

I-5 Exits 40 and 43 (Gold Hill)

Interchange Area Management Plans

Revised Final Technical Memorandum #6

Alternative Analysis

Prepared for

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6. ALTERNATIVE ANALYSIS

This memorandum presents the preliminary improvement concepts developed to address deficiencies in the I-5 Exits 40 and 43 interchange management study areas (IMSAs). The identified improvement concepts are intended to help achieve the goals and objectives set forth for this project while addressing identified deficiencies for all modes.

Once concepts are selected for further analysis, they will be combined to create a comprehensive improvement strategy. As the overall strategy is developed, concepts will be refined so that the improvements work well together.

6.1. Concept Development

Each improvement concept was developed to address specific deficiencies, safety issues, or access concerns. These concepts were developed based upon available standards, warrants, perceived need, safety data, traffic operations, and community livability. Concepts were not limited to roadway issues, and include many bicycle and pedestrian-related projects.

The concepts were developed keeping in mind the objectives developed in Technical Memorandum #2: Goals, Objectives, and Evaluation Criteria for these Interchange Area Management Plans (IAMP):

- Protect the function of the interchanges as specified in the Oregon Highway Plan (OHP) and Jackson County Transportation System Plan (TSP).
- Provide safe and efficient operations on I-5, Access Road, and Main Street as specified in the OHP and Jackson County TSP.
- Facilitate freight travel to the interchange from nearby resource lands.
- Maintain existing emergency routes and identify improvements to the transportation system that may enhance emergency vehicle access.
- Identify safe and convenient bicycle and pedestrian improvements to connect and enhance non-motorized travel at and around the interchanges, including access to the Rogue River Greenway.
- Incorporate bicycle and pedestrian elements, such as sidewalks and bike lanes or shoulders, in roadway upgrades.
- Incorporate current and planned land uses into the design and management systems for Exits 40 and 43, including recommended strategies for land use control.
- Consider the 2009 Regional Plan for the Greater Bear Creek Valley (specifically, inclusion and build-out of the adjacent Tolo industrial area) when evaluating design modifications and management systems for Exits 40 and 43, including recommended strategies for land use control.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and meet OHP requirements and the access spacing standards in Oregon Administrative Rule (OAR) 734-051.

- Provide a process to educate and involve the public in the planning and funding for future transportation system improvements.

This memorandum considers changes/improvements in three general categories:

- **Interchange Ramp Improvements** – These concepts address concerns raised about driver expectation and safety on interchange ramps.
- **Intersection Improvements** – These concepts identify potential improvements to improve traffic flow and/or address safety concerns at individual intersections within the IMSA.
- **Multimodal Improvements** – These concepts identify potential improvements to enhance safety, desirability, and continuity of facilities for non-auto users in the IMSA.

The improvement concept categories often overlap or complement each other. For instance, a roadway segment improvement may include strategies to improve safety and could be combined with a number of pedestrian improvements. Linkages between concepts are discussed in the more detailed concept evaluations for each exit in Sections 6.4 and 6.5, below.

6.1.1. Interchange Ramp Improvements

A review of interchange ramp characteristics indicates inadequate acceleration and deceleration distances at all four I-5 Exit 40 ramps as well as the northbound and southbound off-ramps of Exit 43. Additionally, a detailed review of crash history data for the period between January 1, 2007, and December 31, 2011, shows multiple crashes along IMSA ramps. Collective evaluation of the Exit 40 ramps indicates multiple crashes with one fatality (southbound off-ramp). At Exit 43, multiple ramp crashes were reported for the northbound on-ramp and southbound off-ramp; one of the crashes at the northbound on-ramp was a fatality.

6.1.2. Intersection Improvements

The concepts developed for intersection improvements address operational and safety deficiencies at individual intersections within the IMSAs. Many of the intersection improvements address truck turning issues and sight distance concerns. Other suggested improvements may address queue storage lengths and multimodal connectivity at intersections where overall capacity is not expected to be of concern.

6.1.3. Multimodal Improvements

In alignment with the goals of these plans, the proposed improvements provide enhanced safety and crossing opportunities and improved visibility and awareness between modes, and move toward continuity of facilities for non-auto users in the IMSA. These multimodal improvements primarily serve pedestrians and cyclists; there is currently limited transit service within the IMSAs. The concepts focus on improving crossings where pedestrians and/or cyclists interact with motorized vehicles as well as improving access to the Rogue River Greenway.

The Oregon Bicycle and Pedestrian Plan recommends shoulders that are 6 feet wide for bicycle use, although a minimum 4-foot shoulder is considered adequate when there are physical width limitations. Wider shoulders allow a cyclist to ride far enough from the edge of pavement to avoid debris and conflicts with passing vehicles. Applicable guidelines, standards, environmental constraints, and costs were considered in the development of bicycle/shoulder improvements throughout the corridor.

The crossing improvements proposed include striped crosswalks, pathway connections, and other spot improvements.

6.2. Concept Evaluation

Not all of the concepts proposed in this memorandum will be recommended for implementation. Each improvement concept will be evaluated with regard to applicable impacts (e.g., traffic operations, safety, and environmental), feasibility, stakeholder feedback, and ability to meet the goals of the IAMP.

The concept analysis included traffic operations, road geometries and right-of-way (ROW) requirements, environmental and land use consequences, and cost opinions.

6.2.1. Traffic Operations and Safety

The I-5 Exit 40 and 43 IMSA intersections are forecast to meet operational targets in the future year (2038); however, traffic safety and a multimodal system that supports all forms of transportation are issues. Potential improvements include traffic control modifications, improved intersection turning radii, extensions of ramp lengths at the ramp terminals, and multimodal improvements/connections to local trails. The operational assessment focuses on the volume-to-capacity (v/c) ratio and level of service (LOS) for the 2038 future condition.

At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed. For potential turn lanes on the rural sections of the highway, the APM turn lane criteria¹ were evaluated. Existing traffic volumes were applied to determine whether warrants for turn lanes might be met today.

Some improvements are focused on addressing safety concerns or may address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2005 through 2009) are discussed for those improvements that address safety.

Multimodal improvements focus on addressing deficiencies or gaps in the system, so that all modes of travel are better accommodated.

¹ Section 7.2 Turn Lane Criteria, Analysis Procedures Manual, April 2006, Updated January 2011, online reference: http://www.oregon.gov/ODOT/TD/TPAU/docs/A_APM/APM.pdf. Note: These criteria are also consistent with the criteria in Appendix F of the Highway Design Manual.

6.2.2. Basic Roadway Geometries and Right-of-Way Requirements

Illustrations of basic roadway geometries and ROW needs were developed for concepts that involve infrastructure improvements. The drawings approximate roadway centerlines, edge of roadway, and ROW using available base mapping.

6.2.3. Environmental and Land Use Assessment

Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area for this assessment is designed to identify those areas judged to have considerable potential for conflict.

Socioeconomic effects are also considered. Concept descriptions note if there is a potential for impacts or benefits to Title VI populations in the IMSAs.

6.2.4. Concepts Cost Opinions

Rough order-of-magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The cost opinions include a contingency factor but do not include ROW costs (unless noted otherwise). The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each concept.

Cost opinions were prepared for all improvements associated with the I-5 Exits 40 and 43 IMSA, unless noted otherwise.

6.3. Organization of Improvement Concepts

The I-5 Exits 40 and 43 IAMPs include two interchanges and nearby intersections. For discussion purposes in this memorandum, the concepts have been grouped by interchange as they were discussed in previous memoranda. Each interchange focuses on the four primary improvement categories: intersection, interchange, multimodal, and safety. There are a total of 22 improvement concepts (12 within the Exit 40 IMSA, 10 within the Exit 43 IMSA).

Some improvement concepts have various options to consider, while others might have only one. Many of the concepts can be combined with others, and some provide different solutions to address the same issue. The 22 concepts are discussed in the following sections.

6.4. I-5 Exit 40 Concept Evaluation

I-5 Exit 40 provides access to the City of Gold Hill from the south, to the Tolo Industrial area (to the southeast, near Exit 35), and to surrounding recreational areas. The IMSA includes four roadways in addition to Access Road that serves the interchange. The roadways include (listed from north to south): 2nd Avenue/OR 99, Blackwell Road, Lampman Road, and Old Stage Road. Roadway characteristics are presented in Technical Memorandum #3: Study Area Inventory. In general, all roadways are two lanes with pavement width ranging from 18 to 34 feet. There are no signalized intersections in the IMSA. Posted speed, functional classification, and average

daily traffic (ADT) also influences the development of improvement concepts. IMSA characteristics include:

- Posted speed is 35 miles per hour (mph) along Access Road, 40 mph along 2nd Avenue/OR 99 and Blackwell Road, and 45 mph along Lampman and Old Stage Roads.
- Roadway classifications include rural minor arterial (both Access Road and 2nd Avenue/OR 99), rural major collector (Blackwell Road), and local (Lampman and Old Stage Roads).
- Existing ADT is approximately 5,500 vehicles per day (vpd) along Access Road; the existing ADT along the side streets is: 2nd Avenue/OR 99 (~5,800 vpd), Blackwell Road (~2,500 vpd), Lampman Road (~600 vpd), and Old Stage Road (~900 vpd).
- Forecast ADT for year 2038 for area roadways is: Access Road (~6,800 vpd), 2nd Avenue/OR 99 (~6,500 vpd), Blackwell Road (~3,500), Lampman Road (~700 vpd), and Old Stage Road (~1,100).

There are 12 improvement concepts for this interchange, several of which have varying options to consider. A brief summary of the improvement concepts is presented in Table 6-1 and Figure 6-1. The following sections discuss in detail the potential changes and improvements that are specific to this interchange.

Table 6-1. I-5 Exit 40 Improvement Concepts

ID	Location	General Description	Purpose	Benefit
40-R1	Southbound Off-ramp	Extend southbound off-ramp: <ul style="list-style-type: none"> ▪ <u>Option A</u>: Extend southbound off-ramp ▪ <u>Option B</u>: Straighten and extend southbound off-ramp 	Provide adequate deceleration distance and improve sight distance	Safety, Freight
40-R2	Southbound On-ramp	Extend southbound on-ramp	Provide adequate acceleration distance	Safety, Freight
40-R3	Southbound Ramp Terminal	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
40-R4	Northbound Off-ramp	Extend northbound off-ramp	Provide adequate deceleration distance	Safety, Freight
40-R5	Northbound On-ramp	Extend northbound on-ramp	Provide adequate acceleration distance	Safety, Freight
40-R6	Northbound Ramp Terminal	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
40-R7	Southbound Off-ramp	Move guardrail	Improve sight distance	Mobility, Safety

Table 6-1. I-5 Exit 40 Improvement Concepts

ID	Location	General Description	Purpose	Benefit
40-I1	2 nd Avenue/OR 99 and Blackwell Road at Access Road	Modify intersection: <ul style="list-style-type: none"> ▪ <u>Option A</u>: Modify traffic control to all-way STOP ▪ <u>Option B</u>: Modify traffic control to all-way STOP and add westbound left-turn lane ▪ <u>Option C</u>: Realign to create a standard four-legged intersection, all-way STOP control 	Better facilitate turning movements and pedestrian crossing	Mobility, Multimodal, Safety
40-I2	Access Road at 2 nd Avenue/OR 99 and Blackwell Road	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
40-I3	Access Road at Old Stage Road	Improve turning radii	Provide adequate turning radii (WB-67 ¹)	Safety, Freight
40-MM1	Access Road	Widen to provide 6-foot shoulders between Blackwell Road and Exit 40	Provide facilities along Access Road for all modes of travel, enhance access to the city, and improve safety	Multimodal, Fill System Gap, Safety
40-MM2	Blackwell Road/OR 99	Provide access for all modes of travel between Access Road and KOA campground: <ul style="list-style-type: none"> ▪ <u>Option A</u>: Widen to provide 6-foot shoulders ▪ <u>Option B</u>: Widen to provide a 10-foot multiuse path 	Provide facilities along Blackwell Road and OR 99 for all modes of travel, enhance access to the city and downtown environment, and improve safety	Multimodal, Fill System Gap, Safety
<p>1. WB – Wheelbase is the distance (in feet) between the front and rear axle of a vehicle, typically representative of the largest vehicle to use an intersection/facility. The wheelbase of a vehicle is one of the factors used during design to accommodate turning maneuvers.</p>				

6.4.1. Concept 40-R1: Southbound Off-ramp Extension

The southbound off-ramp is a single lane with an approximate width of 16 feet. It has a gradual incline to the ramp terminal intersection with Access Road. The advisory exit speed on the ramp is 35 mph and the current ramp deceleration length is approximately 280 feet with a taper of 185 feet. In addition to passenger vehicles, various larger vehicles use the ramp, including trucks and recreational vehicles (campers and vehicles with boat trailers).

The desired ramp deceleration distance is 500 feet and the taper is 400 feet (compared to the current 280 feet and 185 feet provided, respectively). The less than desirable ramp length and taper are noticed by all of the vehicles, and may become a safety issue if queues get longer or multiple trucks/recreational vehicles use the off-ramp at the same time. Access Road is the link between the interchange, the city, and recreational areas (including the nearby KOA and Laurel

Hill Golf Course), and it provides alternative access to the nearby intermodal hub at I-5 Exit 35 (Seven Oaks). Further development of the intermodal hub would likely result in increased use of Exit 40 by large vehicles and corresponding increased queue lengths.

Concept 40-R1 has two options:

- Option A would extend the southbound off-ramp with the purpose of providing adequate deceleration distance and improving safety. Option A would require extension of the existing culvert to support the ramp improvement.
- Option B would straighten out the southbound off-ramp to improve sight distance and also extend the off-ramp with the purpose of providing adequate deceleration distance. Two scenarios were looked at to do this. The first scenario shifts the bridge outside the path of Kane Creek but has a longer off-ramp and impacts more ROW, and the second scenario minimizes ROW impacts but requires more structure to clear Kane Creek.

Both options are shown in Figure 6-2. As an interim step, tree trimming (i.e., limbing) could be done in the short term to mitigate sight distance concerns.

Concept 40-R1 – Traffic Operations and Safety

Existing ADT volumes on the southbound off-ramp are approximately 750 vpd. Future 2038 off-ramp ADT volumes are estimated at 900 vpd. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.20 (LOS B) and 0.24 (LOS C), respectively. During the five-year analysis period, there was one fixed object crash attributed to the southbound ramps that resulted in a fatality. The crash was attributed to fatigue and resulted in the vehicle hitting a berm and sign before overturning.

- Option A would result in a more gradual elevation gain, a longer distance to stop, and thus, a more comfortable deceleration experience. It would include guardrail for the length of the improvement (comparable to current conditions) and overall would improve the safety of the off-ramp.
- Option B would have similar impacts as Option A, but would additionally improve safety concerns associated with sight distance.

Overall, the intersection capacity is not expected to change with this improvement. However, it would create additional distance between the ramp terminal and the interstate in order to provide additional storage for queued vehicles.

The southbound ramp terminal is a public access. This improvement would maintain the existing intersection location and is not expected to need additional access management or to impact existing access spacing.

Concept 40-R1 – Basic Roadway Geometries and Right-of-Way Requirements

Both options for Concept 40-R1 would extend the length of the southbound off-ramp to meet the applicable roadway design standards. The longer ramp length would result in a more gradual elevation gain and longer distance to stop. Guardrail would also be extended (Option A), while guardrail and barrier would match the recent construction (Option B). All of the improvements are anticipated to be within ODOT ROW for Option A, while ROW would be required for Option B.

Concept 40-R1 – Environmental and Land Use Assessment

Adjacent zoning includes rural residential and Exclusive Farm Use (EFU); one or both zones may be impacted depending on the final design. Statewide Planning Goals would need to be considered when impacting EFU zones. No additional ROW is required for the culvert extension (Option A). Option B would require additional ROW.

There are two nearby water features, Kane Creek and a ditch/irrigation canal. Kane Creek is listed as a summer and winter steelhead habitat by Oregon Department of Fish and Wildlife (ODFW). This improvement concept includes extension of the existing box culvert (or a new structure) and modifications to the irrigation canal. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 40-R1 – Cost Opinions

The estimated cost of options for Concept 40-R1 are as follows:

- Option A: \$1,470,000
- Option B: \$4,190,000 (shorter bridge length but significantly longer ramp) or \$7,579,000 (minimizes ROW impacts but has longer structure over Kane Creek)

6.4.2. Concept 40-R2: Southbound On-ramp Extension

Exit 40 has a single-lane southbound on-ramp with an approximate width of 17 feet. The current ramp acceleration length is approximately 700 feet, while the desired length is approximately 1,100. The current taper length is approximately 225 feet, though the desired length is 300 feet. Vehicles of various sizes (including trucks, campers, and vehicles with trailers) use the ramp; the larger vehicles may have issues getting up to speed before entering the interstate.

The concept would extend the southbound on-ramp to provide adequate acceleration distance with the purpose of improving safety, as shown in Figure 6-3.

Concept 40-R2 – Traffic Operations and Safety

Existing ADT traffic volumes on the southbound on-ramp are approximately 1,800 vpd, while the 2038 ADT volumes are 2,250 vpd. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.20 (LOS B) and 0.24 (LOS C), respectively. Three crashes were attributed to the southbound on-ramp during the five-year analysis period and included two collision types: rear end (1), and fixed object (2). One of the crashes resulted in minor injuries, while the other two were property damage only. The rear end collision may be attributable to a short acceleration distance, because the error was identified “as failure to decrease speed for slower moving vehicle.”

While the on-ramp would be lengthened with this project, traffic operations are not expected to change within the merge area. There is no apparent crash pattern; however, the longer on-ramp, which would be consistent with design standards, would likely improve the vehicular safety and provide additional space for larger vehicles to get up to speed before merging with interstate traffic.

The southbound ramp terminal is a public access. This improvement is not expected to need additional access management or to impact existing access spacing.

Concept 40-R2 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 40-R2 would extend the length of the southbound on-ramp to meet the applicable roadway design standards. All improvements are anticipated to be within ODOT ROW.

Concept 40-R2 – Environmental and Land Use Assessment

The southbound on-ramp and interstate are located on EFU-zoned land, and there are no natural features near the proposed concept. Statewide Planning Goals would need to be considered when impacting EFU zones. No land use or environmental impacts are anticipated.

The increased impervious surface area may produce additional stormwater that would need to be treated. Other environmental concerns are the fish-bearing stream and wetlands adjacent to the ramp. These should be identified for mitigation based on any future improvements. No socioeconomic impacts are anticipated.

Concept 40-R2 – Cost Opinions

The cost of the extended on-ramp in Concept 40-R2 is estimated at \$850,000.

6.4.3. Concept 40-R3: Southbound Ramp Terminal Turning Radius Improvements

I-5 Exit 40 serves city and recreational traffic (including the nearby KOA and Laurel Hill Golf Course), and it provides alternative access to the nearby intermodal hub at Interchange 35 (Seven Oaks). Access Road is a two-lane facility with a posted speed of 35 mph and a paved

surface of 24 to 34 feet. The southbound ramps (on and off) have a single-lane approach that is approximately 16 feet wide.

Currently the configuration accommodates trucks; however, the ramp terminal turning radius is not designed for truck traffic design vehicles. This design challenge is predominantly focused on the northeast corner for the southbound left-turn movement from Access Road to the southbound on ramp. In addition to the difficulties experienced by trucks (causing them to occasionally create their own path in adjacent lanes), large and/or long recreational vehicles may also have difficulties navigating the ramp terminal.

Concept 40-R3 would modify the northeastern corner to provide a turning radius sufficient to handle a typical design truck (WB-67), as shown in Figure 6-4. The purpose of this improvement is to improve safety for larger loads.

Concept 40-R3 – Traffic Operations and Safety

Existing ADT traffic volumes on Access Road are 2,550 to 3,800 vpd, while the ramp is approximately 750 vpd. Future 2038 volumes on Access Road are estimated at 3,200 to 4,750 vpd; the forecast for the southbound ramp ADT is approximately 900 vpd. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.20 (LOS B) and 0.24 (LOS C), respectively. During the five-year analysis period there were no crashes reported along Access Road near the southbound ramp terminal.

The improvements associated with Concept 40-R3 would improve the overall safety of the intersection (less chance of semi-trailers tracking into other travel lanes) but are not anticipated to change the roadway capacity at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably.

The wider width of the southbound on-ramp would increase the exposure time for bicycle and pedestrian traffic traveling along the east side of Access Road.

The southbound ramp terminal is a public access. This improvement is not expected to need additional access management, but providing a wider turning radius would widen the access and shorten access spacing to the north.

Concept 40-R3 – Basic Roadway Geometries and Right-of-Way Requirements

This improvement would widen the shoulder up to 24 feet with guardrail in the northeast corner of the southbound ramp terminal. The improvement would need significant fill for the steep slopes on Access Road and the southbound on-ramp. The existing land within the northeast corner of the ramp terminal is all ODOT jurisdiction and ROW.

Concept 40-R3 – Environmental and Land Use Assessment

The only adjacent land use is EFU. Statewide Planning Goals would need to be considered when impacting EFU zones.

There are no documented environmental resources near Concept 40-R3, though the increased impervious surface area may produce additional stormwater that would need to be treated. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts.

No socioeconomic impacts are anticipated.

Concept 40-R3 – Cost Opinions

The cost estimate for this improvement concept is \$110,000.

6.4.4. Concept 40-R4: Northbound Off-ramp Extension

The northbound off-ramp is a single lane with an approximate width of 16 feet. It has a gradual incline to the ramp terminal at the intersection with Access Road. The advisory exit speed on the ramp is 45 mph, and the current ramp deceleration length is approximately 200 feet. The taper length for this ramp is zero. Similar to the southbound off-ramp, this ramp is used by vehicles of various sizes (including trucks, campers, and vehicles with trailers).

The desired ramp deceleration distance is 460 feet and the desired taper length is 360 feet (a 200 feet deceleration distance is provided now, while a taper does not currently exist). Like the southbound off-ramp, the deceleration distance is less than the desirable length and may become a safety issue if the length of queues increases. Access Road links and serves multiple uses, including Interchange 35 and the nearby intermodal hub.

The improvement would extend the northbound off-ramp to provide adequate deceleration distance (include guardrail for the length of the improvement) with the purpose of improving safety. Figure 6-5 illustrates the concept.

Concept 40-R4 – Traffic Operations and Safety

The northbound off-ramp has an existing ADT of 2,300 vpd and a future (2038) ADT volume forecast of 2,900 vpd. The ramp terminal critical movement is the westbound left-through-right (WB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.29 (LOS B) and 0.41 (LOS B), respectively. During the five-year analysis period, there were five crashes attributed to the northbound off-ramp. The crashes included three collisions types: rear end (2), fixed object (2), and sideswipe (1). Four of the crashes resulted in minor injuries, while the other one was property damage only.

The benefits of this improvement would be similar to the southbound off-ramp extension (40-R1): a more comfortable deceleration experience and additional storage for queuing at the

ramp terminal. Overall, the operations are not expected to change with this improvement, but safety would be enhanced.

The northbound ramp terminal is a public access. This improvement is not expected to need additional access management or impact existing access spacing.

Concept 40-R4 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 40-R4 would extend the length of the northbound off-ramp to meet the applicable roadway design standards. All improvements are anticipated to be within ODOT ROW.

Concept 40-R4 – Environmental and Land Use Assessment

The adjacent land use is rural residential, and nearby Kane Creek is listed as a summer and winter steelhead habitat by ODFW. Kane Creek is located near the northbound on-ramp and the southbound off-ramp, and is south of the southbound on-ramp. No impacts to the resources are anticipated. No socioeconomic impacts are anticipated either.

The increased impervious surface area may produce additional stormwater that would need to be treated.

Concept 40-R4 – Cost Opinions

The cost estimate for this improvement concept is \$620,000.

6.4.5. Concept 40-R5: Northbound On-ramp Extension

The northbound on-ramp at Exit 40 has a single lane with an approximate width of 17 feet. The current ramp acceleration length is approximately 765 feet, though the desired ramp acceleration distance is 1,100 feet. The on-ramp taper is also shorter than the desired length: The current taper is 190 feet versus the desired 295 feet. Vehicles of various sizes (including trucks, campers, and vehicles with trailers) use the ramp; the larger vehicles may have issues getting up to speed before entering the interstate.

This improvement would extend the northbound on-ramp to provide adequate acceleration distance, as shown in Figure 6-6. The extension would impact the adjacent frontage road, requiring guardrail and a drainage system (both are included in the cost opinion). The purpose of this improvement is to improve safety.

Concept 40-R5 – Traffic Operations and Safety

Existing ADT volumes on the northbound on-ramp are approximately 1,000 vpd, while the 2038 ADT volumes are forecast to be 1,300 vpd. The ramp terminal critical movement is the westbound left-through-right (WB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.29 (LOS B) and 0.41 (LOS B), respectively. One crash was attributed to the northbound on-ramp during the five-year analysis period. The fixed

object collision resulted in property damage only. The interchange ramp spacing does not currently meet standards.

Similar to Concept 40-R2, with this improvement concept traffic operations are not expected to change within the merge area. There is no apparent crash pattern; however, the longer on-ramp, which would be consistent with design standards, would likely improve the vehicular safety and provide additional space for larger vehicles to get up to speed before merging with interstate traffic.

The northbound ramp terminal is a public access. This improvement is not expected to need additional access management or to impact existing access spacing.

Concept 40-R5 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 40-R5 would extend the length of the northbound on-ramp to meet the applicable roadway design standards. Additional ROW would be required to extend the ramp.

Concept 40-R5 – Environmental and Land Use Assessment

The northbound on-ramp and interstate are located on land zoned rural residential. There are potential ROW impacts to properties adjacent to the on-ramp. No socioeconomic impacts are anticipated with the additional ROW acquisition.

Kane Creek runs nearby, but it is not anticipated to be impacted by this improvement concept.

The increased impervious surface area may produce additional stormwater that would need to be treated.

Concept 40-R5 – Cost Opinions

The cost of the on-ramp extension in Concept 40-R5 is estimated at \$1,100,000, which does not include potential ROW impacts.

6.4.6. Concept 40-R6: Northbound Ramp Terminal Turning Radius Improvements

I-5 Exit 40 serves city and recreational traffic (including the nearby KOA and Laurel Hill Golf Course), and provides alternative access to the nearby intermodal hub at Interchange 35 (Seven Oaks). The northbound ramps (on and off) have a single-lane approach that is approximately 16 feet wide, while the crossroad, Access Road, is a two-lane facility with a posted speed of 35 mph and a paved surface of 24 to 34 feet.

Currently the configuration accommodates trucks; however, the ramp terminal turning radius is not designed for truck traffic design vehicles, meaning that turning maneuvers result in trucks crossing into other travel lanes. This design challenge is predominantly focused on the southwest corner for the northbound left-turn movement onto the northbound on-ramp. In addition to the difficulties experienced by trucks (causing them to occasionally create their own

path in adjacent lanes), large and/or long recreational vehicles may also have difficulties navigating the ramp terminal.

Concept 40-R6 would modify the southwest corner (northbound left turn) to provide a turning radius sufficient to handle a typical design truck (WB-67), as shown in Figure 6-7. The purpose of the improvement is to improve safety for larger loads.

Concept 40-R6 – Traffic Operations and Safety

Existing ADT traffic volumes on Access Road are 3,800 to 5,450 vpd, while the ADT for the ramp is approximately 2,250 vpd. Future (2038) ADT volumes on Access Road are estimated at 4,750 to 6,800 vpd; the forecast ADT for the northbound ramp is approximately 2,800 vpd. The ramp terminal critical movement is the westbound left-through-right (WB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.29 (LOS B) and 0.41 (LOS B), respectively. There were seven crashes reported at the northbound ramp terminal during the five-year analysis period, including one serious injury. Four of the crashes included a collision with a fixed object, and three crashes were in the northbound direction and involved guardrail. The observed intersection crash rate exceeds the statewide critical crash rate.

The improvement associated with Concept 40-R6 would move the guardrail in the southwest corner back and improve the overall safety of the intersection (less chance of large trucks tracking into other travel lanes), but it is not anticipated to change the capacity of the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably.

The northbound ramp terminal is a public access. This improvement is not expected to require additional access management, but providing a wider turning radius would widen the access and shorten access spacing to the south.

Concept 40-R6 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would widen the shoulder up to 23 feet with guardrail in the southwest corner of the northbound ramp terminal. The existing land within the improvement area is all ODOT jurisdiction and ROW.

Concept 40-R6 – Environmental and Land Use Assessment

Rural residential is the only adjacent land use; however, no additional ROW is needed. No socioeconomic impacts are anticipated.

There are no documented environmental resources near Concept 40-R6, though the increased impervious surface area may produce additional stormwater that would need to be treated. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts.

Concept 40-R6 – Cost Opinions

The cost estimate for this improvement concept is \$160,000.

6.4.7. Concept 40-R7: Southbound Off-ramp Guardrail Modification

The southbound off-ramp is a single lane with an approximate width of 16 feet. It has a gradual incline to the ramp terminal intersection with Access Road. In addition to passenger vehicles, various larger vehicles use the ramp, including trucks and recreational vehicles (campers and vehicles with boat trailers).

If a driver is stopped on the southbound off-ramp and the driver's eye level is approximately 3.5 feet from the pavement (e.g., when driving a sedan), the driver's sight distance is obstructed to the north by the guardrail on the west side of Access Road. A passenger vehicle is more likely to experience this concern than a higher profile truck/recreational vehicle. Access Road is the link between the interchange, the city, and recreational areas (including the nearby KOA and Laurel Hill Golf Course), and provides alternative access to the nearby intermodal hub at I-5 Exit 35 (Seven Oaks).

This improvement would modify/reposition the guardrail on the southwest end of the interchange bridge with the purpose of providing adequate deceleration distance and improving safety, as shown in Figure 6-8.

Concept 40-R7 – Traffic Operations and Safety

Existing ADT volumes on the southbound off-ramp are approximately 750 vpd. Future (2038) off-ramp ADT volumes are estimated at 900 vpd. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.20 (LOS B) and 0.24 (LOS C), respectively. During the five-year analysis period, there was one fixed object crash attributed to the southbound ramps that resulted in a fatality. The crash was attributed to fatigue, and resulted in the vehicle hitting a berm and sign before overturning.

The Concept 40-R7 improvement would modify or move the guardrail to increase the sight distance available looking north of the southbound off-ramp. It could improve the safety of drivers stopped on the southbound off-ramp and possibly improve safety for traffic heading south on Access Road. However, the improvement would require moving the guardrail back approximately 16 feet, potentially creating an illusion that drivers on Access Road could enter I-5 at the off-ramp, creating a dangerous "Wrong-Way" situation. Clear signage could help mitigate this concern.

Overall, the intersection capacity is not expected to change with this improvement. However, it could decrease delays for vehicles turning onto Access Road from the Exit 40 southbound off-ramp, because these vehicles would have a clearer view of oncoming traffic from the north.

The southbound ramp terminal is a public access. This improvement is not expected to need additional access management or to impact existing access spacing. As previously mentioned, this improvement could require some additional signage or paint to ensure that drivers do not confuse this access as a freeway entrance.

Concept 40-R7 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 40-R7 could potentially widen Access Road to the west in order to shift the guardrail in order to improve sight distance. All improvements are anticipated to be within ODOT ROW.

Concept 40-R7 – Environmental and Land Use Assessment

Adjacent land uses include rural residential and EFU. Statewide Planning Goals would need to be considered when impacting EFU zones. No additional ROW is required, and therefore no land use impacts are anticipated.

There are two nearby water features: Kane Creek and a ditch/irrigation canal. Kane Creek is listed as a summer and winter steelhead habitat by ODFW. There is a high potential for archeological resources should soil need to be disturbed.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 40-R7 – Cost Opinions

The cost estimate for this improvement concept is \$239,000.

6.4.8. Concept 40-I1: 2nd Avenue/OR 99 and Blackwell Road at Access Road Intersection Modifications

Second Avenue/Blackwell Road is a two-lane facility with a posted speed of 40 mph through the Access Road intersection. Access Road is also a two-lane facility and provides access between I-5, adjacent neighborhoods, and recreational facilities. Additionally, Upper River Road intersects Blackwell Road just west of Access Road, creating an off-set intersection. Upper River Road crosses under the Southern Pacific Railroad and runs parallel to the Rogue River, which is a recreational attraction.

Concept 40-I1 has three options:

- Option A would modify the intersection traffic control to an all-way STOP to make it easier to turn left from Access Road to 2nd Avenue.
- Option B would include the all-way STOP control and add a westbound left-turn lane to facilitate access to the I-5 interchange.
- Option C would realign the intersection, straighten Access Road, and include an all-way STOP control.

Figure 6-9 illustrates Option B of Concept 40-11.

Concept 40-11 – Traffic Operations and Safety

Existing traffic volumes on 2nd Avenue, Blackwell Road, and Access Road are 5,800 vpd, 2,500 vpd, and 5,500 vpd, respectively, and future (2038) traffic volumes are estimated at 6,500 vpd, 3,500 vpd, and 6,800 vpd, respectively. The critical northbound movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.55 (LOS C) and 0.76 (LOS D), respectively. During the five-year analysis period, there were four crashes at this intersection, three of which resulted in minor injuries. The crashes were dispersed among the movements, with no apparent pattern. Traffic operations and safety for each of the three options are:

- **Option A:** The modification to a conventional all-way STOP would improve the overall safety of the intersection and meet driver expectation. The traffic control modification would slow all movements at the intersection and make it easier to turn left from Access Road towards Gold Hill. In turn, it would slow traffic through the area (not only through the intersection), making the off-set access to Upper River Road more noticeable and thus ingress and egress easier, thus improving safety. Furthermore, the all-way STOP would facilitate non-motorized crossings of 2nd Avenue/OR 99 and Blackwell Road for resident and recreational users alike, thus improving non-motorized safety as well. Existing intersection operations indicate that the critical northbound left-right movement v/c ratio is 0.44 (LOS B); well below capacity and standard. The future operations for the same movement, with the proposed all-way STOP, would be 0.55 and LOS B; well below standard and capacity.
- **Option B:** Adding the left-turn lane with the all-way STOP would provide similar benefits as Option A would, but would increase capacity on Blackwell Road by separating the left-turning movements from the through movements. The left-turn lane criteria were evaluated and met for the westbound left-turn movement. Installation of guardrail on the east side (Blackwell Road) would also improve safety for motorized traffic by providing protection from the steep ditch that runs parallel to 2nd Avenue/OR 99 and Blackwell Road. Operations would be similar to those under Option A, with v/c ratios of 0.44 (existing) and 0.55 (future), and LOS B for both existing and future (2038).
- **Option C:** Realigning the intersection would provide similar benefits as Option A, and also would improve driver expectancy and safety by aligning the intersection to a standard four-way stop. Operations would be similar to those under Option A, with v/c ratios of 0.44 (existing) and 0.55 (future), and LOS B for both years.

Any improvements to pedestrian facilities should follow the new standards for Americans with Disabilities Act (ADA) compliance.

The intersection of 2nd Avenue/OR 99 and Blackwell Road at Access Road is a public access. Option A would not impact existing accesses, or access spacing, near the intersection. Option B would impact residential driveways (east of Access Road) along Blackwell Road; however, the location of the access (and therefore the spacing) is not anticipated to change. Option C would

impact accesses along 2nd Avenue/OR 99 and Blackwell Road and Access Road. Specifically, the distances between the intersection and accesses on 2nd Avenue/OR 99 and Blackwell Road would change, and three residential accesses on Access Road would be impacted by the realignment.

Concept 40-I1 – Basic Roadway Geometries and Right-of-Way Requirements

Design and ROW needs vary with each option:

- Option A: The traffic control modification for Option A would not require any geometric modifications to the intersection.
- Option B would have geometric modifications. The existing cross section along 2nd Avenue/OR 99 and Blackwell Road includes two 11 to 12-foot travel lanes with up to 2-foot shoulder (for a paved width of 22 to 28 feet), while Access Road also has two 12 to 13-foot travel lanes but a shoulder width of only 1 foot in most places (for a paved width of 24 to 34 feet). Adequate ROW exists along both roadways (2nd Avenue and Blackwell Road) for improvements. Option B would construct a 14-foot left-turn lane and 8-foot (Blackwell Road) to 12-foot (2nd Avenue) shoulders. Significant fill may be needed to maintain slopes between the roadway and the ditch, and this could have some ROW impacts. Blackwell Road would also include guardrail, which would also be an improvement over existing conditions.
- Option C would require significant geometric changes (and fill to maintain slopes between the roadway and the ditch) to Access Road due to the realignment. Assumes a width along Access Road sufficient to accommodate either a left or right northbound turn lane. ROW impacts to the property on the SW corner will be significant but are not included in the estimate.

Concept 40-I1 – Environmental and Land Use Assessment

Adjacent land uses include EFU and rural residential.

- Option A would have no environmental impacts or land use impacts.
- While there appears to be no buildings in the vicinity of the improvements associated with Option B, the widening would impact EFU land, and therefore Statewide Planning Goals would need to be considered. The addition of impervious surface area may produce additional stormwater that would need to be treated.
- Option C: Drainage and water quality effects could be significant, but the existing roadway that would be abandoned is assumed to provide the space for necessary treatment.

The traffic control modification for all options could make pedestrian crossings at the intersection easier, which potentially could be considered a socioeconomic benefit. Improved pedestrian access generally benefits disadvantaged populations.

Concept 40-I1 – Cost Opinions

The estimated costs of the three options for Concept 40-I1 are:

- Option A: \$10,000
- Option B: \$850,000
- Option C: \$711,000

The cost for Option A is considerably lower than the cost for Option B because it includes only pavement restriping and signs for the traffic control change, whereas Option B widens the roadway and constructs a new westbound left turn lane and wider shoulders. The estimated cost for Option C is lower than the cost for Option B due to the added cost for rehabilitation of an existing facility over the cost of new construction. However, the cost of ROW for Option C would be much greater. None of these estimates includes utility relocation or acquisition of additional ROW. Costs associated with these elements would increase the discrepancy between costs of the three options.

6.4.9. Concept 40-I2: 2nd Avenue/OR 99 and Blackwell Road at Access Road Turning Radius Improvements

The roadway characteristics for Concept 40-I2 are the same as those described for Concept 40-I1.

Currently, the intersection turning radius is not designed for truck traffic (WB-67). This design challenge is predominantly focused on the southwest corner. In addition to the difficulties experienced by trucks (causing them to occasionally create their own path in adjacent lanes), large and/or long recreational vehicles may also have difficulties navigating the intersection. This intersection is the link between the interchange, the city, and recreation (including the nearby KOA), and alternative access to the nearby intermodal hub at Interchange 35 (Seven Oaks).

Concept 40-I2 would modify the southwest corner (eastbound right turn) to provide a turning radius sufficient to handle a typical design truck (WB-67), as shown in Figure 6-10, and to include guardrail. The purpose of the improvement is to improve safety for larger loads. It is related to Concept 40-I1.

Concept 40-I2 – Traffic Operations and Safety

Existing traffic volumes on 2nd Avenue, Blackwell Road, and Access Road are 5,800 vpd, 2,500 vpd, and 5,500 vpd, respectively, and future (2038) traffic volumes are estimated at 6,500 vpd, 3,500 vpd, and 6,800 vpd. The critical northbound movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.55 (LOS C) and 0.76 (LOS D), respectively. During the five-year analysis period, there were four crashes at this intersection, three of which resulted in minor injuries. None of the minor injury collisions was attributed to the eastbound right-turning movement.

The improvements associated with Concept 40-I2 would improve the overall safety of the intersection (less chance of large trucks tracking into other travel lanes), but they are not anticipated to change the roadway capacity at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably; this improvement would be negated if 40-I1 (all-way STOP) is implemented. Although higher speeds improve travel time and the overall driver experience, at the intersection they are less safe for other modes of travel.

The intersection of 2nd Avenue/OR 99 and Blackwell Road at Access Road is a public access. This improvement is not expected to require additional access management, but providing a wider turning radius would widen the existing access and shorten access spacing slightly to the west.

Concept 40-I2 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement includes a 12-foot shoulder with guardrail. The existing ROW along 2nd Avenue/OR 99 and Blackwell Road is approximately 80 feet (or greater), and the roadway width is 24 feet. Along Access Road the roadway width is approximately 24 feet, and the ROW is 40 feet. The improvement appears to be constructible within the existing ROW.

Concept 40-I2 – Environmental and Land Use Assessment

Adjacent land uses include rural residential and EFU. While there appear to be no buildings in the vicinity of the improvements, the widening would impact lands that are zoned rural residential.

The increased impervious surface area could have stormwater impacts that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 40-I2 – Cost Opinions

The cost estimate for this concept is \$225,000 and does not include any stormwater treatment that may be required.

6.4.10. Concept 40-I3: Access Road/Old Stage Road Turning Radii Improvements

Access Road is a two-lane roadway that changes to Old Stage Road after passing Old Stage Road (side street). Posted speed along the roadway is 45 mph (the posted speed south of the interchange is higher than the northern counterpart). Old Stage Road (side street) is a two-lane facility with a posted speed of 45 mph. Access Road provides access between I-5, adjacent neighborhoods, the Moose Family Center, Laurel Hill Golf Course, and recreational areas.

Currently the configuration accommodates trucks; however, the intersection turning radius is not designed for truck traffic design vehicles. This design challenge is predominantly focused west of the intersection on both the north and south corners. In addition to the difficulties experienced by trucks (causing them to occasionally create their own path in adjacent lanes),

large and/or long recreational vehicles may also have difficulties navigating the intersection. The intersection area provides an opportunity for new development, which may be affected by the configuration of this intersection. There were no crashes reported during the five-year analysis period at this intersection.

Concept 40-13 would modify the northwest corner (southbound right turn) as well as the southwest corner (eastbound right turn and northbound left turn) to provide a turning radius sufficient to handle a typical design truck (WB-67), as shown Figure 6-11. The purpose of this improvement is to improve safety for larger loads and remove potential barriers to new commercial development at the interchange.

Concept 40-13 – Traffic Operations and Safety

Current traffic volumes along Access Road are approximately 2,550 vpd, and they are 400 vpd along Old Stage Road. The forecast future (2038) daily volumes are anticipated to increase slightly to approximately 3,200 vpd and 450 vpd for Access Road and Old Stage Road, respectively. The critical movement (eastbound) v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.07 (LOS B) and 0.07 (LOS B), respectively. The improvements associated with Concept 40-13 would improve overall safety but are not anticipated to change the roadway capacity at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably, and would reduce the delay for through vehicles. However, the higher speeds could have an adverse impact on pedestrian safety.

The intersection of Old Stage Road at Access Road is a public access. This improvement could impact the adjacent southern access on Old Stage Road due to its proximity to that access. Providing a wider turning radius would widen the existing access and shorten access spacing slightly to both the north and south.

Concept 40-13 – Basic Roadway Geometries and Right-of-Way Requirements

This improvement considers two locations for improvement, the northwest corner and the southwest corner. Both corners include 12-foot shoulders without guardrail. The existing ROW along Access Road/Old Stage Road is 70 feet (or greater), while the roadway width is 34 feet. Along Old Stage Road (side street), the roadway width is approximately 21 feet, and the ROW is 65 feet (or more). The improvements appear to be constructible within the existing ROW at both of the locations for improvement.

Concept 40-13 – Environmental and Land Use Assessment

The widening is located on land zoned EFU (northwest corner) and on interchange commercial land (southwest corner)—the Moose Family Center is located in the southwest corner. The bulk of the intersection appears to be within ODOT interchange ROW, but the improvement could have impacts to other adjacent land uses. Statewide Planning Goals would need to be considered when impacting EFU zones.

Environmental impacts are not anticipated, even though Kane Creek is nearby (to the north). However, the increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 40-I3 – Cost Opinions

The estimated cost associated with the improvement is \$165,000 for the northwest corner improvements and \$115,000 for the southwest corner. Cost estimates do not consider ROW acquisition, if needed.

6.4.11. Concept 40-MM1: Access Road – Widen to Provide Multimodal Access

Access Road is a two-lane facility with a posted speed of 35 mph. It includes narrow shoulders (0 to 5 feet) on both sides. It also provides access to Exit 40, area homes, recreational facilities, and a campground. Currently non-motorized traffic must travel on the edge of the roadway, pinched between the roadway edge and higher speed vehicles, which is a safety concern.

Concept 40-MM1 would provide 6-foot-wide shoulders on either side of Access Road between Blackwell Road and Lampman Road. This improvement concept would improve the pedestrian experience by providing a consistent shoulder (that meet the minimum Jackson County standard width) for non-motorized access along the roadway, as shown in Figure 6-12. The improvement enhances connectivity for non-motorized users and provides access to other multimodal facilities.

Note: This improvement stops short before the ramp terminals. While the I-5 overpass includes 5-foot shoulders (which meets the minimum Jackson County standard for a rural arterial), 6-foot shoulders would be consistent with state standards. Should the opportunity arise for a bridge replacement, the next phase of this improvement could consider widening/replacement of Access Road between the ramp terminals to provide full-width shoulders.

Concept 40-MM1 – Traffic Operations and Safety

Existing ADT volumes on Access Road are between 2,550 vpd and 5,500 vpd. Future (2038) volumes are estimated to be between 3,200 vpd and 6,800 vpd. Crash data for Access Road for the five-year analysis period showed two crashes on the segment proposed for improvement, though neither crash was pedestrian-related. The minimal area available as a shoulder (or the nonexistent shoulder, in some cases) forces non-motorized traffic onto the roadway, causing a safety concern.

The intersections of 2nd Avenue/OR 99 and Blackwell Road and Lampman Road at Access Road are public accesses. This improvement is expected to impact three residential driveways and the accesses to the Running Salmon RV Park and the Jackson County Fire District building. Although impacts would be minimal, coordination with residents and Jackson County Fire would be needed. There are no anticipated impacts to access spacing.

Concept 40-MM1 – Basic Roadway Geometries and Right-of-Way Requirements

The existing cross section along Access Road includes two 12-foot travel lanes with 0 to 5-foot shoulders (one in each direction). The shoulders for the improvement are assumed to be 5 feet wide. In some segments, the existing ROW along Access Road is approximately 50 feet (or greater), compared to the roadway width of 24 feet. The shoulders could possibly be constructed within existing ROW, although they may require shifting of the existing guardrail and fencing; however, some ROW will likely need to be purchased.

Concept 40-MM1 – Environmental and Land Use Assessment

Adjacent lands are zoned rural residential. While there appear to be no buildings in the vicinity of the improvements, the widening would impact adjacent properties. Any new work that occurred in areas of undisturbed soil would have a high potential for archeological resource impacts. The increased impervious surface area may require additional stormwater treatment.

Access Road crosses an irrigation channel where the culvert would have to be extended in order to have space for the widened shoulders on either side of the existing road and for the appropriate foreslopes and backslopes from the roadway. It is assumed that the guardrail from Lampman Road would need to be extended to protect the new culvert ends.

This improvement would improve non-motorized connectivity, which could potentially be considered a socioeconomic benefit, because improved pedestrian access generally benefits disadvantaged populations.

Concept 40-MM1 – Cost Opinions

The cost estimate for this improvement concept is \$924,000 and includes the extension of the culvert.

6.4.12. Concept 40-MM2: Blackwell Road (OR 99)– Provide Multimodal Access

Blackwell Road is a two-lane facility with a posted speed of 40 mph (which reduces to 30 mph just west of the Access Road intersection). It includes narrow shoulders (2 feet wide) and drainage ditches on both sides. It also provides access to Exit 40, area homes, recreational facilities, and a campground. Currently non-motorized traffic must travel on the edge of the roadway, pinched between higher speed vehicles and a deep drainage ditch, which is a safety concern.

This concept would improve the pedestrian crossing experience and has two options, as shown in Figure 6-13:

- Option A would provide 6-foot shoulders (meeting the Jackson County rural standard) on either side of Blackwell Road between Access Road and the campground to provide space for non-motorized access along the roadway.
- Option B would provide a multi-use path adjacent to the roadway between Access Road and the campground, separate the vehicular traffic from the non-motorized traffic, and

enhance non-motorized access along the roadway. The path would be 10 feet wide and located on the south side of the roadway.

Concept 40-MM2 – Traffic Operations and Safety

Existing ADT volumes on Blackwell Road are 2,500 vpd. Future (2038) traffic volumes are estimated to be 3,500 vpd. Crash data for Blackwell Road was not assessed east of the intersection with Access Road. Traffic operations and safety for both of the options are:

- Option A: The addition of shoulders on each side of the roadway is not anticipated to affect vehicular operations, though it will improve the experience of non-motorized users and connectivity with other multimodal facilities. The separation of traffic modes would enhance overall safety.

The intersection of 2nd Avenue/OR 99 and Blackwell Road at Access Road is a public access. This improvement is expected to cross two residential driveways on the north side of Blackwell Road and three residential driveways on the south side. The shoulders would be a part of public ROW.

- Option B: Traffic operations would be similar for Option B as for Option A; however, as an entirely separate facility from the roadway for non-motorized users, Option B would likely be safer than Option A.

This improvement is expected to cross three residential driveways on the south side of Blackwell Road and may require coordination with property owners. The multi-use path would, however, travel through public ROW.

Concept 40-MM2 – Basic Roadway Geometries and Right-of-Way Requirements

The existing cross section along Blackwell Road includes two 12-foot travel lanes with 2-foot shoulders (one in each direction).

- Option A: The added shoulders are assumed to be 5 feet wide and could fit within existing ROW.
- Option B: The multi-use path is assumed to be 10 feet wide and would include 3-foot-wide gravel shoulders per the Oregon Bicycle and Pedestrian Guide. The existing ROW along Blackwell Road is approximately 80 feet (or greater), while the roadway width is 24 feet. The path could possibly be constructed within existing ROW but may require some ROW acquisition on the south side of the roadway.

Concept 40-MM2 – Environmental and Land Use Assessment

Adjacent lands are zoned rural residential.

- Option A: Although there appear to be no buildings in the vicinity of the improvements, the widening would impact adjacent properties. The increased impervious surface area may require additional stormwater treatment.
- Option B: The effects of Option B would be similar to those Option A, but the larger path would have more impact due to its location and larger surface area.

Both options for Concept 40-MM2 could provide socioeconomic benefits, because improved pedestrian and bicycle access generally benefits disadvantaged populations.

Concept 40-MM2 – Cost Opinions

The estimated cost of the options for Concept 40-MM2 are:

- Option A: Approximately \$510,000
- Option B: Approximately \$215,000

6.5. I-5 Exit 43 Concept Evaluation

I-5 Exit 43 provides access to the City of Gold Hill from the north and serves nearby recreational areas. This interchange includes five crossroads in addition to Main Street, the main roadway (listed from north to south): 2nd Avenue (OR 99), River Road, Lampman Road, Rogue River Highway, Frontage Road, and Profetta Lane. Roadway characteristic details are presented in Technical Memorandum #3: Study Area Inventory. In general, all roadways are two lanes with pavement width ranging from 18 feet to 28 feet. There are no signalized intersections in the IMSA. Posted speed, functional classification, and ADT also influence the development of improvement concepts. IMSA characteristics include:

- Posted speed is 45 mph along all IMSA roadways.
- Roadway classifications include rural minor arterial (both Main Street and OR 234/Rogue River Highway/OR 99), rural major collector (N. River Road), and local (Lampman Road, Profetta Lane, and Frontage Road).
- Existing ADT is approximately 200 vpd to 1,300 vpd along Main Street; the ADT along the side streets is: OR 234/Rogue River Highway/OR 99 (~1,600 to 2,300 vpd), River Road (~1,100 vpd), Lampman Road (~500 vpd), Frontage Road (~130 vpd), and Profetta Lane (~70 vpd).
- Forecast ADT for year 2038: Main Street (200 vpd to 1,500 vpd), OR 234/Rogue River Highway/OR 99 (~1,900 vpd to 2,700 vpd), River Road (~1,200 vpd), Lampman Road (~500 vpd), Frontage Road (~130 vpd), and Profetta Lane (~70 vpd).

There are ten improvement concepts for this interchange, several of which have varying options to consider. A brief summary of the concepts is presented in Table 6-2 and Figure 6-14. The following sections discuss in detail the potential changes and improvements that are specific to this interchange.

Table 6-2. I-5 Exit 43 Improvement Concepts

ID	Location	General Description	Purpose	Benefit
43-R1	Southbound Off-ramp	Extend southbound off-ramp	Provide adequate deceleration distance	Safety, Freight
43-R2	Southbound Ramp Terminal	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
43-R3	Northbound Off-ramp	Extend northbound off-ramp	Provide adequate deceleration distance	Safety, Freight
43-R4	Northbound Ramp Terminal	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
43-I1	Rogue River Highway at Main Street	Provide for all modes at the intersection <ul style="list-style-type: none"> ▪ <u>Option A</u>: Add crosswalk on west side of intersection and signage for oncoming traffic ▪ <u>Option B</u>: Modify the traffic control and add crosswalks on multiple approaches 	Enhance opportunities and increase the safety of the pedestrian crossing of OR 99	Safety, Multimodal
43-I2	Main Street at Rogue River Highway (OR 99 and OR 234)	Improve turning radius	Provide adequate turning radius (WB-67 ¹)	Safety, Freight
43-I3	Rogue River Highway/2 nd Avenue at N. River Road	Improve intersection function <ul style="list-style-type: none"> ▪ <u>Option A</u>: Improve turning radius ▪ <u>Option B</u>: Option A and realign intersection and update traffic control 	Provide adequate turning radius (WB-67 ¹) and enhance intersection function	Safety, Freight,
43-MM1	IMSA roadways	Enhance multimodal access between I-5 and the City of Gold Hill <ul style="list-style-type: none"> ▪ <u>Option A</u>: Add signage to roadway ▪ <u>Option B</u>: Widen shoulders where ROW permits ▪ <u>Option C</u>: Add signage and activated warning lights 	Provide facilities along Main Street and Rogue River Highway for all modes of travel	Multimodal, Safety
43-MM2	Rogue River Highway (Rock Point Bridge, 00332A)	Enhance multimodal access across the bridge <ul style="list-style-type: none"> ▪ <u>Option A</u>: Add signage ▪ <u>Option B</u>: Construct 8' cantilevered paths on both sides of bridge ▪ <u>Option C</u>: Build a new structure (non-vehicular traffic) ▪ <u>Option D</u>: Build a new structure (all modes) 	Provide facilities along Rock Point Bridge for all modes of travel	Multimodal, Safety

Table 6-2. I-5 Exit 43 Improvement Concepts

ID	Location	General Description	Purpose	Benefit
43-MM3	Profetta Lane to Old Stage Road – I-5 Alternative Multimodal Crossing	Provide alternate multimodal crossing of I-5 with multi-use path connection	Provide facilities across I-5 for all modes of travel	Multimodal, Safety
1. WB – Wheelbase is the distance (in feet) between the front and rear axle of a vehicle, typically representative of the largest vehicle to use an intersection/facility. The wheelbase of a vehicle is one of the factors used during design to accommodate turning maneuvers.				

6.5.1. Concept 43-R1: Southbound Off-ramp Extension

The southbound off-ramp is a single lane with an approximate width of 16 feet. It has a gradual incline to the intersection with Main Street (ramp terminal). The exit speed on the ramp is 45 mph, and the current ramp deceleration length is approximately 280 feet. Similar to Exit 40, there is a variety of vehicle types that use Exit 43, including trucks and recreational vehicles (campers and vehicles with boat trailers).

The desired ramp deceleration distance is 345 feet. The less than desirable ramp length is noticed by all of the vehicles and may become a safety issue if queues get longer or multiple trucks/recreational vehicles use the off-ramp at the same time. Main Street provides the link between the interchange and Rogue River Highway, which provides access to residential areas, area businesses, and recreational sites.

The improvement would extend the southbound off-ramp with the purpose of providing adequate deceleration distance and improving safety, as shown in Figure 6-15.

Concept 43-R1 – Traffic Operations and Safety

Existing ADT volumes on the southbound off-ramp are approximately 500 vpd. Future 2038 off-ramp ADT volumes are estimated at 600 vpd. The benefits of this improvement would be similar to those identified for the off ramp extension identified at Exit 40: enhanced safety, a more comfortable deceleration experience, and longer storage at the ramp terminal. Overall, the operations are not expected to change with this improvement. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.07 (LOS A) and 0.07 (LOS A), respectively. During the five-year analysis period, there were four crashes reported along the southbound off-ramp of Exit 43. There was no identifiable crash pattern, because each crash was a different collision type—rear-end, fixed object, side-swipe, and other. Half of the crashes resulted in minor injuries (2), while the other half resulted in property damage only (2).

The southbound ramp terminal is a public access. This improvement is not expected to impact existing access spacing or require additional access management.

Concept 43-R1 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 43-R1 would extend the length of the southbound off-ramp to meet the applicable roadway design standards. The longer ramp length would result in a more gradual elevation gain and longer distance for stopping. All improvements are anticipated to be within ODOT ROW.

Concept 43-R1 – Environmental and Land Use Assessment

Adjacent land uses include rural residential, rural light industrial, and exclusive farm use (EFU), and the West Valley Wildlife Area is located to the south. Statewide Planning Goals would need to be considered when impacting EFU zones. No impacts are anticipated for the West Valley Wildlife Area lands. Any new work in areas of undisturbed soil have a high potential for impacts to archeological resources.

An unknown hazardous waste site has been identified near the off-ramp diverge from I-5. Additional investigation into the extent of hazardous materials in the area may be required.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 43-R1 – Cost Opinions

The cost estimate for this concept is \$370,000.

6.5.2. Concept 43-R2: Southbound Ramp Terminal Turning Radius Improvements

The southbound off-ramp is a single lane with an approximate width of 16 feet. Main Street is a two-lane facility that provides access between I-5, adjacent neighborhoods, and recreational facilities. There is no posted speed.

Currently the configuration accommodates trucks; however, the ramp terminal turning radius is not designed for truck traffic design vehicles (WB-67). This design deficiency is predominantly focused on the southwest corner. In addition to the difficulties experienced by trucks (causing them to occasionally create their own path in adjacent lanes), large and/or long recreational vehicles may also have difficulties navigating the ramp terminal.

Concept 43-R2 would modify the southwestern corner (for the eastbound right turn from the off-ramp) to provide a turning radius sufficient to accommodate a typical design truck (WB-67), as shown in Figure 6-15. The purpose of this improvement is to improve safety for larger loads.

Concept 43-R2 – Traffic Operations and Safety

Existing ADT volumes along Main Street range from 250 vpd to 700 vpd, while the southbound off-ramp ADT is approximately 500 vpd. Future (2038) ADT volumes along Main Street would range from 300 vpd to 900 vpd, while the southbound off-ramp ADT volumes are estimated at

600 vpd. The ramp terminal critical movement is the eastbound left-through-right (EB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.07 (LOS A) and 0.07 (LOS A), respectively. During the five-year analysis period, there were no crashes reported along Main Street near the southbound ramp terminal.

The improvements associated with Concept 43-R2 would improve the overall safety of the intersection (less chance of semi-trailers tracking into other travel lanes) but are not anticipated to change the traffic operations at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably.

The southbound ramp terminal is a public access. This improvement may trigger additional access management, because providing a wider turning radius would shorten the distance between the ramp terminal and the intersection to the south (Profetta Lane).

Concept 43-R2 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement is located in the southwestern corner of the ramp terminal and would widen the paved section of roadway between the southbound off-ramp and Profetta Lane (parallel to Main Street) up to 28 feet to facilitate the eastbound right turn of a WB-67. All improvements are anticipated to be within ODOT ROW.

Concept 43-R2 – Environmental and Land Use Assessment

Adjacent land uses include rural residential, rural light industrial, and EFU. Statewide Planning Goals would need to be considered when impacting EFU zones. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts. The West Valley Wildlife Area is located to the south, although impacts to the area are not anticipated.

An unknown hazardous waste site has been identified near the off-ramp diverge from I-5. Additional investigation into the extent of hazardous materials in the area may be required.

The increased turning radius would improve access to the light industrial lands on Frontage Road to the west.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 43-R2 – Cost Opinions

The cost estimate for this concept is \$150,000.

6.5.3. Concept 43-R3: Northbound Off-ramp Extension

The northbound off-ramp is a single lane with an approximate width of 16 feet. The exit speed on the ramp is 45 mph and the current ramp deceleration length is approximately 305 feet. The

taper length for this ramp is 187 feet. Similar to its southbound counterpart (Concept 43-R1: Southbound Off-ramp Extension), there are a variety of vehicle types that use the northbound ramp, including trucks and recreational vehicles (campers and vehicles with boat trailers).

The desired ramp deceleration distance is 345 feet and the taper is 215 feet. The deceleration distance is less than the desirable length and may become a safety issue if the length of queues increases. Main Street provides the link between the interchange and Rogue River Highway, which provides access to residential areas, area businesses, and recreational sites.

The improvement would extend the northbound off-ramp to provide adequate deceleration distance (include guardrail for the length of the improvement) with the purpose of improving safety, as shown in Figure 6-16.

Concept 43-R3 – Traffic Operations and Safety

The northbound off-ramp has an existing ADT of 300 vpd and future (2038) ADT volume forecast of 350 vpd. The ramp terminal critical movement is the westbound left-through-right (WB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.03 (LOS A) and 0.04 (LOS A), respectively. During the five-year analysis period, there were no crashes reported for the northbound off-ramp.

The benefits of this improvement would be similar to those for the southbound off-ramp extension (Concept 43-R1): a more comfortable deceleration experience and additional storage for queuing at the ramp terminal. Overall, the operations are not expected to change with this improvement, but safety would be enhanced.

The northbound ramp terminal is a public access. This improvement is not expected to impact existing access spacing or require additional access management.

Concept 43-R3 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 43-R3 would extend the length of the northbound off-ramp to meet the applicable roadway design standards. All improvements are anticipated to be within ODOT ROW.

Concept 43-R3 – Environmental and Land Use Assessment

The adjacent land use is EFU and the Rogue River is nearby. Statewide Planning Goals would need to be considered when impacting EFU zones. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts. However, no impacts are anticipated to any of the aforementioned resources.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 43-R3 – Cost Opinions

The cost estimate for this concept is \$550,000.

6.5.4. Concept 43-R4: Northbound Ramp Terminal Turning Radius Improvements

The northbound off-ramp is a single lane with an approximate width of 16 feet. Main Street is a two-lane facility that provides access between I-5, adjacent neighborhoods, and recreational facilities. There is no posted speed.

The northeast corner (westbound right turn from the off-ramp) of the ramp terminal is not designed to provide a turning radius large enough for truck traffic design vehicles (WB-67), though it does accommodate the turns (meaning turning maneuvers result in trucks crossing into other travel lanes). In addition to the difficulties experienced by trucks (causing them to occasionally create their own path in adjacent lanes), large and/or long recreational vehicles may also have difficulties navigating the ramp terminal.

Concept 43-R4 would modify the northeast corner of the ramp terminal to provide a turning radius sufficient to handle a typical design truck (WB-67), as shown in Figure 6-16. The purpose of the improvement is to improve safety for larger loads.

Concept 43-R4 – Traffic Operations and Safety

Existing ADT volumes along Main Street range from 750 vpd to 1,250 vpd, while the northbound off-ramp ADT is approximately 300 vpd. Future 2038 ADT volumes along Main Street would range from 900 to 1,500 vpd, while the northbound off-ramp ADT volumes are estimated at 350 vpd. The ramp terminal critical movement is the westbound left-through-right (WB L/T/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.03 (LOS A) and 0.04 (LOS A), respectively. During the five-year analysis period, there were no crashes reported along Main Street near the southbound ramp terminal.

As with Concept 43-R2: Southbound Ramp Terminal Turning Radius Improvements, Concept 43-R4 would improve the overall safety of the intersection (less chance of semi-trailers tracking into other travel lanes), but it is not anticipated to change the intersection capacity or traffic operations. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably.

The northbound ramp terminal is a public access. This improvement is not expected to require additional access management, but providing a wider turning radius would widen the access and shorten access spacing to the north.

Concept 43-R4 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement is located in the northeastern corner of the ramp terminal and would widen the paved section of roadway between the northbound off-ramp and the Rogue River Highway (parallel to Main Street) up to 17 feet to facilitate the westbound right turn of a WB-67. All improvements are anticipated to be within ODOT ROW.

Concept 43-R4 – Environmental and Land Use Assessment

The adjacent land use is interchange commercial and EFU. Statewide Planning Goals would need to be considered when impacting EFU zones. Any new work in areas of undisturbed soil have a high potential for archeological resource impacts. Nearby is the Rogue River and a freshwater emergent wetland; no impacts to those resources are anticipated.

The increased turning radius would improve access to the Rogue River Highway and adjacent interchange commercial lands.

The increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 43-R4 – Cost Opinions

The estimated cost of Concept 43-R4 is approximately \$60,000.

6.5.5. Concept 43-I1: Rogue River Highway/Main Street Intersection Modifications

Rogue River Highway (also known as OR 99 and OR 234, parallel alignment) is a two-lane facility with a posted speed of 45 mph through the Main Street intersection. Main Street is also a two-lane facility that provides access between I-5, adjacent neighborhoods, and recreational facilities.

Currently, the intersection has a unconventional arrangement: The intersection functions with STOP-controlled movements in the eastbound direction (all movements) and for the northbound left-turn movement of the shared approach (northbound right turns and westbound movements do not need to stop). Although pedestrians can legally cross at an intersection, it is confusing to do so at an unconventional intersection, particularly if there is no marked crosswalk.

This concept would improve the pedestrian crossing experience and has two options, as shown in Figure 6-17:

- Option A would stripe a crosswalk on the west side of the intersection and add signage to alert users to look for oncoming westbound traffic.
- Option B would modify the intersection traffic control to a conventional all-way STOP configuration as well as add marked crosswalks.

The purpose of the project is to enhance crossing opportunities and overall safety.

Concept 43-I1 – Traffic Operations and Safety

Existing ADT volumes on Rogue River Highway range from 400 vpd (west of the intersection) to 1,800 vpd (to the east), while Main Street ADT is 1,250 vpd. Future (2038) volumes are estimated at 450 vpd to 2,150 vpd along the Rogue River Highway and 1,500 vpd along Main Street. The intersection critical movement is the northbound left-right (NB L/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.09 (LOS A) and 0.09 (LOS A), respectively. Pedestrian data is not available at this time. There were no crashes reported at this intersection during the five-year analysis period. Traffic operations and safety for each of the two options are:

- Option A, adding the crosswalk striping along the west side, would have nominal operational impacts to westbound traffic and no additional operational impacts to the currently stopped movements. While Option A provides a clearly marked crosswalk, it may also provide a false sense of security to pedestrians and potentially make the intersection less safe. Although no crashes were reported for the existing intersection, the potential for crashes is higher at unconventional intersections.
- Option B, modifying traffic control to a conventional all-way STOP, would result in more of an operational impact than would Option A, because all westbound traffic would have to stop, not just those waiting for a pedestrian. Overall, Option B (all-way STOP) would operate acceptably, with an existing v/c ratio of 0.13 (westbound left-through movement, worst movement) and of 0.15 (same movement). A traffic control modification such as Option B would slow all movements, meet driver expectancy, provide a designated crosswalk, and improve the safety of the intersection. By slowing drivers down in a conflict area and facilitating non-motorized crossings of Rogue River Highway for residents and recreational users alike, Option B also improves non-motorized safety.

The intersection of Rogue River Highway at Main Street is a public access. This improvement is not expected to impact existing access spacing or require additional access management.

Concept 43-I1 – Basic Roadway Geometries and Right-of-Way Requirements

The existing cross section along Rogue River Highway includes two 12-foot travel lanes with minimal shoulder (approximately 2 feet). Neither Option A nor Option B would require additional pavement or lane width; therefore, no additional ROW would be required.

Concept 43-I1 – Environmental and Land Use Assessment

The adjacent land uses are rural residential, interchange commercial, and EFU. No environmental or land use impacts have been identified for this improvement concept. The improvement could provide socioeconomic benefits by improving non-motorized access in the IMSA. Improved pedestrian and bicycle access generally benefits socioeconomically disadvantaged populations.

Concept 43-I1 – Cost Opinions

Estimated costs for this concept would be:

- Option A: \$7,000
- Option B: \$10,000

6.5.6. Concept 43-I2: Rogue River Highway/Main Street Turning Radius Improvements

Rogue River Highway (also known as OR 99 and OR 234, parallel alignment) is a two-lane facility with a posted speed of 45 mph through the Main Street intersection. Main Street is also a two-lane facility that provides access between I-5, adjacent neighborhoods, and recreational facilities.

As discussed in Concept 43-I1: Rogue River Highway/Main Street Intersection Modifications, this intersection does not operate with conventional STOP control. Intersection truck turning templates were evaluated for a WB-67 (typical design vehicle), and it was determined that the eastbound right turn (from Rogue River Highway to southbound Main Street) is not designed for truck traffic design vehicle turns, but they can be accommodated (meaning turning maneuvers result in trucks crossing into other travel lanes). This is a safety concern for motorists if trucks need to swing wide into oncoming traffic lanes and non-vehicular traffic, thus cutting the corner and infringing on the shoulder/bikeway. The intersection area provides an opportunity for new development, which may be affected by the configuration of this intersection.

This improvement concept would increase the turning radius on the southwest corner of the intersection, as shown in Figure 6-18, to provide improved safety for all modes, enhance the connections to area businesses and recreational areas, and remove potential barriers to new interchange commercial development

Concept 43-I2 – Traffic Operations and Safety

Existing ADT volumes on Rogue River Highway range from 400 vpd (west of the intersection) to 1,800 vpd (to the east), while ADT on Main Street is 1,250 vpd. Future (2038) volumes are estimated at 450 vpd to 2,150 vpd along the Rogue River Highway, and 1,500 vpd along Main Street. The intersection critical movement is the northbound left-right (NB L/R). The critical movement v/c ratio (and LOS) for the existing and future (2038) conditions would be 0.09 (LOS A) and 0.09 (LOS A), respectively. The improvement associated with Concept 43-I2 is not anticipated to change the capacity or traffic operations at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably. The Concept 43-I2 improvements could improve the overall safety at the intersection by providing adequate space to serve all modes. It should be noted that, although higher speeds improve travel time and the overall driver experience, at the intersection they are less safe for other modes of travel and may outweigh the benefits of the added space.

During the five-year analysis period, there were no crashes reported at this intersection.

The intersection of Rogue River Highway at Main Street is a public access. This improvement is not expected to require additional access management, but providing a wider turning radius would widen the access and shorten access spacing to the west.

Concept 43-I2 – Basic Roadway Geometries and Right-of-Way Requirements

Roadway features and widths are described above in Section 6.5.5, Concept 43-I1 Rogue River Highway/Main Street Intersection Modifications. The improvements would widen the southwest corner to accommodate a WB-67 design vehicle and may require additional ROW. Physical constraints include the adjacent utility corridor.

Concept 43-I2 – Environmental and Land Use Assessment

Adjacent lands are zoned interchange commercial, rural residential, and EFU. The improved eastbound truck turning radius would serve the commercially zoned property located to the west of the intersection on the south side.

Freshwater emergent wetlands are nearby, but likely beyond the ROW impacts associated with Concept 43-I2. However, the increased impervious surface area may produce additional stormwater that would need to be treated.

No socioeconomic impacts are anticipated.

Concept 43-I2 – Cost Opinions

The estimated cost of Concept 43-I2 is \$160,000.

6.5.7. Concept 43-I3: Rogue River Highway/2nd Avenue at N. River Road Intersection Enhancements

Rogue River Highway (OR 99 and OR 234 alignments, also known as 2nd Avenue) and N. River Road are two-lane facilities. The posted speed along both roadways is 45 mph. N. River Road provides access to a nearby quarry, while the Rogue River Highway provides access to the northern part of Gold Hill. The intersection is skewed and has unconventional traffic control.

Intersection truck turning templates were evaluated for a WB-67 (typical design vehicle), and it was determined that the eastbound right turn (from N. River Road to southbound Rogue River Highway) cannot be made while maintaining a single travel lane. This is a safety concern for motorists if trucks need to swing wide into oncoming traffic lanes and non-vehicular traffic, thus cutting the corner and infringing on the shoulder/bikeway. This improvement concept would realign the intersection and modify the current traffic control to a more standard configuration. A later phase, such as adding a westbound left-turn lane (and associated widening of the west leg of the intersection) could be considered in order to separate westbound left-turning vehicles and facilitate northbound truck turning.

There are two options (shown in Figure 6-19) for this concept:

- Option A addresses the eastbound truck turning movement by widening the southwest corner.
- Option B would realign the southern leg (bridge access) of the intersection at a near 90-degree angle for northbound left-turning movements with a STOP control and longer storage length (traditional T-intersection, side street STOP control). A second phase of this option would add a westbound left-turn lane and would widen the western leg of the intersection to the north, opposite the left-turn lane. Option A improvements would also be included to address the truck turning limitations.

A third option, realignment of N. River Road (western leg) as a single stopped approach, was considered but discarded due to environmental and physical constraints. Environmental constraints include the nearby Sardine Creek Wildlife Area. Physical constraints include the adjacent utility corridor, railroad tracks, the Rogue River, and the Rogue River Bridge (a historic structure with a width of 18 feet). The land and environmental impacts of this third option were assumed to be too great.

The purpose of this improvement concept is to provide improved safety for all modes and enhance the connections to area businesses and recreational areas. The realignment of the southern leg of the intersection may also provide an additional buffer between vehicular traffic on Rogue River Highway and the newly constructed multimodal path located in the southeast corner of the intersection.

Concept 43-13 – Traffic Operations and Safety

The northbound approach of Rogue River Highway is the critical movement and has a v/c ratio that currently operates at 0.08. During the five-year analysis period, there were no crashes reported at this intersection. Traffic operations and safety for each of the two options are:

- Option A would improve the overall safety of the intersection but is not anticipated to change the traffic capacity or operations at the intersection. The increased turning radius would allow heavy vehicles to turn at higher speeds and accelerate more comfortably. It should be noted that, although higher speeds improve travel time and the overall driver experience, at the intersection they are less safe for other modes of travel, which may outweigh the benefits of the added space. Increasing the turning radius will potentially impact a new multi-use path on the south side of N. River Road.
- Option B would realign the intersection to address both the truck turning deficiency and the unconventional traffic control at the intersection. The realignment and truck turning modifications are not anticipated to have capacity impacts; however, the change in traffic control (T-intersection, side street STOP) would have roadway capacity impacts and would result in a northbound v/c ratio of 0.07 (existing 2012) and 0.09 (2038). While the traffic control would be conventional, it would require highway traffic to stop on a 45 mph facility in a rural area, which is unexpected and a potential safety concern in itself. This improvement concept would result in improved safety for trucks turning right

onto Rogue River Highway (eastbound right movement), but the modified STOP sign along Rogue River Highway has the potential to increase the number of rear-end collisions or to cause a failure of vehicles to stop at all. The bicycle and pedestrian modes would benefit from a more conventional STOP configuration and the reduced number of conflict points; however, a striped crosswalk is not included. The increased turning radius could also impact the new multi-use path on the south side of N. River Road.

The intersection of Rogue River Highway/2nd Avenue at N. River Road is a public access. Both options would have minor impacts to the access but would not require additional management. Widening the turning radius in both options would have minor impacts on spacing to the west, while the removal of pavement in Option B would slightly increase spacing to the east.

Concept 43-I3 – Basic Roadway Geometries and Right-of-Way Requirements

Physical constraints include the adjacent utility corridor, railroad tracks, and the historic Rogue River Bridge. Design features and ROW impacts include:

- Option A would widen the southwest corner to accommodate a WB-67 vehicle, which may require additional ROW. Some fill may be required to increase the turning radius on the southwest corner.
- Option B would realign the southern leg of the Rogue River Highway at the intersection as a two-lane approach and potentially result in ROW impacts. The degree of ROW impacts will need to be quantified at the time of design. Utility poles run perpendicular and adjacent to N. River Road (on both sides) and would need to be considered if widening (phase 2) is pursued.

Concept 43-I3 – Environmental and Land Use Assessment

The adjacent lands are zoned EFU and rural residential. Environmental constraints include the Rogue River, which has two ODFW-classified habitats: summer and winter Steelhead and fall and spring Chinook, Coho Salmon, and Pacific Lamprey. The Sardine Creek Wildlife Area is nearby and located to the north (on the other side of the railroad tracks).

- Option A would have ROW impacts in the southwest quadrant of the intersection. The proximity of the Rogue River and the need to fill near the river is also a concern with this option, although impacts could possibly be avoided. The nearby Sardine Creek Wildlife Area is another consideration. In addition, any impact to the new multi-use path could trigger Section 6(f) concerns. Additional impervious surface and stormwater treatment would also need to be addressed.
- Option B would have all of the same impacts as Option A; however, because changes would occur on both sides of the intersection, there would be a greater area of impact.

No socioeconomic impacts are anticipated with either option, but the potential impact to the multi-use path could be construed as a negative effect for disadvantaged populations, who may be more reliant on non-auto modes of travel.

Concept 43-I3 – Cost Opinions

The estimated costs of Concept 43-I3 are:

- Option A: \$220,000
- Option B: \$230,000

6.5.8. Concept 43-MM1: IMSA Roadways Multimodal Improvements

IMSA roadways are narrow; some have minimal lane widths (as narrow as 9 feet across the Rogue River Bridge); and most have minimal shoulder widths (0 to 5 feet), all of which have no bicycle or pedestrian facilities. Gold Hill is increasingly becoming known for its recreational opportunities, including the Rogue River Greenway and cycling routes.

This improvement concept considers improvements along Main Street and Rogue River Highway and includes three options. (Bridges will be considered later, in Concept 43-MM2: Rogue River Highway (Rock Point Bridge, 00332A) – Enhance Multimodal Access.) Rogue River Highway/2nd Avenue (north of the Rock Point Bridge) is served by the Rogue River Greenway. However, the multimodal improvements from the bridge south toward the interchange provide limited connectivity.

The three options to enhance the current infrastructure, illustrated in Figure 6-20, are:

- Option A would add signage along both IMSA roadways. Depending on the location, signs can warn drivers of bicycles and/or pedestrians in the roadway or remind them to share the road. Sharrows were considered, but they were eliminated from consideration due to roadway speeds in excess of 30 mph.
- Option B would widen the shoulders where ROW exists. This is a spot treatment and would not result in continuous facilities.
- Option C would include the signage from Option A combined with warning lights to capture the drivers' attention. The installation would be ideal in areas that are constrained (areas of narrow ROW or bridge width) and would be activated only when users are present. An example of a sign/warning light combination is a caution pedestrian sign with a light ensemble attached (either LED or alternating yellow).

Concept 43-MM1 – Traffic Operations and Safety

Existing ADT volumes on Rogue River Highway range from 1,600 vpd to 2,300 vpd, while ADT on Main Street ranges from 200 vpd to 1,300 vpd. Future (2038) volumes are estimated at 1,900 vpd to 2,700 vpd along the Rogue River Highway and 200 vpd to 1,500 vpd along Main Street. There were two crashes reported along Rogue River Highway (between N. River Road and

Lampman Road) in the five-year analysis period. Both were fixed object collisions that resulted in property damage only. Neither involved non-auto transportation.

All of the options would improve driver awareness of other modes using the roadways. Additionally:

- Operationally, Option A would provide no change to the roadway capacity and would not change how the road is currently used, although there may be occasional slowing of vehicular traffic when a bicycle or pedestrian is present.
- Option B would not modify roadway capacity either, though it would provide areas for non-motorized users to pull off of the road to let motorized users pass and would improve the user experience for non-motorized users. Option B would provide areas where the modes could be separated, which would be an enhancement along the 45 mph facility.
- Operationally, Option C would be the same as Option A.

None of the options would impact access spacing or require access management; all impacted roads are public facilities.

Concept 43-MM1 – Basic Roadway Geometries and Right-of-Way Requirements

All improvements are anticipated to be within ODOT ROW. Design features for the various options include:

- Option A would maintain existing paved section and ROW.
- Option B would widen the paved roadway to the south in spot locations along Rogue River Highway within existing ROW.
- Physically, Option C would be the same as Option A.

Concept 43-MM1 – Environmental and Land Use Assessment

Lands in the vicinity are zoned rural residential, interchange commercial, and EFU. The Rogue River and freshwater emergent wetlands are in proximity to the north of this concept.

- There are no environmental or land use impacts anticipated for Option A or Option C.
- Option B would be within ODOT ROW along Rogue River Highway. Though the Rogue River is nearby the Rogue River Highway widening (to the north), impacts are not anticipated. However, the increased impervious surface area may produce additional stormwater that would need to be treated.
- Any of the three options could provide socioeconomic benefits by improving non-motorized access across the roadways and river. Improved pedestrian and bicycle access generally benefits disadvantaged populations.

Concept 43-MM1 – Cost Opinions

The estimated costs for Option 43-MM1 are:

- Option A: \$15,000 (signage along Main Street and Rogue River Highway)
- Option B: \$450,000 (widen Rogue River Highway to the south, install guardrail, provide paved 8-foot shoulders on both sides)
- Option C: approximately \$50,000 (per warning light installation)

6.5.9. Concept 43-MM2: Rogue River Highway (Rock Point Bridge, 00332A) – Enhance Multimodal Access

The Rogue River Highway (Rock Point Bridge, 00332A) is a historic structure built in 1919. The railings were recently replaced (in 2010). However, the travel lanes are still only 9 feet wide. The total structure width is 19 to 20 feet, leaving no room for bicycle or pedestrian facilities.

Concept 43-MM2 considers multimodal enhancements to facilitate non-motorized crossings of the bridge and has three options for consideration, as illustrated in Figure 6-21:

- Option A would add signage on the bridge.
- Option B would construct 8-foot-wide paths on both sides of the Rock Point Bridge.
- Option C would build a parallel structure and maintain the aesthetics of the historic bridge. It is assumed that the parallel structure would be located at the nearest narrow section, which was assumed to be the connection between Main Street and N. River Road directly to the north. The structure is assumed to be 270 feet long and 15 feet wide. The width includes a 10-foot-wide path with a 2-foot shy distance (and railing) on both sides.
- Option D would be similar to Option C, but would serve vehicular traffic as well. Cost estimates were not prepared for this option, because a vehicular structure is not the original intent of the concept. If Option D were selected as the preferred concept, cost estimates would be revisited.

Concept 43-MM2 – Traffic Operations and Safety

Existing ADT volumes on Rogue River Highway are ~1,600 vpd; while the future (2038) volumes are estimated at 1,900 vpd. There are no documented crash patterns along the Rogue River Highway. Non-vehicular operations could be improved by providing additional facilities, as presented in any of these options. Traffic operation consideration for each of the options are:

- Option A would alert motorized traffic to the presence of non-vehicular traffic that may be sharing the roadway; however, it is not anticipated to change the bridge capacity or traffic operations.
- Option B would provide pathways along the bridge that would serve non-auto modes and separate them from motorized vehicles.

- Option C would provide a dedicated non-vehicular bridge with adequate width to serve a mix of modes and directions. Option C would also move non-motorized users off of the highway onto N. River Road, a rural major collector with a comparable posted speed of 45 mph; avoid the need to widen Rogue River Highway between Main Street and the Rock Point Bridge; and provide a direct route to Exit 43.
- Option D would provide a new vehicular structure that meets current design standards for vehicular and non-auto modes (vehicle travel lanes, bike lanes, and sidewalks). It would significantly impact the traffic circulation and operations within the IMSA north of the interchange. Additionally, it would provide unrestricted access to the City of Gold Hill and surrounding areas for freight, transit, and emergency vehicles, which are currently limited by the existing 9-foot travel lanes.

Options C and D would impact access spacing and require access management; all impacted roads are public facilities. Options C and D would change access at the Main Street and Rogue River Highway (OR 99) intersection and add a new access on N. River Road.

Concept 43-MM2 – Basic Roadway Geometries and Right-of-Way Requirements

Design and ROW needs vary with each option:

- Option A would not result in any changes to roadway geometry. Any further modifications to the bridge will continue to compromise the historic nature and aesthetics of the bridge. Option A can be implemented within existing ROW.
- Option B would not modify the existing roadway geometry of the bridge itself; however, it would create two 8-foot-wide paths that affect the aesthetics and historical nature of the bridge on both sides. Safe transitions at either end of the bridge, and a connection to the newly constructed Rogue River Greenway, present a concern that has not been considered in much detail with this preliminary concept. Option B can be constructed within existing ROW.
- Option C would include a new multi-use path bridge that includes 10 feet of travel width, 2 feet of shy distance on each side, and railing (for a total of 15 feet in width). It will require new non-motorized connections to the existing roadway network. Option C will require new ROW, the extent of which would be determined at the time of design.
- Option D, as mentioned above, would provide a new vehicular structure that meets current design standards for vehicular and non-auto modes (vehicle travel lanes, bike lanes, and sidewalks). This improvement is conceptual at this time and will be further vetted if this option is preferred. It will require new connections to the existing roadway network. Option D also will require new ROW, the extent of which would be determined at the time of design.

Concept 43-MM2 – Environmental and Land Use Assessment

The land adjacent to the existing bridge is zoned EFU, while the land between Main Street and N. River Road is zoned rural residential, interchange commercial, and EFU. All of the options for this improvement concept could provide socioeconomic benefits by improving non-motorized

access in the IMSA. Improved pedestrian and bicycle access generally benefits disadvantaged populations.

- Option A would occur within the current pavement extents and have no anticipated environmental impacts.
- Option B would require bridge work over the Rogue River, which carries summer and winter Steelhead and fall and spring Chinook, Coho Salmon, and Pacific Lamprey. The increased impervious surface area may produce additional stormwater that would need to be treated.
- Option C would also require bridge work over the Rogue River, which carries summer and winter Steelhead and fall and spring Chinook, Coho Salmon, and Pacific Lamprey, and which may require environmental permitting. In addition, Option C would potentially be aligned within two types of nearby wetlands: freshwater emergent and freshwater forested/shrub. The increased impervious surface area may produce additional stormwater that would need to be treated. Additional analysis to assess air quality and noise may be needed.

Concept 43-MM2 – Cost Opinions

The cost opinions for concepts involving bridge construction (Options B and C) include considerations for work bridges and falsework; however, they do not include 50 percent engineering and construction (E & C), roadway, temporary protection and direction of traffic (TP&D) costs, or inflation. The costs of Concept 43-MM2 vary as follows:

- Option A: \$1,500
- Option B: \$1,000,000
- Option C: \$1,500,000

6.5.10. Concept 43-MM3: Profetta Lane to Old Stage Road – I-5 Alternative Multimodal Crossing

Main Street is a two-lane facility that provides access between I-5, adjacent neighborhoods, and recreational facilities. Main Street where it crosses I-5 via Interchange 43 does not have any bicycle or pedestrian facilities and minimal (1- to 2-foot-wide) shoulders. The Main Street Bridge over I-5 does not have any deficiencies listed (source: ODOT, 2012 Bridge Condition Report), and improvements to the structure are not anticipated at this time.

This improvement concept would provide an alternate (lower-cost) route improvement for crossing I-5 by connecting Profetta Lane to the Old Stage Road/Lampman Road undercrossing with a multi-use path, as seen in Figure 6-22.

Concept 43-MM3 – Traffic Operations and Safety

Existing ADT volumes on Main Street range from 200 vpd to 1,300 vpd. Future (2038) volumes are estimated to range from 200 vpd to 1,500 vpd along Main Street. Traffic volumes were not

collected on Lampman Road or Old Stage Road outside of the IMSA; however, volumes are expected to be less than those on Main Street. Pedestrian data is not available at this time.

There were no crashes reported during the five-year analysis period on any of the roadways (Profetta Lane, Old Stage Road, and Lampman Road) that would serve multimodal traffic as a result of this concept being implemented. However, the underpass that connects Old Stage Road to Lampman Road would need to incorporate a way for users of the multi-use path to safely enter the underpass. This concept improves connectivity, but it could require that significant measures be put in place to maintain safety. The underpass is currently constrained; it has limited shoulder width for multimodal users. Additional signage or widening of the underpass are options for addressing the safety concern; however, due to roadway speeds of 45 mph, sharrows would not be an option. Widening of the underpass would be costly, and therefore the funds may be more efficiently used by widening the Main Street I-5 overcrossing.

Profetta Lane is a public access, while the existing terminus of Old Stage Road provides access to residential driveways. This improvement may trigger additional access management, since it creates two new multimodal access points on existing public facilities.

Concept 43-MM3 – Basic Roadway Geometries and Right-of-Way Requirements

The existing cross section along Main Street includes two 12-foot travel lanes with minimal shoulders (approximately 1- to 2-foot wide). The existing roadway facilities are not planned to be widened; however, the existing unpaved path between Profetta Lane and Old Stage Road has some design constraints.

To the north of the path, the ground slopes steeply up to I-5, and to the south, there appears to be a ditch. The ditch runs along the path and then turns to the south right before the paved portion of Old Stage Road begins.

A fence that would be to the north of the unpaved path should be installed along the whole length of the path to protect path users from the steep slope. The fence would be installed in order to provide about 2 feet of lateral clearance from the path. A safety rail would also be installed to the south of the unpaved path to separate users from the existing ditch.

The multi-use path would feed into the Old Stage Road underpass, which is currently constrained.

This concept may result in ROW impacts along Lampman Road.

Concept 43-MM3 – Environmental and Land Use Assessment

The adjacent land use is EFU. The existing pavement on Old Stage Road marks the beginning of a residential area. The multi-use path will likely need to be an improved shared-use facility in order to avoid significant ROW impacts and to allow continued access for residential users.

The design may increase the impervious surface area and produce additional stormwater that would need to be treated.

The concept could provide socioeconomic benefits by improving non-motorized access in the IMSA. Improved pedestrian and bicycle access generally benefits disadvantaged populations.

Concept 43-MM3 – Cost Opinions

The cost of Concept 43-MM3 is approximately \$470,000. This cost is for the multi-use path only and does not reflect measures to deal with the limited width of the Old Stage Road underpass.

6.6. Evaluation Matrix

The information presented in this memo will also be summarized in a separate matrix for comparison of alternatives.

Attachments:

Figure 6-1. Interchange 40 – Summary of Concepts

Figure 6-2. Concept 40-R1: Southbound Off-ramp Extension

Figure 6-3. Concept 40-R2: Southbound On-ramp Extension

Figure 6-4. Concept 40-R3: Southbound Ramp Terminal Turning Radius Improvements

Figure 6-5. Concept 40-R4: Northbound Off-Ramp Extension

Figure 6-6. Concept 40-R5: Northbound On-ramp Extension

Figure 6-7. Concept 40-R6: Northbound Ramp Terminal Turning Radius Improvements

Figure 6-8. Concept 40-R7: Southbound Off-ramp Guardrail Modification

Figure 6-9. Concept 40-I1: 2nd Avenue/Blackwell Road/Access Road Intersection Modifications

Figure 6-10. Concept 40-I2: 2nd Avenue/Blackwell Road/Access Road Turning Radius Improvements

Figure 6-11. Concept 40-I3: Access Road/Old Stage Road Turning Radius Improvements

Figure 6-12. Concept 40-MM1: 2nd Avenue (OR 99) Bridge Multimodal Improvements

Figure 6-13. Concept 40-MM2: Blackwell Road Multimodal Path

Figure 6-14. Interchange 43 – Summary of Concepts

Figure 6-15. Concepts 43-R1 & R2: Southbound Off-ramp and Turning Radius Improvements

Figure 6-16. Concepts 43-R3 & R4: Northbound Off-ramp and Turning Radius Improvements

Figure 6-17. Concept 43-I1: Rogue River Highway/Main Street Intersection Modifications

Figure 6-18. Concept 43-I2: Rogue River Highway/Main Street Turning Radius Improvements

Figure 6-19. Concept 43-I3: Rogue River Highway/2nd Avenue/N. River Road Intersection Enhancements

Figure 6-20. Concept 43-MM1: Study Area Roadways Multimodal Improvements

Figure 6-21. Concept 43-MM2: Rogue River Highway (OR 234/OR 99) Bridge Multimodal Improvements

Figure 6-22. Concept 43-MM3: I-5 Alternative Multimodal Crossing

I-5 Exit 40 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1, 2, 3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
INTERCHANGE RAMP IMPROVEMENTS							
40-R1	Southbound Off-ramp	Extend southbound off-ramp: <ul style="list-style-type: none"> Option A: Extend southbound off-ramp Option B: Straighten and extend southbound off-ramp 	Provide adequate deceleration distance	<ul style="list-style-type: none"> Off-ramp ADT (vpd): Existing – 750; Future (2038) – 900 Critical movement (EB L/T/R) V/C: Existing – 0.20; Future (2038) – 0.24 Critical movement (EB L/T/R) LOS: Existing – B; Future (2038) – C 1 fatal crash during 5-year analysis period No change to ramp capacity/operations Would provide additional queue storage Would enhance driver comfort during deceleration Interim project: Could perform pruning as a temporary mitigation for sight distance concerns Option B: Would improve sight distance and alleviate concerns 	<ul style="list-style-type: none"> Off-ramp has single 16' lane Current deceleration length is 280' and taper is 185' Desired deceleration length is 500' and taper is 400' Includes guardrail extension for length of improvement Option A: <ul style="list-style-type: none"> Improvements anticipated to be within ODOT ROW Option B: <ul style="list-style-type: none"> Depending on the alignment, new bridge over Kane Creek is between 170' and 470' Guardrail and barrier are included to match the recent construction ROW would be required 	<ul style="list-style-type: none"> Existing zoning is rural residential and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed Nearby Kane Creek and ditch/irrigation canal Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated High potential for archeological resource impacts in areas of undisturbed soils Option A: Would require extension of existing box culvert and modifications to the irrigation canal Option B: If bridge can be shifted outside the path of Kane Creek, it will have fewer impacts to Kane Creek but require more ROW 	<ul style="list-style-type: none"> Option A: \$1,470,000 Option B: \$4,190,000 - \$7,579,000 Does not include utility relocation, hazardous materials, or ROW
40-R2	Southbound On-ramp	Extend length of southbound On-ramp	Provide adequate acceleration distance	<ul style="list-style-type: none"> On-ramp ADT (vpd): Existing – 1,800; Future (2038) – 2,250 Critical movement (EB L/T/R) V/C: Existing – 0.20; Future (2038) – 0.24 Critical movement (EB L/T/R) LOS: Existing – B; Future (2038) – C 3 crashes during 5-year analysis period: minor injury (1), PDO (2) No change to ramp capacity or I-5 merge operations Additional length (compared to today) for larger vehicles to get up to speed 	<ul style="list-style-type: none"> On-ramp has single 17' lane Current acceleration length is 700' and taper is 225' Desired acceleration length is 1,100' and taper is 300' Improvements anticipated to be within ODOT ROW 	<ul style="list-style-type: none"> Existing zoning is EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed No nearby natural features, or anticipated land use or environmental impacts Additional stormwater treatment may be needed with increased impervious surface Environmental concerns include the adjacent fish bearing stream and wetlands No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> \$850,000 Does not include utility relocation, hazardous materials, or ROW
40-R3	Southbound Ramp Terminal	Modify northeast corner of ramp terminal intersection to improve truck mobility (SBL, EBL)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> Off-ramp ADT (vpd): Existing – 750; Future (2038) – 900 Access Road ADT (vpd): Existing – 2,550 to 3,800, Future (2038) – 3,200 to 4,750 Critical movement (EB L/T/R) V/C: Existing – 0.20; Future (2038) – 0.24 Critical movement (EB L/T/R) LOS: Existing – B; Future (2038) – C No crashes reported during 5-year analysis period No change to roadway capacity/operations Would improve overall safety Would make truck turning and acceleration easier Increased exposure time for bicycle and pedestrian traffic traveling along east side of Access Road 	<ul style="list-style-type: none"> On and off-ramps each have single ~16' travel lane Access Road has paved surface of 24'–34' Constructible within the available ROW (northeast corner) Significant fill needed for steep slopes on Access Road and the southbound On-ramp 	<ul style="list-style-type: none"> Existing zoning is EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed Would facilitate access to future intermodal hub, interchange commercial, and/or nearby industrial development No nearby environmental resources High potential for archeological resource impacts in areas of undisturbed soils Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> \$110,000 Does not include utility relocation, hazardous materials, or ROW
40-R4	Northbound Off-ramp	Extend length of northbound off-ramp	Provide adequate deceleration distance	<ul style="list-style-type: none"> Off-ramp ADT (vpd): Existing – 2,300; Future (2038) – 2,900 Critical movement (WB L/T/R) V/C: Existing – 0.29; Future (2038) – 0.41 Critical movement (WB L/T/R) LOS: Existing – B; Future (2038) – B 5 crashes during 5-year analysis period, resulting in minor injuries (4) and PDO (1) No change to ramp capacity/operations Would provide additional queue storage Would enhance driver comfort during deceleration 	<ul style="list-style-type: none"> Off-ramp has single 16' lane Current deceleration length is 200' and no taper Desired deceleration length is 460' and taper 360' Includes guardrail Improvements anticipated to be within ODOT ROW 	<ul style="list-style-type: none"> Existing zoning is rural residential Nearby Kane Creek; no impacts anticipated Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> \$620,000 Does not include utility relocation, hazardous materials, or ROW

I-5 Exit 40 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1,2,3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
40-R5	Northbound On-ramp	Extend length of northbound On-ramp	Provide adequate acceleration distance	<ul style="list-style-type: none"> ▪ On-ramp ADT (vpd): Existing – 1,000; Future (2038) – 1,300 ▪ Critical movement (WB L/T/R) V/C: Existing – 0.29; Future (2038) – 0.41 ▪ Critical movement (WB L/T/R) LOS: Existing – B; Future (2038) – B ▪ 1 crash during 5-year analysis period: PDO ▪ No change to ramp capacity or I-5 merge operations ▪ Additional length (compared to today) for larger vehicles to get up to speed 	<ul style="list-style-type: none"> ▪ On-ramp has single 17' lane ▪ Current acceleration length is 765' and taper is 190' ▪ Desired acceleration length is 1,100' and taper is 295' ▪ Additional ROW needed for improvement ▪ Includes guardrail and drainage system 	<ul style="list-style-type: none"> ▪ Existing zoning is rural residential; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed ▪ Nearby Kane Creek; no impacts anticipated ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$1,100,000 ▪ <u>Includes drainage</u> ▪ Does not include utility relocation, hazardous materials, or ROW
40-R6	Northbound Ramp Terminal	Modify southwest corner of ramp terminal intersection to better accommodate truck movements (NBL)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 2,250, Future (2038) – 2,800 ▪ Access Road ADT (vpd): Existing – 3,800 to 5,450, Future (2038) – 4,750 to 6,800 ▪ Critical movement (WB L/T/R) V/C: Existing – 0.29; Future (2038) – 0.41 ▪ Critical movement (WB L/T/R) LOS: Existing – B; Future (2038) – B ▪ 7 crashes during 5-year analysis period: 1 serious injury ▪ Observed crash rate exceeds statewide critical crash rate ▪ No change to roadway capacity/operations ▪ Would improve overall safety ▪ Would make truck turning and acceleration easier 	<ul style="list-style-type: none"> ▪ On and off-ramps each have single 16' travel lane ▪ Access Road has paved surface of 24'–34' ▪ Includes guardrail ▪ Constructible within the available ROW (southwest corner) 	<ul style="list-style-type: none"> ▪ Existing zoning is rural residential ▪ High potential for archeological resource impacts in areas of undisturbed soils ▪ Would facilitate access to future intermodal hub, interchange commercial, and/or nearby industrial development ▪ No documented nearby environmental features ▪ Additional stormwater treatment needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$160,000 ▪ Does not include utility relocation, hazardous materials, or ROW
40-R7	Southbound Off-ramp	Move guardrail	Improve sight distance	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 750; Future (2038) – 900 ▪ Critical movement (EB L/T/R) V/C: Existing – 0.20; Future (2038) – 0.24 ▪ Critical movement (EB L/T/R) LOS: Existing – B; Future (2038) – C ▪ 1 fatal crash during 5-year analysis period ▪ No change to ramp capacity/operations ▪ Would provide additional sight distance for vehicles on southbound off-ramp; may decrease eastbound delay 	<ul style="list-style-type: none"> ▪ Off-ramp has single 16' lane ▪ Current sight distance for vehicles on the southbound off-ramp looking left (north) at oncoming traffic on Access Road is limited by guardrail ▪ Improvements anticipated to be within ODOT ROW 	<ul style="list-style-type: none"> ▪ Existing zoning is rural residential, and EFU; EFU impacts would necessitate determination whether a Statewide Planning Goal Exception is needed ▪ High potential for archeological resource impacts in areas of undisturbed soils ▪ Nearby Kane Creek and ditch/irrigation canal ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$239,000 ▪ Does not include utility relocation, hazardous materials, or ROW

I-5 Exit 40 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1,2,3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
INTERSECTION IMPROVEMENTS							
40-11	2 nd Avenue / OR 99 and Blackwell Road at Access Road	<p>Modify intersection</p> <ul style="list-style-type: none"> Option A: Modify traffic control to all-way STOP Option B: Modify traffic control to all-way STOP and add westbound left-turn lane Option C: Realign Access Road to create a standard 4-legged intersection, all-way STOP control 	Better facilitate turning movements and pedestrian crossing	<ul style="list-style-type: none"> Blackwell Road ADT (vpd): Existing – 2,500; Future (2038) – 3,500 2nd Avenue ADT (vpd): Existing – 5,800; Future (2038) – 6,500 Access Road ADT (vpd): Existing – 5,500; Future (2038) – 6,800 Critical movement (NB L/R) V/C: Existing – 0.55; Future – 0.76 Critical movement (NB L/R) LOS: Existing – C; Future – D Critical movement (NB L/R) Queue: Existing – 125'; Future – 175' 4 crashes during 5-year analysis period, including 3 minor injury Roadway user needs vary at intersection: rural section (to east), narrow bridge (to west), heavy recreational traffic, all modes <p><u>Option A:</u></p> <ul style="list-style-type: none"> Critical movement (NB L/R) V/C: Existing – 0.44; Future – 0.55 All-way STOP LOS: Existing – B; Future – B Critical movement (NB L/R) Queue: Existing – 100'; Future – 125' Stopping traffic on 2nd Avenue/OR 99 and Blackwell Road may facilitate posted speed transition but may result in more rear-end collisions Pedestrian/bicycle crossings easier with traffic stopped on 2nd Avenue/OR 99 and Blackwell Road <p><u>Option B:</u></p> <ul style="list-style-type: none"> Critical movement (NB L/R) V/C: Existing – 0.44; Future – 0.55 All-way STOP LOS: Existing – B; Future – B Critical movement (NB L/R) Queue: Existing – 100'; Future – 100' Left-turn lane criteria evaluated and met (ODOT-TPAU) Left-turn lane on Blackwell Road improves safety by separating turns from through traffic Other benefits and concerns with all-way STOP same as Option A <p><u>Option C:</u></p> <ul style="list-style-type: none"> Critical movement (NB L/T/R) V/C: Existing – 0.44; Future – 0.55 All-way STOP LOS: Existing – B; Future – B Critical movement (NB L/R) Queue: Existing – 100'; Future – 125' Realignment would improve driver expectation Realignment would decrease safety concerns associated with offset intersection Other benefits and concerns with all-way STOP same as Option A 	<ul style="list-style-type: none"> Existing travel lanes: 11-12' (all roadways) Existing shoulder width: 0'-2' (all roadways- most sections) Existing paved width: 24'-34' (all roadways); ROW: 80' (2nd Avenue), 83' (Blackwell Road), 40' (Access Road) <p><u>Option A:</u></p> <ul style="list-style-type: none"> Same as above <p><u>Option B:</u></p> <ul style="list-style-type: none"> Add 14' left-turn lane on Blackwell Road Widen shoulders to 8' on Blackwell Road and 12' on 2nd Avenue Assumes equal widening to each side Significant fill needed for steep slopes on both sides of 2nd Avenue/OR 99 and Blackwell Road for turn lane and shoulder widening Would require restriping and additional signage ROW impacts anticipated <p><u>Option C:</u></p> <ul style="list-style-type: none"> Significant fill needed for steep slopes on both sides of 2nd Avenue/OR 99 and Blackwell Road for rebuild/realignment of Access Road Assumes wide enough to accommodate either left or right northbound turn lanes ROW impacts anticipated in southwest corner 	<ul style="list-style-type: none"> Existing zoning is rural residential and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed No environmental resource in immediate vicinity <p><u>Option A:</u></p> <ul style="list-style-type: none"> No land use or environmental impacts Improved pedestrian access generally benefits socioeconomically disadvantaged populations <p><u>Option B:</u></p> <ul style="list-style-type: none"> Potential land use impacts (EFU lands) No nearby natural elements or environmental impacts identified Additional stormwater treatment may be needed with increased impervious surface Improved pedestrian access generally benefits socioeconomically disadvantaged populations <p><u>Option C:</u></p> <ul style="list-style-type: none"> Similar impacts as Option B, though more significant due to large fill required for realignment 	<ul style="list-style-type: none"> Option A: \$10,000 Option B: \$850,000 Option C: \$711,000 Does not include utility relocation, hazardous materials, or ROW
40-12	2 nd Avenue / OR 99 and Blackwell Road at Access Road	Modify southwest corner of intersection to better accommodate truck movements (EBR)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> Blackwell Road ADT (vpd): Existing – 2,500; Future (2038) – 3,500 2nd Avenue ADT (vpd): Existing – 5,800; Future (2038) – 6,500 Access Road ADT (vpd): Existing – 5,500; Future (2038) – 6,800 Critical movement (NB L/R) V/C: Existing – 0.55; Future – 0.76 Critical movement (NB L/R) LOS: Existing – C; Future – D 4 crashes during 5-year analysis period, including 3 minor injury No change to roadway capacity/operations Would improve overall safety Would make truck turning and acceleration easier Adverse impacts for non-auto users (higher speed turning movement) 	<ul style="list-style-type: none"> Existing travel lanes: 11-12' (all roadways) Existing shoulder width: less than 2' (all roadways) Improved corner shoulder width: 12' (2nd Avenue (OR 99)/Access Road) Existing paved width: 24'-28' (all roadways) ROW: 80' (2nd Avenue), 83' (Blackwell Road), 40' (Access Road) Appears constructible within the available ROW Includes guardrail Significant fill needed for steep slopes: Access Road and 2nd Avenue (OR 99) 	<ul style="list-style-type: none"> Existing zoning is rural residential and EFU Potential impacts to adjacent rural residential lands from fill Would facilitate access to future intermodal hub, interchange commercial, and/or nearby industrial development Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> \$225,000 Does not include utility relocation, hazardous materials, stormwater treatment, or ROW

I-5 Exit 40 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1,2,3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
40-13	Access Road at Old Stage Road	Modify northwest and southwest corners of intersection to better accommodate truck movements (SBR, NBL, and EBR)	Provide adequate turning radii for WB-67	<ul style="list-style-type: none"> Access Road ADT (vpd): Existing – 2,550; Future (2038) – 3,200 Old Stage Rd ADT (vpd): Existing – 400; Future (2038) – 450 Critical movement (EB L/R) V/C: Existing – 0.07; Future – 0.07 Critical movement (EB L/R) LOS: Existing – B; Future – B No crashes reported during 5-year analysis period No change to roadway capacity/operations Would improve overall safety Would make truck turning and acceleration easier Adverse impacts for non-auto users (higher speed turning movement) 	<ul style="list-style-type: none"> Existing travel lanes: 12' (Access Road); 10' (Old Stage Road) Existing shoulder: 0–5' (Access Road); 0' (Old Stage Road) Improved corner shoulder width: 12' (Access Road/Old Stage Road) Existing paved width: 24'–34' (Access Road); 21' (Old Stage Road) ROW: 70'+ (Access Road); 65'+ (Old Stage Road) Constructible within the available ROW <p><i>Note: Geometric data from Technical Memorandum #3, based on ODOT Roadway Inventory report (2012). Since then, intersection and roadway have been modified as part of the Kane Creek Fish Passage project.</i></p>	<ul style="list-style-type: none"> Existing zoning is EFU, interchange commercial Potential impacts to adjacent lands (EFU) – may need to consider Statewide Planning Goals Would facilitate access to interchange commercial and/or nearby industrial development Nearby Kane Creek, though no environmental impacts anticipated Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> Northwest: \$165,000 Southwest: \$115,000 Does not include utility relocation, hazardous materials, or ROW
MULTIMODAL IMPROVEMENTS							
40-MM1	Access Road	Widen to provide 6' shoulders between Blackwell Road and Lampman Road	Provide facilities for all modes of travel, enhance access to the city, and improve safety	<ul style="list-style-type: none"> Access Road ADT (vpd): Existing – 5,500; Future (2038) – 6,800 No change to roadway capacity/operations 2 crashes during 5-year analysis period, including 3 minor injury No non-motorized crashes during 5-year analysis period Project could connect other multimodal facilities Improved level of service/experience/connectivity for non-motorized users 	<ul style="list-style-type: none"> Existing travel lanes: 12' (Access Road) Existing shoulder: 0–5' Improved shoulder width: 5' Existing paved width: 24'–34' (Access Road) ROW: 50'+ ROW required The guardrail at the intersection between Access Road and Lampman Road will need to be shifted <p><i>Note: Geometric data from Technical Memorandum #3, based on ODOT Roadway Inventory report (2012). Since then, intersection and roadway have been modified as part of the Kane Creek Fish Passage project.</i></p>	<ul style="list-style-type: none"> Adjacent lands are zoned rural residential; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed There is an irrigation channel crossing Access Road where the culvert would have to be extended Additional stormwater treatment may be needed with increased impervious surface Improved non-motorized connectivity generally benefits socioeconomically disadvantaged populations High potential for archeological resource impacts in areas of undisturbed soils 	<ul style="list-style-type: none"> \$924,000 Includes culvert extension Does not include utility relocation, hazardous materials, or ROW
40-MM2	Blackwell Road (OR 99)	Provide access for all modes of travel between Access Road and KOA campground: <ul style="list-style-type: none"> Option A: Widen to provide 6' shoulders Option B: Widen to provide a 10' multiuse path 	Provide facilities for all modes of travel, enhance access to the city and downtown environment, and improve safety	<ul style="list-style-type: none"> Blackwell Road ADT (vpd): Existing – 2,500; Future (2038) – 3,500 No change in vehicular capacity or operations Crash data not assessed east of Access Road <p>Option A:</p> <ul style="list-style-type: none"> Provides shoulders to rural County standard Enhances safety with better separation of modes Provides access for all modes on both sides of Blackwell Road Project could connect other multimodal facilities Improved level of service/experience/connectivity for non-motorized users <p>Option B:</p> <ul style="list-style-type: none"> Multiuse path separates traffic modes, improving overall safety Consistent with the Oregon Bicycle and Pedestrian Design Guidelines recommendations 	<ul style="list-style-type: none"> Existing travel lanes: 12' Existing shoulder width: 2' Existing paved width: 28' Existing drainage ditches on both sides ROW: 83' <p>Option A:</p> <ul style="list-style-type: none"> Improved shoulder width: 6' May require ROW acquisition <p>Option B:</p> <ul style="list-style-type: none"> 10' multi-use path on south side with 3' gravel shoulders Steep drainage ditches May require ROW acquisition 	<ul style="list-style-type: none"> For Option A, there is an irrigation channel crossing Blackwell Road where the culvert would have to be extended For Option B, the multi-use path would need a new culvert to cross the existing irrigation channel Existing zoning rural residential; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed Potential impacts to adjacent lands Additional stormwater treatment may be needed with increased impervious surface Improved pedestrian access generally benefits socioeconomically disadvantaged populations 	<ul style="list-style-type: none"> Option A: \$510,000 Option B: \$215,000 Does not include utility relocation, hazardous materials, or ROW

Notes:

- Traffic operations were evaluated for concepts that were identified to address operational deficiencies. The operational assessment focuses on the volume-to-capacity (v/c) ratio for the 2012 existing and 2038 future condition.
 - At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed.
 - Some improvements are focused on addressing safety concerns or may address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2007 through 2011) are discussed for those improvements that address safety.
 - Illustrations were developed for concepts that involve infrastructure improvements.
 - Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.
 - Rough order of magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor but do not include right-of-way costs. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each project.
- General Notes: ADT = Average Daily Traffic; NB = northbound; SB = southbound; EB = eastbound; WB = westbound; R = right; L = left; T = through; vpd = vehicles per day; LOS = level of service; ROW = right-of-way; EFU = Exclusive Farm Use; PDO = property damage only; TPAU = Transportation Planning Analysis Unit.

I-5 Exit 43 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1, 2, 3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
INTERCHANGE RAMP IMPROVEMENTS							
43-R1	Southbound Off-ramp	Extend length of southbound off-ramp	Provide adequate deceleration distance	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 500, Future (2038) – 600 ▪ Critical movement (EB L/T/R) V/C: Existing – 0.07; Future (2038) – 0.07 ▪ Critical Movement (EB L/T/R) LOS: Existing – A; Future (2038) – A ▪ 4 crashes during 5-year analysis period, resulted in minor injury (2), PDO (2) ▪ No change to ramp capacity/operations ▪ Would provide additional queue storage ▪ Would enhance driver comfort during deceleration 	<ul style="list-style-type: none"> ▪ Off-ramp has single 16' lane ▪ Current deceleration length is 280' ▪ Desired deceleration length is 345' ▪ Improvements anticipated to be within ODOT ROW 	<ul style="list-style-type: none"> ▪ Existing is rural residential, rural light industrial, and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) ▪ High potential for archeological resource impacts in areas of undisturbed soils ▪ Nearby West Valley Wildlife Area; no impacts anticipated ▪ Unknown hazardous waste site near off-ramp diverge from I-5; additional investigation needed ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$370,000 ▪ Does not include utility relocation, hazardous materials, or ROW
43-R2	Southbound Ramp Terminal	Modify southwest corner of ramp terminal intersection to better accommodate truck movements (EBR)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 500; Future (2038) – 600 ▪ Main Street ADT (vpd): Existing – 250 to 700; Future (2038) – 300 to 900 ▪ Critical movement (EB L/T/R) V/C: Existing – 0.07; Future (2038) – 0.07 ▪ Critical movement (EB L/T/R) LOS: Existing – A; Future (2038) – A ▪ No crashes reported during 5-year analysis period ▪ No change to roadway capacity/operations ▪ Would improve overall safety ▪ Would make truck turning and acceleration easier 	<ul style="list-style-type: none"> ▪ Off-ramp is single 16' lane ▪ Widen section of roadway between the southbound off-ramp and Profetta Lane up to 28' ▪ Constructible within the available ROW (southwest corner) 	<ul style="list-style-type: none"> ▪ Existing zoning is EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) ▪ High potential for archeological resource impacts in areas of undisturbed soils ▪ Would facilitate access to interchange commercial and light industrial lands on Frontage Road/Profetta Lane ▪ Nearby West Valley Wildlife Area; no impacts anticipated ▪ Unknown hazardous waste site near off-ramp diverge from I-5; additional investigation needed ▪ Additional stormwater treatment needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$150,000 ▪ Does not include utility relocation, hazardous materials, or ROW
43-R3	Northbound Off-ramp	Extend length of northbound off-ramp	Provide adequate deceleration distance	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 300; Future (2038) – 350 ▪ Critical movement (WB L/T/R) V/C: Existing – 0.03; Future (2038) – 0.04 ▪ Critical movement (WB L/T/R) LOS: Existing – A; Future (2038) – A ▪ 0 crashes during 5-year analysis period ▪ No change to ramp capacity/operations ▪ Would provide additional queue storage ▪ Would enhance driver comfort during deceleration 	<ul style="list-style-type: none"> ▪ Off-ramp has single 16' lane ▪ Current deceleration length is 305' and taper is 187' ▪ Desired deceleration length is 345' and taper is 215' ▪ Includes guardrail ▪ Improvements anticipated to be within ODOT ROW 	<ul style="list-style-type: none"> ▪ Existing zoning is EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) ▪ High potential for archeological resource impacts in areas of undisturbed soils ▪ Nearby Rogue River; no impacts anticipated ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$550,000 ▪ Does not include utility relocation, hazardous materials, or ROW
43-R4	Northbound Ramp Terminal (I-5 and Main Street)	Modify northeast corner of ramp terminal intersection to better accommodate truck movements (WBR)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> ▪ Off-ramp ADT (vpd): Existing – 300; Future (2038) – 350 ▪ Main Street ADT (vpd): Existing – 750 to 1,250; Future (2038) – 900 to 1,500 ▪ Critical movement (WB L/T/R) V/C: Existing – 0.03; Future (2038) – 0.04 ▪ Critical movement (WB L/T/R) LOS: Existing – A; Future (2038) – A ▪ No crashes reported during 5-year analysis period ▪ No change to roadway capacity/operations ▪ Would improve overall safety ▪ Would make truck turning and acceleration easier 	<ul style="list-style-type: none"> ▪ Off-ramp is single 16' lane ▪ Widen section of roadway between the northbound off-ramp and Rogue River Highway up to 17' ▪ Constructible within the available ROW (northeast corner) 	<ul style="list-style-type: none"> ▪ Existing zoning is interchange commercial and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) ▪ Would facilitate access to interchange commercial Rogue River Highway ▪ Nearby Rogue River and freshwater emergent wetlands; no impacts anticipated ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$60,000 ▪ Does not include utility relocation, hazardous materials, or ROW

I-5 Exit 43 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1, 2, 3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
INTERSECTION IMPROVEMENTS							
43-11	Rogue River Highway (OR 99) at Main Street	Enhance pedestrian access and modify traffic control <u>Option A:</u> <ul style="list-style-type: none"> ▪ Add pedestrian crossing on west side and signage ▪ Maintain existing unconventional STOP control at intersection <u>Option B:</u> <ul style="list-style-type: none"> ▪ Modify intersection traffic control (change to all-way STOP) ▪ Add crosswalk at intersection 	Provide facilities for all modes of travel	<ul style="list-style-type: none"> ▪ Main Street ADT (vpd): Existing – 1,250; Future (2038) – 1,500 ▪ Rogue River Highway ADT (vpd): Existing – 400 to 1,800, Future (2038) – 450 to 2,150 ▪ Critical movement (NB L/R) V/C: Existing – 0.09; Future (2038) – 0.09 ▪ Critical movement (NB L/R) LOS: Existing – A; Future (2038) – A ▪ Critical movement (NB L/R) Queue: Existing – 50'; Future (2038) – 50' ▪ 0 crashes during 5-year analysis period ▪ Would improve overall safety <u>Option A:</u> <ul style="list-style-type: none"> ▪ Operations: Existing NB V/C – 0.09; Future NB V/C – 0.09 ▪ Provides a designated crossing area for pedestrians crossing roadway to improve safety; however, may provide a false sense of security ▪ Crosswalks not typical at rural intersections <u>Option B:</u> <ul style="list-style-type: none"> ▪ All-way STOP: Existing WB V/C – 0.13; Future WB V/C – 0.15 ▪ Critical movement (NBL) Queue: Existing – 50'; Future (2038) – 50' ▪ Conventional STOP control conducive to driver expectation and indicator of changing roadway conditions ▪ Other benefits and concerns are the same as Option A 	<ul style="list-style-type: none"> ▪ Number of existing travel lanes (Rogue River Highway and Main Street): 2 ▪ Existing travel lanes width (both roadways): 12' ▪ Existing shoulder width: 2' (minimum) ▪ Existing paved width (both roadways): 18'–38' ▪ No additional ROW needed for either option (A or B) 	<ul style="list-style-type: none"> ▪ Existing zoning rural residential, interchange commercial, EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) ▪ No land use or environmental resource impacts ▪ Improved pedestrian access generally benefits socioeconomically disadvantaged populations 	<ul style="list-style-type: none"> ▪ <u>Option A:</u> \$7,000 ▪ <u>Option B:</u> \$10,000 ▪ Does not include utility relocation, hazardous materials, or ROW
43-12	Rogue River Highway (OR 99) at Main Street	Modify southwest corner of intersection to better accommodate truck movements (EBR)	Provide adequate turning radius for WB-67	<ul style="list-style-type: none"> ▪ Main Street ADT (vpd): Existing – 1,250; Future (2038) – 1,500 ▪ Rogue River Highway ADT (vpd): Existing – 400 to 1,800; Future (2038) – 450 to 2,150 ▪ Critical movement (NB L/R) V/C: Existing – 0.09; Future (2038) – 0.09 ▪ Critical movement (NB L/R) LOS: Existing – A; Future (2038) – A ▪ 0 crashes during 5-year analysis period ▪ No change to roadway capacity/operations ▪ Would improve overall safety ▪ Would make truck turning and acceleration easier 	<ul style="list-style-type: none"> ▪ Number of existing travel lanes (Rogue River Highway and Main Street): 2 ▪ Existing travel lanes width (both roadways): 12' ▪ Existing shoulder width (minimum): 2' ▪ Existing paved width (both roadways): 18'–38' ▪ May require additional ROW (southwest corner) ▪ Nearby utility corridor 	<ul style="list-style-type: none"> ▪ Existing zoning rural residential, interchange commercial, EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed ▪ Additional ROW needed on southwest corner (interchange commercial zoning) ▪ Would facilitate access to interchange commercial ▪ Nearby freshwater emergent wetlands; no impact anticipated ▪ Additional stormwater treatment may be needed with increased impervious surface ▪ No socioeconomic impacts anticipated 	<ul style="list-style-type: none"> ▪ \$160,000 ▪ Does not include utility relocation, hazardous materials, or ROW

I-5 Exit 43 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1,2,3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
43-13	Rogue River Highway (OR 99/2 nd Avenue) at N. River Road	Improve intersection function <u>Option A:</u> <ul style="list-style-type: none"> Modify southwest corner of intersection to better accommodate truck movements (EBL) <u>Option B:</u> <ul style="list-style-type: none"> Option A improvements Intersection realignment Modify intersection traffic control 	Provide facilities for all modes of travel including WB-67	<ul style="list-style-type: none"> N River Road ADT (vpd): Existing – ~1,100; Future (2038) – ~1,200 Rogue River Highway ADT (vpd): Existing – ~1,600 to 2,300; Future (2038) – ~1,900 to 2,700 Critical movement (NBL) V/C: Existing – 0.08; Future (2038) – 0.09 Critical movement (NBL) LOS: Existing – A; Future (2038) – A Critical movement (NBL) Queue: Existing – 25'; Future (2038) – 25' 0 crashes during 5-year analysis period <u>Option A:</u> <ul style="list-style-type: none"> Operations: Existing EB V/C – 0.05; Future NB V/C – 0.06 No change to roadway capacity/operations Would make eastbound truck turning and acceleration easier Increased turning speeds would be less safe for non-auto users Would reduce speed for majority of movements and improve overall safety <u>Option B:</u> <ul style="list-style-type: none"> Side street STOP: Existing NBL/T V/C – 0.07; Future NB V/C – 0.09 Critical movement (NBL) Queue: Existing – 25'; Future (2038) – 50' Would make truck turning and acceleration easier Conventional STOP control conducive to driver expectation and indicator of changing roadway conditions, though 45 mph speed is a concern Could add later phase to provide a left-turn refuge lane for westbound traffic Potential increase in the number of rear-end collisions 	<ul style="list-style-type: none"> Existing travel lanes: 12' (both roadways) Existing shoulder width: 0' (N. River Road) to 2' (Rogue River Highway) Existing paved width: 24' (N. River Road); 18' to 38' (Rogue River Highway) Physical constraints: utility corridor, railroad tracks, and historic Rogue River Bridge <u>Option A:</u> <ul style="list-style-type: none"> Modifications to southwest corner Some fill may be needed to increase turning radius May require additional ROW <u>Option B:</u> <ul style="list-style-type: none"> Changes to southwest corner the same as for Option A Potential reduction in paved surface on southeast corner with intersection realignment 	<ul style="list-style-type: none"> Existing zoning is rural residential and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed <u>Option A:</u> <ul style="list-style-type: none"> Potential land use impacts; consideration of Statewide Planning Goals may be needed Near Rogue River; 2 classified habitats that need to be considered Nearby Sardine Creek Wildlife area Any impact to the new multi-use path could trigger Section 6(f) concerns. Additional stormwater treatment may be needed with increased impervious surface No socioeconomic impacts anticipated <u>Option B:</u> <ul style="list-style-type: none"> Changes to southwest corner the same as for Option A Potential pavement reduction on southeast corner could offset added pavement on southwest corner Improved pedestrian access generally benefits socioeconomically disadvantaged populations 	<ul style="list-style-type: none"> <u>Option A:</u> \$220,000 <u>Option B:</u> \$230,000 Does not include utility relocation, hazardous materials, or ROW
MULTIMODAL IMPROVEMENTS							
43-MM1	IMSA Roadways (Main Street and Rogue River Highway)	Enhance multimodal access between I-5 and the City of Gold Hill <u>Option A:</u> <ul style="list-style-type: none"> Add signage to travel lanes <u>Option B:</u> <ul style="list-style-type: none"> Widen shoulders (to 8' on both sides) along Rogue River Highway where ROW exists (spot treatments); install guardrail <u>Option C:</u> <ul style="list-style-type: none"> Add Option A signage Add activated warning lights 	Provide facilities for all modes of travel	<ul style="list-style-type: none"> Main Street ADT (vpd): Existing – 200 to 1,300; Future (2038) – 200 to 1,500 Rogue River Highway ADT (vpd): Existing – 1,600 to 2,300; Future (2038) – 1,900 to 2,700 Posted speed: 45 mph (Rogue River Highway); Main Street speed is not posted 2 crashes (Rogue River Highway) reported during 5-year analysis period, both PDO <u>Option A:</u> <ul style="list-style-type: none"> No change to roadway capacity/operations Occasional slowing of traffic when a bicycle is present and increased driver awareness <u>Option B:</u> <ul style="list-style-type: none"> No change to roadway capacity/operations Wider shoulders on Rogue River Highway would separate non-motorized traffic from travel lane Would allow motorized traffic to pass non-motorized traffic more easily (except on the bridge) <u>Option C:</u> <ul style="list-style-type: none"> Same as Option A 	<ul style="list-style-type: none"> Existing travel lanes: 9'–14' Existing shoulder width: 0–5' Existing paved width: 18'–38' <u>Option A:</u> <ul style="list-style-type: none"> Would maintain existing paved section and ROW <u>Option B:</u> <ul style="list-style-type: none"> Would widen the paved roadway to the south in spot locations along Rogue River Highway; within existing ROW <u>Option C:</u> <ul style="list-style-type: none"> Would maintain existing paved section and ROW 	<ul style="list-style-type: none"> Existing zoning is rural residential, interchange commercial, and EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed (no ROW impacts anticipated) <u>All Options:</u> <ul style="list-style-type: none"> Improved pedestrian/bicycle access generally benefits socioeconomically disadvantaged populations <u>Option A:</u> <ul style="list-style-type: none"> No impacts anticipated <u>Option B:</u> <ul style="list-style-type: none"> Rogue River and freshwater emergent wetlands are in proximity to Rogue River Highway (to the north); impacts not anticipated Additional stormwater treatment may be needed with increased impervious surface <u>Option C:</u> <ul style="list-style-type: none"> No impacts anticipated 	<ul style="list-style-type: none"> <u>Option A:</u> \$15,000 (signage - Main Street and Rogue River Highway) <u>Option B:</u> \$450,000 <u>Option C:</u> \$50,000 per warning light installation

I-5 Exit 43 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety ^{1,2,3}	Basic Roadway Geometries and Right-of-Way ⁴	Environmental and Land Use ⁵	Cost Opinion ⁶
43-MM2	Rogue River Highway (Rock Point Bridge, 00332A)	Enhance multimodal access across the Rock Point Bridge <u>Option A:</u> ▪ Add signage on the bridge <u>Option B:</u> ▪ Construct 8' cantilevered path on both sides <u>Option C:</u> ▪ Build a parallel structure directly north of the Main Street/Rogue River Highway intersection and connecting to N. River Road <u>Option D:</u> ▪ Similar to Option C, but would serve all modes of traffic	Provide facilities for all modes of travel	<ul style="list-style-type: none"> Rogue River Highway ADT (vpd): Existing – ~1,600; Future (2038) – ~1,900 No documented crash patterns on Rogue River Highway <u>Option A:</u> <ul style="list-style-type: none"> No change to roadway capacity/operations Would increase driver awareness of non-auto travel <u>Option B:</u> <ul style="list-style-type: none"> Would improve overall safety by separating travel modes <u>Option C:</u> <ul style="list-style-type: none"> Would have significant impacts on non-auto circulation and operations at Main Street/Rogue River Highway intersection and also the new intersection with River Road Would separate modes of traffic by providing dedicated facilities to cross the river for non-motorized users Would increase safety for vulnerable users <u>Option D:</u> <ul style="list-style-type: none"> Would have significant impacts on circulation (all modes) and operations at Main Street/Rogue River Highway intersection and also the new intersection with River Road Enhanced freight and emergency vehicle access 	<ul style="list-style-type: none"> Existing travel lanes: 9' Existing shoulder width: none Existing structure width: 19'–20' <u>Option A:</u> <ul style="list-style-type: none"> No change to roadway Improvements anticipated to be within ODOT ROW <u>Option B:</u> <ul style="list-style-type: none"> No change to roadway Cantilevered path would be 8' Widening has not been assessed for structural viability Need to further consider safe transitions at each end of the bridge and connection to Rogue River Greenway Improvements anticipated to be within ODOT ROW <u>Option C:</u> <ul style="list-style-type: none"> No change to bridge Separate facilities for non-motorized traffic New structure assumed to 270' long, 15' wide (10' path, 2' shy each side, and railing) Assumed to be located directly north of Main Street and connect to N. River Road Significant ROW impacts, to be determined at time of design <u>Option D:</u> <ul style="list-style-type: none"> No change to bridge Separate facilities for non-motorized traffic Assumed to be located directly north of Main Street and connect to N. River Road Significant ROW impacts, to be determined at time of design 	<ul style="list-style-type: none"> Existing zoning is EFU near existing bridge with interchange commercial and rural residential near Main Street; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed <u>All Options:</u> <ul style="list-style-type: none"> Improved pedestrian access generally benefits socioeconomically disadvantaged populations Section 106 Determination of Effect would be required for all four options <u>Option A:</u> <ul style="list-style-type: none"> See impacts to “all options” <u>Option B:</u> <ul style="list-style-type: none"> Would affect the aesthetics and historical nature of the bridge Would require work over the Rogue River Additional stormwater treatment may be needed with increased impervious surface <u>Option C:</u> <ul style="list-style-type: none"> Potential land use impacts; determination of whether Statewide Planning Goal Exception is needed Environmental concerns include the adjacent fish-bearing stream and wetlands Environmental permitting Would require work over the Rogue River and freshwater emergent wetlands Additional stormwater treatment may be needed with increased impervious surface Air quality and noise analysis may be needed <u>Option D:</u> <ul style="list-style-type: none"> Similar to Option C 	<ul style="list-style-type: none"> <u>Option A:</u> \$1,500 <u>Option B:</u> \$1,000,000 <u>Option C:</u> \$1,500,000 <u>Option D:</u> not estimated at this time Does not include utility relocation, hazardous materials, or ROW
43-MM3	Profetta Lane to Old Stage Road – I-5 Alternative Multitmodal Crossing	Provide alternate multimodal crossing of I-5 with multi-use path connection	Provide facilities across I-5 for all modes of travel	<ul style="list-style-type: none"> Profetta Lane ADT (vpd): Existing – <100; Future (2038) – <100 Main Street ADT (vpd): Existing – 200 to 1,300; Future (2038) – 200 to 1,500 Lampman Road and Old Stage Road ADT, V/C, and LOS were not collected as part of this project near the proposed improvement area No documented crash patterns on Profetta Lane, Old Stage Road or Lampman Rd near planned improvement area Multi-use path would provide an alternative multimodal access across I-5 without rebuilding Exit43 The underpass that connects Old Stage Road to Lampman Road would also need to incorporate a way for users of the multi-use path to safely enter the underpass (e.g., additional signage or overpass widening) 	<ul style="list-style-type: none"> Existing travel lanes: 12' (Main Street) Existing shoulder: 1'–2' (Main Street) Existing unpaved path may not provide sufficient width for a multi-use path Widening requires slope stabilization down to I-5 Fence and safety rail would be needed Potential ROW impacts on Lampman Road 	<ul style="list-style-type: none"> Existing zoning is EFU; new ROW would necessitate determination of whether a Statewide Planning Goal Exception is needed Additional stormwater treatment may be needed with increased impervious surface The existing pavement on Old Stage Road is also the beginning of a residential area Improved pedestrian access generally benefits socioeconomically disadvantaged populations 	<ul style="list-style-type: none"> \$470,000 Does not include utility relocation, hazardous materials, or ROW Does not include improvements to underpass

Notes:

- Traffic operations were evaluated for concepts that were identified to address operational deficiencies. The operational assessment focuses on the volume-to-capacity (v/c) ratio for the 2012 existing condition and the 2038 future condition.
 - At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed.
 - Some improvements are focused on addressing safety concerns or may address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2007 through 2011) are discussed for those improvements that address safety.
 - Illustrations were developed for concepts that involve infrastructure improvements.
 - Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.
 - Rough order-of-magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor but do not include right-of-way costs. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each project.
- General Notes: ADT = Average Daily Traffic; NB = northbound; SB = southbound; EB = eastbound; WB = westbound; R = right; L = left; T = through; vpd = vehicles per day; LOS = level of service; ROW = right-of-way; EFU = Exclusive Farm Use; PDO = property damage only; TPAU = Transportation Planning Analysis Unit.

- 40-R1 Southbound Off-Ramp Extension** – Reconfigure off-ramp to improve deceleration distance and sight distance
- 40-R2 Southbound On-ramp Extension** – Extend length of southbound on-ramp to provide adequate acceleration distance
- 40-R3 Southbound Ramp Terminal Turning Radius Improvements** – Modify northeast corner to improve truck mobility (SBL, EBL)
- 40-R4 Northbound Off-Ramp Extension** – Extend length of northbound off-ramp to provide adequate deceleration distance
- 40-R5 Northbound On-ramp Extension** – Extend length of northbound on-ramp to provide adequate acceleration distance
- 40-R6 Northbound Ramp Terminal Turning Radius Improvements** – Modify southwest corner to better accommodate truck movements (NBL)
- 40-R7 Southbound Off-Ramp Guardrail Modification** – Move guardrail to improve sight distance
- 40-I1 2nd Avenue/OR 99 and Blackwell Road at Access Road Intersection Modifications** – Modify traffic control, add left-turn lane, or realignment
- 40-I2 2nd Avenue/OR 99 and Blackwell Road at Access Road Turning Radius Improvements** – Modify southwest corner to better accommodate truck movements (EBR)
- 40-I3 Access Road/Old Stage Road Turning Radius Improvements** – Modify northwest and southwest corners to better accommodate truck movements (SBR, NBL, and EBR)
- 40-MM1 Access Road Multimodal Access** – Widen to provide 6' shoulders between Blackwell Road and Lampman Rd
- 40-MM2 Blackwell Road/OR 99 Multimodal Access** – Provide access for all modes of travel between Access Road and KOA camp ground by widening shoulders or constructing a multi-use path



I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-1
Summary of Concepts
 I-5 Exit 40

Legend

- Interchange Ramp Improvements
- ▲ Intersection Improvements
- Multimodal Improvements





I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Structure

Figure 6-2
 Concept 40-R1
 Southbound Off-Ramp Extension
 I-5 Exit 40





Southbound On-Ramp Extension

I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

- ROW Line
- Ramp Extension

Figure 6-3
Concept 40-R2
Southbound On-Ramp Extension
I-5 Exit 40





Widening for Southbound Left-Turn Movement



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  Proposed Guardrail
-  New Pavement

Figure 6-4
 Concept 40-R3
 Southbound Ramp Terminal
 Turning Radius Improvements
 I-5 Exit 40





Northbound Off-Ramp Extension

I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  Proposed Guardrail
-  New Pavement

Figure 6-5
 Concept 40-R4
 Northbound Off-Ramp Extension
 I-5 Exit 40





I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  Guardrail
-  New Pavement

Figure 6-6
Concept 40-R5
Northbound On-Ramp Extension
I-5 Exit 40





Widen for Northbound Left-Turn Movement



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  Guardrail
-  New Pavement

Figure 6-7
 Concept 40-R6
 Northbound Ramp Terminal
 Turning Radius Improvements
 I-5 Exit 40



Southbound Off-Ramp Guardrail Modification for Improved Sight Distance



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

- Edge of Pavement
- Edge of Gravel
- Guardrail
- New Pavement

Figure 6-8
Concept 40-R7
Southbound Off-Ramp
Sight Distance Improvements
I-5 Exit 40





I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-9

Concept 40-I1

2nd Avenue/OR 99 and Blackwell Road at Access Road
Intersection Modifications

I-5 Exit 40

Legend

- ROW Line
- Edge of Pavement
- Edge of Gravel
- Guardrail
- Centerline
- Striping

- Pavement Removal
- New Pavement
- STOP Control





Widening for Eastbound Right-Turn Movement



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  Property Line
-  Edge of Pavement
-  Edge of Gravel
-  New Pavement

Figure 6-10
 Concept 40-12
 2nd Avenue/OR 99 and Blackwell Road at Access Road
 Turning Radius Improvements
 I-5 Exit 40





Widening for Southbound Right-Turn Movement



Widening for Northbound Left-Turn and Eastbound Right-Turn Movements



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  New Pavement

Figure 6-11

Concept 40-13

Access Road at Old Stage Road

Turning Radius Improvements

I-5 Exit 40





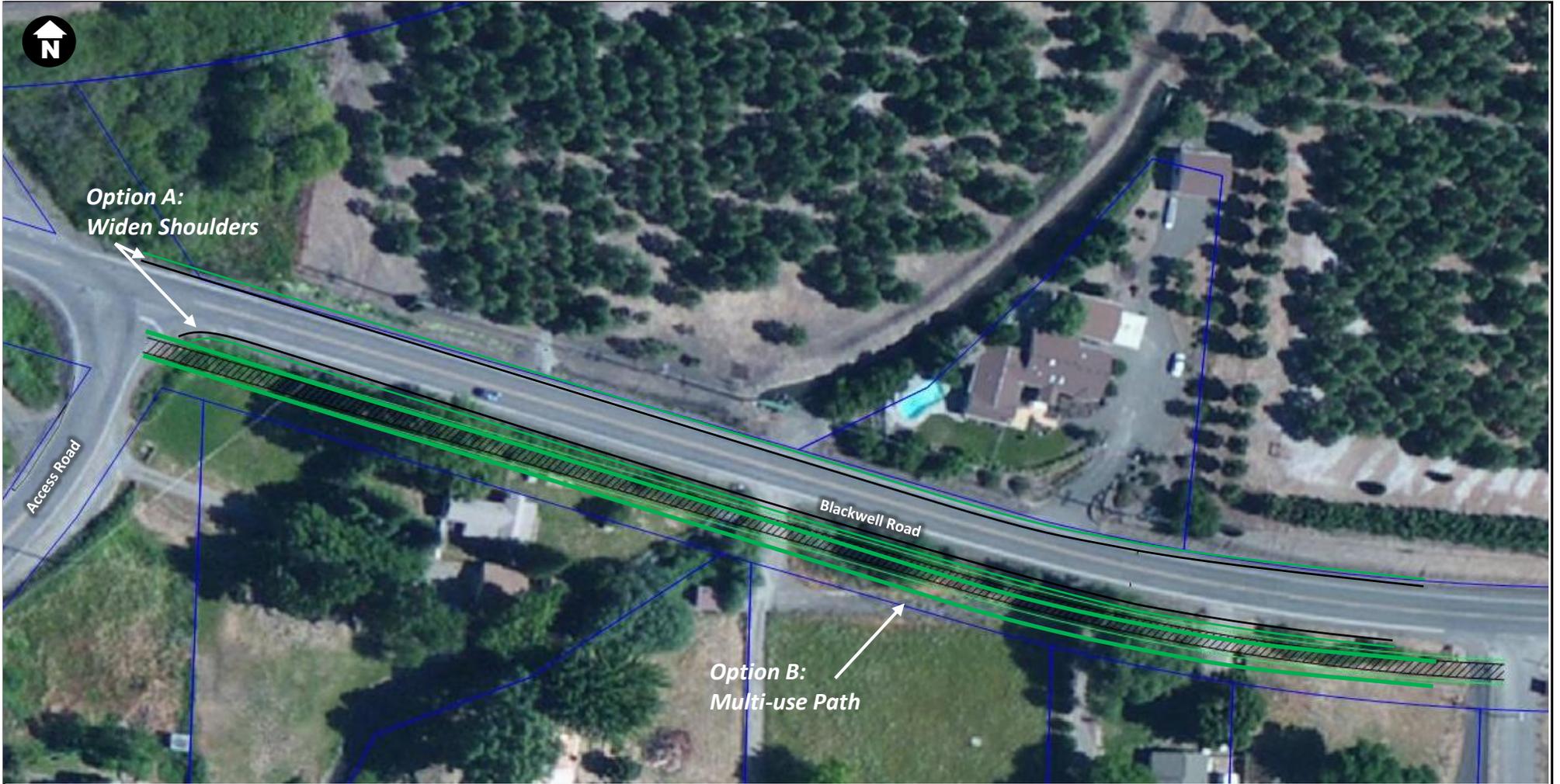
I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  Edge of Pavement
-  Edge of Gravel

Figure 6-12
Concept 40-MM1
Access Road
Widen to Provide Multi-Modal Access
I-5 Exit 40





I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-13

Concept 40-MM2

Blackwell Road (OR 99)

Multi-Modal Access

I-5 Exit 40

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel

-  New Pavement



- 43-R1 Southbound Off-Ramp Extension** – Extend length to provide adequate deceleration distance
- 43-R2 Southbound Ramp Terminal Turning Radius Improvements** – Modify southwest corner to better accommodate truck movements (EBR)
- 43-R3 Northbound Off-Ramp Extension** – Extend length to provide adequate deceleration distance
- 43-R4 Northbound Ramp Terminal Turning Radius Improvements** – Modify northeast corner to better accommodate truck movements (WBR)
- 43-I1 Rogue River Highway at Main Street Intersection Modifications** – Enhance pedestrian access and modify traffic control
- 43-I2 Rogue River Highway at Main Street Turning Radius Improvements** – Modify southwest corner to better accommodate truck movements (EBR)
- 43-I3 Rogue River Highway/2nd Avenue at N. River Road Intersection Enhancements** – Improve intersection function for all modes of travel
- 43-MM1 IMSA Roadways Multimodal Improvements** – Enhance multimodal access between I-5 and the City of Gold Hill
- 43-MM2 Rogue River Highway (Rock Point Bridge, 00332A)** – Enhance multimodal access across the Rock Point Bridge
- 43-MM3 Profetta Lane to Old Stage Road - I-5 Alternative Multimodal Crossing** Provide alternate multimodal crossing of I-5 with multi-use path connection



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

- Interchange Ramp Improvements
- ▲ Intersection Improvements
- Multimodal Improvements

Figure 6-14
Summary of Concepts
 I-5 Exit 43





I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-15

*Concepts 43-R1 and 43-R2
Southbound Off-Ramp*

Ramp Extension and Improved Turning Radius

I-5 Exit 43

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  New Pavement for Ramp Extension





I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-16

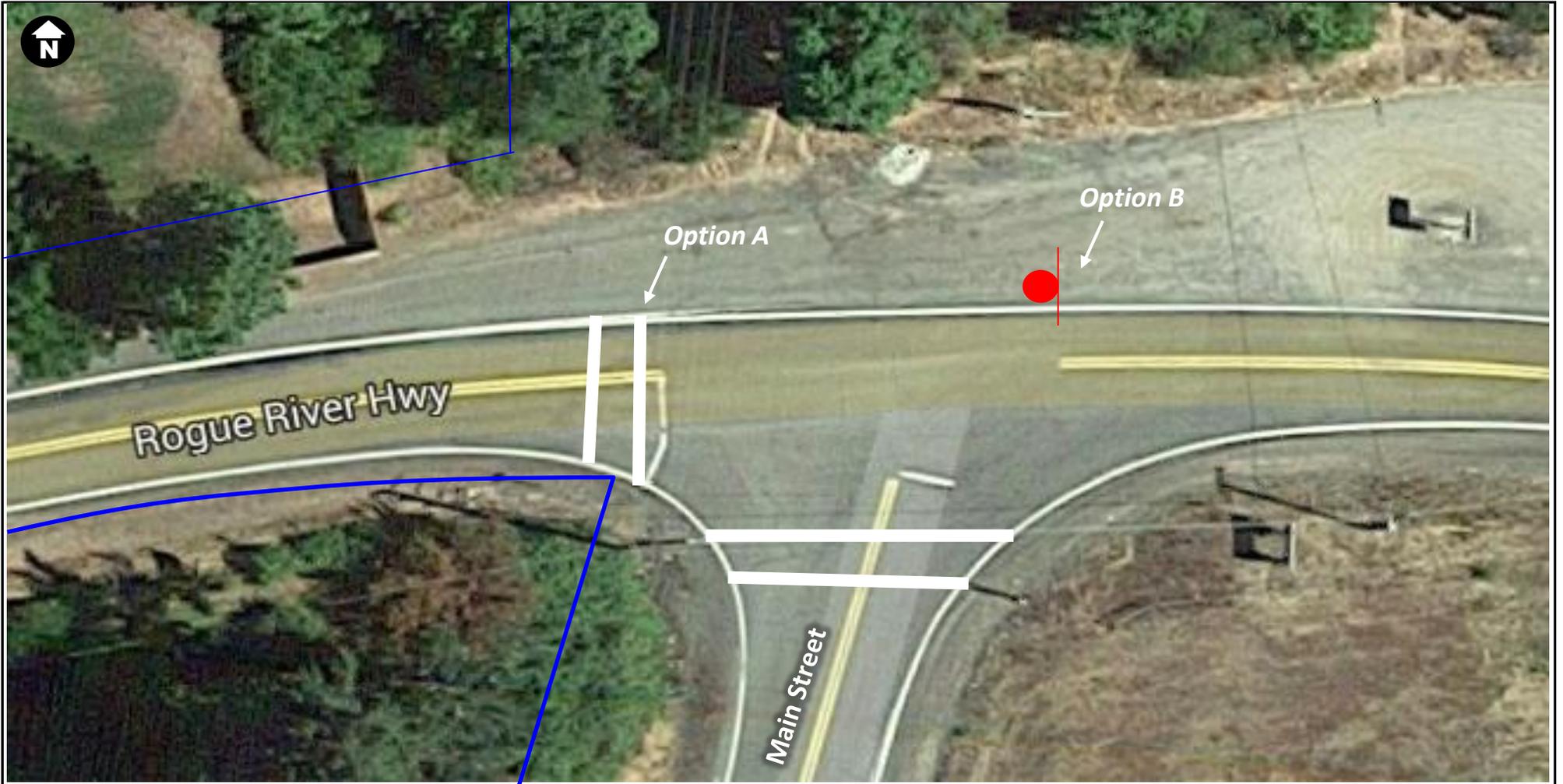
*Concepts 43-R3 and 43-R4
Northbound Off-Ramp*

*Ramp Extension and Improved Turning Radius
I-5 Exit 43*

Legend

-  Property Line
-  Edge of Pavement
-  Edge of Gravel
-  Guardrail
-  New Pavement for Ramp Extension
-  New Pavement for Turning Radius





I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-17

Concept 43-11

Rogue River Hwy at Main Street

Enhanced Pedestrian Access and Traffic Control Modification

I-5 Exit 43

Legend

 Property Line
 Crosswalk

 STOP Control (Option B only)





Widening for Eastbound Right-Turn Movement



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  New Pavement

Figure 6-18

Concept 43-12

Rogue River Hwy at Main Street

Improved Turning Radius

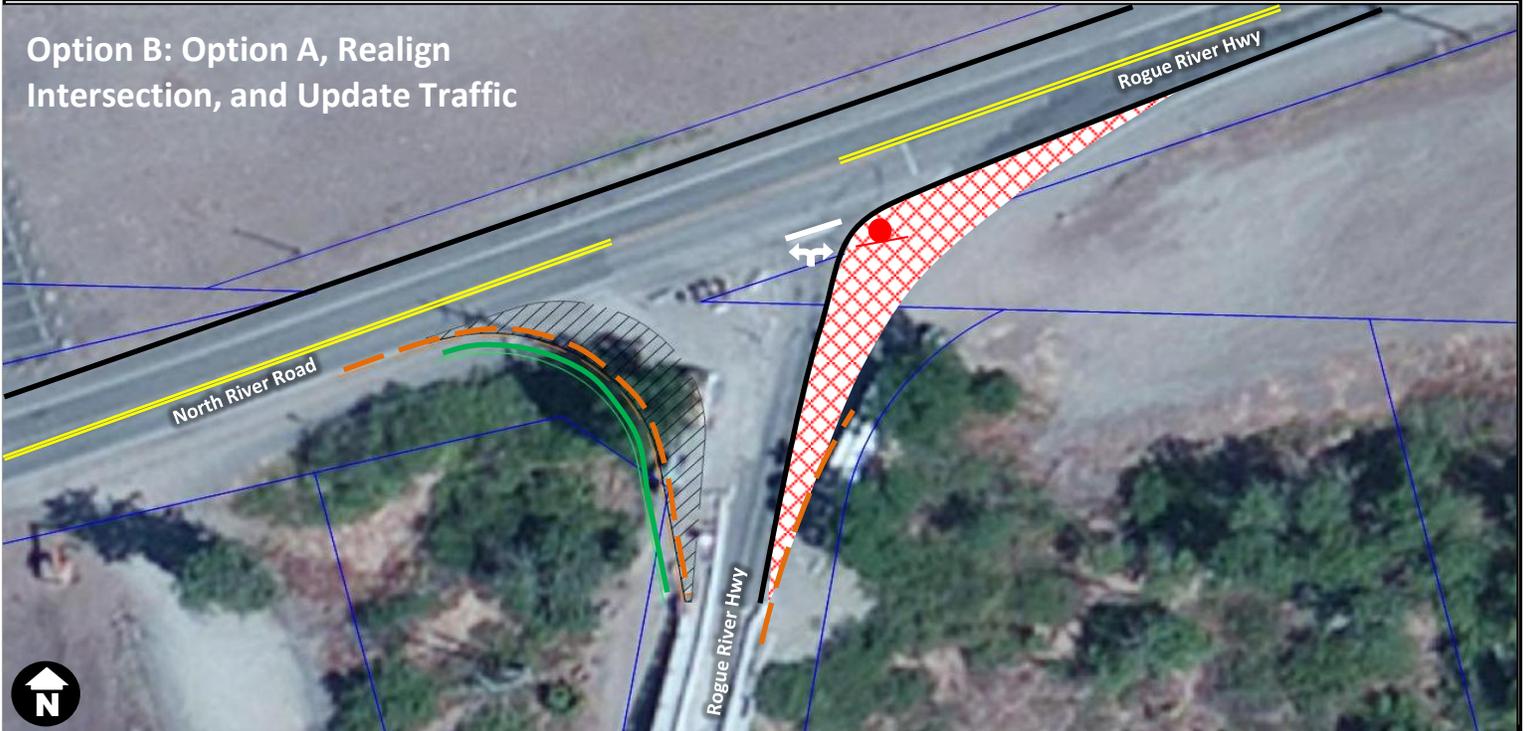
I-5 Exit 43



Option A: Widening for Eastbound Right-Turn Movement



Option B: Option A, Realign Intersection, and Update Traffic



I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  ROW Line
-  Edge of Pavement
-  Edge of Gravel
-  Guardrail
-  Crosswalk
-  New Pavement
-  Pavement Removal
-  STOP Control

Figure 6-19

Concept 43-13

Rogue River Hwy/2nd Avenue at River Road

Intersection Enhancements

I-5 Exit 43





I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

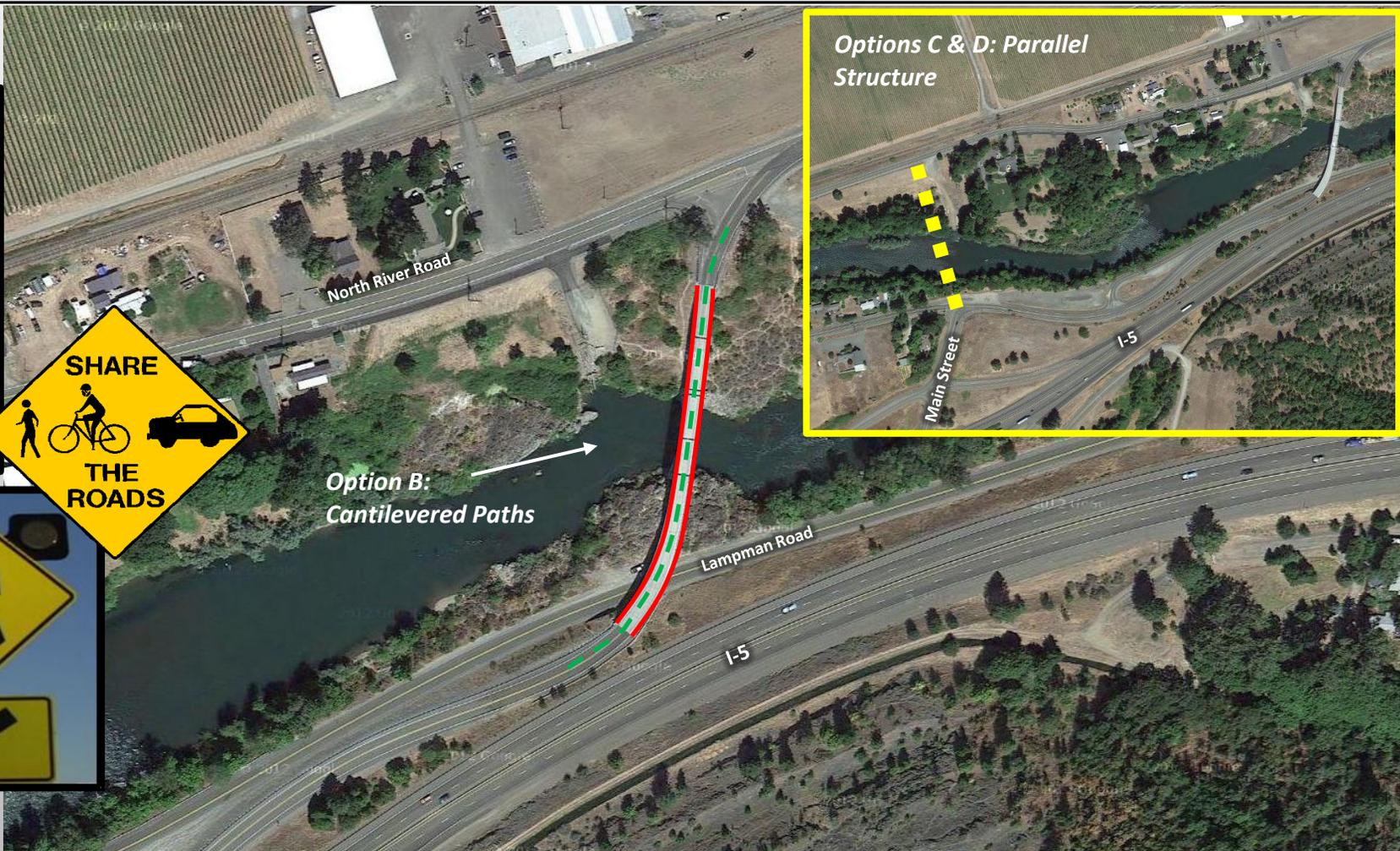
-  Edge of Pavement
-  Edge of Gravel
-  Guardrail
-  New Pavement

Figure 6-20
 Concepts 43-MM1
 IMSA Roadways
 Enhance Multi-Modal Access
 I-5 Exit 43





Option A: Add Signage to Travel Lanes



I-5 Exits 40 and 43 Interchange Area Management Plans

Figure 6-21

Concepts 43-MM2

Rogue River Hwy (Rock Point Bridge, 00332A)

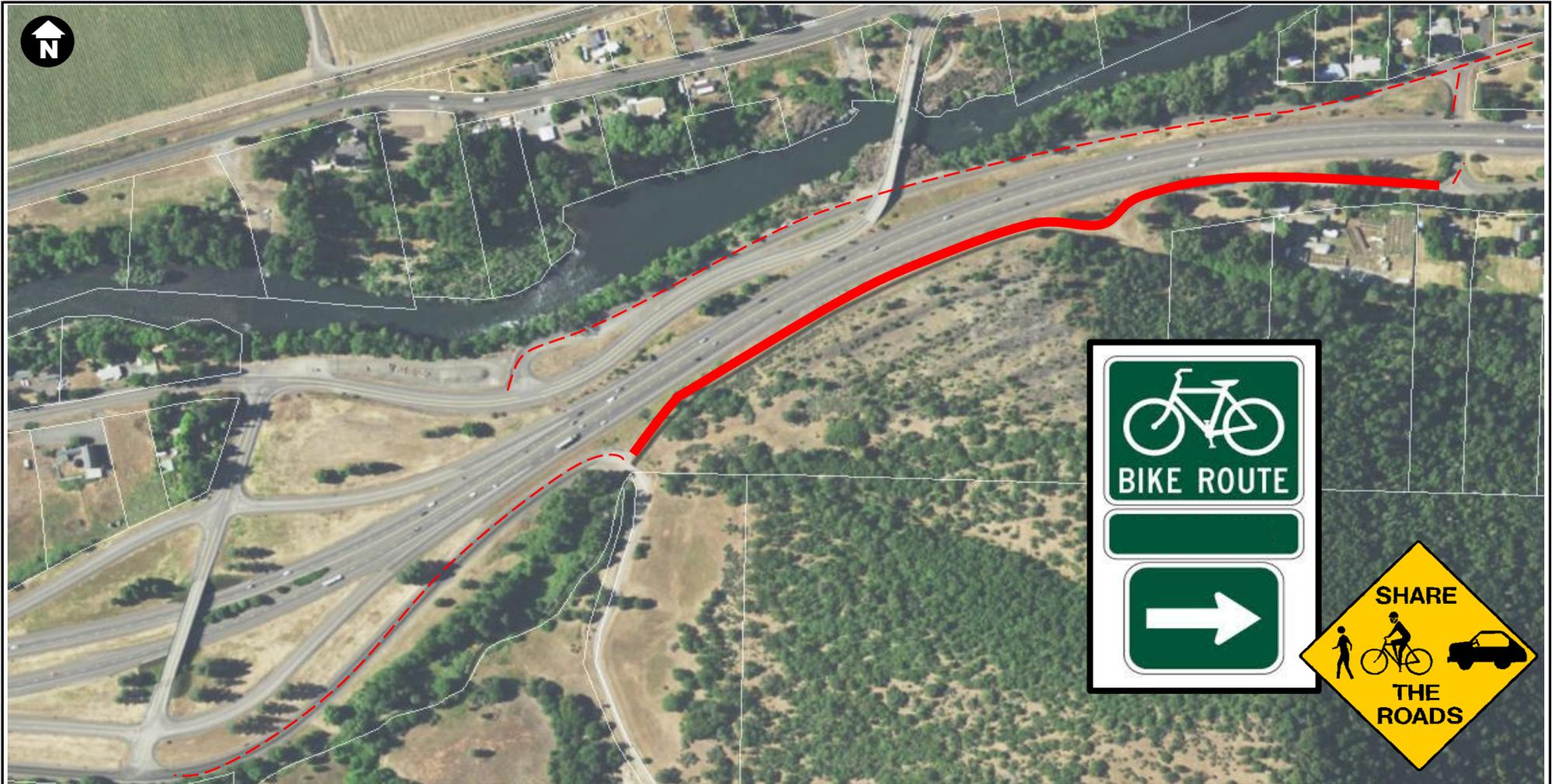
Enhance Multi-Modal Access

I-5 Exit 43

Legend

-  Signs (Option A)
-  Cantilevered Paths (Option B)
-  Parallel Structure (Option C)





I-5 Exits 40 and 43 Interchange Area Management Plans

Legend

-  Wayfinding Signage
-  Proposed multi-use path with pedestrian railing
-  ROW Line

Figure 6-22

*Concepts 43-MM3
 Profetta Lane to Old Stage Road
 I-5 Alternative Multi-Modal Crossing
 I-5 Exit 43*

