4. Identification and Evaluation of Alternatives

The alternative identification and evaluation process provides for the implementation of the facility needs identified within the Master Plan Update (MPU). The alternatives are first identified, then through the evaluation process are shaped to the needs of the airport, culminating in a single Preferred Alternative. This Preferred Alternative is the result of significant review and coordination with the FAA, WSDOT Aviation Division, the Port of Olympia, and the MPU TAC. FAA requirements, facility needs, stakeholder priorities, community resources, fiscal constraints, environmental constraints, and comments from stakeholders, the public and other interested parties are utilized within the selection criteria for the Preferred Alternative. The Identification and Evaluation of Alternatives chapter is an important and required part of a Master Plan update and is built directly upon the facility requirements chapter and other information collected during the development of this Master Plan Update.

4.1. Development of Alternatives

Bringing together elements of the Master Planning process and incorporating the strategic vision of the Port and the Airport Master Plan Update TAC is important when determining future airport development. Evaluation criteria weighed when developing alternatives for future development at OLM required each of the following areas to be evaluated:

- **Safety**
  - **Improves Safety**: Does the alternative improve pilot and ATC situational awareness, and follow FAA best practices?
  - **Meets Design Standards**: Does the alternative meet or exceed FAA standards and regulations?
- **Efficiency**
  - **Enhances Operations Efficiency**: Does the alternative allow ease of access around the airfield for the users and ATC?
  - **Supports Adaptable Facilities**: Does the alternative allow for development adaptability due to unforeseen challenges or changes in demand?
  - **Ease of Implementation:** Does the alternative require significant preparation and construction?
- **Land Management**
  - **Accommodates Forecasted Demand:** Does the alternative accommodate the FAA approved forecasted demand that the airport anticipates?
  - **Increases Developable Area:** Does the alternative utilize increased available land for development?
  - **Balances Airfield:** Does the alternative provide specific areas for users with similar activities and distribute development?
  - **Land Use Compatibility:** Does the alternative meet FAA airport land use requirements and minimize conflicts with off airport neighbors?
  - **Non-Aviation Commercial Development Opportunities:** Does the alternative provide for non-aviation commercial development options to aid in revenue generation for the airport?
  - **Supports Adaptable Land Use:** Does the alternative provide land uses that will be adaptable for changes in demand volume throughout the planning period?

- **Fiscal Sustainability**
  - **Financially Responsible:** Does the alternative provide for fiscal responsibility and less burden on the sponsor?
  - **New Pavement Eligibility for FAA Funding:** Does the alternative qualify for eligibility of FAA funding for large pavement areas in the alternative?
  - **Supports Aeronautical Revenue Generation**: Does the alternative provide opportunities to increase aeronautical revenue generation?
  - **Supports Non-Aeronautical Revenue Generation**: Does the alternative provide opportunities to increase non-aeronautical revenue generation?
- **Environmental Awareness**
  - **HCP Compatibility**: Does the alternative fit within the parameters of the draft HCP?
  - **Environmental Compatibility:** Does the alternative minimize the general environmental impacts to the neighbors and the area?
  - **Noise Minimization to Sensitive Areas:** Does the alternative minimize aviation related noise for noise sensitive areas neighboring the airport?
  - **Recreation Sustainability:** Does the alternative consider impacts to recreational areas around the airport?

Using the evaluation criteria, stakeholder input for each alternative was provided by the TAC, the Port of Olympia, and the community members. TAC meetings were held in May 2020, July 2020, December 2020, and March 2021, and public open houses were advertised and held in September 2021, February 2022, May 2022, and October 2022 to present the various alternatives and receive comments regarding the alternatives and the Airport MPU. The feedback received from all sources helped to create the Preferred Alternative.

4.2. Airport Alternatives

The alternatives, to include the Preferred Alternative, reflect extensive analysis of the facility needs, fiscal abilities, environmental constraints, current use, and forecasted growth of the Airport. The FAA, through Advisory Circular 150/5070-6B, establishes the framework for the Master Planning process based on the individual airport's overall complexity, size, and use.

It is critical that any planned development at OLM is in full compliance with FAA standards and in accordance with FAA grant assurances. Non-compliance with FAA grant assurances could jeopardize all future development at the Airport. Due to this requirement, two specific items were deemed as absolutely necessary for any proposed development and were included as part of every alternative. These are:

- Continued Pavement Maintenance
- Sign and Marking Upgrades

The general development items that were addressed by the alternatives were:

- Different alternatives to address taxiway design standards issues.
- Runway length of the crosswind runway.
- Development of revenue generating buildable areas for hangars, commercial, agricultural and aviation industrial development.

- Airside and facility development opportunities to enhance safety, revenue, services, and growth of the Airport.

4.2.1. Taxiway Alternatives

The taxiway system at the Airport provides a network to the runways from the apron and hangar areas. The system is large and does not meet the current FAA standards that taxiway systems need to conform to. Specific standards that were under review during the alternative analysis include:

- **Direct apron to runway access**: The FAA requires a 90 degree turn between the apron and the runway to assist in reducing the potential for runway incursions due to the directness of travel between the apron and the runway.
- **Taxiways utilizing 90-degree angles when turning onto a runway**: FAA studies show that there is a higher probability for an incursion when the angle of the intersection of the taxiway and runway is not at a 90-degree angle or if the taxiway intersection is significantly wider than a standard intersection.
- **Taxiways crossing runways in the middle third of the runway**: According to FAA Engineering Brief No. 75, "The preference is for aircraft to cross in the last third of the runway whenever possible, since within the middle third of the runway the arriving/departing aircraft is usually on the ground and traveling at a high rate of speed."

The taxiway layouts are an important factor in the development process as the layout will dictate future buildable areas and runway length adjustments for the crosswind runway. Each alternative conforms with FAA standards.

4.2.1.1. *Taxiway Alternative 1*

The first alternative provided for the taxiway system focuses on taxiway standards. This includes realignment of taxiways and removal of some taxiways along with portions of other taxiways to address standards.

Items considered within Taxiway Alternative 1 include:

Realignment of Taxiway F: Taxiway F runs roughly parallel to Runway 17/35 on the east side of the runway. The taxiway is nonstandard with multiple jogs and turns connecting Taxiway E to Runway 35. In this alternative the existing Taxiway F pavement that intersects Taxiway G and connects with Runway 8/26 will be removed, and the taxiway will be moved closer to the runway and in line with the southern portion of the existing Taxiway F. Moving Taxiway F allows for realignment of Connector Taxiways L and G to intersect the runway at 90-degree intersection points outside of the middle third of the runway. Additionally, the intersection points for Taxiway F where it crosses Runway 8/26 would be moved outside of the middle third of the runway, which will obtain a 90-degree connector taxiway on the north side of Runway 8/26, remove the direct runway to apron access, and maintain clearance distances required for the VORTAC.

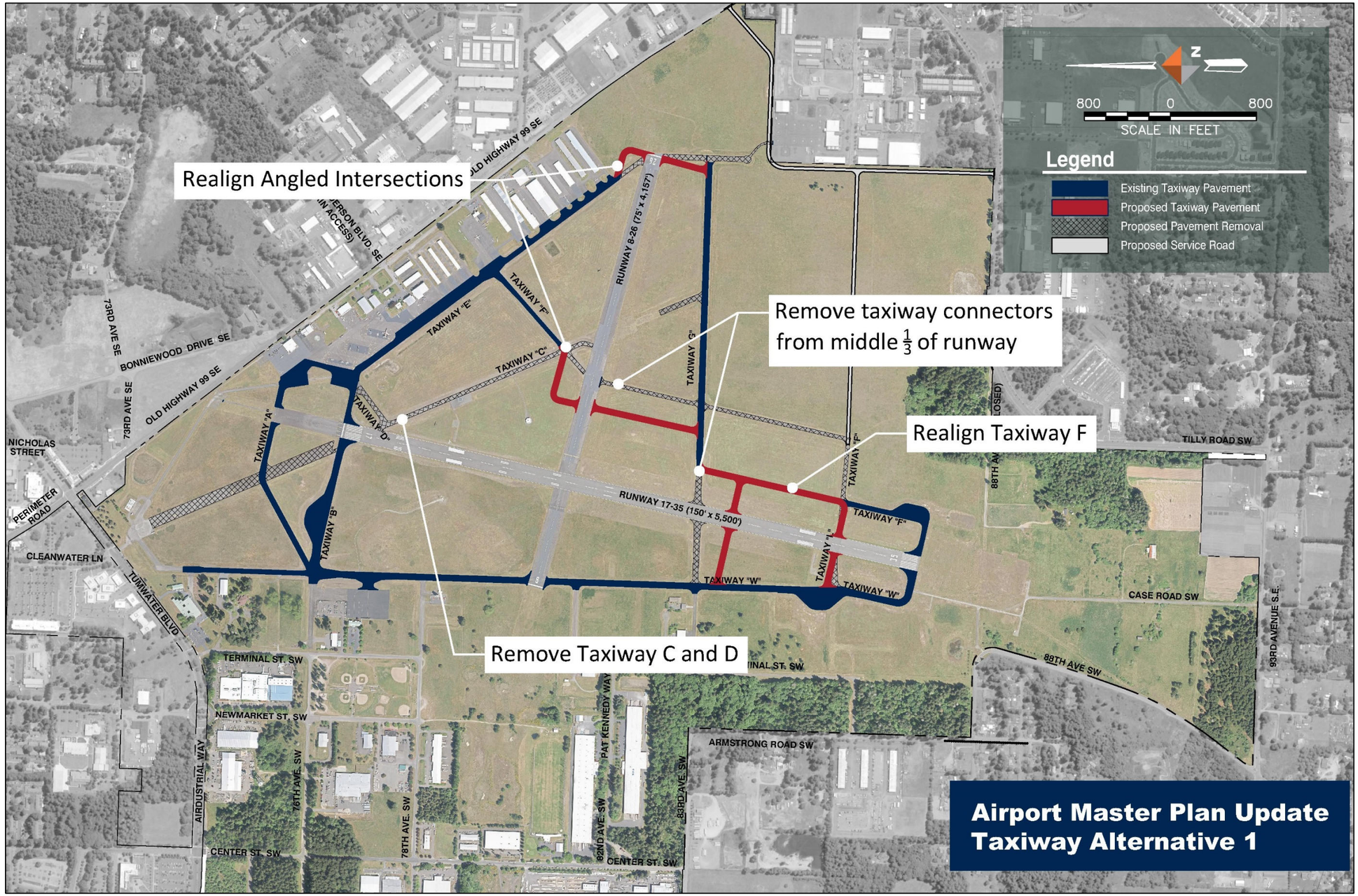
Taxiway C & D Removal: The entirety of Taxiway C, which runs from Taxiway G to the north end of the airfield, is proposed in this alternative to be removed along with Taxiway D, which is located between Taxiway E and Taxiway C. Removal of these taxiways would eliminate the non-

standard runway entrance to Runway 17. Removal of Taxiway C will also provide for a 90-degree intersection point outside of the middle third of Runway 8/26 with the modifications to Taxiway F.

Realignment of the angled taxiway connectors: The Taxiway F and C intersections to Runway 8/26 will be removed and replaced with a single Taxiway F intersection point for Runway 8/26 outside of the middle third of the runway. Additionally, at the end of Runway 26 realignment of the angled intersection point for Taxiway E will provide for a 90-degree intersection from the taxiway to the runway.

With the removal of Taxiways C and D along with the realignment of Taxiway F and the runway connector taxiways, Taxiway Alternative 1 has 885,000 square feet less pavement than the existing ALP. Taxiway Alternative 1 is depicted on Figure 4-1.

Figure 4-1: Taxiway Alternative 1 Layout



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4.2.1.2. *Taxiway Alternative 2*

The second taxiway alternative is a continuation of the taxiway alternatives from Taxiway Alternative 1 to further address taxiway standards through the incorporation of parallel taxiways. This includes further development of the east side parallel taxiway from Runway 17/35, Relocating the parallel taxiway on the west side of Runway 17/35, and relocation of the parallel taxiway on the south side of Runway 8/26. This alternative will result in the shortening of Runway 8/26, which will be evaluated in the runway alternative section of this chapter.

Items considered within Taxiway Alternative 2 include:

Realignment of Taxiway F: Taxiway F runs roughly parallel to Runway 17/35 on the east side of the runway. The taxiway is nonstandard with multiple jogs and turns connecting Taxiway E to Runway 35. In this alternative the existing Taxiway F pavement that intersects the Taxiway G on the south side will be removed, and the taxiway will be moved closer to the runway and in line with the southern portion of the existing Taxiway F. Unlike Taxiway Alternative 1, this alternative continues a parallel taxiway from the southern edge of Runway 8/26 to Runway 35. The northern edge intersection of Taxiway F is shown as proposed in Taxiway Alternative 1 due to the VORTAC, rather than being placed at the proposed runway end similar to the southern portion. The intersection point for Taxiway F where it crosses Runway 8/26 on the north side would be moved outside of the middle third of the runway, which will obtain a 90-degree connector taxiway on the north side of Runway 8/26, remove the direct runway to apron access, and maintain clearance distances required for the VORTAC. Moving Taxiway F allows for realignment of connector Taxiways L and G to intersect the runway at 90-degree intersection points outside of the middle third of the runway.

Realignment of Taxiway W: Taxiway Alternative 2 proposes the realignment of Taxiway W to be in line with the dimensional standards set on the parallel taxiway portion of Runway 35 between Taxiway connector L and Runway 35. Taxiway W is proposed to run as a true parallel to Runway 17/35, with the exception of a jog around the ASOS. Realignment of Taxiway W would facilitate the possible reduction in length for Runway 8/26, which will be evaluated in the runway alternative section of this Chapter.

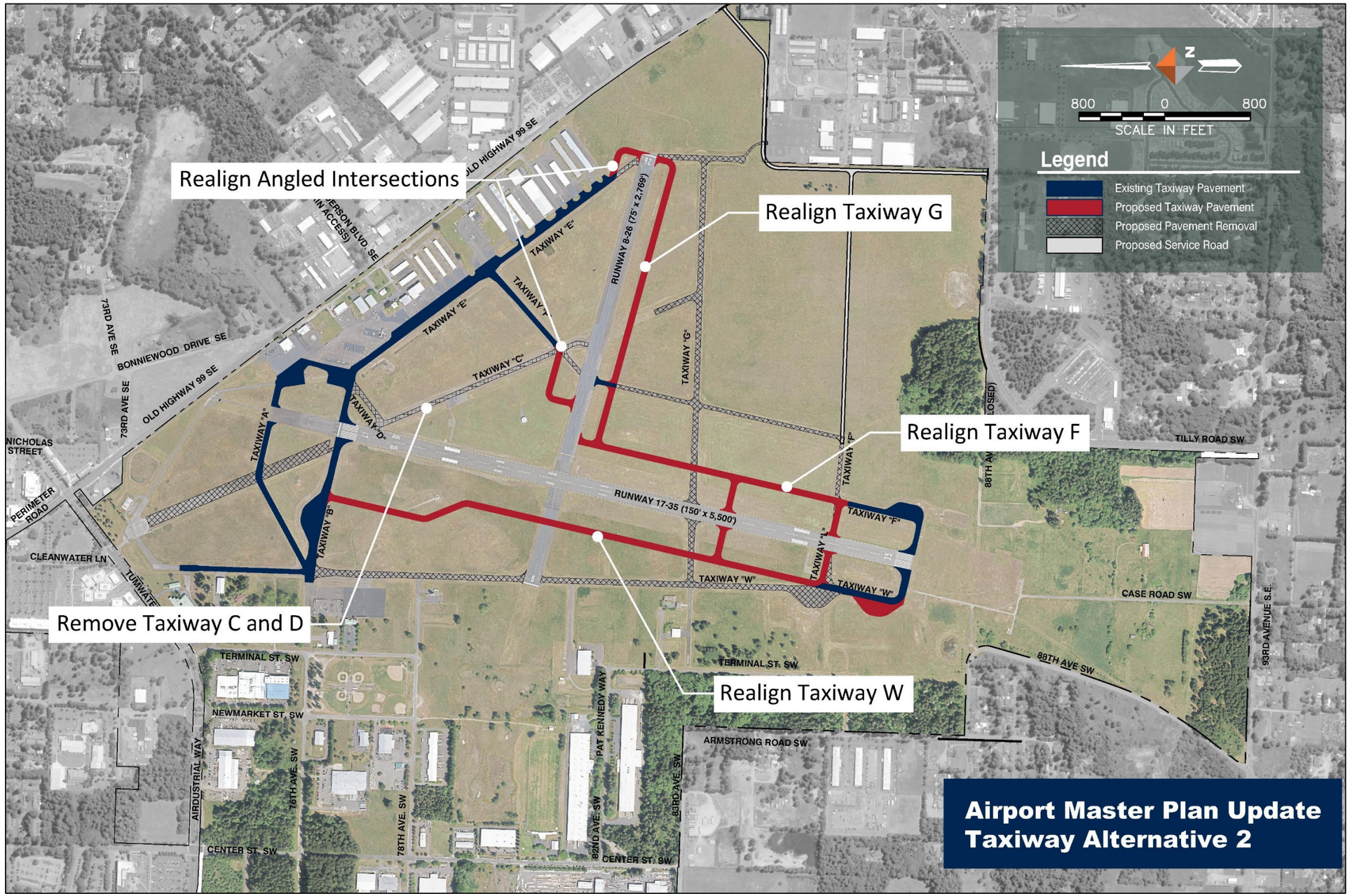
Realignment of Taxiway G: To tighten up the areas utilized by the taxiways to conform to standardized geometry, Taxiway Alternative 2 proposes the realignment of Taxiway G to run parallel to Runway 8/26 on the south side of the runway. Taxiway G connector taxiways that cross Runway 17/35 would be moved outside of the middle third of Runway 17/35 and most likely be given new identification as connector taxiways as they would no longer be in line with Taxiway G, which would be moved to be in parallel with Runway 8/26.

Taxiway C & D Removal: As proposed in Taxiway Alternative 1, the entirety of Taxiway C, which runs from Taxiway G to the north end of the airfield, is proposed in this alternative to be removed, along with Taxiway D which is located between Taxiway E and Taxiway C. Removal of these taxiways would eliminate the non-standard runway entrance to Runway 17. Removal of Taxiway C will also provide for a 90-degree intersection point outside of the middle third of Runway 8/26 with the modifications to Taxiway F.

Realignment of the angled taxiway connectors: The Taxiway F and C intersections to Runway 8/26 will be removed and replaced with a single Taxiway F intersection point for Runway 8/26 outside of the middle third of the runway. Additionally, at the end of Runway 26 realignment of the angled intersection point for Taxiway E will provide for a 90-degree intersection from the taxiway to the runway.

With the removal of Taxiways C and D along with the realignment of connector taxiways and Taxiway F, W and G, and shortening Runway 8/26, Taxiway Alternative 2 has 911,500 square feet less pavement than the existing ALP. Taxiway Alternative 2 is depicted on Figure 4-2.

Figure 4-2: Taxiway Alternative 2 Layout



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4.2.1.3. *Taxiway Alternative 3*

The third alternative for the taxiway system focuses on a continuation of the taxiway alternatives from Taxiway Alternative 1 and Taxiway Alternative 2 to further address taxiway standards and reduction of pavement while tightening the geometry around the runways. Included in this set of alternatives are parallel taxiways for Runway 8/26 on both sides of the runway, along with standardized parallel taxiways on the southern portion of Runway 17/35 and non-standard parallel taxiways on the north end of Runway 17/35 as the taxiway system conforms to the VORTAC and ASOS placements that are existing.

Items considered within Taxiway Alternative 3 include:

- **Realignment of Taxiway F**: Taxiway F is proposed to be realigned south of Runway 8/26 to be a true parallel taxiway for the southern portion of Runway 17/35. Nearly all of Taxiway F existing pavement would be removed except for the existing parallel portion for Runway 35 and the connector taxiway pavement for Runway 8/26 (which would need to be reclassified with a different taxiway connector letter). Taxiway F north of Runway 8/26 will be removed in this alternative.

- **Realignment of Taxiway W**: Taxiway Alternative 3, like Taxiway Alternative 2, proposes the realignment of Taxiway W to be in line with the dimensional standards set on the parallel taxiway portion of Runway 35 between Taxiway connector L and Runway 35. Taxiway W would be proposed to run as a true parallel to Runway 17/35, with the exception of a jog around the ASOS. Realignment of Taxiway W would require the taxiway to intersect and cross Runway 8/26, as this alternative shows that Runway 8/26 runway length would remain as it currently is at 4,157'. The runway alternative section will evaluate runway length options later in this chapter.

- **Realignment of Taxiway G**: To tighten up the areas utilized by the taxiways to conform to standardized geometry, Taxiway Alternative 3 proposes the realignment of Taxiway G to run parallel to Runway 8/26 on the south side of the runway. Taxiway G would run the full length of Runway 8/26 and intersect Taxiway F and cross Runway 17/35 and Taxiway W. All the existing Taxiway G pavement would be removed, as it would be fully realigned to Runway 8/26.

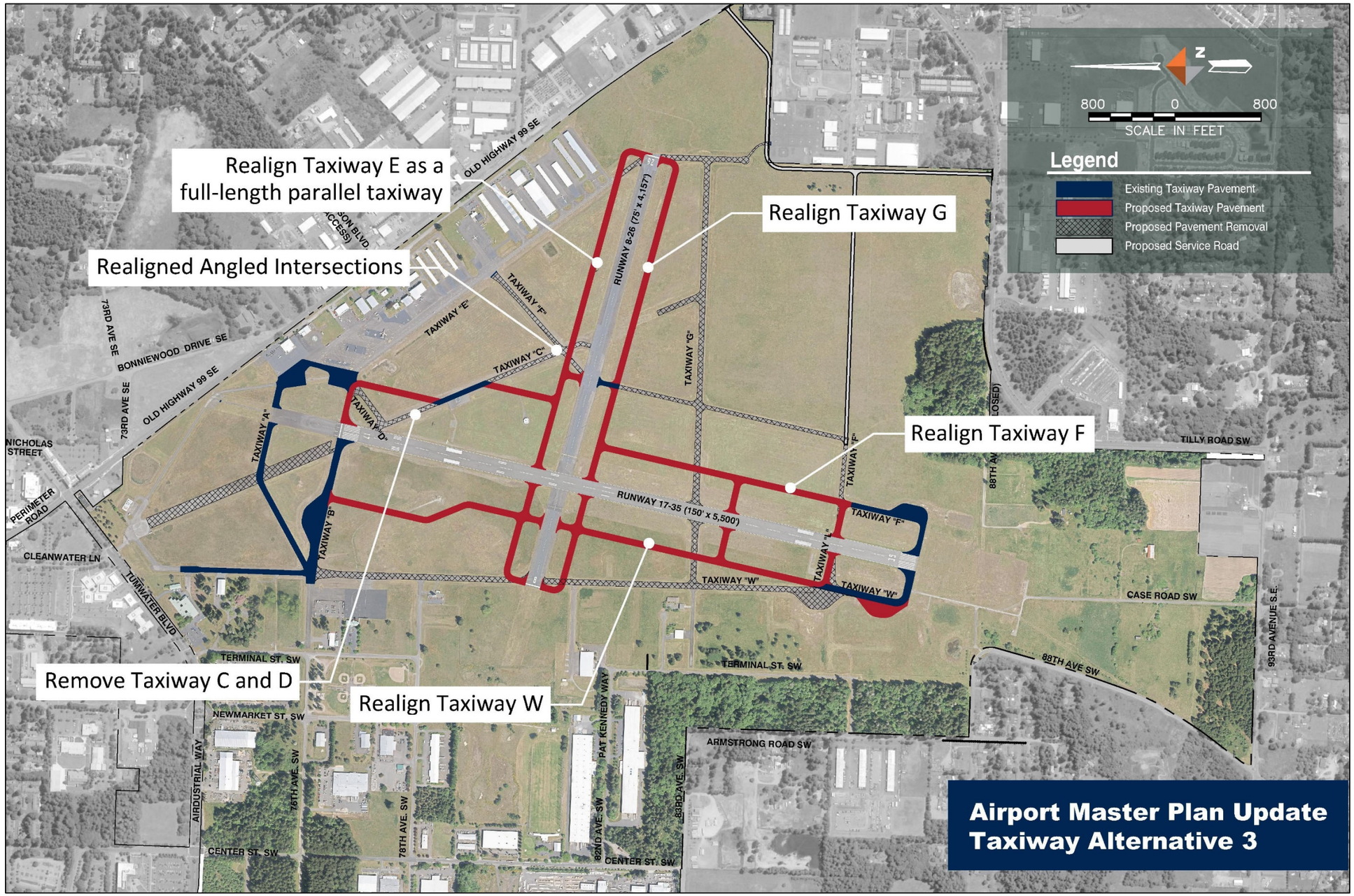
- **Realignment of Taxiway E**: Taxiway E, which is currently the taxiway along the apron between Runway 17 and Runway 26, would be realigned as a true parallel taxiway for Runway 8/26 on the north side of the runway. The realignment would have the taxiway cross Runway 17/35 and Taxiway W.

- **Taxiway C & D Removal**: Unlike what was proposed in Taxiway Alternative 1 and 2, the portion of Taxiway C between Runway 8/26 and Runway 17/35 would remain in place and be joined with connector taxiways that run parallel to Runway 17/35 providing for movement around the VORTAC and connecting the apron to a future parallel Taxiway E for Runway 8/26. The remainder of Taxiway C is proposed in this alternative to be removed along with Taxiway D which is located between Taxiway E and Taxiway C. Removal of these taxiways would eliminate the non-standard runway entrance to Runway 17. Removal of Taxiway C will also provide for a 90-degree intersection point outside of the middle third of Runway 8/26.

- **Realignment of the angled taxiway connectors**: All taxiway connectors intersecting the runway would be realigned to meet the 90-degree intersection standards recommended by the FAA.

The realignment of the taxiway system will provide a more standardized parallel taxiway system. Taxiway Alternative 3 has 490,000 square feet less pavement than the existing ALP. Taxiway Alternative 3 is depicted on Figure 4-3.

Figure 4-3: Taxiway Alternative 3 Layout



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4.2.2. Runway Alternatives

Runway length alternatives for the Airport are focused on the crosswind runway, Runway 8/26. Runway 8/26 does not meet the FAA funding eligibility requirements to justify a federally funded secondary runway. The Airport and the community understand the importance for a crosswind or secondary runway and desire to keep the runway maintained, understanding it is unlikely to receive federal funds to assist with its maintenance. The following alternatives examine the options believed to be best align with the Port's goals.

4.2.2.1. *Runway Alternative 1*

Runway Alternative 1 proposes to maintain Runway 8/26's full length of 4,157 feet. This alternative will not change any pavement length dimensions for Runway 8/26 and will have the crosswind runway remain as is. No changes are proposed for the primary runway, Runway 17/35. Runway Alternative 1 is depicted on Figure 4-4.

4.2.2.2. *Runway Alternative 2*

Runway Alternative 2 proposes to shorten Runway 8/26 by 1,388 feet on the Runway 8 side, resulting in a crosswind runway length of 2,769 feet. The change in runway length would allow for Taxiway W to be realigned without crossing Runway 8/26, and would also place the safety area for Runway 8 outside of the safety area for Runway 17/35. This would provide for both of the runways to no longer be intersecting each other. No changes are proposed for the primary runway, Runway 17/35. Runway Alternative 2 is depicted on Figure 4-5.

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Figure 4-4: Runway Alternative 1 Layout

Figure 4-5: Runway Alternative 2 Layout

4.2.3. Development Areas

Development of the Airport with respect to structures, hangars, and businesses is categorized into similar uses. Areas of consideration include:

- **Small General Aviation Development**: This component encompasses many of the smaller aircraft used for personal use and training. Many of the aircraft in this category would be small single and twin-engine aircraft with limited wingspans. The structures associated with this category could include small box hangars, multi aircraft hangars and T-hangars.
- **Corporate General Aviation Development**: Structures within this category would be intended to house larger twin engine corporate aircraft and jets. These jets would be that of personal/business type aircraft and not commercial airline type jets.
- **Commercial Development**: Development areas that are ideally situated with prime road frontage will be considered for commercial business development. These areas would ideally have access from a primary roadway, and also provide access to the airfield.
- **Aviation-related Industrial Development**: Industrial development options that are aviation related are included in the alternatives. There is abundant land within the airport, of which some areas will provide potential options for development for aviation-related industrial components, such as aviation manufacturing and other aviation related businesses. These areas discourage incompatible uses and heights.
- **Feasibility of Commercial Air Service Development**: Future development areas for Commercial Air Service will be identified within the development alternatives. This will allow for the identification of developable land for air service development, if required in the future, to include placeholders for a potential future terminal building and associated parking and facilities.

These categories, along with development of existing areas, are shown in the following alternative options as potential development alternatives that were presented for consideration. All development categories were included within each proposal, but were placed in different areas around the airport to identify the best fit for the Preferred Alternative.

4.2.3.1. *Development Alternative 1*

Development Alternative 1 is similarly lined up with the development options of Taxiway Alternative 1. Correlating the development and taxiway alternatives with each other allows for the understanding of the development potential within each taxiway and runway alternative option. The Preferred Alternative will be a combination of the most preferred taxiway, runway and development options, and the areas for development will be adjusted to fit the preferred taxiway and runway options. Development Alternative 1 areas by category include:

- **Small General Aviation Development (137 Acres):** Focus areas within Development Alternative 1 were significantly related to Small GA Development. The Small GA category was a large portion of the development options within the alternative, and would allow for significant growth within that category. There is currently a nationwide shortage of aircraft hangars. Allocation of optional development land for small GA aircraft would be able to meet a need within the greater area for developable land for hangars. Development areas selected within this alternative were to continue the existing development at the airport on the east side of the

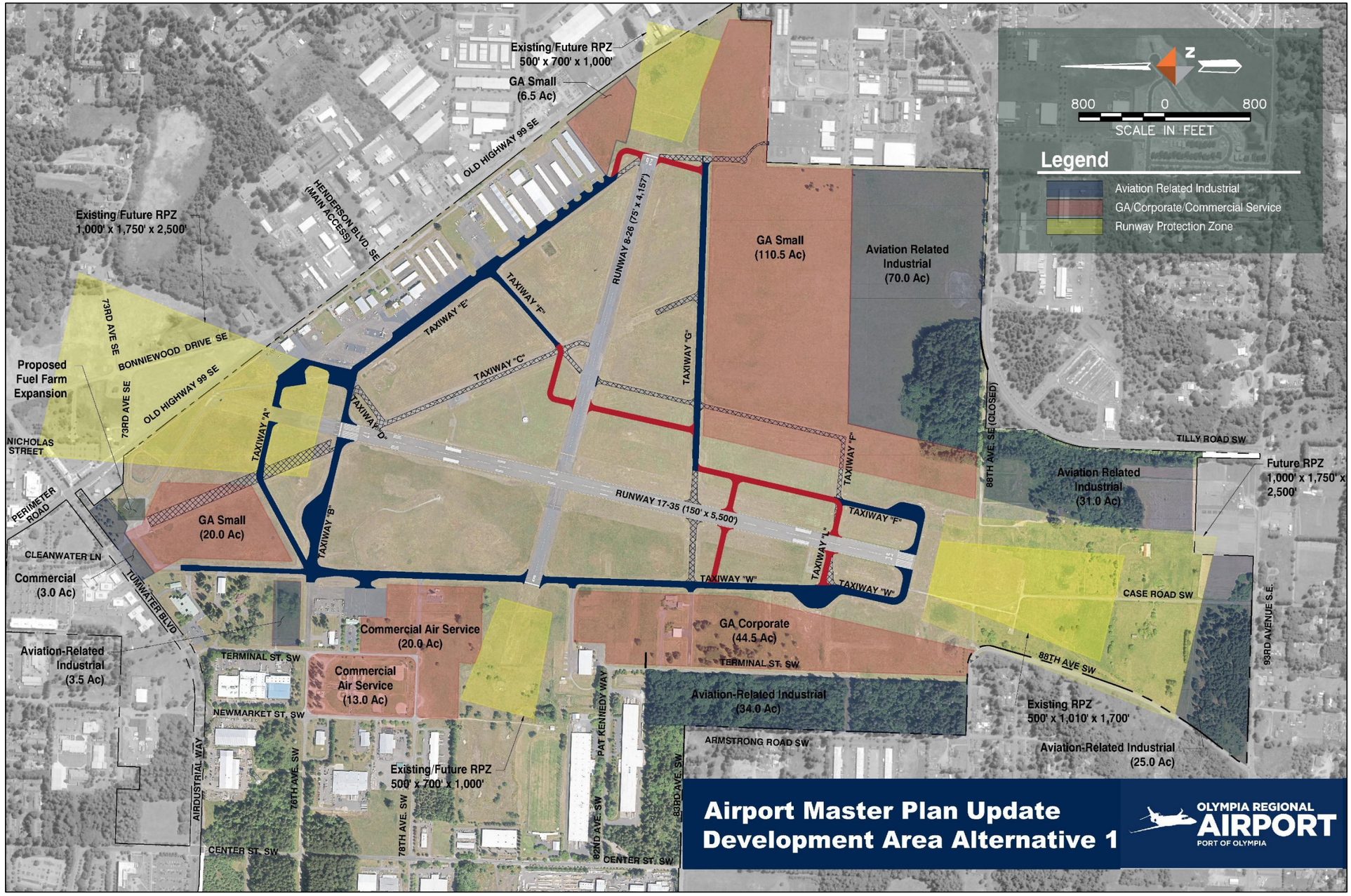
airport toward the Runway Protection Zone (RPZ) of Runway 26 (6.5 Acres). In addition to the continued development, new areas identified for development include:

  - A large portion of land adjacent to the Existing Taxiway G and extending south, with primary frontage to a taxiway. (110.5 Acres)
  - An area for development between the RPZ of Runway 35 and the north end of the existing Taxiway W. (20 Acres)

- **Corporate General Aviation Development (44.5 Acres):** In an effort to locate development areas by similar use categories, the GA corporate development area for Development Alternative 1 was placed on the southwest side of the airport adjacent to the south end of the existing Taxiway W between the RPZs for Runway 8 and 17. This provides a large area of land (44.5 Acres) to be utilized for larger corporate aircraft, and also provides road access and close access to Runway 17/35.
- **Commercial Development (3 Acres):** Commercial development on the airport will ideally be an area that will be accessible by road and from the airport. The northeast corner of the airport provides an area (3 Acres) of developable land that would have direct access from Tumwater Blvd SW (with close proximity to Capitol Blvd SW) and also be able to have access to the airfield. This area could house commercial entities that provided aircraft specific maintenance or commercial products, allowing the public to fly in or drive in to conduct business.
- **Aviation-related Industrial Development (163.5 Acres):** Aviation-related Industrial Development is vitally important to the airport, as it will allow for development of land to accommodate manufacturing related to the aviation industry, which would require landside access, but have the potential need for airside access as well. Areas identified within this alternative for Aviation-related Industrial Development include:
  - Development south of the proposed small GA development area on the southeast side of the airport. This area has two parcels identified with one (70 Acres) running along the east/west portion of Tilley Rd SE, east of the major turn, and the other (31 Acres) running along the north/south portion of Tilley Rd SE, after the major turn.
  - A portion of land (25 Acres) outside the RPZ for Runway 17 on the south side of the airport is available for Aviation Related Industrial Development along 93rd Ave SE. This will allow for utilization of land between the RPZ and the airport property area on this side of the airport.
  - An area (34 Acres) between Armstrong Rd SW and Terminal St and continuing south to 88th Ave SW is identified as an option for Aviation-related Industrial Development. Only areas not bordered by Terminal St SW would have airside access at this time.
  - Lastly, a small area of land (3.5 Acres) between the existing Taxiway W and Terminal Street SW and north of the 7600 Terminal Street hangar complex. This would provide landside and airside access options.
- **Feasibility of Commercial Air Service Development (33 Acres)**: Commercial Air Service at the airport was traditionally located on the western side of the airport along Taxiway W and north of the air traffic control tower. The old terminal currently is no longer utilized as a terminal but is the offices of WSDOT Aviation Division. This alternative maintains and expands this area as a proposed future development area for commercial air service for a total of 33 Acres.
- **Fuel Farm Expansion**: The fuel farm has been identified as a candidate for expansion within all the alternatives. This expansion would plan for and anticipate duplication of the existing facility. This would provide the airport with the ability to double the capacity for aviation fuel storage while keeping the fuel in the same location at the airport.

Development Alternative 1 is depicted on Figure 4-6.

Figure 4-6: Development Area Alternative 1 Layout



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4.2.3.2. *Development Alternative 2*

Development Alternative 2 is similarly lined up with the development options of Taxiway Alternative 2. The Preferred Alternative will be a combination of the most preferred taxiway, runway and development options, and the areas for development will be adjusted to fit the preferred taxiway and runway options. This alternative is similar to Development Alternative 1, with the primary adjustment being made to the GA Small development total Acres south of Runway 8/26 and Taxiway G. More land is allocated to Aviation-related Industrial Development in this southeastern portion of the airport for this alternative. Additionally, this alternative takes into account the taxiway and runway alternatives, allowing for more developable areas.

Development Alternative 2 areas by category include:

- **Small General Aviation Development (112.5 Acres):** Development areas selected within this alternative for Small GA Development were to continue the existing development at the airport on the east side of the airport toward the RPZ of Runway 26 (6.5 Acres). In addition to the continued development, new areas identified for development include:
    - A large portion of land adjacent to the existing Taxiway G and extending south, with primary frontage to a taxiway (86 Acres). This takes into account Taxiway G shifting, allowing for more space.
    - An area for development between the RPZ of Runway 35 and the north end of the existing Taxiway W (20 Acres).

- **Corporate General Aviation Development (50 Acres):** The GA corporate development area for Development Alternative 2 is similarly located to that of Development Alternative 1, on the southwest side of the airport adjacent to the south end of the existing Taxiway W between the RPZs for Runway 8 and 17, but is expanded due to Taxiway W being shifted as a parallel taxiway to Runway 17/35. This provides a large area of land (50 Acres) to be utilized for larger corporate aircraft, and also provides road access and close access to Runway 17/35.

- **Commercial Development (3 Acres):** Commercial development on the airport for Development Alternative 2 remains as planned in Development Alternative 1. The northeast corner of the airport is ideal as it provides an area (3 Acres) of developable land that would have direct access from Tumwater Blvd SW (with close proximity to Capitol Blvd SW) and also be able to have access to the airfield.

- **Aviation-related Industrial Development (205.5 Acres):** Aviation-related Industrial Development is expanded from Development Alternative 1 to include portions north of the Development Alternative 1 option. This would allocate more land for Aviation-related Industrial Development, to include:
    - Development south of the proposed small GA development area on the southeast side of the airport would be expanded in this alternative. This area has two parcels identified with one (112 Acres) running along the east/west portion of Tilley Rd SE, east of the major turn, and the other (31 Acres) running along the north/south portion of Tilley Rd SE, after the major turn.
    - A portion of land (25 Acres) outside the RPZ for Runway 17 on the south side of the airport is available for Aviation Related Industrial Development along 93rd Ave SE. This

will allow for utilization of land between the RPZ and the Airport property area on this side of the airport.
    - An area (34 Acres) between Armstrong Rd SW and Terminal St and continuing south to 88th Ave SW is identified as an option for Aviation-related Industrial Development. Only areas not bordered by Terminal St SW would have airside access at this time.
    - Lastly, a small area of land (3.5 Acres) between the existing Taxiway W and Terminal Street SW and north of the 7600 Terminal Street hangar complex. This would provide landside and airside access options.

- **Feasibility of Commercial Air Service Development (72 Acres):** Commercial Air Service Development would be located in a similar location to that of Development Alternative 1 and the traditional terminal area, but would be expanded with the relocation of Taxiway W to be more in line with Runway 17/35 as a parallel taxiway. This alternative maintains this area as a proposed future development area for commercial air service and expands the overall area for a total of 72 Acres.

- **Fuel Farm Expansion:** The fuel farm has been identified as a candidate for expansion within all the alternatives. This expansion would plan for and anticipate duplication of the existing facility. This would provide the airport with the ability to double the capacity for aviation fuel storage while keeping the fuel in the same location at the airport.

Development Alternative 2 is depicted on Figure 4-7.

Figure 4-7: Development Area Alternative 2 Layout

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4.2.3.3. *Development Alternative 3*

Development Alternative 3 is shown compared to the development options of Taxiway Alternative 2. The Preferred Alternative will be a combination of the most preferred taxiway, runway and development options, and the areas for development will be adjusted to fit the preferred taxiway and runway options. This option examines the development possibilities of placing future Commercial Air Service on the east side of the airport and additional small GA development.

Development Alternative 3 areas by category include:

- **Small General Aviation Development (85.5 Acres):** Development areas selected within this alternative for Small GA Development were to continue the existing development at the airport on the east side of the airport toward the RPZ of Runway 26 (6.5 Acres). In addition to the continued development, new areas identified for development include:
    - Developable land south of Taxiway E (18 Acres), outside of the VORTAC critical area, has potential for development within this alternative. This area would have potential hurdles to cross with user access as it is within the airfield and across an existing active taxiway, but may be a feasible option if necessary.
    - Developable area adjacent to the existing WSDOT Aviation Division apron and building is proposed within this alternative as a viable expansion for GA small development. This alternative shows Taxiway W being relocated allowing for additional space for development between the relocated Taxiway W and the Runway 8 RPZ for an overall area of 41 Acres.
    - The area for development between the RPZ of Runway 35 and the north end of the existing Taxiway W remains a viable option for development within this alternative. (20 Acres)

- **Corporate General Aviation Development (49.5 Acres):** The GA corporate development area for Alternative 3 is as proposed in Alternative 2, which is located on the southwest side of the airport adjacent to the south end of the existing Taxiway W between the RPZs for Runway 8 and 17, but is expanded due to Taxiway W being shifted as a parallel taxiway to Runway 17/35. This provides a large area of land (49.5 Acres) to be utilized for larger corporate aircraft, and also provides road access and close access to Runway 17/35.

- **Commercial Development (3 Acres):** Commercial development on the Airport for Development Alternative 3 remains as planned in Development Alternative 1 and 2. The northeast corner of the airport is ideally situated for this type of development as the area (3 Acres) provides direct access from Tumwater Blvd SW (with close proximity to Capitol Blvd SW). This area also is able to have access to the airfield.

- **Aviation-related Industrial Development (218.5 Acres):** Aviation-related Industrial Development is expanded from Development Alternative 1 to include portions north of the Development Alternative 1 option. This would allocate more land for Aviation-related industrial development, to include:
    - Development south of the proposed small GA development area on the southeast side of the airport would be expanded in this alternative. This area has two parcels identified with one (112 Acres) running along the east/west portion of Tilley Rd SE, east of the

major turn, and the other (31 Acres) running along the north/south portion of Tilley Rd SE, after the major turn.

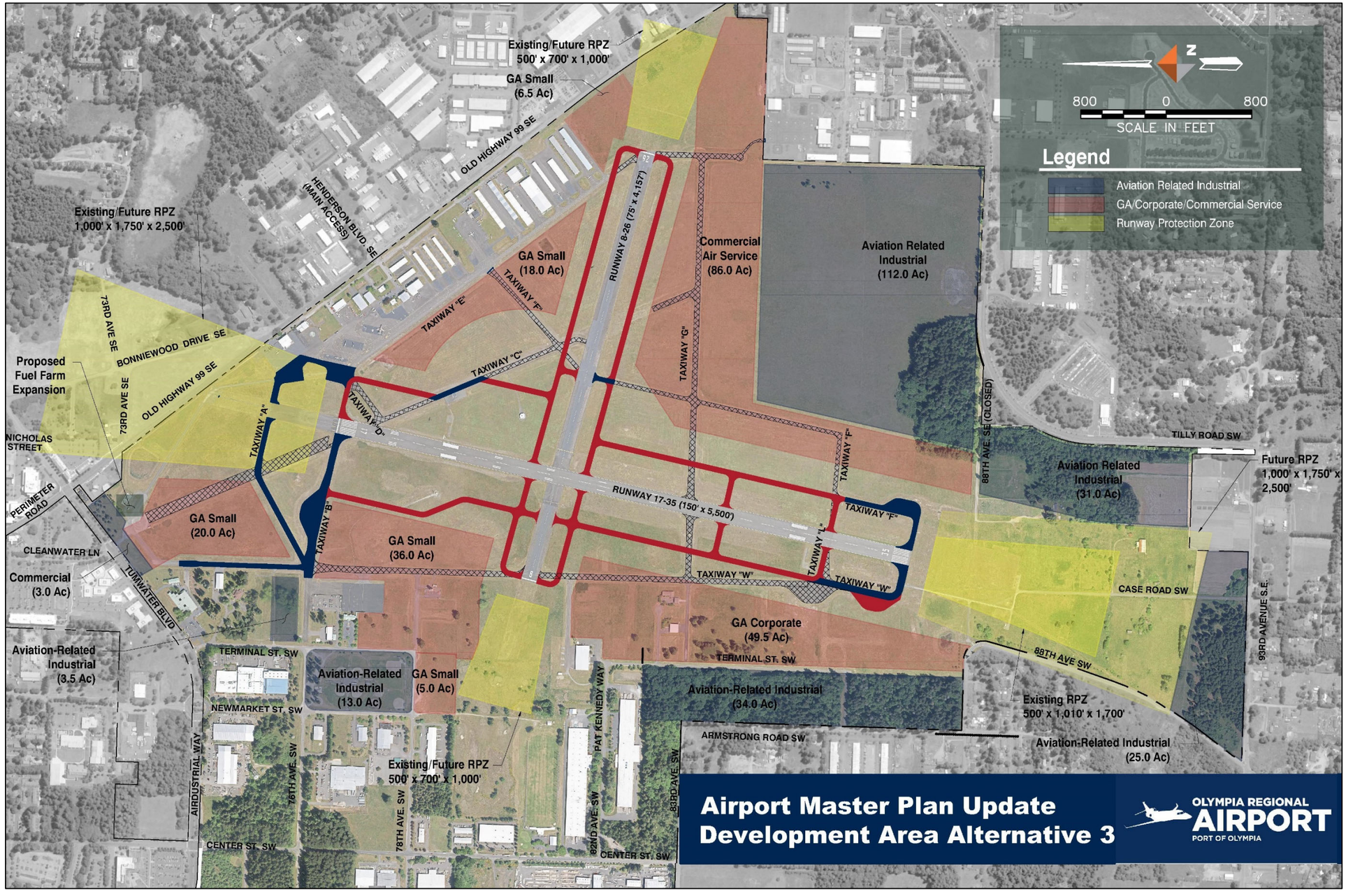
- A portion of land (25 Acres) outside the RPZ for Runway 17 on the south side of the airport is available for Aviation Related Industrial Development along 93rd Ave SE. This will allow for utilization of land between the RPZ and the airport property area on this side of the airport.
- An area (34 Acres) between Armstrong Rd SW and Terminal St and continuing south to 88th Ave SW is identified as an option for Aviation-related Industrial Development. Only areas not bordered by Terminal St SW would have airside access at this time.
- An area (13 Acres) currently not used by the airport, but utilized by the community as a baseball field, is identified as a potential area for future aviation-related industrial development if ever needed.
- Lastly, a small area of land (3.5 Acres) between the existing Taxiway W and Terminal Street SW and north of the 7600 Terminal Street hangar complex. This would provide landside and airside access options.

- **Feasibility of Commercial Air Service Development (86 Acres):** This alternative proposes the Commercial Air Service Development Area (86 Acres) to be located on the east side of the airport, north of the Aviation-related Industrial Development Area and south of Runway 8/26 and its associated parallel taxiway. This alternative would extend south in parallel with Runway 17/35, maintaining this area as a proposed future development area for commercial air service.

- **Fuel Farm Expansion:** The fuel farm has been identified as a candidate for expansion within all the alternatives. This expansion would plan for and anticipate duplication of the existing facility. This would provide the airport with the ability to double the capacity for aviation fuel storage while keeping the fuel in the same location at the airport.

Development Alternative 3 is depicted on Figure 4-8.

Figure 4-8: Development Area Alternative 3 Layout



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4.3. Environmental Review of Near-Term Projects

The environmental review is not intended to fulfill the requirements of environmental review required by National Environmental Policy Act (NEPA) or provide a definitive determination of what level of environmental review pursuant to NEPA will be required. The purpose of this environmental summary is to inform the community, airport sponsor, and regulatory agencies of the importance of minimizing the environmental impacts of proposed airport development and to provide a general indication of the likely need for further investigation. Table 4-1 provides an indication of the likely need for further environmental analysis to determine the exact impacts, if any, that are associated with the proposed improvements. At the appropriate time, the FAA would decide whether and to what extent any additional investigation would be required. Appropriate environmental documentation in accordance with FAA Order 5050.4B, NEPA Instructions for Airport Actions and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures is required to be completed prior to commencing with project actions.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Air Quality, including Greenhouse Gases (GHGs) and Climate	Potentially significant air quality impacts associated with an FAA project or action would be demonstrated by the project or action exceeding one or more of the National Ambient Air Quality Standards (NAAQS) for any of the time periods analyzed. The six criteria air pollutants include carbon monoxide (CO), particulate matter (PM, ozone (O3), sulfur dioxide (SO2), lead (Pb), and nitrogen oxide (NOx). With respect to GHGs and climate, federal standards for aviation- related GHG emissions are still being developed.	The Airport is located in Thurston County, and according to the EPA, is designated in an attainment area for all NAAQS. A portion of Thurston County, specifically the Olympia, Tumwater, and Lacey area is designated an attainment/maintenance for PM10. Air Quality will be addressed as part of any future NEPA review.
Coastal Resources	No specific thresholds have been established; however, if a local Coastal Development Permit cannot be issued due to a lack of consistency with a local coastal program, the FAA typically will not make a Federal Coastal Consistency determination either.	N/A
Compatible Land Use	Compatible land use evaluations for airports must consider the land uses in the vicinity of an airport to ensure those uses do not adversely affect safe aircraft operations. In addition, if an airport action would result in impacts exceeding FAA thresholds of significance which have land use ramifications, such as disruption of communities, relocation of businesses or residences, and induced socioeconomic impacts, the effects of the land use impacts shall be discussed. Local land use policy inconsistencies may also indicate land use compatibility issues.	The land uses within the vicinity of OLM consist of commercial, industrial, and mixed use. Future development at the Airport is unlikely to present a significant noise impact to surrounding land use based on the current 65 DNL noise contour, providing that compatible land use in the future is maintained by the City of Tumwater.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Construction Impacts	Construction impacts alone are rarely significant pursuant to NEPA. See significance threshold(s) for the resource(s) that construction could affect.	FAA-required best management practices (see Advisory Circular (AC) 150/5370-10G, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control), as well as State and local permits, would be implemented during construction projects at the Airport.
Department of Transportation (DOT) Act: Section 4(f)	When the action's physical use would be more than minimal, or its constructive use substantially impairs the Section 4(f) property. In either case, mitigation is not enough to sustain the resource's designated use.	No direct impacts or substantial impairment (constructive use) of Section 4(f) resources were found as a part of the Master Plan process. This will be reviewed as a part of any NEPA review for future projects.
Farmland	When the combined score on Form AD1006 ranges between 200 and 260. Impact severity increases as the total score approaches 260. NOTE: Form AD-1006 is used by the U.S. Department of Agriculture, NRCS to assess impacts under the FPPA.	No concerns.
Fish, Wildlife, and Plants	The United States Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat.	The City of Tumwater, Port of Olympia and regulatory agencies (including FAA) are working jointly on the Brush Prairie HCP developed to balance growth and the preservation of primarily three covered species: Olympia pocket gopher, streaked horned lark and the Oregon spotted frog. The HCP is a detailed plan for achieving this goal and is required under Section 10 of the Endangered Species Act, under which permits can be issued to "take" an endangered species by causing harm to the species or its habitat. In this case, "take" is expected to result from new development, from maintenance of City and Port facilities, and from maintenance performed at the conservation reserve sites. The plan will include a detailed description of the activities to be performed, both for development and species protection, and their effects upon the species. Future projects will be reviewed against the HCP.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Floodplains	Executive Order 11988, Floodplain Management directs federal agencies to "avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative"	No concerns. A review of the on-line Flood Insurance Rate Maps prepared by FEMA, shows the Airport is not located within the 100-year floodplain. The Airport is within a Minimal Flood Hazard, Zone X. This is an area defined as being outside the SFHA, known as the 100-year floodplain. Zone X areas are higher than the elevation of the 0.2% annual chance flood. Any subsequent project-related environmental review process will evaluate the need for additional floodplain analysis.
Hazardous Materials, Pollution Prevention, and Solid Waste	Hazardous materials: • When an action involves a property on or eligible for the NPL. Uncontaminated properties within an NPL site's boundary do not always trigger this significance threshold. Pollution prevention: • See significance thresholds for water quality. Solid waste: • There are no solid waste thresholds of significance established.	There are no NPL sites located on the Airport. The Airport currently recycles cardboard, aluminum, glass, plastics, paper products, and batteries. Construction would produce construction debris. The effects of additional waste and its disposal to landfills will be considered during any environmental review process of future development.
Archaeological, and Cultural Resources	An action adversely affects a protected property and the responsible FAA official determines that information from the State and/or tribal Historic Preservation Officer addressing alternatives to avoid adverse effects and mitigation warrants further study.	Any areas at the Airport that would be disturbed by new development should be surveyed for cultural resources prior to ground disturbance and monitored during construction unless previously disturbed to the point that artifacts could no longer be intact. In the event that unknown resources are found during construction, all applicable State and Federal laws regarding such finds must be followed. Based on the historical inventory completed as part of this Master Plan, there are no historical resources that would be adversely affected by the Master Plan. However, A cultural resources survey and Section 106 and Government to Government consultation will need to be undertaken prior to any development.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Light Emissions and Visual Effect	Light emissions: • An action's light emissions create annoyance to interfere with normal activities Visual effects: • Consultation with Federal, State, or local agencies, tribes, or the public shows these effects contrast with existing environments and the agencies state the effect is objectionable.	Light emissions: · All new lighting associated with the proposed development would remain on the airfield and other developed portions of the Airport. Visual effects: · Proposed improvements on Airport property will be evaluated to determine any significant change to the overall appearance of the Airport from off- airport areas.
Natural Resources and Energy	An action's construction, operation, or maintenance would cause demands that would exceed available or future (project year) natural resource or energy supplies.	Planned development projects at the Airport are not anticipated to result in a demand for natural resources or energy consumption beyond what is available by service providers.
Noise	An action, compared to the No Action alternative for the same timeframe, would cause noise sensitive areas located at or above the 65 decibel (dB) DNL to experience a noise increase of at least DNL 1.5 dB. Additionally, an increase from DNL 63.5 dB to DNL 65 dB is a significant impact.	Noise maps were not prepared for this Master Plan Update. Noise analysis is not required for GA if there are less than 90,000 annual piston powered aircraft operations or 700 annual jet powered aircraft operations. However, any subsequent project-related environmental review process will evaluate the need for a noise analysis.
Secondary (Induced) Impacts	Induced impacts will not normally be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts.	In general, the recommended projects are being designed/planned to accommodate forecast aviation growth rather than proposing development that would induce growth at the Airport.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Socioeconomic issues—an action would cause: • Extensive relocation, but sufficient replacement housing is unavailable; • Extensive relocation of community businesses that would cause severe economic hardship for affected communities; • Disruption of local traffic patterns that substantially reduce the Levels of Service of roads serving the Airport and its surrounding communities; • A substantial loss in community tax base. Environmental justice issues: • If an action would cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, a significant impact may occur. Children's health & safety risk: • An action causing disproportionate health and safety risks to children may indicate a significant impact.	As a part of the Master Plan, no impacted populations were found to be located within the boundaries of the OLM study area. Socioeconomic impacts, environmental justice and children's environmental health and safety risks will be provided as part of any subsequent NEPA review.
Water Quality	An action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact.	Environmental review of future projects will assess possible impacts on any drinking wells, local receiving waters including those related to stormwater runoff.

Table 4-1: Review of Environmental Resource Categories at OLM

FAA Resource Category	FAA Threshold of Significance	Potential Concerns
Wetlands, jurisdictional or non-jurisdictional	An action would: • Adversely affect a wetland's function to protect the quality or quantity of a municipal water supply, including sole source aquifers and a potable water aquifer. • Substantially alter the hydrology needed to sustain the affected wetland's values and functions or those of a wetland to which it is connected. • Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare. • Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically- important timber, food, or fiber resources of the affected or surrounding wetlands. • Promote development that causes any of the above impacts. • Be inconsistent with applicable State wetland strategies.	The National Wetlands Inventory does not indicate the presence of wetlands on the Airport. Project specific wetlands determinations and/or delineations should be performed for future Airport improvement proposals. If any proposed projects impact these wetlands, the Airport will coordinate with the U.S. Army Corps of Engineers to determine the extent of the impacts and any mitigation measures, if required.
Wild and Scenic Rivers	No specific thresholds have been established.	N/A

Source: The Aviation Planning Group Analysis 2022

4.4. Preferred Alternative

The creation of the Preferred Alternative and terms for development was heavily influenced by all formal comments about the specific alternatives. Comments were solicited and received from all sources identified within this Master Plan, including the Olympia Regional Airport Management, the Technical Advisory Committee, the FAA and WSDOT Aviation Division, interested Stakeholders, and the community. The Preferred Alternative incorporates elements previously defined in the previous sections of this chapter.

The Preferred Alternative, as depicted in **Figure 4-9**, incorporates the mandatory elements previously described as:

- Continued Pavement Maintenance
- Sign and Marking Upgrades

The Preferred Alternative also includes the following selected alternative options:

Taxiway Preferred Alternative

The Preferred Alternative for the taxiway system is a combination of selected options from Taxiway Alternative 1 and Taxiway Alternative 2:

- **Realignment of Taxiway F**: Taxiway F runs roughly parallel to Runway 17/35 on the east side of the runway. The taxiway is nonstandard with multiple jogs and turns connecting Taxiway E to Runway 35. In this alternative the existing Taxiway F pavement that intersects Taxiway G and connects with Runway 8/26 will be relocated outside of the middle third of the runway. The portion from Taxiway G to Runway 8/26 will be relocated approximately 600 feet to the west. This will allow the relocated portion of Taxiway F to line up with the existing southern portion of Taxiway F at the Taxiway connector L intersection on through to the connection point at Taxiway G. The realignment is intended to meet the minimum runway-taxiway separation requirement of 400 feet. Moving Taxiway F allows for realignment of Connector Taxiways L and G into a single taxiway connector to intersect the runway at 90-degree intersection points outside of the middle third of the runway. Additionally, the intersection point for Taxiway F where it crosses Runway 8/26 would be moved outside of the middle third of the runway, which will obtain a 90 degree connector taxiway on the north side of Runway 8/26, remove the direct runway to apron access, and maintain the Taxiway clearance distances required for the VORTAC.

- **Realignment of Taxiway W**: Taxiway W's preferred alternative is to relocate Taxiway W from Taxiway L intersection to run parallel to Runway 17/35 at a separation of 400 feet up and to the critical area for the ASOS. At that point, Taxiway W will jog to the west around the ASOS and connect to Taxiway B.

- **Taxiway C & D Removal**: The entirety of Taxiway C, which runs from Taxiway G to the north end of the airfield, is to be removed along with Taxiway D which is located between Taxiway E and Taxiway C. Removal of these taxiways would eliminate the non-standard runway entrance to Runway 17. Removal of Taxiway C will also provide for a 90-degree intersection point outside of the middle third of Runway 8/26 with the modifications to Taxiway F.

- **Realignment of the angled taxiway connectors**: The Taxiway F and C intersections to Runway 8/26 will be removed and replaced with a single Taxiway F intersection point for Runway 8/26 outside of the middle third of the runway. Additionally, at the end of Runway 26 realignment of the angled intersection point for Taxiway E will provide for a 90-degree intersection from the taxiway to the runway.

Runway Preferred Alternative

The Preferred Alternative is for no change to Runway 17/35. Runway 8/26 is planned to be reduced in overall width and length, but not to the extent proposed in Runway Alternative 2 and Taxiway Alternative 2. Discussions with the TAC, ATC and Airport Management have resulted in a mixture of Runway Alternative 1 and Alternative 2. The runway will be shortened by 647 feet, meeting Taxiway W at its relocated position. This will provide access to the runway end from the west side of the airport while still reducing the overall amount of pavement to be maintained. The reduction will leave a runway length of 3,510 feet, and a width of 60’ feet.

An additional landing area is proposed in the preferred alternative. This landing area will be in the grass east of Runway 17/35 and south of Runway 8/26. The dimensions of the grass landing area are proposed to be 60’ wide by 2,000’ long.

Development Alternative

Development Alternative 2 has been selected as the preferred development alternative for the airport. This alternative provides more land allocation to Aviation-related Industrial Development in this southeastern portion of the airport, reducing the overall GA small development area slightly. Additionally, this alternative takes into account the taxiway and runway alternatives, allowing for more developable areas.

Preferred Development Alternative areas by category include:

- **Small General Aviation Development (96.5 Acres):** Development areas selected for Small GA Development continue the existing development at the airport on the northeast side of the airport toward the RPZ of Runway 26 (6.5 Acres). In addition to the continued development, areas identified for development include:
    - A large portion of land adjacent to Taxiway G and extending south along Taxiway F, with primary frontage to a taxiway (70 Acres).
    - An area for development between the RPZ of Runway 35 and the north end of the existing Taxiway W (20 Acres).

- **Corporate General Aviation Development (48 Acres):** The GA corporate development area is located on the southwest side of the airport adjacent to the south end of the future Taxiway W between the RPZs for Runway 8 and 17. The total area is expanded due to Taxiway W being shifted as part of this Preferred Alternative as a parallel taxiway to Runway 17/35. This provides

a large area of land (48 Acres) to be utilized for larger corporate aircraft, and also provides road access and easy access to and from Runway 17/35 via Taxiway W.

- **Commercial Development (3 Acres):** Commercial development on the airport will be shown on the northeast corner of the airport. This location was found in all alternatives to be ideal as it provides an area (3 Acres) of developable land that would have direct access from Tumwater Blvd SW (with close proximity to Capitol Blvd SW) and also allows for access to the airfield.

- **Aviation-related Industrial Development (200.5 Acres):** Aviation-related Industrial Development allocates land to include:
    - The development south of the proposed small GA development area, near Taxiway G and Taxiway F, on the southeast side of the airport. This area has two parcels identified with one (110.5 Acres) running along the east/west portion of Tilley Rd SE, east of the major turn, and the other (31 Acres) running along the north/south portion of Tilley Rd SE, after the major turn.
    - An area (34.2 Acres) between Armstrong Rd SW and Terminal St and continuing south to 88th Ave SW is identified as a preferred option for Aviation-related Industrial Development. Only areas not bordered by Terminal St SW would have airside access at this time.
    - Lastly, a small area of land (3.5 Acres) between the existing Taxiway W and Terminal Street SW and north of the 7600 Terminal Street hangar complex.. This would provide landside and airside access options.

- **Commercial Air Service Development (54.5 Acres):** Commercial Air Service Development would be located in a similar location to the traditional terminal but would be expanded with the relocation of Taxiway W to be more in line with Runway 17/35 as a parallel taxiway. This alternative maintains this area as a proposed future development area for commercial air service and expands the overall area for a total of 54.5 Acres.

- **Agriculture (25 Acres):** A portion of land (25 Acres) outside the RPZ for Runway 17 on the south side of the airport will be planned as agricultural land along 93rd Ave SE. This will allow for utilization of land between the RPZ and the airport property area on the south side of the airport.

- **Fuel Farm Expansion:** The fuel farm has been identified as a candidate for expansion within all the alternatives, to include the Preferred Alternative. This expansion plans for the ability to duplicate the existing fuel facility with regard to size. This will provide the airport with the ability to double the capacity for aviation fuel storage while keeping the fuel in the same location at the airport.

Overall, the Preferred Alternative has 550,000 square feet less pavement than the existing ALP with regard to taxiways and runway pavement. All aspects of the Preferred Alternative are depicted on **Figure 4-9**.

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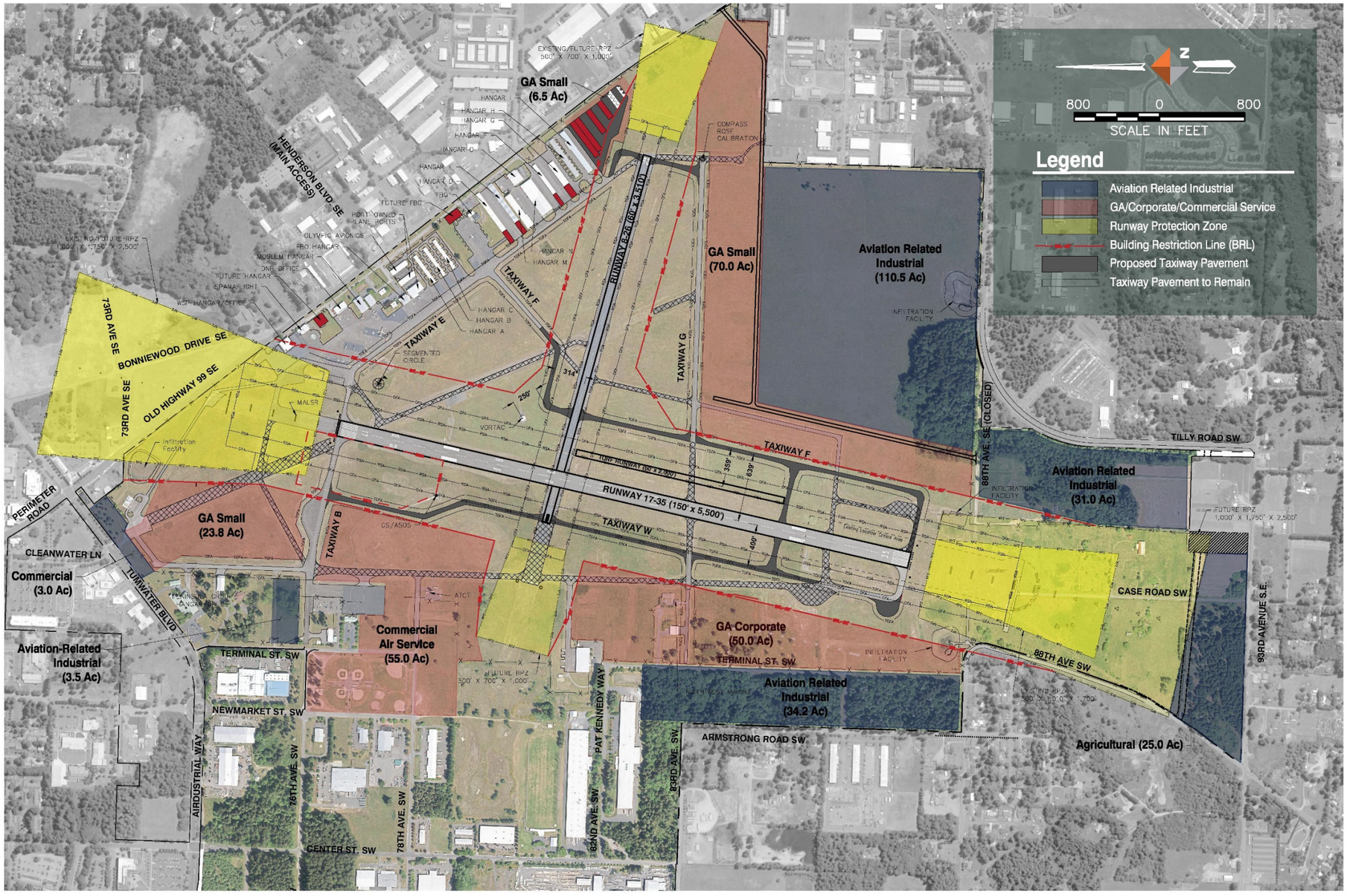
Figure 4-9: Preferred Alternative



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4.4.1. Preferred Alternative Conclusion

Identifying the Preferred Alternative for future development at OLM is an essential step in the development of the Master Plan Update, ensuring that the airport is carefully and thoughtfully developed throughout the planning period. The Preferred Alternative is directly translated into the drawings contained within the ALP. Consideration for all aspects of this planning study have been thoroughly analyzed to ensure that each part of the future development aligns with the needs of the Airport, reflecting the elemental needs of the Airport and its stakeholders. An airport's needs and funding abilities can change rapidly and unexpectedly throughout the planning period; therefore, the Preferred Alternative is designed to assist with these unexpected changes by outlining future developments and allowing for flexibility in the development of the Airport.