CHAPTER 4

DEVELOPMENT ALTERNATIVES

4.0 DEVELOPMENT ALTERNATIVES

4.1 Introduction and Purpose

This chapter identifies and evaluates development alternatives for ORS. The alternatives were guided by master plan goals and objectives defined in Chapter 1 and they address facility requirements identified in Chapter 3. The alternatives were also guided by the issues, needs and ideas presented by stakeholders in the master plan survey and public meetings, and by the Advisory Committee. Stakeholder views varied from those who wanted major expansion to those who mostly just wanted to maintain existing facilities. The master plan evaluated the alternatives using input from the Advisory Committee, other stakeholder meetings, the FAA, and airport staff through various methods, including individual meetings, email communications, and public open house meetings. The Draft Development Plan, made up of projects from each of the alternatives was similarly reviewed by these groups. The alternatives, evaluation process, and Draft and Final Development Plan are further described below.

Some alternatives were considered but were soon dismissed without extensive evaluation. Moving the airport to another location on the island was briefly discussed but was thought to be prohibitively expensive. Most of Orcas Island is characterized by heavily wooded, steep terrain. Very little of the topography is suitable for airport operations, and much of the flatter terrain is developed or covered by wetlands. Also, closing the airport was not considered to be a viable option. The remote location of the island and inclement weather conditions for much of the year make land-based aircraft operations a critical part of the transportation network for the island and the region.

As noted in **Chapter 3 Facility Requirements**, the Runway Design Code (RDC) for ORS is expected to become B-II-1A-5000. This RDC accounts for the approach speed, runway and taxiway dimensions, and visibility minimums of the mix of airplanes which account for most of the critical operations that have been going on at ORS for the past several years. Many of the dimensional requirements for the runway and taxiway safety areas of a B-II airport are larger than those for a B-I airport, the current RDC for Orcas Island. These safety requirements were a priority in the consideration of development alternatives for the airport and include widening the runway from 60 feet to 75 feet, increasing the separation distance between the runway and the parallel taxiway, increasing the dimensions of the Runway Safety Area (RSA) and Runway Object Free Area (ROFA) on each end of the runway, and evaluating runway length. Considerable attention was also given to ways in which the conflicts between the Runway Protection Zones (RPZs) and the roads within them could be reduced or eliminated. Mount Baker Road crosses the RPZ for Runway 34, and Brandt's Landing Lane crosses the RPZ for Runway 16. Competing interests such as the presence of wetlands and private property ownership adjacent to the airport were also considered.

4.2 Alternatives Overview and Identification

Runway/Taxiway Alternatives 1 – 4 were developed to show a range in the level of effort and cost of development for modifications to the runway, parallel taxiway, connector taxiways, and affected airport facilities. Alternative 1 has the least development and cost, and Alternative 4 has the most. The alternatives are described below and shown in **Figures 4.1 to 4.4.** Projects addressing the issues, needs, and facility requirements were included in each of the alternatives based on which alternative best matched the type of project.

Where major improvements have been suggested in an alternative, all the components of those improvements were proposed to meet safety standards for existing aircraft and current operations at the airport. For example, clearing obstacles from the Runway Safety Area requires relocating the airport terminal and some hangar facilities. Most of the planned improvements would be made on existing airport property to improve the safety of operations that have been going on for several years. No plans for development to increase the number of operations or the size of aircraft conducting them are anticipated. **Table 4.1** includes a comparison of the components of the alternatives.

Table 4.1: Alternatives Evaluation

Runway/ Taxiway Alternative Designation	Alternative Name	Alternative Components							
		Airside			Landside				
		Runways	Taxiways	Misc.	Aprons & Lease Lots	Access & Parking	Maintenance Faciltities	Fencing & Security	Property & Acquisition
1	No-Build	No change to Existing	No change to Existing	Requires MOS for runway-to-parallel taxiway separation distance, taxiway safety area width, taxiway object free area width, etc.	No change to Existing	No change to Existing	No change to Existing	No change to Existing	No change to Existing
2	Runway Widening and 156-foot Runway/Taxiway Separation	Widen runway to 75'	Increase runway - taxiway separation to 156'	Requires MOS for runway-taxiway separation distance	New lease lots, additional hangar space, tiedowns, and ground access will be provided at the Southeast and West Development Areas on existing airport property. The Southeast Development Area will also provide space for cargo facilities, parking, and a new terminal building.	Close Brandts Landing Lane. Realign Mt. Baker Road within RW 34 RPZ as property becomes availiable. Construct additional internal access roads and vehicle parking to accommodate lease lot development. Facilitate pedestrian access to Eastsound.	New Maintenance and Operations facilility in the Southeast Development Area	Relocate wildlife fence in the future RSA for Runway 16	Acquire land from Brandt's Landing Marina
3	Runway Widening, Displaced Thresholds, and 240-foot Runway/Taxiway Separation	Widen the runway to 75 feet and add displaced thresholds to each runway to increase the runway length to 3,400 feet	Increase runway - taxiway separation to 240'	No MOS required	New lease lots, additional hangar space, tiedowns, and ground access will be provided at the Southeast and West Development Areas on existing airport property. The Southeast Development Area will also provide space for cargo facilities, parking, and a new terminal building.	Close Brandts Landing Lane. Realign Mt. Baker Road within RW 34 RPZ as property becomes availiable. Construct additional internal access roads and vehicle parking to accommodate lease lot development. Facilitate pedestrian access to Eastsound.	New Maintenance and Operations facilility in the Southeast Development Area	Relocate wildlife fence in the future RSA for Runway 16	Acquire land from Brandt's Landing Marina, a portion of the Parnell parcel, and a portion of the Larson parcel along the east side of the north end of the runway.
4	Runway Realignment, Displaced Thresholds, and 240-foot Runway/Taxiway Separation	Realign and widen the runway to 75 feet and add displaced thresholds to each runway to increase the runway length to 3,400 feet.	Increase runway - taxiway separation to 240'	No MOS required. Aligns approach and departure operations over the community	New lease lots, additional hangar space, tiedowns, and ground access will be provided at the Southeast and West Development Areas on existing airport property. The Southeast Development Area will also provide space for cargo facilities, parking, and a new terminal building.	Close Brandts Landing Lane. Realign Mt. Baker Road within RW 34 RPZ as property becomes availiable. Construct additional internal access roads and vehicle parking to accommodate lease lot development. Facilitate pedestrian access to Eastsound.	New Maintenance and Operations facilility in the Southeast Development Area	Relocate wildlife fence in the future RSA for Runway 16	Acquire land from Brandt's Landing Marina, a portion of the Parnell parcel, and a portion of the Larson parcel along the east side of the north end of the runway.

The alternatives included:

- **Alternative 1: No-Build** – Minor maintenance and management of the existing runway and taxiways with minor use of capital projects.
- **Alternative 2: Runway Widening and 156-foot Runway/Taxiway Separation** – Widen the runway from 60 feet to 75 feet, relocate the parallel taxiway to increase separation from the runway to 156 feet.
- **Alternative 3: Runway Widening, Displaced Thresholds, and 240-foot Runway/Taxiway Separation** – Widen the runway from 60 feet to 75 feet, add displaced thresholds to increase runway length to 3,400 feet, and relocate the parallel taxiway to increase separation from the runway to 240 feet.
- **Alternative 4: Runway Realignment, Displaced Thresholds, and 240-foot Runway/Taxiway Separation** – Widen and rotate the runway slightly, add displaced thresholds to increase runway length to 3,400 feet, and relocate the parallel taxiway to increase separation from the runway to 240 feet.

Alternatives were also developed for the southeast area of the airfield. Southeast Development Alternatives 1 and 2 show different configurations for the terminal building, cargo hangar, based-aircraft hangars, parking areas, etc. These layouts are shown in **Figures 4.5 and 4.6.** In these alternatives, storage facilities for maintenance equipment will be provided either as part of the terminal building or in a stand-alone maintenance building.

The airport owns a considerable amount of property on the west side of the runway which is currently not in use. A potential layout for the construction of new hangars in this West Development Area is shown in **Figure 4.7**. In the winter aircraft that remain outside overnight can be subject to the accumulation of ice, snow, and frost. In the summer aircraft interiors can become hot enough to damage sensitive avionics and can become very uncomfortable for passengers. A structure that can be used as a deice facility in the winter and a shade structure in the summer is planned. Potential locations for it are the Southeast Development Area and the West Development Area, and these locations are shown in the figures.

At the north end of the runway Brandts Landing Lane encroaches into the Runway Protection Zone (RPZ) for Runway 16. Roads are considered an incompatible land use for the property within an RPZ, and **Figure 4.8** shows the dimensions and location of the Runway 16 RPZ if the road were removed. It also shows a possible aircraft holding area at Taxiway A4 near the north end of the runway. All alternatives with the exception of Alternative 1: No-Build include the acquisition of land on the north end of the runway and closure of Brandt's Landing Lane to eliminate the incompatible land use within the RPZ.

Just off the south end of the runway Mount Baker Road encroaches into the RPZ for Runway 34. **Figure 4.9** illustrates different options for relocating Mount Baker Road to eliminate the conflict.

4.3 Alternatives Evaluation

Airport stakeholders and the project team evaluated alternatives and projects using several methods. All project ratings by stakeholders were completed without consideration of funding limitations, per FAA guidance. Detailed results of these ratings can be found in **Appendix X**.

- **Advisory Committee -** Committee members rated projects within each alternative high-, medium- or low-priority using colored dots.
- **Public Open House Meetings –** A public open house meeting was held on June 5, 2018 to present the draft alternatives. Those in attendance at this meeting were given opportunity to rate the priority of the alternative projects. Another public open house meeting was held on September 19, 2018 to present the draft preferred development plan. The master planning team answered questions and solicited comments from participants regarding the merits and challenges of the alternatives.
- **Email Comments –** Approximately 300 email comments were submitted as of October 8, 2018 by residents, members of area pilot associations, and many other people with an interest in Orcas Island.

4.3.1 Alternative 1: No-Build

Alternative 1, shown in **Figure 4.1**, continues management and minor maintenance of existing facilities with existing staff and operating funds, but with minimal investment in capital projects. It is very likely that federal funding would no longer be available with this alternative, since ORS would not be meeting grant assurances. ORS could also need to repay grant monies received in the past. An overwhelming number of stakeholders prefer this option, believing that any improvements would be synonymous with airport expansion and enlargement, more noise, increased traffic, and more people placing greater demands on overstressed island resources.

The obvious benefit of the No-Build option is the savings in capital investment. Conditions are never static, however, and regular maintenance of facilities is required to sustain a satisfactory level of serviceability. Regardless of how diligent maintenance efforts are, the infrastructure will eventually degrade to the point at which continued maintenance is no longer cost-effective, and capital replacement is required, or facilities will become unusable.

As the demand for the air transportation of passengers and cargo increased, aircraft operators increased the number of their flights to meet those demands. They also began using aircraft that could more economically meet the new mission requirements. Notable among the new aircraft put into service was the Cessna 208 Caravan—a single-engine turboprop—which replaced piston-engine twins previously in use. The Cessna Caravan is an Aircraft Design Group II (ADG-II) airplane. The numerous operations of Cessna Caravans at ORS are the primary reason for change of the Runway Design Code to B-II.

The safety area dimensions of ADG-II are larger than for ADG-I, and major improvements at ORS would be needed to meet the requirements of the new standards. The FAA places a significant emphasis on operational safety at airports, and continued FAA funding for ORS is contingent on efforts to meet the safety requirements for the standards that apply to the way the airport is being used. As an interim measure some safety issues may be temporarily mitigated by implementing Modifications of Airport Design Standards (MOS) (Ref. FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards). An MOS can be requested based on an analysis of operations at a specific airport. However, The FAA will not grant an MOS for some conditions such as non-standard RSA dimensions, non-standard Obstacle Free Zone (OFZ) surfaces, or impermissible land uses within RPZ limits. Also, the airport must certify that modifications to standards will provide an acceptable level of safety. Several modifications to standards would be required to address the numerous non-standard conditions at ORS (runway-to-parallel taxiway separation distance, taxiway safety area width, taxiway object free area width, to name a few). Requests for MOS for these non-standard conditions are not likely to receive FAA approval because the more safety-critical items would remain unaddressed.

4.3.2 Alternative 2: Runway Widening and 156-foot Runway/Taxiway Separation

This alternative (**Figure 4.2**) includes widening the runway from 60 feet to 75 feet and relocating the parallel taxiway to increase its separation from the runway to 156 feet. It would include acquisition of land on the north end of the runway and closure of Brandt's Landing Lane to eliminate the incompatible land use within the RPZ.

One of the most common ADG-II airplanes operating at ORS is the Cessna Caravan, with a wingspan of 52'-1". A runway-taxiway separation distance of 156 feet provides the same wingtip clearance for most of the largest ADG-II aircraft currently operating at ORS as they would have if they were ADG-I airplanes. Implementing this alternative, however, would require the acquisition of land from Brandt's Landing Marina along the east side of the north end of the runway. It would also require an MOS from the FAA, because the runway-taxiway separation distance would still be less than what the standards require. Approval of an MOS is not guaranteed and is not permanent. If granted, the MOS is subject to FAA review and renewal at least every five years, and the FAA will expect continued progress toward full compliance with safety standards as a condition of subsequent approval.

New lease lots, additional hangar space, tiedowns, and ground access will be provided at the Southeast and West Development Areas on existing airport property. The Southeast Development Area will also provide space for

Figure 4.1. Runway/Taxiway Alternative 1 - No Build

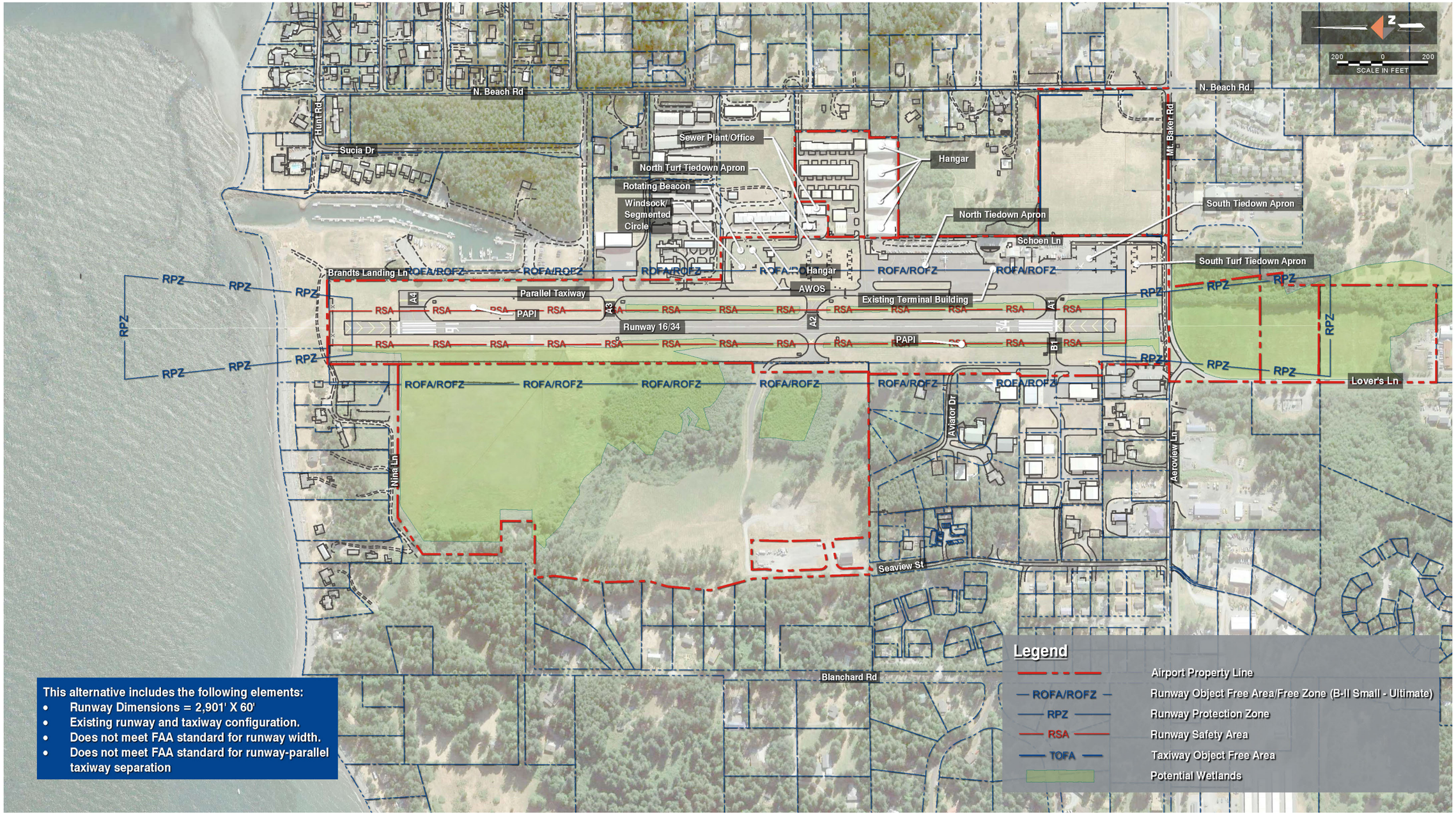

Figure 4.2. Runway/Taxiway Alternative 2 - Widening and 156'Runway/Taxiway Separation