CHAPTER 2. ALTERNATIVES AND ALTERNATIVES DEVELOPMENT

Alternative Solutions

How a Range of Alternatives Was Developed

Alternatives were developed in a collaborative, step-by-step process involving the affected communities, regulatory agencies, jurisdictional stakeholders, and the public. Developing alternatives began with defining the project purpose and need, and identifying goals and objectives. The goals and objectives are listed in detail in Table 4 (p. ES-30). The environmental constraints and opportunities came from the 2004 Environmental Baseline Report, which provided a current inventory of environmental conditions in the corridor.

The Project Advisory Committee assisted the Project Management Team in developing screening criteria. The screening criteria were developed to screen the many alternatives and ideas received at the public workshops held during the alternatives development process. The criteria were not rated but were used as discussion points with the project teams and the Public Advisory Committee in winnowing down or combining alternatives toward a recommended range of alternatives. (Evaluation criteria were later developed to provide metrics for comparatively evaluating the range of alternatives in the SDEIS.) Below is a list of the screening criteria. The alternatives were measured against the screening criteria to determine which ones should be carried forward for further refinement.

North from project alignment at west end of Camp Withycombe

Screening Criteria for Goal 1: Transportation/Operations

1. Optimize performance of regional transportation system.
2. Provide additional vehicular capacity for regional travel at least equivalent to a four-lane, limited access highway between I-205 and Rock Creek Junction as indicated by the 1998 Sunrise Major Investment Study conclusion and the 2000 RTP amendment.
3. Provide connectivity and access for bicycles and pedestrians along any new highway facility as well as improve the connectivity of the I-205 multi-use path.
4. Provide flexibility for high capacity transit (HCT) within or in association with any new regional highway facility.[16]
5. The projected service levels of new intersections and interchange movements should be in balance with the projected operational levels of connecting roadway facilities.
6. Provide appropriate access for emergency vehicles in any new highway improvements.
7. Provide a facility that addresses the goals and policies of the Oregon Highway Plan, including mobility standards, access

[16] *Subsequent to developing this evaluation measure, the regional public transit agency, TriMet, concluded that the appropriate corridor for HCT would be Sunnyside Road to the north.*

management, and rail and highway compatibility.

8. Improve travel safety on state highways and associated interchanges/intersections within the corridor.

9. Provide a cost-effective solution.

Screening Criteria for Goal 2: Industrial and Commercial Vitality

1. Improve the efficiency and safety of truck access to the interstate and regional highway system for freight distribution centers in the corridor.

2. Maintain or improve local circulation needs of affected industrial uses.

3. Minimize construction impacts to local businesses.

4. Provide I-205 access for the Lawnfield business area at least as direct as shown in the adopted 1996 interchange design and endorsed by the Lawnfield Area Business Organization group in 1996.

5. Minimize displacements of businesses and retain as much viable industrial land as possible.

Screening Criteria for Goal 3: Community Livability

1. Provide connectivity to the regional highway system for the residential collector and minor arterial streets of 135th, 142nd, and 152nd Avenues.

2. Provide local roadway connectivity.

3. Minimize residential displacements.

4. Minimize, where practicable, project-related noise impacts to established residential uses.

5. Minimize, where practicable, project-related visual impacts.

6. Avoid disproportionate adverse impacts on low-income and minority communities.

7. Avoid dividing established residential areas.

Screening Criteria for Goal 4: Natural and Cultural Resources

1. Avoid impacting as much as practicable the existing terrestrial and riparian wildlife corridors.

2. Consider opportunities for enhancing terrestrial and aquatic corridors and habitat in the project area.

3. Protect streams/mitigate impacts to riparian areas.

4. Avoid/minimize/mitigate impacts to protected wetlands.

5. Protect habitat/mitigate impacts to T&E species.

6. Protect ground and surface water quality.

7. Avoid impacting National Register eligible historic sites in the project corridor.

8. Avoid/minimize/mitigate impacts to known archaeological sites.

9. Minimize impacts to air quality.

Alternatives Considered but Dismissed

The Project Management Team hosted a two-day public design workshop in December 2004 to work on evaluating or developing alternatives for the full length of the project area as well as options for specific locations or features. Twenty-one alternatives were identified and screened: 19 build alternatives, one no build alternative, and one Transit/ Transportation Demand Management (TDM)/Transportation System Management (TSM) alternative (see Table 5, p. 11). Five of the 21 alternatives had been originally developed but were eliminated during the 1993 DEIS. Those five were re-evaluated in terms of the screening criteria for this SDEIS.

Table 5. Summary of Alternatives Considered		
	Alternatives	**Recommend Forward to SDEIS**
1	No Build (includes planned street/highway improvements in Financially Constrained RTP, as well as TDM/TSM/Transit elements)	Yes
	Alternatives Eliminated in 1993 DEIS and Revisited in Current SDEIS	
2	Widen Existing OR 212/224	No
3	Alignment across Mount Talbert	No
4	More Westerly Crossing of Camp Withycombe	No
5	Enhanced Transit/TSM/TDM [Elements of each would be included in final alternative.]	No
	Alternatives Considered in Current SDEIS: New 6-lane Highway	
I-205 Interchange Area		
6	1996 Design (Modified)	No
7	New Design	Yes
Lawnfield Area		
8	1996 Design (Modified)	Yes
9	Maintain Lawnfield Road Area Access	No
10	SE 98th Avenue/Sunnybrook Connection	Yes
Midpoint Area		
11	1996 Split Interchange	Yes
12	Single Interchange	Yes
13	Half Interchange	No
14	No Mid-Point Interchange	Yes
SE 135th Avenue to Rock Creek Junction Area		
15	Follow Tree-line Alignment	Yes
16	Central Alignment	Yes
17	Move Existing OR 212 to the North	No
18	Southern Alignment	No
19	On Top of Bluff Alignment	No
East End Area		
20	Alignment through Knoll	Yes
21	Alignment North of Knoll	Yes

In addition, new alternatives were developed either by the technical team or through the public design workshop. The alternatives were reviewed in light of the screening criteria to determine which ones should be carried forward for further refinement. The following is a brief description of and rationale for alternatives and options (old and new) considered but not recommended for further design or study.

Alternatives Proposed in 1993 DEIS

Four conceptual design alignments proposed in the 1993 DEIS were re-evaluated for the current SDEIS and not advanced for further consideration. These alternatives were dismissed primarily because they did not meet the purpose and need of the proposed Sunrise Project (p. 1), or conflicted with the project's goals and objectives as reflected in the screening criteria.

The principal factors why each design concept did not meet the project screening criteria are noted below.

1. Widen or double-deck existing OR 212/224

Existing OR 212/224 currently functions primarily as an arterial, rather than a highway, due to the high number of driveway accesses and intersecting streets prevalent along this facility. Arterial roads have about half the capacity of an access-controlled highway. Accommodating forecasted 2030 traffic volumes and providing for all of the necessary local commercial and industrial traffic movements at multiple at-grade intersections on this highway would require either expansion of the existing 5-lane highway to approximately 14 lanes, or construction of a double-decked highway over OR 212/224. Significant revisions to the existing Clackamas Highway Interchange would be required to accommodate both alternatives on OR 212/224.

Either highway design would create significant business displacements, and access issues, along OR 212/224 and the adjacent Clackamas Industrial Area, as well as create adverse visual and noise impacts. Although the widening of OR 212/224 alternative would require a larger footprint throughout the corridor than the double-decked highway alternative, construction of a midpoint interchange as part of the double-decked alternative would require significant right-of-way acquisition in the mid-section of the corridor in order to provide adequate ramp connections from elevated highway double-deck to ground-level businesses. Both alternatives would impact approximately 350 properties (access and displacements) and 243 acres for right-of-way. Approximately 285 business properties would be impacted, of which about half would result in business displacements. Approximately 180 residential units would also be impacted.

The historic Frank A. Haberlach House (13002 SE OR 212/224) would be displaced under both of these alternatives, with minor impacts to the nearby historic Silverthread Kraut and Pickle Works Building. This alignment would still impact a portion of the Clackamas Elementary School recreation field (*de minimis*), but avoid impacting Camp Withycombe. The widening of OR 212/224 is estimated to cost approximately $760 to $820 million to construct (2013). The double-deck alternative is estimated to cost approximately $1.3 to $1.5 billion to construct (2013).

This alternative did not meet the project's purpose and need and conflicted with a number of its goals and objectives intended to support the viability of the Clackamas area for industrial uses and to avoid impacting historic properties.

2. Alignment across Mount Talbert

This alignment presents numerous topographic and neighborhood constraints. It would require excavating up to 130 feet along a historically unstable slope. The resulting roadway would have long, steep grades at each end, causing lower travel speeds, difficulties for truck usage, and higher maintenance costs due to more frequent sanding for icy conditions. This alignment was initially considered as one means of minimizing impacts to commercial/industrial properties north of the Clackamas Highway (OR 212/224). However, while this area was largely undeveloped in the early 1990s, by 2004 it had developed into the Sunnyside community with hundreds of new residences. It is estimated that up to 577 properties would be impacted by this alignment, including approximately 727 residential units and 238 businesses.

There would also likely be *de minimis* impacts to the recreation fields of two schools in the Sunnyside neighborhood: Clackamas High School, and Clackamas Elementary School. The crossing of Mount Talbert by the Sunrise Project would impact a portion of this 183 acres greenspace/ habitat area, the largest undeveloped butte in northern Clackamas County, and sever critical wildlife corridors connecting Mount Talbert, Camp Withycombe/ODOT forested slope parcel, and Rock Creek habitats. This alignment would still impact a portion of the KEX Towers site, but avoid impacting Camp Withycombe. It is estimated to cost approximately $1.0 to $1.1 billion to construct (2013). This alignment conflicts with goals and objectives dealing with

minimizing impacts to wildlife habitat and its connectivity, visual and noise impacts, neighborhood cohesion, and residential displacement.

3. More westerly crossing of Camp Withycombe

A crossing of Camp Withycombe beginning farther to the west than the proposed build alternatives (Alternatives 2 and 3) presents design difficulties in connecting to the Sunrise/Milwaukie/I-205 interchange. A more westerly crossing would follow a route along the west side of the UPRR tracks at a highly-skewed angle, and then traverse the northern portion of Camp Withycombe before matching up at the eastern border of the camp to the proposed alignments for the two build alternatives. Although not directly impacting any other structures within Camp Withycombe than the firing range facilities impacted in the proposed build alternatives, the Oregon Military Department has stated that this more westerly alignment would require additional right-of-way acquisition from the camp's already limited (77+ acres) base property needed for base redevelopment and further reduce their base perimeter security buffer.

Problems with the western route include the cost and complexity of the crossing over the railroad; the need for relatively high (35 to 40 feet) and costly retaining walls along the section that parallels the railroad; substandard design speeds for two major curves; and the complexity of the I-205 interchange resulting from the approach angle of the Sunrise and I-205 alignments. It is estimated to cost approximately $1.2 to $1.3 billion to construct (2013). This alternative would not meet the project's purpose and need due to substandard design speed, poor angle of approach to the I-205 interchange, and substandard curves.

4. Alignment south of Camp Withycombe

This alignment alternative would completely avoid any impacts to Camp Withycombe by traversing to the south of the camp and then east along Jennifer Road, parallel and south of OR 212/224, before resuming the proposed alignments (Alternatives 2 and 3) near SE 142nd Avenue. However, this alignment alternative does not adequately meet the project's purpose and need to address congestion and safety conditions in the OR 212/224 corridor between its interchange with I-205 and Rock Creek Junction and to serve growing demand for access to the state highway system. By connecting to the state highway system (I-205) south of the OR 212/224 corridor at the Gladstone Interchange, it provides limited benefit to relief of the OR 212/224 corridor and connections to Milwaukie Expressway and I-205 northbound.

This more southerly alignment along lower 82nd Drive and Jennifer Road would impact numerous businesses and residences located along these roadways traversing the southern portion of the Clackamas Industrial Area. A large grouping of three lower-income manufactured home parks (440 units) to the south of OR 212/224, between SE 135th and SE 142nd Avenues, and a 30-unit home park near SE 152nd Avenue would also be adversely impacted by this alignment alternative, with approximately 90 units displaced. It is estimated that up to 300 properties (access and displacements) would be impacted by this alignment, including approximately 210 residential units and 55 to 60 businesses. While not requiring as expansive an interchange on I-205 as under the two build alternatives, to accommodate connections to/from the proposed Sunrise Project/I-205/Milwaukie Expressway/82nd Avenue (OR 2123N), this longer alignment is estimated to cost $1.1 to $1.2 billion to construct (2013).

Alternatives from the Public Design Workshops

Six alternatives developed at the workshops were not recommended for study in the SDEIS based on the ratings generated by applying the screening criteria. The main reasons for their low ratings are described for each alternative below.

1. 1996 Design (Modified) for the I-205 Interchange Area

This 1996 design concept was reviewed and modified in 2004 to assess whether it could accommodate the projected higher 2030 traffic volumes. It did not accommodate traffic movements as well, or as safely, as the new design put forward under **Alternatives 2 and 3**.

2. Maintain Lawnfield Road area access

This alternative would maintain access to the Lawnfield Business Area via Lawnfield Road and an at-grade rail crossing at the Union Pacific Railroad main line. State statutes direct ODOT to eliminate at-grade railroad crossings wherever possible and particularly along designated High Speed Passenger Rail corridors, which includes the Union Pacific Railroad main line through the project area. If the grade crossing were separated at the Union Pacific Railroad main line crossing, this design option would add more vertical height to the adjacent interchange and add unreasonable costs and complexity to the design of the interchange. Further study indicated that local circulation improvements in the Lawnfield Business Area proposed under **Alternatives 2 and 3**, including construction of a grade-separated crossing of the Union Pacific Railroad main line at Tolbert Street or an extension of SE 98th Avenue to Sunnybrook Road, would provide acceptable access from the Lawnfield Business Area to the regional highway system with lower costs and complexity.

3. Half Interchange at the Midpoint area

Half interchanges are inconsistent with ODOT policies on access and highway standards because they tend to create motorist confusion and unsafe driving conditions. In addition, alternative would provide access to the regional highway system to/from the Clackamas Industrial Area in only one direction.

4. Move Existing OR 212/224 to the North from SE 135th Avenue to the Rock Creek Junction Area

This alternative would have potentially adverse impacts to the Rock Creek riparian area, particularly the lower segment of Rock Creek designated as Essential Salmonid Habitat. The crossing approach for the new facility of Rock Creek in this area would be at an angle, instead of perpendicular, requiring a larger structure and footings in this sensitive section of the creek. It also would displace a moderate number of businesses and create adverse impacts to remaining businesses currently oriented to the existing OR 212/224 by requiring reconnection of driveways to a new alignment.

5. Southern Alignment from SE 135th Avenue to the Rock Creek Junction Area

This alternative would have similarly adverse impacts to the Rock Creek riparian area as the previous option, with visual impacts to residential areas to the south and east. The interchange design and connections to/from existing OR 212 and 224 would be difficult and extremely costly.

6. Top of the Bluff Alignment from SE 135th Avenue to the Rock Creek Junction Area

This alternative would have similarly adverse impacts to the Rock Creek riparian area as the previous two options with a crossing higher upstream, and it would have potentially adverse impacts to the passage of wildlife in the Rock Creek riparian reaches and east-west corridor. In addition, it would divide an established residential area, create higher noise levels, and cause more adverse visual impacts to residential areas.

Alternatives Carried Forward

After ten of the alignments or design alternatives were eliminated, 11 were selected to be carried forward for evaluation in the SDEIS (see Table 5, p. 11). These 11 alternatives were refined into the three alternatives and the six design options considered in this SDEIS as potential ways of meeting the purpose and need for the proposed Sunrise Project.

Alternatives

Three alternatives are under consideration. **Alternative 1–No Build** is required by NEPA, ODOT, and FHWA guidelines. **Alternatives 2 and 3** would incorporate the construction of a new multi-lane, limited-access highway north of and parallel to the existing OR 212/224 between I-205 and Rock Creek Junction.

Alternative 1 – No Build

The conventional FHWA definition of a no build condition for a transportation project is the ongoing maintenance of existing facilities plus the addition of planned transportation project improvements that are already funded and programmed for implementation as described in the Financially Constrained Project List of the Metro RTP (see Figure 3, Alternative 1–No Build, p. ES-7). The planned transportation project improvements are assumed to have independent utility and are part of the regional transportation modeling assumptions that are used to evaluate the SDEIS No Build and the SDEIS build alternatives. The impacts of each project will need to be analyzed independently when a project undergoes detailed analysis, and as such this analysis is not undertaken as part of the SDEIS evaluation.

In the case of the proposed Sunrise Project, some deviation from this convention was necessary to develop a more accurate No Build alternative that would reflect anticipated future conditions that would result from recent UGB expansions and assumed additional UGB expansions. The proposed Sunrise Project is intended to serve two large areas of planned future urbanization—the Damascus/Boring UGB expansion area and the Metro-identified "provisional urban expansion area" south of the Clackamas River.

When the work on this SDEIS began, the existing 2025 RTP did not include all the roads necessary to serve those areas and the planning horizon for the proposed Sunrise Project is 2030, not 2025. For those reasons, the project team assumed that some additional roads would be built, even if they were not then planned in the RTP.

Otherwise, the regional transportation model would show an unrealistic amount of traffic on the proposed Sunrise Project in the expansion areas. To correct for this issue, the project team created a list of reasonably foreseeable improvements that would likely be in place by 2030.

Subsequent to the analysis on this SDEIS, Metro adopted an updated RTP in 2008 with a 2035 Financially Constrained Project List which includes all of the assumed major road facilities in the Damascus/Boring UGB expansion area. The cities of Happy Valley and Damascus are currently developing comprehensive land use plans and transportation system plans for the area included in this addition to the regional UGB.

The "provisional urban expansion area" south of the Clackamas River area is still outside of the UGB, and as such the Metro RTP 2035 Financially Constrained Project List does not contain the assumed projects in this area. Consultations with local jurisdictions in the corridor, as well as the professional engineering judgment of agency and consultant staff, were utilized to estimate needed transportation improvements, pending completion of local land use and transportation planning efforts. The projects include:

- Gronlund Road (5 lanes/35 mph);
- Bradley Road (3 lanes/35 mph);
- Forsythe Road (5 lanes/35 mph);
- Holcomb Boulevard (3 lanes/35 mph);
- Clackamas River Drive (3 lanes/35 mph);
- OR 213 (south of I-205) (4 lanes); and
- A new crossing of the Clackamas River connecting the I-205/Gladstone interchange with Clackamas River Drive (5 lane/35 mph).

In addition to the projects south of the Clackamas river area, a project that is not currently in the 2035 RTP is:

- Create a climbing lane on OR 212 between Rock Creek Junction and SE 172nd Avenue.

In addition to normal maintenance of the existing OR 212/224, several programmed larger transportation projects in the project vicinity are assumed to be included.

Following are those larger, programmed projects with the years of construction in parentheses as updated in the recent Metro RTP 2035 Financially Constrained Project List:

- Widen SE 82nd Drive, from existing three lanes to five lanes between Lawnfield Road and OR 212/224 (2026-2035).
- Improve existing two-lane OR 212 connection to Mather Road via SE 102nd Avenue, Clackamas Road, and Industrial Way for improved truck access, with better intersection/roadbed conditions for trucks turning ,and wider shoulders (2008-2017).
- Construct a new, four- and five-lane arterial, extending north and east from Rock Creek Junction Interchange to connect to SE 162nd and SE 172nd Avenues (partial construction in 2008 – completed 2020).
- Construct the Sunnybrook West Extension, a three-lane facility extending from 82nd Avenue (OR 213N) to Harmony Road near Fuller Road (2008-2017).
- Widen SE 172nd Avenue from existing two lanes to four and five lanes between Foster Road and OR 212 (Phase 1, OR 212 to Sunnyside Road – 20082009; Phase 2, Sunnyside Road to Foster Road – 2017).
- Widen OR 224 from existing two lanes to five lanes between Rock Creek Junction and Carver Bridge (2018).
- Replace existing two-lane Carver Bridge and widen to five lanes (Phase 1 – replace two lane bridge – 2010; Phase 2 – widen bridge to five lanes – 2025).

Alternative 1 would implement the planned bicycle and pedestrian improvements, as shown on Figure 4 (p. ES-8). Higher levels of TDM and TSM are assumed as part of Alternative 1 and the build alternatives.

Transit improvements included under **Alternative 1–No Build** are limited to those identified in Metro's 2035 RTP and include primarily modest increases in service hours. These assumed transit improvements include the following:

- I-205 LRT to Clackamas Regional Center in 2009;
- Frequent Bus: Line 31 - Milwaukie to Clackamas Regional Center via OR 224;
- Frequent Bus: Line 31 - Clackamas Regional Center to 152nd Avenue via OR 212/224; and
- Frequent Bus: Line 79 - Clackamas Town Center to Oregon City via Webster Road and 82nd Drive.

In order to incorporate the baseline information of the TSM/TDM, the Sunrise Project build alternatives assumed all of the transit improvements assumed by **Alternative 1** and adds two additional transit improvements:

- A new local transit service from Happy Valley to the Springwater Area via Butler Road; and
- New express bus service on the Sunrise Project between the Clackamas Transit Center and Damascus Town Center.

Alternative 2 – Limited-Access Highway with Midpoint Access

The proposed highway alignment generally would be north of and parallel to the existing OR 212/224. The project begins with changes to the local road network in the area of SE Johnson Road and ends by tapering into OR 212 just east of SE 172nd Avenue (see Figure 5, Alternatives 2 and 3, p. ES-9). From I-205 to Rock Creek Junction (where OR 212/224 splits into OR 212 to the east and OR 224 to the south), the highway would have six lanes plus auxiliary lanes. Auxiliary lanes would be between:

- Southbound I-205 on-ramp to Midpoint off-ramp;
- Midpoint off-ramp to northbound I-205 off-ramp;

- Midpoint on-ramp to Rock Creek off-ramp; and
- Rock Creek on-ramp to Midpoint off-ramp.

East of Rock Creek Junction, the highway would narrow to six lanes with no auxiliary lanes until SE 172nd Avenue, where it would narrow to five lanes.

This alternative is distinguished from **Alternative 3** by a midpoint, (conventional) diamond interchange in the vicinity of SE 122nd Avenue, which would have on- and off-ramps connecting the highway to the existing OR 212/224 via SE 122nd Avenue. The purpose of the midpoint interchange is to meet the objective of ensuring access to OR 212/224 for businesses along that corridor. Travelers would use this connection to access OR 212/224 from either direction on the proposed Sunrise Project, and, conversely, residents and businesses in the area would use SE 122nd Avenue to go eastbound or westbound on the proposed Sunrise Project.

At the Rock Creek Junction area, the proposed Sunrise Project would incorporate a folded diamond interchange aligned north of a prominent knoll. The connection between OR 224 and OR 212 would be reconfigured 1,300 feet south with a signalized T-intersection. The new access road would turn north and connect to the existing OR 212/224 at another signalized T-intersection. Figures 10 through 17 (p. 23 through p. 30) illustrate the connections that would be made via ramps and auxiliary lanes for all of the alternatives and design options.

This alternative with a midpoint interchange can be modified with different roadway alignments and interchange designs, as discussed under the heading Design Options.

Alternative 3 – Limited-Access Highway with No Midpoint Access

In contrast to **Alternative 2**, this alternative would not have a midpoint interchange, resulting in no access to or from the proposed Sunrise Project between I-205 and Rock Creek Junction (see inset, Figure 5, p. ES-9). This alternative can be modified with different roadway alignments and interchange designs at Rock Creek Junction, as discussed in the Design Options section.

Transit, Bikeway, and Pedestrian Improvements

The two build alternatives would allow for new local transit service from Happy Valley to the Gresham area, more frequent service between Damascus and Gresham, more frequent service between Airport Way and Damascus, more frequent service on Sunnyside Road between Clackamas Regional Center and Damascus Town Center, and new express bus service along the proposed Sunrise Project between the Clackamas Transit Center and Damascus Town Center. Current regional plans identify Sunnyside Road as the primary east-west, high capacity transit route within the Sunrise Project.

Alternatives 2 and 3 would improve the bicycle and pedestrian system. They would add multi-use path improvements with connections to the existing I-205 trail system, filling gaps in that system between SE 82nd Drive and SE Roots Road as well as between I-205 and the existing on-street facilities at SE 122nd Avenue. Figures 5 through 9 (p. ES-9 through p. ES-13) show the proposed multi-use path.

Design Options

Six design options are proposed as variations on certain aspects of the build alternatives. Each design option was developed to address different constraints or to avoid or minimize specific natural or built environmental impacts. Most of the design options can be substituted for a comparable segment alignment (such as **Design Option C-2 or C-3** instead of **Alternative 2** in that segment) and most are available under each build alternative. A more detailed description of each design option in relation to each build alternative follows.

The options are depicted on figures that correspond to three geographic subareas

referred to in the Project Location and Study Area (text box, p. ES-1). Many design options were considered, but only a few were carried forward for study. The design options retain their original numbering system.

The 15 technical reports used geographical areas designated Zones A, B, C, and D to reference the location of the design options, although the impact analysis within each technical report was not necessarily meant to be based on those zone boundaries. In the SDEIS, the narrative is intended to be less focused on the zone boundaries and more focused on features in the proposed Sunrise Project area. For reviewers of both the technical reports and the SDEIS, the I-205 Interchange area corresponds to Zone A, the Midpoint area corresponds to Zones B and C, and the Rock Creek Junction area corresponds to Zone D.

Design Option A-2: Modified 1996 design

Design Option A-2 is in the I-205 Interchange area and could be implemented with either build alternative. This design option would differ from **Alternatives 2 and 3** by not extending Lawnfield to the north (see Figure 6, Comparison of Options for I-205 Interchange Area, p. ES-10) and replacing it with a smaller local connection to/from SE 82nd Drive and the Lawnfield industrial area. The connection would be from SE Industrial Way over the Union Pacific Railroad tracks via SE Tolbert Street. This option was developed to address business community concerns about connectivity in the area. This design option is available under both build alternatives. It may be substituted for the North Lawnfield Extension.

Design Option B-2: 1996 Split interchange (modified)

Design Option B-2 is in the SE 122nd Avenue area and is an option for **Alternative 2** only, because Alternative 3 does not have an interchange in the Midpoint area. **Design Option B-2** would have a modified split-diamond interchange involving both SE 122nd Avenue and SE 130th Avenue (see Figure 7, Comparison of Options for Midpoint Area, p. ES-11) instead of single diamond interchange only at SE 122nd Avenue. Travelers on the proposed Sunrise Project would have two choices of exits, a feature that is intended to reduce potential congestion on OR 212/224 at the off- and on-ramps at the midpoint under **Alternative 2**. **Design Option B-2** could be considered with **Design Option A-2** and/or **Design Option C-2**. However, it would not be compatible with the design of the curves in **Design Option C-3**, so those two options could not be combined.

Design Option C-2: Central alignment

Design Option C-2 is located in the SE 135th Avenue area and may be substituted for the comparable segment in **Alternatives 2 and 3**, and for **Design Option C-3**. **Design Option C-2** would alter the road alignment in the vicinity of Rock Creek, moving it closer to the existing OR 212/224 alignment (see Figure 8, Comparison of Options for Midpoint Area [East End], p. ES-12). Its purpose is to reduce impacts to the wildlife corridor by moving the alignment farther from the base of the bluff.

Design Option C-3: Modified follow tree-line alignment

Design Option C-3 would more closely follow the existing tree line to the north to reduce impacts to a residential development (see Figure 8, p. ES-12). It may be substituted for the comparable segment in **Alternatives 2 and 3**, and for **Design Option C-2**. However, **Design Option B-2** and **Design Option C-3** are incompatible due to the curves in **Design Option C-3**.

Design Option D-2: Alignment through knoll (folded diamond interchange)

Design Option D-2 is in the Rock Creek Junction area and could be used with either build alternative or **Design Option D-3**. This option would move the folded diamond interchange south from its location mostly north of a natural knoll under **Alternatives 2 and 3**. **Design Option D-2** would place the alignment through the knoll but would have lower right-of-way impacts on a narrow wildlife corridor and the site of the

proposed medical care complex (see Figure 9, Comparison of Options for Rock Creek Junction Area, p. ES-13).

Design Option D-3: Single-point diamond interchange

Design Option D-3 in the Rock Creek segment is an option to **Alternatives 2 and 3** and to **Design Option D-2**. This design option replaces the folded diamond interchange with a single-point diamond design interchange that would require less right-of-way (see Figure 9, p. ES-13) and reduce impacts on the site of the proposed medical care complex.

Preliminary Project Costs

Preliminary construction and right-of-way cost estimates for the build alternatives and design options are presented in Table 1 (p. ES-6). Actual construction costs would depend upon labor and materials costs, competitive market conditions, final project requirements, and other variables at the time of the construction contract. Construction cost estimates are based on unit costs as derived from recent large construction projects in the region. Both cost estimates for current year (2008) and expected year of construction (2013) are provided. Estimated 2013 costs are derived using inflation factors of 4.3 percent (2009 – 2011) and 4.0 percent (2012 – 2013).

The total cost of the proposed project depends on the alternative and design option selected. Table 1 (p. ES-6) shows that in 2008 dollars, Alternative 2 is estimated to cost $1,209 million, while Alternative 3 is estimated at $1,147 million. Alternative 2 with Design Option B-2 has the highest estimated cost—$1,308 million—while Alternative 3 with Design Option D-2 has the lowest estimated cost—$1,064 million.

FHWA has guidance for major projects that imposes requirements on recipients of federal financial assistance for projects with an estimated cost of $500 million or more. The proposed Sunrise Project will need to comply with those requirements by developing a Project Management Plan and Financial Plan, mechanisms for managing such large projects.

How New Connections Would Be Made

This section describes and depicts how travelers would get from point to point on the new highway. Figures 10 through 17 (pp. 23 through 30) depict the changes to connections that would occur.

Changes to connections between I-205, Milwaukie Expressway, and SE 82nd Avenue/Drive

The proposed alignment would cross SE 82nd Avenue and I-205 with a long overpass, then turn southeast (Figures 10 and 11, pp. 23 and 24). Travelers could make the following connections:

- From eastbound on the Milwaukie Expressway to I-205 northbound via a looped on-ramp;
- From eastbound on the Milwaukie Expressway to I-205 southbound by turning right onto the on-ramp at the western end of the overpass;
- From westbound on the proposed Sunrise Project to I-205 northbound via an auxiliary lane and off-ramp;
- From westbound on the proposed Sunrise Project to I-205 southbound by a loop to I-205 on-ramp;
- From I-205 traveling north or south, access to the proposed Sunrise Project at signals at end of off-ramps or, in the case of southbound I-205 to eastbound Sunrise, via a direct fly-over ramp;
- From northbound on I-205 to SE 82nd Avenue/Drive via a dedicated off-ramp; and
- From southbound on I-205 to westbound Milwaukie Expressway (OR 224) by turning right only at a signal at the west end of the proposed Sunrise Project overpass.

On I-205, the on- and off-ramps would be "braided," or channeled, between interchanges at SE Sunnyside Road, the proposed Sunrise Project, and OR 212/224. Braided ramps mean traffic will be separated according to its destination; the braided ramps are what give the I-205/Sunrise Interchange its spaghetti-like look. For example, traffic on I-205 southbound will have a ramp dedicated to the eastbound direction on the proposed Sunrise Project. By separating traffic, the braided ramps avoid the "weaving" that currently happens when traffic from one highway has to cross lanes to access another highway or exit. Braided ramps address the safety needs of the project by reducing potential collision points and they also improve traffic flow. By preventing certain connections, they help to eliminate dangerous movements that tend to happen today on I-205. For example, the braided ramps will eliminate the movements between Sunnyside Road and SE 82nd Avenue and the movements between OR 212/224 and SE 82nd Avenue. The movements would be possible on local streets but not on I-205.

The Lawnfield area network would change by the addition of a street connection from SE Lawnfield Road to SE Mather Road through an extended SE 98th Avenue. SE Lawnfield Road would be extended west and south under the proposed Sunrise Project to connect with SE Clackamas Road.

SE 82nd Avenue (west of I-205) would be directly connected to SE 82nd Drive (east of I-205) over I-205. Travelers on SE 82nd Avenue/Drive wanting to go south on I-205 would have a signalized on-ramp just south of the Milwaukie Expressway.

Travelers on I-205 northbound would connect directly to SE 82nd Avenue/Drive through a signalized off-ramp. Travelers from SE 82nd Avenue at the north end of the project area wanting to go either north or south on I-205 could use SE Sunnyside Road.

The new interchange configuration does not affect the connection between the Sunnyside/Sunnybrook Interchange and the OR 212/224 Interchange. The braided ramps still allow drivers to use I-205 between the two interchanges.

Connections at the Midpoint Area

Travelers would use the Midpoint connection to access OR 212/224 from either direction on the proposed Sunrise Project (Figures 12 through 15, pp. 25 through 28). Conversely, residents and business traffic traveling from OR 212/224 would use SE 122nd Avenue to go eastbound or westbound on the proposed Sunrise Project.

Under **Design Option B-2**, travelers on the proposed Sunrise Project or on OR 212/224 could exit either at SE 122nd Avenue or at SE 130th Avenue.

Connections at Rock Creek Junction

Under **Alternatives 2 and 3** and **Design Option D-2**, the proposed Sunrise Project would incorporate a folded diamond interchange aligned north of a prominent knoll. Figures 16 and 17 (pp. 29 and 30) depict schematic drawings of the connections in the Rock Creek Junction area. Travelers eastbound on the proposed Sunrise Project wanting to connect to OR 224 eastbound would use an exit ramp and turn right at the signalized intersection. Travelers westbound on the proposed Sunrise Project wanting to connect to OR 212 eastbound would exit via an off-ramp and turn left to a connecting road to OR 212/224. The same connecting road to OR 212/224 would be used by travelers wanting to go east or west on the highway. Westbound travel would connect to a loop ramp at the same location as the westbound off-ramp. Eastbound travel would be via an on-ramp from the connecting road just south of the highway.

Under **Design Option D-3**, the interchange ramps would lead to a signal underneath the highway and travelers would use the connecting road under the highway the same as described above for **Design Option D-2**.

The connection between OR 224 and OR 212 would be reconfigured 1,300 feet farther south with a signalized T-intersection. The new access road would turn north and connect to the

existing OR 212/224 at another signalized T-intersection.

How the Preferred Alternative Will Be Developed

Ultimately, the Preferred Alternative will be the one that best meets the project purpose and need and minimizes unavoidable negative environmental and community impacts.

The Project Management Team and technical team will evaluate the results of the SDEIS analysis, looking for the alternative and design options that best meet the purpose, need, goals, and objectives for the project. The Project Management Team has developed specific evaluation criteria to measure how well each alternative and design option would meet the stated goals and objectives and, therefore, the purpose of and need for the proposed Sunrise Project.

Aerial view of Rock Creek Junction

The goals, together with the criteria, are presented in the section titled "The Characteristics of a Good Solution." Table 4 (p. ES-30) lists the goals, criteria, and sections of the SDEIS that discuss the impact evaluation corresponding to the criteria. Reviewers can use this table to guide their own comments on what the Preferred Alternative, including recommended mitigation, should be.

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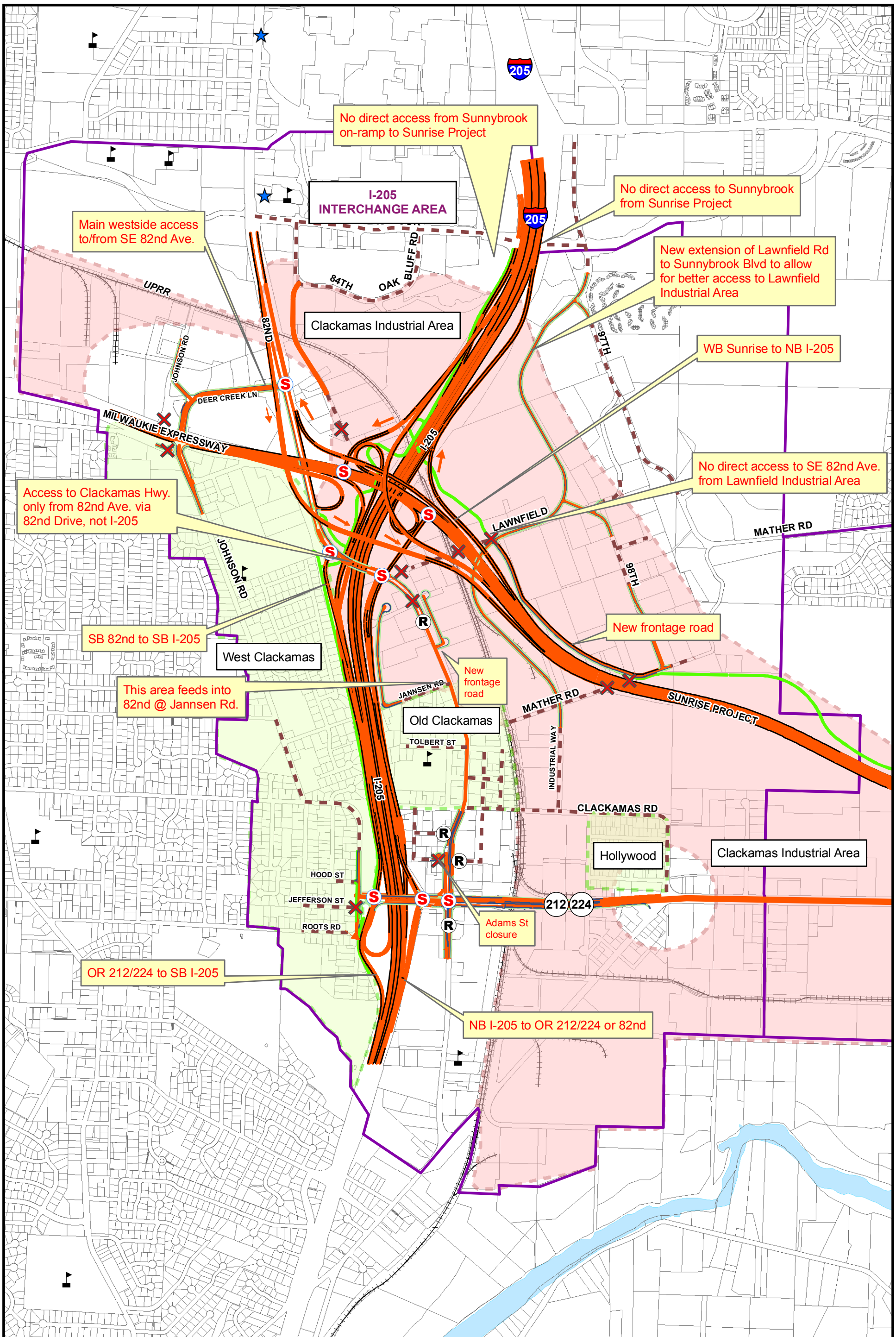
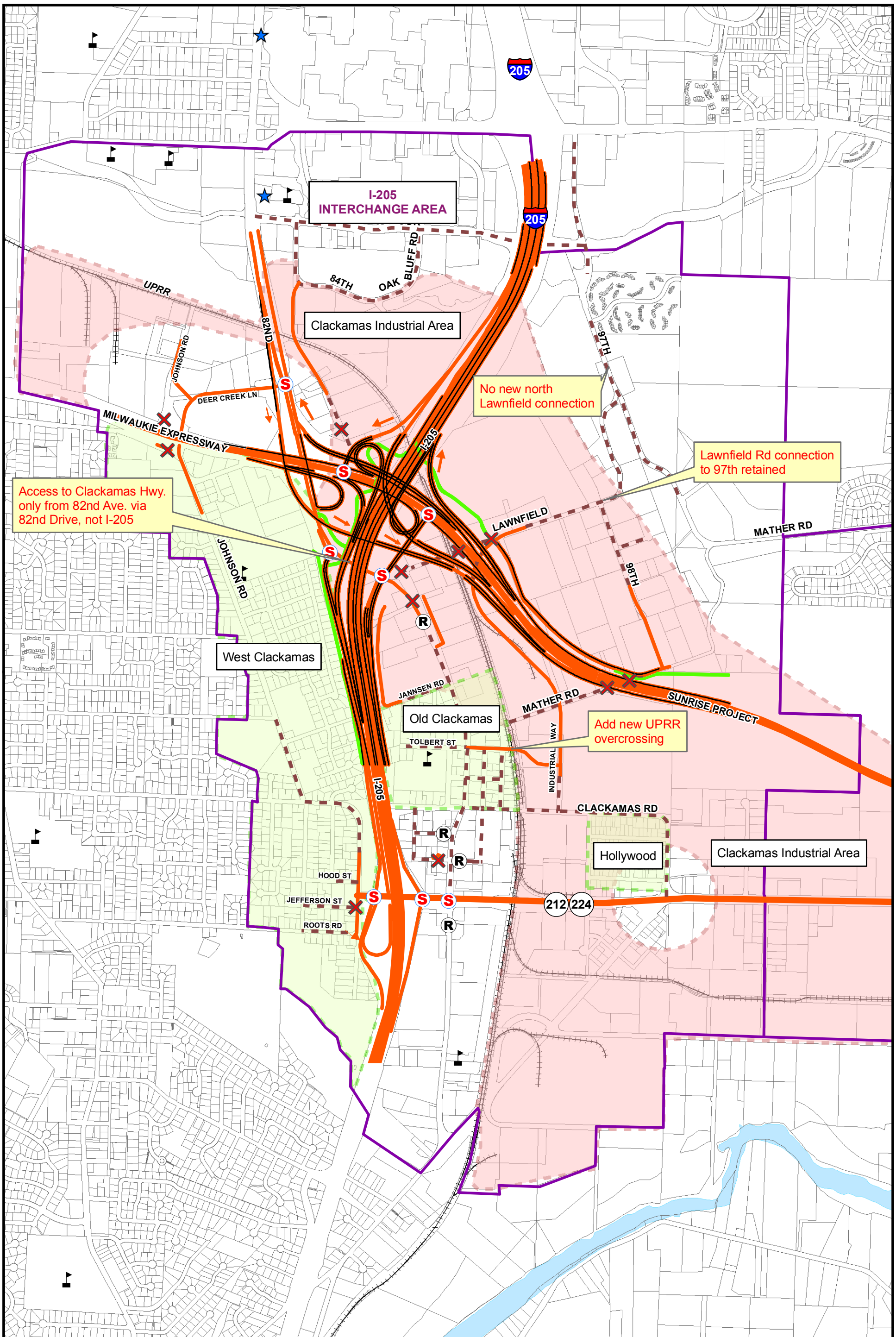


Figure 10

Alternatives 2 and 3 Travel Patterns, I-205 Interchange Area

Sunrise Project, I-205 to Rock Creek Junction



800 400 0 800 Feet

Sources:
ODOT and Metro, Portland OR

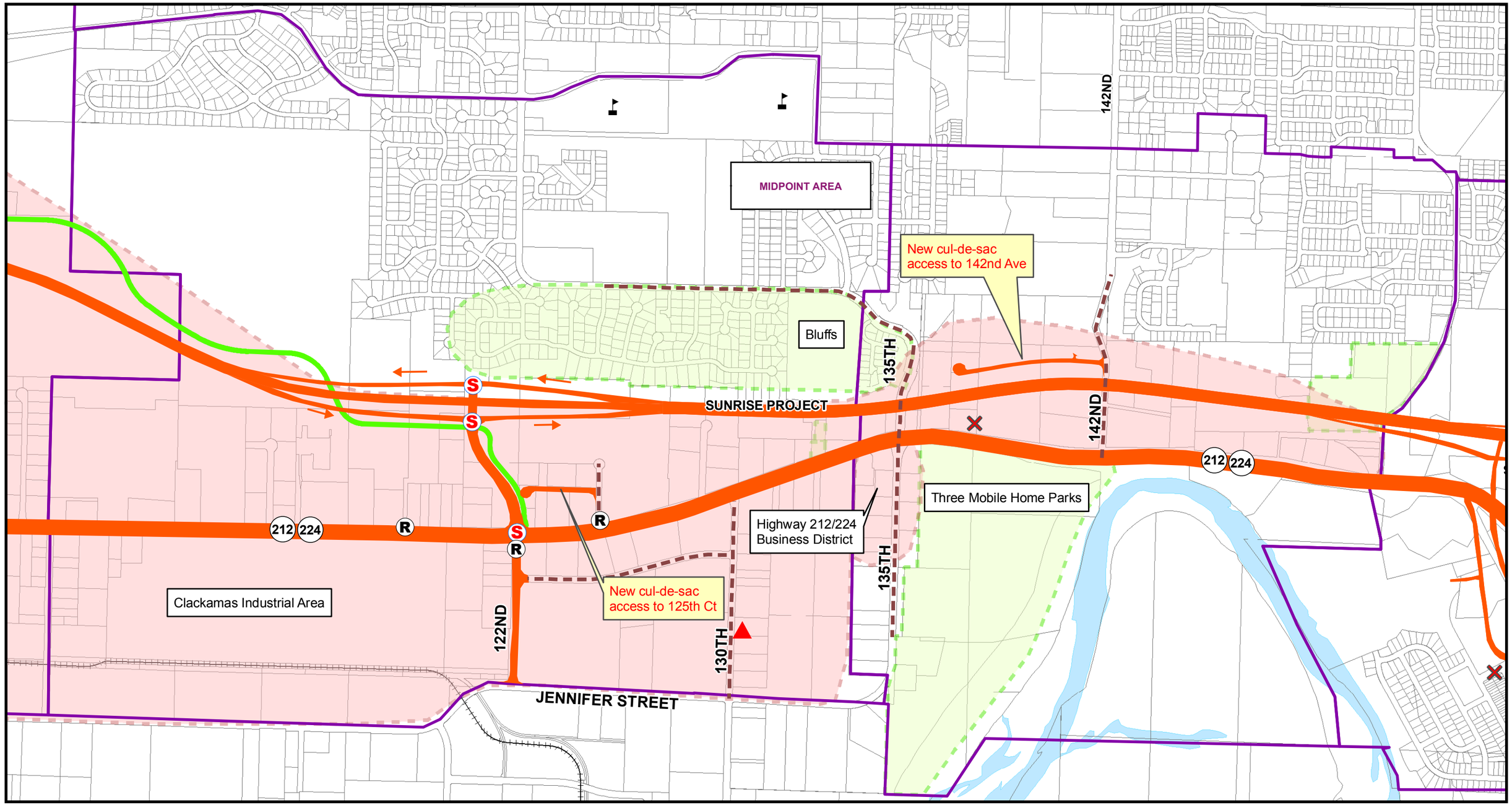
Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Multi-use Path
- Proposed Project
- Business Districts
- Neighborhoods
- Police Station
- Railroad
- Right-in, Right-out
- Schools
- Signal
- I-205 Interchange Area Boundary

Figure 11

Design Option A-2 Travel Patterns

Sunrise Project, I-205 to Rock Creek Junction



1,000 0 1,000 Feet

Sources:
ODOT and Metro, Portland OR

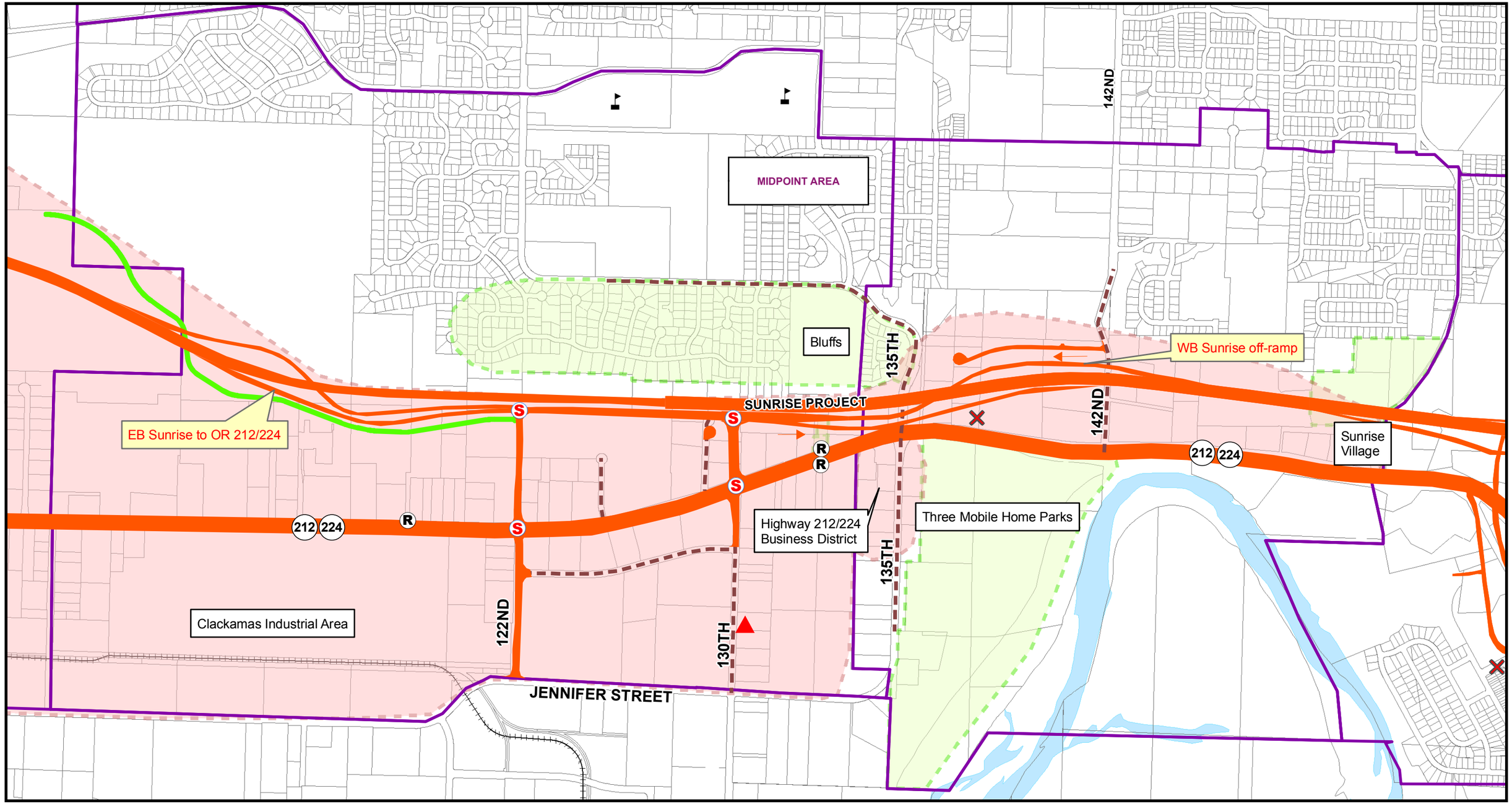
Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Fire Stations
- Business Districts
- Multi-use Path
- Neighborhoods
- Right-in, Right-out
- Proposed Project
- Schools
- Signal
- Midpoint Area Boundary

Figure 12

Alternative 2 Travel Patterns, Midpoint Area

Sunrise Project, I-205 to Rock Creek Junction



1,000 0 1,000 Feet

Sources:
ODOT and Metro, Portland OR

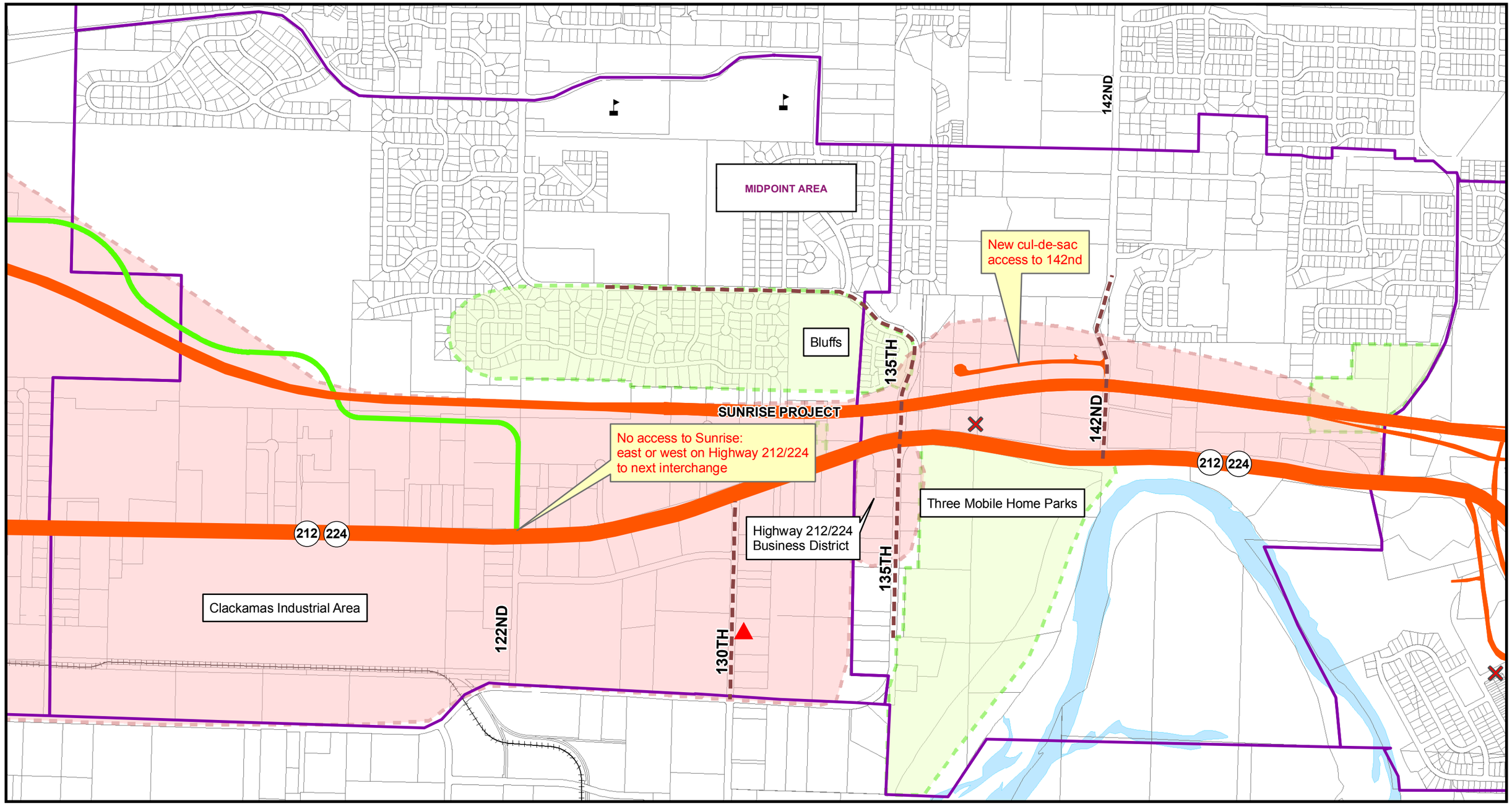
Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Fire Stations
- Business Districts
- Multi-use Path
- Neighborhoods
- Right-in, Right-out
- Proposed Project
- Schools
- Signal
- Midpoint Area Boundary

Figure 13

Design Option B-2 Travel Patterns

Sunrise Project, I-205 to Rock Creek Junction



1,000 0 1,000 Feet

Sources:
ODOT and Metro, Portland OR

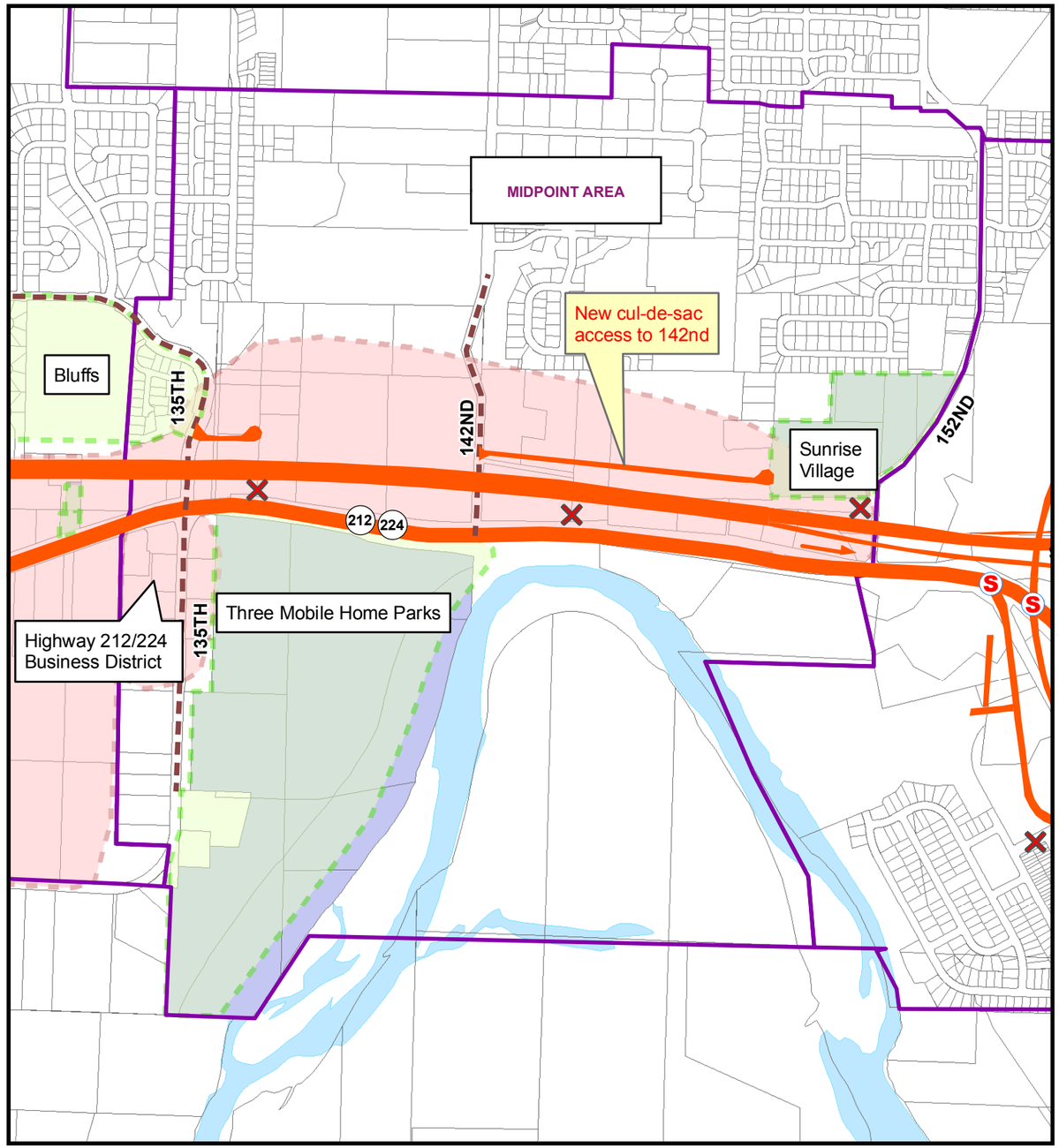
Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Fire Stations
- Business Districts
- Multi-use Path
- Neighborhoods
- Right-in, Right-out
- Proposed Project
- Schools
- Signal
- Midpoint Area Boundary

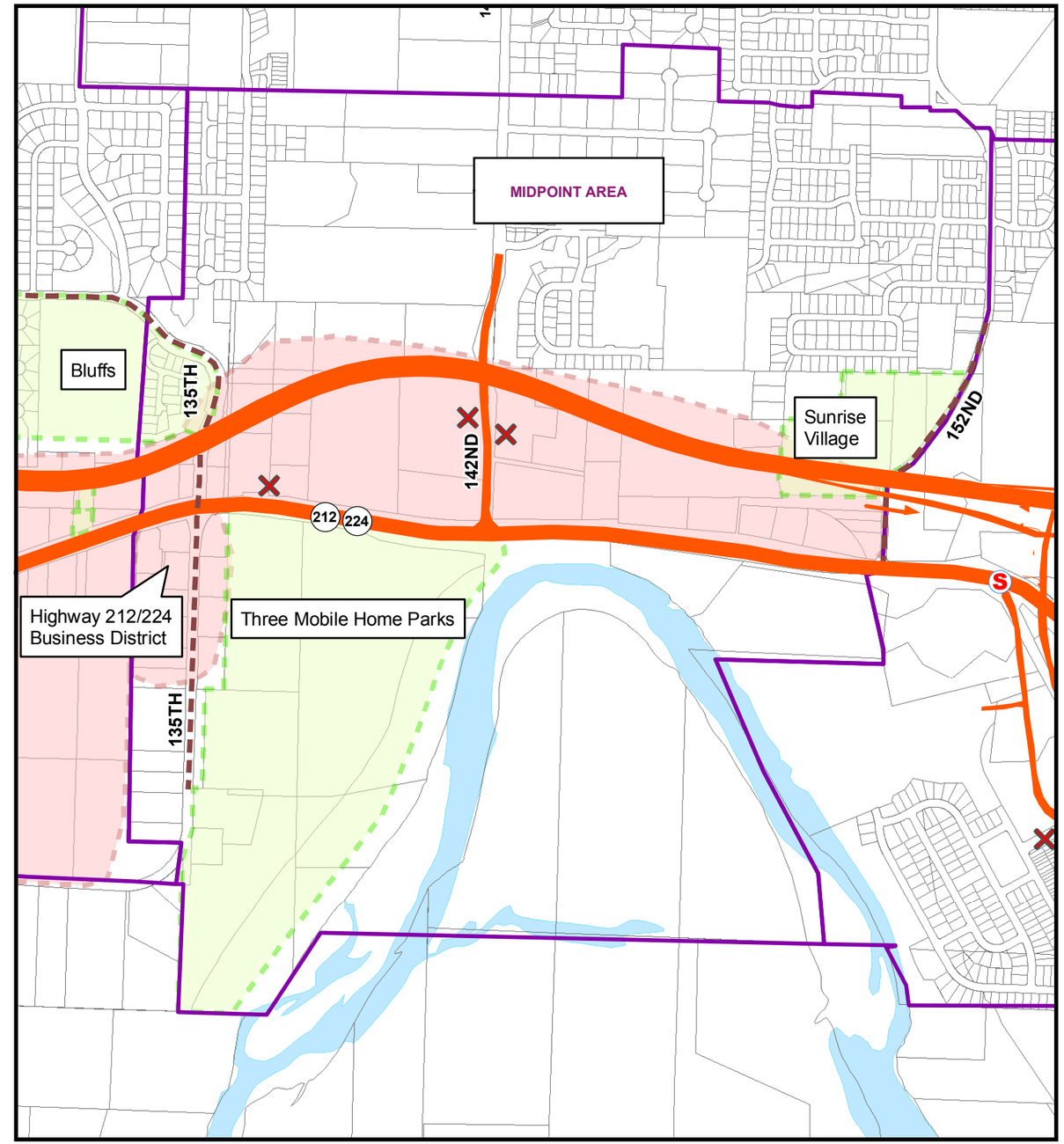
Figure 14

Alternative 3 Travel Patterns, Midpoint Area

Sunrise Project, I-205 to Rock Creek Junction



Option C-2: Central Alignment



Option C-3: Modified Follow Tree-line Alignment

1,000 0 1,000 Feet

Sources:
ODOT and Metro, Portland OR

Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Fire Station
- Business Districts
- Neighborhoods
- Proposed Project
- Signal
- Midpoint Area Boundary

Figure 15

Design Options C-2 and C-3 Travel Patterns

Sunrise Project, I-205 to Rock Creek Junction

ROCK CREEK JUNCTION AREA

Rock Creek Industrial Area

Medical Center

New road by others

WB Sunrise from south of OR 212 via OR 224

Sunrise Village

162ND

172ND

New cul-de-sac

End Armstrong Circle

Clackamas Industrial Area

SUNRISE PROJECT

212

Sunnyside Community Church

ANDEREGG

End OR 212

BELAIR

GOOSEHOLLOW

Orchard Lake

Anderegg Park

Bel Air Estates

224

ORCHARD VIEW

ECKERT

Orchard Lake residents would have up to 3,200 feet of out-of-direction travel

Bel Air Subdivision residents may have their only access to the subdivision changed to a right-in / right-out depending upon the final design of the transition from the proposed Sunrise Project to existing OR 212.

N

1,000 0 1,000 Feet

Sources:
ODOT and Metro, Portland OR

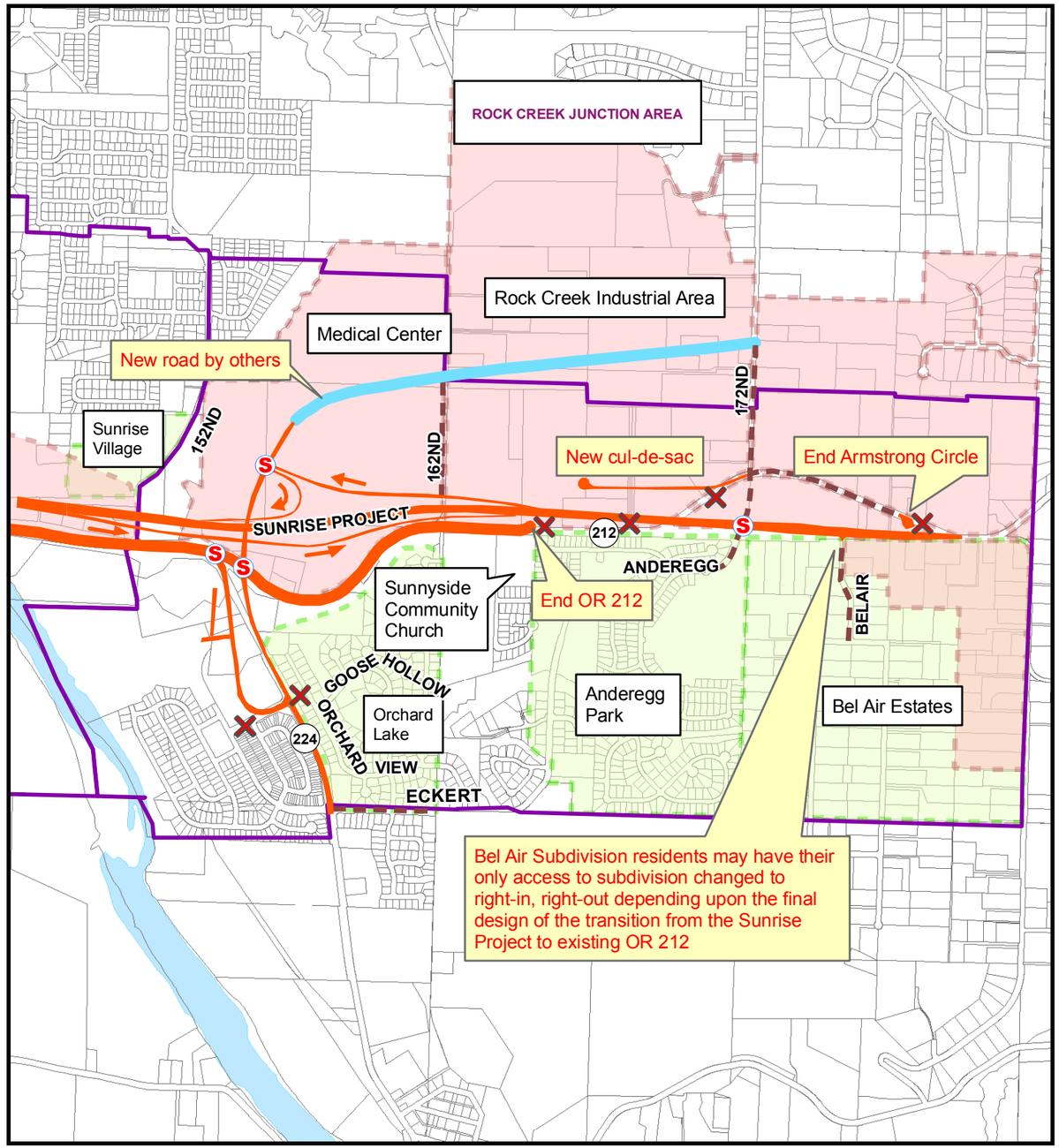
Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Business Districts
- Neighborhoods
- Proposed Project
- Signal
- Rock Creek Junction Area Boundary

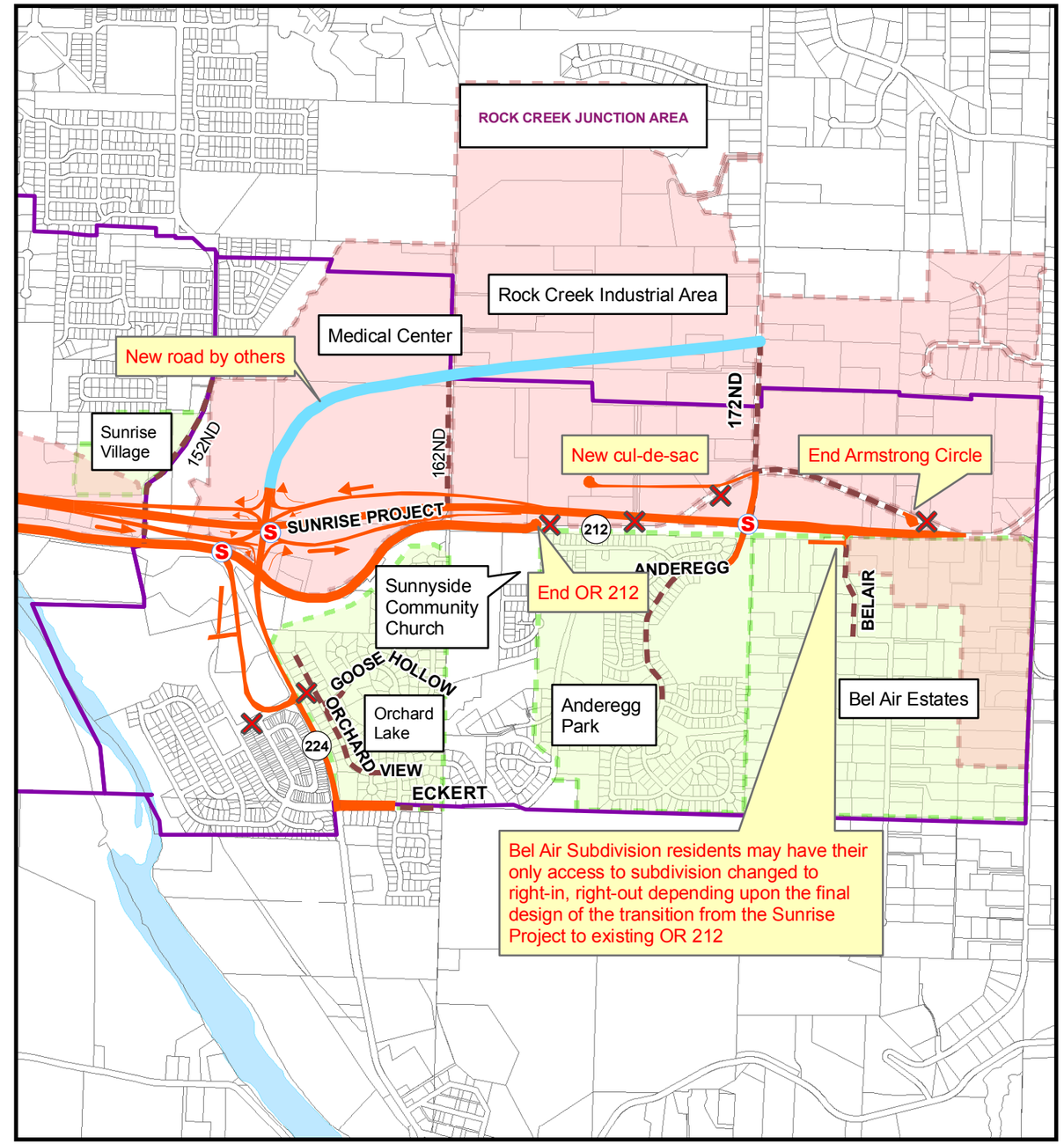
Figure 16

Alternatives 2 and 3 Travel Patterns, Rock Creek Junction Area

Sunrise Project, I-205 to Rock Creek Junction



Option D-2: Alignment Through Knoll (Folded Diamond Interchange)



Option D-3: Single-Point Diamond Interchange

N

1,500 0 1,500 Feet

Sources:
ODOT and Metro, Portland OR

Legend

- Close Existing Access
- Directional Traffic Flow
- Existing Street
- Business Districts
- Neighborhoods
- Proposed Project
- Signal
- Rock Creek Junction Area Boundary

Figure 17

Design Options D-2 and D-3 Travel Patterns

Sunrise Project, I-205 to Rock Creek Junction