeast side of the existing apron. The concrete area would be 135’ in width and 30’ in length for a total area of 4,126sf of Portland Cement Concrete Pavement (PCCP). The apron reconstruction would potentially require the relocation of two light poles, relocation of the vehicle service road, and relocation of ground support equipment storage on the apron.

ALTERNATIVE 1 – Northeast Apron Reconstruction

This alternative, as shown in Figure 4-32, involves the reconstruction of 4,126sf of pavement to PCCP to accommodate the weight of an ERJ-175. This alternative is estimated at a total project cost of $1,998,900 and does not include any relocation of light poles, service roads, demolition of existing facilities, engineering, environmental compliance, or construction management services.
Figure 4-32
Alternative 1 - Northeast Apron Reconstruction
4.6 ALTERNATIVES SUMMARY

The preferred Airport development alternative outlines the necessary development and facility improvements that will not only meet the forecasted demand presented in Chapter 2 – Forecast, but also ultimately supports competitiveness and financial viability for the Airport. It is recommended that the Airport acquire available property north of Highway 126 for future aeronautical and non-aeronautical uses, in addition to ensuring compatible uses. The following improvement alternatives are recommended.

Airside Facilities
✓ Extend Runway End 5 to the southwest by 2,962 feet for a total length of 10,000 feet for Runway 5-23
✓ Upgrade the approach to Runway 5-23 to support RNAV and LPV approach capabilities
✓ Demolish existing taxiway connectors E and H that provide direct access to Runway 5-23 from the passenger terminal apron and reconstruct taxiway connectors E and H in a position that conforms to current FAA AC 150/5300-13A, Change 1, Airport Design standards
✓ Construct a new taxiway connector from Taxiway F to the passenger terminal apron on the northeast side
✓ Construct the first phase of a new parallel taxiway on the east side of Runway 5-23, and eliminate two segments of Taxiways F and C, to address FAA identified Hot Spots 1 and 2
✓ Construct the second phase of a new parallel taxiway on the east side of Runway 5-23 to facilitate aircraft movements and support a future central GA development area
✓ Construct the third phase of a new parallel taxiway on the east side of Runway 5-23 to facilitate aircraft movements
✓ Construct improvements to the north and south ends of taxiway connector A to conform to current FAA AC 150/5300-13A, Change 1, Airport Design standards
✓ Reconstruct the passenger terminal apron to allow the tail of a parked ERJ-175 to remain under the FAR Part 77 surfaces and have the weight of the aircraft properly supported
✓ Coordinate with the FAA, Oregon Department of Transportation – Highway Division, County of Deschutes, and the local Irrigation District for the relocation of a segment of Highway 126 outside of Runway 23’s RPZ to comply with requirements in FAA AC 150/5300-13A, Change 1, Airport Design and the 2012 RPZ Memo

General Aviation Development
✓ Expand existing GA facilities on the north side
✓ Develop new GA facilities east of the Runway 5 End that would support future aviation uses upon buildout of the north side GA facilities
Vehicle Parking
- Develop property near the Deschutes County Fair Grounds Expo Center for the expansion of rental car facilities, new long-term parking, and remote parking
- Expand employee parking to include the vacant parcel within the central terminal area
- Expand existing vendor parking to consume a portion of the existing employee parking lot

Support Facilities
- Relocate the SRE building to the northside GA development area
- Construct a new fuel farm south of the existing passenger terminal
- Relocate the ARFF building outside of the future RVZ

Passenger Terminal Building
- Expand the passenger terminal building to the west to accommodate future passenger demand and larger ADG-III aircraft

Non-Aeronautical Property Development
- Develop non-aeronautical property in the Fairgrounds Industrial, Airport Way, West Business Park, and North Business Park Subareas
- Explore amending the zoning near the Airport to accommodate a wider range of airport-compatible uses, including commercial, industrial, and institutional uses

4.6.1 PREFERRED DEVELOPMENT CONCEPT

Capital costs will be calculated and added to the improvement projects identified in the implementation plan. The preparation of an updated ALP will begin to show how the Airport will look at the end of the implementation plan.

The preferred airport layout is shown in Figure 4-33.
Figure 4-33
Preferred Alternatives