

OR 42 Expressway Management Plan

DRAFT Technical Memorandum #5 Concept Development and Evaluation

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

May 2012

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5. CONCEPT DEVELOPMENT AND EVALUATION

This memorandum presents the preliminary improvement concepts developed to address long-range deficiencies in the OR 42 corridor. The goal of the identified improvement concepts is 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 comprehensive improvement strategies. These strategies will then be evaluated as a whole to ensure the improvements work well together.

5.1. 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 bicycle, pedestrian, and transit-related projects.

The concepts were developed keeping in mind the four goals identified for the OR 42 Expressway Management Plan:

1. Improve safety and operations of the expressway corridor for all modes of travel.
2. Upgrade the corridor to meet Expressway standards.
3. Facilitate freight travel by maintaining efficient through movement in the corridor.
4. Provide better accessibility to Roseburg, Winston, and the Green Area consistent with the adopted local comprehensive land use and transportation plans

This memorandum considers changes/improvements in the following categories:

- **Multi-Modal Improvements** – These concepts identify potential improvements to enhance bicycle, pedestrian, and transit facilities along the OR 42 corridor.
- **Intersection Improvements** – These concepts identify potential improvements to improve traffic flow, provide additional capacity, or address safety concerns at individual intersections within the OR 42 corridor.
- **Network Connectivity and Access Control** – These concepts identify potential roadway connections that would improve access for local traffic, address conformity to access control standards along OR 42, and improve safety.

The proposed concepts often have overlap in purpose and benefits. For instance, an intersection improvement with the primary purpose of improving safety may also include operational benefits, although not being proposed for that purpose. Linkages between purpose and benefits are discussed in the evaluations.

The concepts identified in this memorandum are above and beyond any other projects that have been identified for implementation along the corridor either through ODOT's 2011-2013

Statewide Transportation Improvement Program (STIP), the Regional Transportation Plan (RTP), and City and County Transportation System Plans (TSPs).

5.1.1. Multi-Modal Improvements

In alignment with the goals of this plan, the proposed multi-modal improvements provide enhanced bicycle, pedestrian, and transit facilities throughout the corridor.

A multi-use trail runs immediately adjacent to OR 42 along its north side for the entire length between Lookingglass Road and OR 99. This trail provides continuous bicycle and pedestrian facilities to serve through-travel, and local trips along the north side. There are only a few sections of OR 42 within the study area with sidewalks or marked bike lanes and only two intersections with marked crosswalks (Carnes Road/OR 42 and Grant Smith Road/OR 42). On the south side of OR 42, sidewalks and bike lanes are present on OR 42 southwest of Lookingglass Road but these facilities end where the expressway begins. Some isolated segments of bike lanes and sidewalks are also present at the intersections of Carnes Road, and Roberts Creek Road.

In alignment with Goals 1 and 4 of this plan, the proposed multi-modal improvements link continuous bicycle and pedestrian facilities along both sides of OR 42 that may reduce the need to cross the highway or use the highway shoulder. The Oregon Bicycle and Pedestrian Design Guide¹ recommends separated paths rather than shoulders and sidewalks for facilities with high speeds and high traffic volumes. Wherever possible, these concepts provide separated bicycle and pedestrian facilities along OR 42 within the available right of way (ROW), or provide facilities along parallel routes.

5.1.2. Intersection Improvements

These intersection improvements concepts address safety and operational deficiencies at individual intersections within the OR 42 corridor.

Some improvements are targeted at locations that fail to meet the state's mobility targets during the corridor planning period. However, these improvements may also have added safety benefits. Conversely, many of the concepts proposed to improve safety improvement will also have operational affects.

Improving safety throughout the OR 42 corridor has been identified as a priority, and is consistent with the goals of this plan. A roadway characteristics audit² was performed in conjunction with a detailed crash history analysis³ to identify measures at specific locations or general strategies for improving overall safety. While some improvement concepts are targeted

¹ Oregon Bicycle and Pedestrian Design Guide, ODOT, 2011

² The roadway characteristics audit was performed using aerial imagery and ODOT Video Log.

³ The crash data used in this safety investigation was from the most recent six-year period available (January 1, 2005 to December 31, 2010).

at locations with either a high frequency of crashes, or fatal and/or serious injuries, some concepts were identified due to roadway attributes and environmental factors, or that may contribute to future crashes.

5.1.3. Network Connectivity and Access Control

These concepts identify potential roadway connections that would improve access for local traffic, facilitate access control along OR 42, and improve safety.

The safety of a roadway is closely related to the location, orientation, and frequency of access points. Research has clearly shown a direct correlation between the number of access points and collision rates. Typically, as the number of access points increases, so do collision rates. Upgrading the corridor to meet Expressway standards with improved access control is one strategy to help improve safety throughout the corridor.

5.2. 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, environmental, etc.), feasibility, stakeholder feedback, and ability to meet the goals of the corridor plan.

The concept analysis included traffic operations, road geometries and ROW requirements, environmental and land use consequences, and cost opinions.

5.2.1. Traffic Operations and Safety

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 2035 future condition. Operational results for the concepts were compared to the mobility targets set forth in the Oregon Highway Plan (OHP)⁴ and Highway Design Manual⁵ (HDM).

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 traffic signal concepts, the ODOT preliminary traffic signal warrants⁶ were evaluated. For potential turn lanes on the rural sections of the highway, the APM turn lane criteria⁷ were evaluated. Existing traffic volumes were applied to determine if warrants for traffic signals or criteria for turn lanes

⁴ Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions, 1999 Oregon Highway Plan, Amended December 2011, online reference: <http://www.oregon.gov/ODOT/TD/TP/OHP2011.shtml>

⁵ Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity [V/C] Ratio), Highway Design Manual, 2003, online reference: http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

⁶ Section 7.4 Traffic Signal Warrants, Analysis Procedures Manual, April 2006, Updated January 2011, online reference: http://www.oregon.gov/ODOT/TD/TPAU/docs/A_APM/APM.pdf

⁷ 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.

might be met today. Year 2034 traffic volumes were also evaluated to determine potential need in the future.

The existing (2011) and future baseline (2035) traffic volumes have been attached to this memo (Figure 5-1– Existing and Figure 5-2– Future) for easy reference.

Some improvements are focused on addressing safety concerns or may address safety as well as traffic operations deficiencies. Crash patterns from the six-year analysis period (2005 through 2010) are discussed for those improvements that address safety.

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

Evaluations of basic roadway geometry and ROW needs were conducted for concepts that involve infrastructure improvements. These items are addressed in the detailed concept discussions.

5.2.3. 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 is designed to identify those areas judged to have considerable potential for conflict.

5.2.4. Concepts Cost Opinions

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

5.3. Organization of Improvement Concepts

The OR 42 EMP focuses on the 3.32-mile segment designated as an Expressway from Lookingglass Road to the ramps at I-5 Exit 119. There are 18 improvement concepts that have been developed at various locations.

The improvement concepts have various strategies to consider. Many of the concepts can be combined with others; some provide different solutions to address the same issue. Within several of the concepts, there may be different options. The 18 concepts are discussed in the next three sections.

5.4. Multi-Modal Improvements

Five potential multi-modal improvements were identified during the concept development process to bring OR 42 to enhance bicycle, pedestrian, and transit facilities. A brief summary of the projects is presented in Table 5-1, with locations identified in Figure 5-3.

Table 5-1. Multi-Modal Improvement Concepts

ID	Location	General Description	Purpose	Category
1	Lookingglass Road to OR 99 (MP 74.61-76.22)	Enhance bicycle and pedestrian facilities along the south side of OR 42	Provide facilities along OR 42 for all modes of travel	Bicycle & Pedestrian
2	Lookingglass Road to Grant Smith Road (MP 73.88-76.22)	Install roadway lighting at key locations	Enhance visibility and safety in the corridor	Safety
3	Winston Section (MP 74.34)	Connect Winston Section Road to the multi-use path on the north side of OR 42 with a multi-use path undercrossing near the South Umpqua River (under bridge)	Provide a safe route for bicyclists and pedestrians to cross OR 42	Bike/Pedestrian
4	Grange Road (MP 75.53)	Construct sidewalks with curb and gutter along length of road	Provide parallel route to OR 42 for bicyclists and pedestrians	Bicycle & Pedestrian
5	NW Corner of Carnes Road (MP 75.72)	Provide a park and ride facility that coordinates with the adjacent bus stop	Improved transit facilities	Transit

5.4.1. Concept 1 – Enhance Bicycle/Pedestrian Facilities along the South Side of OR 42

A multi-use trail runs immediately adjacent to OR 42 along its north side for the entire length between Lookingglass Road and OR 99. This trail provides continuous bicycle and pedestrian facilities to serve through-travel, and local trips along the north side. Wide shoulders present on the south side of the highway can also serve bicyclists and pedestrians but with no physical separation from the adjacent, high speed traffic. Furthermore, the high traffic volumes make crossing difficult. A pedestrian, or bicyclist, who start or ends his trip on the south side of the expressway, must cross the four lanes of traffic to get to the path. Pedestrians and bicyclists using the shoulder on the south side of the expressway have been observed several times when collecting other inventory data for the corridor. These users have opted not to cross the expressway for reasons which may include both safety concerns and inconvenience.

This concept would enhance bicycle and pedestrian facilities along the south side of OR 42 to facilitate through-travel, support local trips to/from the south side of the highway, and reduce the need to cross the highway or use the highway shoulder. This concept provides two options for providing these facilities:

- **Option A:** Maintain directional bicycle traffic along the south shoulder of OR 42, and install a 6-foot sidewalk with a landscape buffer for pedestrian traffic.
- **Option B:** Construct a multi-use path on the south side of OR 42 that is separated by a landscape buffer to facilitate bi-directional bicycle and pedestrian traffic.

Neither of these options assumes that the bridges over the South Umpqua River or the Central Oregon and Pacific (CORP) Railroad will be widened and that the substandard facilities will remain on those sections of roadway.

Concept 1 – Traffic Operations and Safety

Current traffic demand in this corridor ranges from approximately 15,000 vpd at the west end of the study area, near Lookingglass Road, to approximately 23,000 vpd at the east end of the study area, near Grant Smith Road. The 2035 forecast demand is expected to range from 22,000 vpd near Lookingglass Road to 31,000 vpd near Grant Smith Road.

Both options would provide a continuous facility on the south side of OR 42 which would potentially decrease the need for bicyclists and pedestrians to cross the expressway. Although the multi-use path is present on the north side of the expressway, the high traffic volumes make crossing difficult. Pedestrians or bicyclists who start or end their trip on the south side of the expressway, must cross the four lanes of traffic to get to the path. Pedestrians and bicyclists using the shoulder on the south side of the expressway have been observed several times when collecting other inventory data for the corridor. These users have opted not to cross the expressway for reasons which may include both safety concerns and inconvenience.

Concept 1, Option A would stripe an eastbound bike lane on the south side of the roadway, and would provide a buffered sidewalk for pedestrians. The Oregon Bicycle and Pedestrian Design Guide recommends separated paths rather than shoulders and sidewalks for facilities with high speeds and high traffic volumes. However, it is possible that enhancing the urban feel of the corridor could provide a traffic calming effect, and help reduce travel speeds through the corridor.

Concept 1, Option B would provide a buffer between high-speed traffic and bicycles/pedestrians to allow for two-way traffic along a multi-use path. This option would be consistent with the Oregon Bicycle and Pedestrian Plan recommendations, and would increase safety for vulnerable users.

Concept 1 – Basic Roadway Geometries and Right-of-Way Requirements

Both options within this concept would occur within the available right of way (ROW), and would include illumination for the new facilities along the south side of OR 42.

Concept 1, Option A would include an 8-foot right shoulder, 6-foot buffer, a 6-foot landscape buffer, and a 6-foot sidewalk along the south side of OR 42. Drainage improvements would be involved with the proposed configuration. This option assumes that no retaining walls would be required, and that the slope would change from 6:1 from the edge of pavement to 4:1 from the back of sidewalk.

Concept 1, Option B would provide a 5-foot buffer between high-speed traffic and bicycles/pedestrians to allow for two-way traffic along a 10-foot multi-use path. This option assumes that no retaining walls would be required, and that the slope would change from 6:1

from the edge of pavement to 3:1 from the edge of the multi-use path. This option would be consistent with the Oregon Bicycle and Pedestrian Plan recommendations, and would increase safety for vulnerable users.

Concept 1 – Environmental and Land Use Assessment

There are riparian corridors, aquatic habitat, wildlife habitat and wetlands along the South Umpqua River and Roberts Creek. Disturbance to undeveloped areas especially should be avoided if possible. Wetland delineations should be conducted once concept footprints are identified. Impacts to wetlands should be avoided; mitigation and permitting will be necessary if impacts cannot be avoided. Best management practices incorporated into project design and construction can help minimize impacts.

Also, the Umpqua Floodway, on both sides of the South Umpqua River, is over 2,000 feet wide. Fill in of floodways and floodplains should be avoided.

Concept 1, Option A assumes that drainage would be required on the south side.

Concept 1, Option B assumes that existing drainage would be adequate on the south side.

Concept 1 – Cost Opinions

This estimate does not include costs for widening bridges or lengthening culverts. The largest difference between the costs of Option A versus Option B is the need for drainage improvements.

Concept 1, Option A improvements are estimated at \$5.5 million for the improvements related to the bike lane, buffer, and sidewalk.

Concept 1, Option B improvements are estimated at \$3.8 million for the multi-use pathway and associated improvements.

Neither estimate includes costs for widening bridges or lengthening culverts.

5.4.2. Concept 2 – Add Roadway Lighting at Key Locations

Roadway lighting provides increased visibility for all modes and helps minimize conflicts between modes. While some street lighting exists in the corridor, Concept 2 would install additional lighting at key locations between Lookingglass Road and the Grants Pass Road (MP 73.88-76.22) to improve safety. Specific locations have not been identified but lighting should be considered at higher volume unsignalized intersections, and other locations where lighting could improve safety. There may be an opportunity to have roadway lighting also provide spillover coverage for proposed pedestrian and bicycle facilities (Concept 1).

Concept 2 – Traffic Operations and Safety

Lighting can improve safety at locations where there are likely conflicts between vehicles, pedestrians, and bicycles. The greatest benefits are offered where surrounding facilities currently provide little light across the roadway. Lighting can also increase the attractiveness of pedestrian and bicycle facilities after dusk.

Concept 2 – Basic Roadway Geometries and Right-of-Way Requirements

Improvements included in this concept would occur within the available right of way (ROW).

Concept 2 – Environmental and Land Use Assessment

There are not any anticipated environmental or land use impacts associated with the proposed lighting improvements. Lighting spillover and sky glow may reach adjacent properties.

Concept 2 – Cost Opinions

The estimated cost of the proposed lighting improvements will be dependent on the number of locations identified and what other improvements might also be happening in the corridor. Specific recommendations and cost opinions for additional illumination will be determined as the preferred concept is identified.

5.4.3. Concept 3 – Multi-Use Undercrossing at Winston Section Road

While a pedestrian or bicyclist can cross the expressway at any intersection, the high traffic volumes make crossing four lanes of high speed traffic very difficult. Only two traffic signals, located at the east end of the corridor are available to facilitate crossing movements..

A new multi-use undercrossing of the South Umpqua bridges would connect the multi-use path on the north side of OR 42 with Winston Section Road. This connection would serve as the only grade-separated crossing of OR 42 for bicycles and pedestrians, and would improve north-south connectivity.

Concept 3 – Traffic Operations and Safety

Current traffic demand along OR 42 at this location is approximately 17,000 vpd, with a higher 2035 forecast demand of approximately 24,000 vpd. This undercrossing minimizes the likelihood that pedestrians and bicycles will cross OR 42 at uncontrolled and at-grade locations. This will improve safety for vulnerable users, and increase the attractiveness of alternative travel modes.

The undercrossing users would have to travel some distance out of direction to connect with the multi-use path or Winston Section Road. The connection would use existing hillsides to get from OR 42 down under the bridges and around to the other side of the expressway.

Concept 3 – Basic Roadway Geometries and Right-of-Way Requirements

The proposed pathway and undercrossing can be constructed within the existing ROW. The pathway would be approximately 1,000 feet long, with a typical width of 10 feet. Minimal excavation would be required because of the existing terrain.

Concept 3 – Environmental and Land Use Assessment

There is a riparian corridor, aquatic habitat, wildlife habitat and wetlands along the South Umpqua River. However, the area underneath the bridges is already heavily disturbed because unpaved access is already present. Further disturbance would likely be avoidable or minimized. Wetland delineations may be conducted once concept footprints are identified. Impacts to wetlands should be avoided; mitigation and permitting will be necessary if impacts cannot be avoided. There would be no land use impacts associated with this concept.

Concept 3 – Cost Opinions

The cost for this concept is estimated at \$500,000.

5.4.4. Concept 4 – Enhance Bicycle and Pedestrian Facilities along Grange Road

As described in Concept 1, a multi-use trail runs immediately adjacent to OR 42 along its north side for the entire length between Lookingglass Road and OR 99 but facilities on the south side are limited to the roadway shoulder and some sporadic sections of sidewalk. Despite the close proximity of high speed traffic, pedestrians and bicyclists use the shoulder on the south side of the expressway. These users have opted not to cross the expressway for reasons which may include both safety concerns and inconvenience.

Concept 4 would enhance bicycle and pedestrian facilities along the south side of OR 42 via Grange Road, a parallel route, rather than providing these facilities adjacent to the highway, as described for Concept 1. Similar to Concept 1, Concept 4 would enhance bicycle and pedestrian facilities along the south side of OR 42 to facilitate through-travel, support local trips to/from the south side of the highway, and reduce the need to cross the highway or use the highway shoulder. However, this option does not serve users along the entire length of the corridor; the improvements would extend along Grange Road from Rolling Hills Road to Roberts Creek Road.

Concept 4 – Traffic Operations and Safety

The enhanced bicycle and pedestrian facilities along Grange Road would decrease the need for bicyclists and pedestrians to cross the expressway, and would put users next to slow-speed vehicular traffic (approximately 25 mph). This concept would enhance bicycle and pedestrian mobility and safety, although it would involve a slight increase in travel distance for through traffic. Current traffic demand along Grange Road is very low, with approximately 800 vpd, with a slightly higher 2035 forecast demand of approximately 1,300 vpd.

Although it is considered desirable to provide bicycle and pedestrian facilities along a highway so that users have direct access to their destinations, the section of OR 42 between Rolling Hills

Road and the commercial area at Roberts Creek Road has no direct access to the highway. All of the residences and businesses in the area take access off Grange Road, thus the more direct local connection would actually be provided by facilities on Grange Road rather than along the expressway.

Concept 4 – Basic Roadway Geometries and Right-of-Way Requirements

This concept would occur within the available right of way (ROW), and would include illumination for the new facilities along Grange Road. Six foot sidewalks would be included on both sides of the roadway, but the roadway is assumed to have shared lanes for bicycles and low-speed vehicles.

Concept 4 – Environmental and Land Use Assessment

This option assumes that drainage would be included with the sidewalk installation. There are no anticipated environmental or land use impacts.

Concept 4 – Cost Opinions

Improvements associated with this concept are estimated at \$5.5 million.

5.4.5. Concept 5 – Park-and-Ride Facilities and Transit Stop at Carnes Road

Park-and-ride facilities can be an important component of transit programs. They offer a way for users of various modes to transfer onto and off of transit, making transit ridership a more attractive option. These facilities can also be used to facilitate carpooling. or Carnes Road

Currently, Umpqua Transit serves the study area with paratransit, fixed route, and commuter bus service on weekdays. South County Route 99 extends from Roseburg to Canyonville and runs along OR 42 between I-5 and Winston with a stop on Carnes Road. The Winston Commuter Route extends from Roseburg to Winston and also uses OR 42 and the stop on Carnes Road. The commuter service includes nine northbound bus runs and eight southbound bus runs each day.

Concept 5 would install a park-and-ride facility in the northwest quadrant of the OR 42 and Carnes Road intersection with an adjacent transit stop on OR 42 or Carnes Road. This property is currently owned by ODOT. This park-and-ride facility could make these existing services more accessible and attractive.

Concept 5 – Traffic Operations and Safety

Current traffic demand at this location is approximately 19,600 vpd, with a slightly higher 2035 forecast demand of approximately 27,400 vpd.

Both auto and bus access to this site may be limited by the presence of standing queues and the high frequency of crashes reported at and between Emils Way and Carnes Road. Access to/from OR 42 would be limited to right-in and right-out movements. Access on Carnes Road

may also be limited to right-in and right-out movements because of the limited site frontage and the presence of standing queues from the traffic signal.

Concept 5 – Basic Roadway Geometries and Right-of-Way Requirements

The proposed facilities could be constructed within the existing ROW. Access would be restricted to right-in and right-out only. Approximately 75 to 125 parking spaces could be accommodated, depending on the chosen site plan.

Concept 5 – Environmental and Land Use Assessment

This concept would only involve impacts to ODOT-owned property in the northwest quadrant of the OR 42 and Carnes Road intersection. No environmental impacts are associated with this concept.

Concept 5 – Cost Opinions

Improvements for this concept are estimated at \$1.0 million.

5.5. Intersection Improvements

Seven potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns. A brief summary of the projects is presented in Table 5-2 with concept locations identified in Figure 5-3. The following sections discuss in detail potential intersection improvements.

Table 5-2. Intersection Improvement Concepts

ID	Location	General Description	Purpose	Category
6	Lookingglass Road (MP 73.88)	Relocate Lookingglass Road to connect at 4-way intersection and install traffic signal	Improve operations and safety	Operations/Safety
7	Rolling Hills Road (MP 74.77)	Signalize intersection	Improve operations and safety	Operations/Safety
8	Rolling Hills Road (MP 74.77)	Add right-turn deceleration lane on OR 42 in the eastbound and westbound directions	Address existing safety concerns and decrease delay	Safety/Operations
9	Landers Avenue (MP 75.42)	Add right-turn deceleration lane on OR 42 in the westbound direction	Address existing safety concerns and decrease delay	Safety/Operations
10	Emils Way/Grange Road (MP 75.53)	Add right-turn deceleration lane on OR 42 in the eastbound and westbound directions	Address existing safety concerns and decrease delay	Safety/Operations
11	Carnes Road/Roberts Creek Road (MP 75.72)	Increase intersection capacity	Improve operations and safety	Operations/Safety
12	OR 99/Grant Smith Road (MP 76.22)	Increase intersection capacity	Improve operations and safety	Operations/Safety

5.5.1. Concept 6 – Relocate and Signalize Lookingglass Road

Lookingglass Road provides the most direct access from OR 42 to Wildlife Safari, a significant regional attraction. It also provides a parallel route to OR 42 through Winston. The Lookingglass Road intersection with OR 42 is currently STOP-controlled. Although the delays on Lookingglass Road are not very long during the weekday peak period of activity on OR 42, they are expected to be significantly longer in the future.

A new traffic signal at the intersection of OR 42 and Lookingglass Road (MP 73.88) would improve operations for left turning vehicles from Lookingglass Road and help facilitate peak recreational traffic during the summer months. The current alignment of this roadway is not ideal for a traffic signal, however, as both the eastbound OR 42 approach and southbound Lookingglass road approach are on a downgrade. Relocation of Lookingglass Road to a more level location, which could allow for a 4-way intersection combined with another street to the south of OR 42, would allow for a preferred signalized connection. This concept considers three relocation options:

- **Option A:** Close the current connection of Lookingglass Road and extend the roadway to the east to create a 4-way intersection with Pepsi Road (MP 74.19). Install a traffic signal at new 4-way intersection.
- **Option B:** Close the current connection of Lookingglass Road and extend the roadway to the east to create a 4-way intersection with Umpqua Safari Road (MP 74.03), with a possibility of extending Pepsi Road to the west to combine with Umpqua Safari Road. Install a traffic signal at new 4-way intersection.
- **Option C:** Either close the current connection of Lookingglass Road or limit it to right-in only, and align the roadway to create a 4-way intersection with Brosi Orchard Road (MP 73.76). Install a traffic signal at new 4-way intersection.

Concept 6 – Traffic Operations and Safety

Current traffic demand along OR 42 at this location is approximately 15,000 vpd, with a higher 2035 forecast demand of approximately 22,000 vpd. Current demand on Lookingglass Road is estimated at 3,000 vpd with forecast demand near 4,000 vpd. Daily volume data is not available for Pepsi Road or Brosi Orchard Road. Based on these data, preliminary analysis indicates that existing traffic volumes on Lookingglass Road and OR 42 meet ODOT's preliminary traffic signal warrants.

There were no crashes reported at the current intersections of OR 42 at Lookingglass Road, Umpqua Safari Road, or Pepsi Road.

Concept 6, Option A would reduce delays and queues for traffic turning left from the side streets (Lookingglass Road and Pepsi Road) during peak periods, but result in increased delay for through traffic on OR 42 throughout the day. In addition, a signal installation typically increases the potential for rear-end collisions due to a high frequency of stopping vehicles.

Concept 6, Option B would have similar operational and safety results to those for Option A with reduced delay and queues for Lookingglass Road and Umpqua Safari Road but added delay for through traffic on OR 42. If Pepsi Road were connected to Umpqua Safari Road, the additional operational benefits would be increased.

Concept 6, Option C could not be analyzed because Brosi Orchard Road is outside of the current expressway study area and traffic data is not available. However, this option would still be located on a hill, where grade issues would be a concern. Thus, delays to the through traffic on OR 42 would be greater than the other two options as vehicles stopped on the hill would be slower to start up and regain travel speed that at a level location.

Concept 6 – Basic Roadway Geometries and Right-of-Way Requirements

Each of the proposed relocation options would require additional ROW. The cross section of Lookingglass Road extensions would include 12 foot travel lanes and 6 foot shoulders.

Concept 6, Option A would include approximately 2,100 feet of additional roadway primarily outside of the existing ROW. This extension would require widening or construction of a box culvert and bridge, and would likely impact two homes on the north side of OR 42 opposite Pepsi Road.

Concept 6, Option B would include approximately 1,000 feet of additional roadway on the north side of OR 42, and approximately 1,100 feet of additional roadway (for the Pepsi Road extension) on the south side of OR 42, primarily outside of the existing ROW. This option is similar to Option A, but combines improvements on the north and south to avoid impacts to homes north of OR 42 opposite Pepsi Road. Bridge and culvert modifications would be required on the south side of OR 42.

Concept 6, Option C would include approximately 600 feet of additional roadway primarily outside of the existing ROW. This alignment would result in a skewed intersection at OR 42 with a steeper grade than at the current Lookingglass Road approach.

Concept 6 – Environmental and Land Use Assessment

Two of the options would have potential environmental impacts and all three options would have some type of land use impacts.

Concept 6, Option A would require widening or construction of a box culvert and bridge, and would likely impact two homes on the north side or OR 42 opposite Pepsi Road. The extension would require acquisition of ROW from lands north of OR 42. There are riparian corridors, aquatic habitat, wildlife habitat and wetlands near of the Umpqua River. Disturbance to undeveloped areas especially should be avoided if possible. Wetland delineations should be conducted once concept footprints are identified. Impacts to wetlands should be avoided; mitigation and permitting will be necessary if impacts cannot be avoided.

Also, the Umpqua Floodway, on both sides of the South Umpqua River, is over 2,000 feet wide. Fill in of floodways and floodplains should be avoided. This concept would interact with both the floodway and 100 year floodplain. No net rise will have to be demonstrated if improvements involve fill in floodways. Cut and fill requirements will need to be adhered to in floodplains.

Concept 6, Option B would have similar environmental impacts as Option A, but many would be located on the south side of the expressway rather than the north side. This option would not have impacts to existing residential structures but would require acquisition of ROW for both the Lookingglass Road and Pepsi Road extensions.

Concept 6, Option C would include impacts to an existing structure and would require acquisition of ROW from landowners between Lookingglass Road and OR 42. This alignment would not have environmental impacts.

Concept 6 – Cost Opinions

Concept 6, Option A improvements are estimated at \$6.0 million. This estimate includes costs for bridge and culvert improvements, as well as a traffic signal, but does not include ROW impacts.

Concept 6, Option B improvements are estimated at \$6.0 million. This estimate includes costs for bridge and culvert improvements, as well as a traffic signal, but does not include ROW impacts.

Concept 6, Option C improvements are estimated at \$1.5 million. This estimate includes a traffic signal, but does not include ROW impacts.

5.5.2. Concept 7 – Signalize Rolling Hills Road Intersection

There are no traffic signals for over a two-mile stretch along OR 42 between Carnes Road and the city of Winston. Without traffic signals, side street traffic must pull out into the high-speed traffic on the expressway when adequate gaps in the traffic stream are available. Making right turns is relatively easy but making left turns can be very difficult, particularly during the peak commuting periods during the day. Conditions for making left turns will only get worse as traffic volumes on the expressway continue to increase.

Concept 7 would install a new traffic signal at the intersection of OR 42 and Rolling Hills Road (MP 74.77) to improve operations and safety for side-street traffic. To support the need for a signal, this concept should be paired with other concepts that manage access to the highway and direct additional traffic to the Rolling Hills intersection. A STIP project (Key no. 15006) includes the signalization of this intersection along with plans to create a frontage road between Rolling Hills Road and Jackie Avenue.

Concept 7 – Traffic Operations and Safety

Current traffic demand along OR 42 at this location is approximately 19,000 vpd, with a higher 2035 forecast demand of approximately 27,000 vpd. The current side-street demand from Rolling Hills is approximately 500 vpd. The Douglas County Transportation System Plan (TSP) includes the extension of Rolling Hills Road northward to connect with Happy Valley Road. With this extension, a significantly higher forecast volume of nearly 5,000 vpd is expected.

There were 23 crashes reported in the segment from Rolling Hills Road to Landers Avenue, 16 of which occurred at Rolling Hills Road. Three of these crashes resulted in fatal and/or serious injuries. Seventeen of the reported crashes were turning or angle collisions.

Preliminary signal warrants, based on traffic volumes, are not met under existing conditions or within five years assuming the current network configuration and access to OR 42. If access management east of this intersection directs more traffic to this location, or if Rolling Hills extends to Happy Valley Road, this signal would be warranted within approximately 5 to 10 years. Without other improvements, a signal would still be warranted at this location within the horizon year of 2035.

The addition of a traffic signal would reduce delays and queues, particularly for left turns from Rolling Hills Road and across the expressway. However, through traffic on OR 42 would experience increased delay throughout the day.

The addition of a traffic signal would likely reduce the frequency and severity of the turning and angle collisions by stopping the through traffic on OR 42 to allow vehicles to turn to and from Rolling Hills Road. However, a signal installation typically increases the potential for rear-end collisions due to a high frequency of stopping vehicles, but rear end collisions are typically much less severe than high speed turning and angle collisions.

Concept 7 – Basic Roadway Geometries and Right-of-Way Requirements

Signalization of Rolling Hills Road can occur within existing ROW.

Concept 7 – Environmental and Land Use Assessment

This concept would not have environmental or land use impacts.

Concept 7 – Cost Opinions

Signal improvements are estimated at \$500,000, but costs of local connectivity improvements would be dependent upon the routes and cross-sections chosen.

5.5.3. Concept 8 – Right-Turn Deceleration Lanes at Rolling Hills Road

Currently there are no right-turn deceleration lanes on OR 42 at the Rolling Hills Road intersection (MP 74.77). Without right-turn lanes, vehicles making westbound and eastbound

right turns must either decelerate significantly in the high-speed travel lane or steer partially into the shoulder, which can result in rear-end collisions.

Concept 8 would enhance safety for turning vehicles by adding a dedicated right-turn lane in both the eastbound and westbound directions to allow vehicles to decelerate safely in a lane separated from high-speed through traffic.

Concept 8 – Traffic Operations and Safety

Current traffic demand at this location is approximately 19,000 vpd, with a slightly higher 2035 forecast demand of approximately 27,000 vpd. The current right-turn demand during the peak hour from OR 42 accounts for 2 to 4 percent of the total traffic on the highway.

Preliminary analysis using ODOT's turn lane criteria indicates that existing volumes are sufficient to warrant right-turn deceleration lanes for both the eastbound and westbound approaches of OR 42 at Rolling Hills Road.

Sixteen crashes were reported at this location in the 6-year analysis period, none of which were rear-end collisions involving vehicles making the westbound or eastbound right-turn movement.

Nevertheless, providing a right-turn deceleration lane would improve safety by allowing vehicles to decelerate away from high-speed through traffic. There would also be operational benefits for both the turning and through vehicles through reduced delays.

Concept 8 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would modify the northeast and southwest corners of the intersection to provide a deceleration lane of appropriate length to allow vehicles to slow to an appropriate turning speed. This lane can be accommodated within the existing ROW, although the adjacent drainage and multi-use path on the northeast quadrant would need to be shifted to the north. Lighting for the intersection of OR 42 at Rolling Hills Road is included in this concept.

Concept 8 – Environmental and Land Use Assessment

This concept would not impact adjacent properties, but would require a realignment of drainage and the multi-use pathway on the north side of OR 42.

Concept 8 – Cost Opinions

The estimated cost of Concept 8 is approximately \$500,000.

5.5.4. Concept 9 – Right-Turn Deceleration Lane at Landers Avenue

Currently, there are no right-turn deceleration lanes on OR 42 at the Landers Avenue intersection (MP 75.42). As noted with Concept 8, without right-turn lanes, vehicles making a

westbound right turn from OR 42 must either decelerate significantly in the high-speed travel lane or steer partially into the shoulder, which can result in rear-end collisions.

Concept 9 would enhance safety for right-turning vehicles by adding a dedicated right-turn lane to allow vehicles to decelerate safely in a lane separated from high-speed through traffic.

Concept 9– Traffic Operations and Safety

Current traffic demand at this location is approximately 19,000 vpd, with a slightly higher 2035 forecast demand of approximately 27,000 vpd. The current right-turn demand accounts for 6 to 7 percent of the total traffic on the highway.

Preliminary analysis using ODOT’s turn lane criteria indicates that existing volumes are sufficient to warrant right-turn deceleration lanes on the westbound approaches of OR 42 at Landers Avenue.

Seven crashes were reported at this location in the 6-year analysis period, one of which was rear-end collisions involving a vehicle making the westbound right-turn movement. This crash resulted in a serious/incapacitating injury caused by a vehicle following a turning vehicle too closely. This type of collisions could be avoided by the addition of a right-turn deceleration lane.

In addition to the safety benefits, a right-turn deceleration lane would also provide operational benefits by reducing delays for through traffic.

Concept 9 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would modify the northeast corner of the intersection to provide a deceleration lane of appropriate length to allow vehicles to slow to an appropriate turning speed. This lane can be accommodated within the existing ROW, although the adjacent drainage and multi-use path would need to be shifted to the north. Lighting for the intersection of OR 42 at Landers Lane is included in this concept. The existing pavement width is 84 feet at this location.

Concept 9 – Environmental and Land Use Assessment

This concept would not impact adjacent properties, but would require a realignment of drainage and the multi-use pathway on the north side of OR 42.

Concept 9 – Cost Opinions

The estimated cost of Concept 9 is approximately \$250,000.

5.5.5. Concept 10 – Right-Turn Deceleration Lanes at Emils Way/Grange Road

Currently, there are no right-turn deceleration lanes on OR 42 at the Emils Way/Grange Road intersection (MP 75.53). As noted with previous concepts, without right-turn lanes, vehicles

making a right turn from OR 42 must either decelerate significantly in the high-speed travel lane or steer partially into the shoulder, which can result in rear-end collisions.

Concept 10 would enhance safety for right-turning vehicles by adding dedicated right-turn lanes on the westbound approach to Emils Way and eastbound approach to Grange Road to allow vehicles to decelerate safely in a lane separated from high-speed through traffic.

Concept 10 – Traffic Operations and Safety

Current traffic demand at this location is approximately 19,600 vpd, with a higher 2035 forecast demand of approximately 27,400 vpd. The current right-turn demand at Emils Way accounts for 1 to 2 percent of the total westbound traffic on the highway while the right-turn demand on Grange Road accounts for 4 to 6 percent of the total eastbound traffic on OR 42.

Preliminary analysis using ODOT's turn lane criteria indicates that existing volumes are sufficient to warrant right-turn deceleration lanes on both the westbound and eastbound approaches of OR 42 at Emils Way/Grange Road.

Twelve crashes were reported at this location in the 6-year analysis period, none of which was rear-end collisions involving a right-turn movement.

Nevertheless, providing a right-turn deceleration lane would improve safety by allowing vehicles to decelerate away from high-speed through traffic. In addition to the safety benefits, a right-turn deceleration lane would also provide operational benefits by reducing delays for through traffic.

Concept 10 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would modify the northeast and southwest corners of the intersection to provide a deceleration lane of appropriate length to allow vehicles to slow to an appropriate turning speed. This lane can be accommodated within the existing ROW, although the adjacent drainage and multi-use path on the northeast quadrant would need to be shifted to the north. Lighting for the intersection of OR 42 at Emils Way/Grange Road is included in this concept. The existing pavement width is 84 feet at this location.

Concept 10 – Environmental and Land Use Assessment

This concept would not impact adjacent properties, but would require a realignment of drainage and the multi-use pathway on the north side of OR 42.

Concept 10 – Cost Opinions

The estimated cost of Concept 10 is approximately \$500,000.

5.5.6. Concept 11 – Carnes Road/Roberts Creek Road Additional Turn Lanes

The signalized intersection of OR 42 with Carnes Road/Roberts Creek Road is currently exceeding ODOT's mobility targets for an expressway outside of an urban area and the intersection has moderate delays and queuing during peak commuting periods. As volumes continue to grow both on the expressway and the intersecting roads, operations are expected to deteriorate to a condition where demand at the intersection will be near capacity. Many traffic movements would experience long delays with substantial queuing in all turn lanes. Many vehicles waiting to make a left turn would have to wait multiple green cycles to get through the intersection.

Concept 11 would improve the OR 42/Carnes Road/Roberts Creek Road intersection by adding capacity where needed. Four options are considered within this concept:

- **Option A (without Rolling Hills extension – Concept 13):** Install dual left turns on the eastbound, westbound, and southbound approaches, and modify signals to provide protected left turns on all approaches. This concept would require a design exception to use the Oregon Highway Plan mobility targets rather than the more stringent Highway Design Manual standards. This option is consistent with the preferred alternative identified in the Interchange Area Management Plan for I-5 interchanges 119 and 120⁸.
- **Option B (without Rolling Hills extension – Concept 13):** Install dual left turns only for the eastbound and westbound approaches, and modify signals to provide protected left turns on all approaches. This concept would require a design exception to exceed OHP mobility targets.
- **Option C (with Rolling Hills extension – Concept 13):** Install dual left turns only for the southbound approach, convert the westbound right-turn lane into a shared through/right, and modify signals to provide protected left turns on all approaches. This concept would require a design exception to use the Oregon Highway Plan mobility targets rather than the more stringent Highway Design Manual standards.
- **Option D (with Rolling Hills Road extension – Concept 13):** Install dual left turns only for the southbound approach, and modify signals to provide protected left turns on all approaches. This concept would require a design exception to exceed OHP mobility standards.

Concept 11 – Traffic Operations and Safety

Current traffic demand along OR 42 at this intersection is approximately 20,000 vpd, with a higher 2035 forecast demand of approximately 30,000 vpd. The total daily entering volumes,

⁸ The Interchange Area Management Plan (IAMP) for I-5 Interchanges 119 and 120 was completed in 2008 and has been adopted by the OTC and Douglas County. Interchange 119 connects I-5 with OR 42 at the eastern edge of the EMP study area.

including Carnes Road and Roberts Creek Road, is approximately 28,000 vpd, with a 2035 forecast demand of 40,000 vpd.

There is one segment identified in the top 10% of the most recent (2010) SPIS rankings within the corridor, which is at the intersection of Carnes Road/Roberts Creek Road. This intersection has the second highest number of reported collisions (39) and crash rate (0.64 crashes/mev) within the study area in the six-year analysis period. One of these crashes involved a fatality, and 19 involved injuries. Fourteen of the reported crashes were turning collisions.

Each of the proposed improvement options include providing protected left turns where they are currently permitted, on the northbound and southbound approaches. This modification would reduce the potential for turning and angle collisions, which are crash types that typically involve injuries.

Concept 11, Option A assumes that the proposed extension of Rolling Hills Road does not occur. This option would provide a reduction in delay and queuing during peak periods, but result in the greatest impacts. This option would not meet the HDM mobility standard, but would nearly meet the OHP target with a v/c ratio of 0.81.

Concept 11, Option B also assumes that the proposed extension of Rolling Hills Road does not occur. These improvements would provide a slightly smaller reduction in delay and queuing during peak periods, compared to Option A, but result in fewer impacts to adjacent lands. This option would exceed the OHP target with a v/c of 0.84 and require a design exception.

Concept 11, Option C assumes that the proposed extension of Rolling Hills Road does occur. This option would provide the greatest reduction in delay and queuing during peak periods, but result in substantial impacts to adjacent lands. This is the only option that would meet the OHP mobility target, with a v/c ratio of 0.78.

Concept 11, Option D assumes that the proposed extension of Rolling Hills Road does occur. This option would provide a slightly smaller reduction in delay and queuing during peak periods, compared to Option C, but result in the smallest impacts amongst all of the options. This option would exceed the OHP target with a v/c of 0.86 and require a design exception.

Concept 11 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 11, Option A would involve significant ROW impacts. OR 42 would be widened both sides OR 42 to add dual left-turn lanes on both legs with paved shoulders but could be accommodated within existing ROW. All widening on Carnes Road and Roberts Creek Road would occur on the east side to minimize property impacts, but would still involve ROW impacts for parcels in northeast and southeast quadrants. Carnes Road would require two additional lanes: one to add the second southbound left turn lane and the other to provide additional receiving lane for the dual eastbound left-turn movement. Roberts Creek Road would require one additional receiving lane for the dual westbound left-turn movement. Additional receiving lanes would need to extend approximately 700 feet to the north, and 600 feet to the south to

accommodate lane drops. New 6 foot sidewalks would be included on the east side of Carnes Road and Roberts Creek Road.

Concept 11, Option B would also involve significant ROW impacts. OR 42 would be widened both sides OR 42 to add dual left-turn lanes on both legs with paved shoulders but could be accommodated within existing ROW. All widening on Carnes Road and Roberts Creek Road would occur on the east side to minimize property impacts, but would still involve ROW impacts for parcels in northeast and southeast quadrants. Carnes road would require one additional lane to facilitate an additional receiving lane for the dual eastbound left-turn movement. Roberts Creek Road would require one additional receiving lane for the dual westbound left-turn movement. The receiving lane on Carnes Road would extend approximately 700 feet to the north to accommodate a lane drop while the lane on Roberts Creek Road would extend approximately 600 feet. New 6 foot sidewalks would be included on the east side of Carnes Road and Roberts Creek Road.

Concept 11, Option C would involve ROW impacts in the northeast quadrant to add dual southbound lefts on Carnes Road. All widening on Carnes Road would occur on the east side to minimize property impacts. The turn lane on Carnes Road would extend approximately 700 feet to the north to accommodate standard storage and tapers. New 6 foot sidewalks would be included on the east side of Carnes Road. Improvements along OR42 would include extending an additional westbound through lane 1200 feet west of the intersection to allow for typical lane reduction, with 720 feet of taper, matching into the existing alignment west of Landers Ave. This could be accommodated within existing ROW.

Concept 11, Option D would involve ROW impacts in the northeast quadrant to add dual southbound lefts on Carnes Road. All widening on Carnes Road would occur on the east side to minimize property impacts. The turn lane on Carnes Road would extend approximately 700 feet to the north to accommodate standard storage and tapers. New 6 foot sidewalks would be included on the east side of Carnes Road.

Concept 11 – Environmental and Land Use Assessment

This concept would involve property impacts for each of the proposed options, and only Option B would avoid impacts to existing structures. There are no environmental impacts associated with this concept.

Concept 11 – Cost Opinions

Concept 11, Option A improvements are estimated at \$3.1 million.

Concept 11, Option B improvements are estimated at \$2.8 million.

Concept 11, Option C improvements are estimated at \$2.1 million.

Concept 11, Option D improvements are estimated at \$1.3 million.

These estimates do not include ROW impacts.

5.5.7. Concept 12 – OR 99/Grant Smith Road Intersection Improvements

The signalized intersection of OR 42 with OR 99/Grant Smith Road is currently exceeding ODOT's mobility targets for an expressway outside of an urban area and the intersection has moderate delays and queuing during peak commuting periods. As volumes continue to grow both on the expressway and the intersecting roads, operations are expected to deteriorate to a condition where demand at the intersection will be near capacity. Many traffic movements would experience long delays with substantial queuing in all turn lanes. Many vehicles waiting to make a left turn or continue through the intersection would have to wait multiple green cycles to get through the intersection.

Concept 12 would improve the intersection operations by adding capacity with a second eastbound left-turn lane. This concept would require a design exception to use the Oregon Highway Plan mobility targets rather than the more stringent Highway Design Manual standards.

Concept 12 – Traffic Operations and Safety

Current traffic demand along OR 42 at this intersection is approximately 22,000 vpd, with a higher 2035 forecast demand of approximately 30,000 vpd. The total daily entering volumes, including OR 99 and Grant Smith Road, is approximately 28,000 vpd, with a 2035 forecast demand of 38,000 vpd.

This intersection has the second highest number of reported collisions (44) and crash rate (0.75 crashes/mev) within the study area in the six-year analysis period. One of these crashes involved a fatality, and 24 involved injuries. Nine of the reported crashes were turning or angle related, and 31 were rear end related.

This concept would provide protected left turns where they are currently permitted, on the northbound and southbound approaches. This modification would reduce the potential for turning and angle collisions, which are crash types that typically involve injuries.

This option would provide a reduction in delay and queuing during peak periods, but would not meet the HDM mobility standard. It would meet the OHP target with a v/c ratio of 0.80 and would require a design exception.

Concept 12 – Basic Roadway Geometries and Right-of-Way Requirements

This concept would involve ROW impacts in the northwest, northeast, and southwest quadrants to facilitate widening of OR 42 to facilitate the dual left turn lanes and along OR 99 to allow for an additional receiving lane. Widening could occur on each side of both facilities to minimize impacts.

Concept 12 – Environmental and Land Use Assessment

This concept would potentially impact property in the northwest, northeast, and southwest quadrants of the intersection, but would not impact existing structures.

Concept 12 – Cost Opinions

The estimated cost of Concept 12 is approximately \$1.0 million.

5.6. Network Connectivity and Access Control

Six potential network connectivity and access control improvements were identified during the concept development process to provide improved access for local traffic, facilitate access control along OR 42, and improve safety. A brief summary of the concepts are presented in Table 5-3 with concept locations identified in Figure 5-3. The following sections discuss in detail potential changes and improvements that are specific to network connectivity.

Table 5-3. Network Connectivity and Access Control

ID	Location	General Description	Purpose	Category
13	Rolling Hills (MP 74.77)	Extend Rolling Hills Road to connect with Happy Valley Road	Improved connectivity	Connectivity/ Operations
14	Emils Way/Grange Road (MP 75.53)	Reduce turning conflicts	Enhance safety for all users	Safety
15	Grange Road Extension to the South/East (MP 75.53)	Create new road connection from the east end of Grange Road to provide alternative access to OR 42	Provide alternative access to facilitate access management along OR 42	Safety/ Access Management
16	Between Rolling Hills Road and Landers Avenue (MP 74.77-75.53)	Improve local connectivity and modify access to OR 42 from Rolling Hills Road to Landers Avenue	Improved connectivity and alternative access	Safety/ Access Management
17	Winery Lane (MP 76.07-76.22)	Control access at Winery Lane	Provide alternative access to facilitate access management along OR 42	Safety/ Access Management
18	Lookingglass Road to Grant Smith Road (MP 73.88-76.22)	Install U-turn opportunities at key locations	Supplement intersection closures and right-in/right-out only movements	Operations/ Safety

5.6.1. Concept 13 – Extend Rolling Hills Road to Happy Valley Road

Currently, Rolling Hills Road connects with OR 42 and Happy Valley Road but is missing a section, approximately one-half mile long that prevents continuous travel the full length of the roadway. Without this connection, traffic in some of the neighborhoods currently served by Rolling Hills Road must use OR 42 to travel into Roseburg or Winston.

Concept 13 would extend Rolling Hills Road northward to Happy Valley Road as identified in the Douglas County TSP. This link would serve local traffic, as well as relieve demand on parallel routes. This concept should be ultimately considered in conjunction with Concept 7, signalization of the Rolling Hills Road intersection with OR 42.

Concept 13 – Traffic Operations and Safety

The Rolling Hills Road extension would potentially shift up to 200 eastbound left turns during the peak hour from Carnes Road to Rolling Hills Road in the forecast year of 2035. This shift would provide significant operational benefits at Carnes Road, which is currently capacity constrained and in need of improvements. The current side-street demand from Rolling Hills is approximately 500 vpd, with a significantly higher forecast volume of nearly 5,000 vpd assuming that Rolling Hills Road connects to Happy Valley Road. With higher demand on Rolling Hills Road, a traffic signal at OR 42 (see Concept 7) will be necessary to facilitate turning movements to and from the highway.

There were 16 reported crashes at the OR 42/Rolling Hills Road intersection in the 6-year study period. Three of these crashes resulted in fatal and/or serious injuries. Additional traffic on Rolling Hills Road may increase the severe crash rate at this intersection without alternative traffic control, such as a signal. While a signal may result in more rear-end collisions, it would mitigate the more severe turning and angle collisions that currently occur and would likely worsen with more side street traffic demand on Rolling Hills Road.

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

The proposed Rolling Hills Road extension would require approximately 2,400 feet of additional roadway primarily outside of existing ROW. The cross section of Rolling Hills Road would include a 42-foot paved roadway with 6 foot sidewalks.

Concept 13 – Environmental and Land Use Assessment

This concept would involve property impacts, but could avoid impacts to existing structures depending upon the chosen alignment. There are no environmental impacts associated with this improvement.

Concept 13 – Cost Opinions

The cost for this concept is estimated at \$3.5 million, not including ROW.

5.6.2. Concept 14 – Grange Road/Emils Way – Reduce Turning Conflicts

Twelve crashes occurred near the OR 42/Grange Road/Emils Way intersection within a 6-year analysis period, including some fatalities. Most of these crashes were related to turning movements to and from Grange Road/Emils Way.

Concept 14 considers restricting allowable turn movements at this intersection in order to reduce the number of conflicts and resulting crashes at the intersection. Two options were considered:

- **Option A:** Restrict traffic movements turning from Grange Road and Emils Way to right turn onto OR 42 but allow both right and left turns from OR 42 onto the side streets.
- **Option B:** Restrict traffic movements turning to and from Grange Road and Emils Way to right turns only.

This concept should be ultimately considered in conjunction with Concept 15, an extension of Grange Road to provide alternative access to Roberts Creek Road.

Concept 14 – Traffic Operations and Safety

Twelve crashes were reported during the 6-year analysis period; most were turning collisions. Reducing the number of conflict points would reduce the overall collision potential at this unsignalized location.

Concept 14, Option A would reduce delays and queues on Grange Road and Emils Way by eliminating the left-turn movement onto OR 42. Although this option would eliminate some of the turning conflicts that have shown consistent crash patterns, it would not eliminate the conflict with the westbound left-turn movement from OR 42 onto Grange Road/Emils Way, which has resulted in 4 of the 8 turning collisions in the 6-year analysis period.

Option A would still allow ingress to local businesses, but would require some egress to use alternative routing. From Grange Road, vehicles that want to turn left onto OR 42 could travel down Grange Road to Rolling Hills Road to access OR 42. From Emils Way, vehicles would have no option but to turn right onto OR 42 and then turn around using other local roads or possibly executing a U-turn (see Concept 18).

Concept 14, Option B would reduce delays and queues on Grange Road and Emils Way by eliminating the left-turn movement to and from OR 42. This option would eliminate the conflict between the westbound left-turn movement onto Grange Road and eastbound traffic on OR 42.

Option B would still allow some ingress and egress to/from local businesses, but would require alternative routing for all vehicles turning left. Without additional roadway connections, this option would have far greater impacts on traffic circulation than Option A. In addition to the routing options discussed in Option A for vehicles turning left from the side streets, left-turning vehicles from OR 42 would need to travel a significant way out of direction or look for U-turn options (see Concept 18).

The traffic circulation impacts described for both options could be partially mitigated by an extension of Grange Road to provide alternative access to Roberts Creek Road, which would allow access to and from the businesses on the south side of the highway.

Concept 14 – Basic Roadway Geometries and Right-of-Way Requirements

Currently all movements are allowed at the intersection of OR 42 and Grange Road/Emils Way. A raised median would need to be installed in the existing painted median, to restrict the turning movements for either Option A or B. With Option A, minor roadway widening within the existing ROW may be needed to add the raised median with the left-turn lanes from OR 42. With Option B, the raised median could be installed within the existing painted median and no widening would be necessary. There would be no direct impacts to adjacent properties.

Concept 14 – Environmental and Land Use Assessment

There would be no direct impacts to adjacent properties, although drainage relocation would need to occur due to roadway widening. There are no environmental impacts associated with this concept.

Restricting turn movements to Grange Road would impact the businesses on the south side of the highway. The extent of the impacts would depend on whether Option A or Option B is implemented and whether the turn restrictions are paired with additional roadway connections (Concept 15) and/or U-turns (Concept 18).

Restricting turn movements to Emils Way would have a lesser impact on the residences north of the highway but drivers would have be inconvenienced by the restrictions and would have to travel further. The extent of the inconvenience would depend on whether Option A or Option B is implemented and whether the turn restrictions are paired with U-turns (Concept 18).

Concept 14 – Cost Opinions

The estimated cost of Concept 14 is approximately \$1.3 million for the median and drainage relocation associated with Option A, and \$300,000 for the reduced improvements associated with Option B. This estimate does not include utility relocation.

5.6.3. Concept 15 – Extend Grange Road East to Roberts Creek Road

Currently, Grange Road has connections with OR 42 across from Rolling Hills Road and Emils Way, and terminates on the east end at a commercial/retail development. The unsignalized connection with OR 42 across from Emils Way experiences significant delays during peak periods and has had numerous turning-related crashes in recent years.

Concept 15 would extend Grange Road to tie in with Roberts Creek Road to provide access to a signalized connection with OR 42, facilitate access management along OR 42, and improve safety. Two options have been developed:

- **Option A:** Create a new roadway connection from the east end of Grange Road to tie in with Brittney Avenue.
- **Option B:** Create a new roadway connection from the east end of Grange road to Roberts Creek Road to create a 4-way intersection with Tannhauser Avenue.

Concept 15 – Traffic Operations and Safety

Although current traffic demand along most of Grange Road is fairly low, the demand at the intersection with OR 42 is quite high (almost 3,000 vpd) because of the high business activity immediately to the north. Either option for the Grange Road extension would allow vehicles to shift east to Roberts Creek Road to gain access to a signalized connection with OR 42; moreover, this would provide alternative ingress/egress for businesses on the south side of the highway with or without access restrictions. The new connection would have bicycle and pedestrian facilities to improve mobility for all modes.

Concept 15, Option A would provide the new connection between Grange Road and Roberts Creek Road via Brittney Avenue. This option would add more traffic to Brittney Road, a local residential street that also serves a school. The extent of the traffic increase would depend on the extent of the access restrictions discussed under Concept 14. This option would be longer than Option B and would involve out-of-direction travel for users.

Concept 15, Option B would provide a more direct connection between Grange Road and Roberts Creek Road. This new roadway would not impact the nearby residences by adding traffic to local streets. The connection to Roberts Creek Road opposite Tannhauser Road would still be more than 500 feet from the signal at OR 42, which would allow adequate storage at the traffic signal so that queues would not block the new connection.

Concept 15 – Basic Roadway Geometries and Right-of-Way Requirements

The proposed Grange Road extension would include 12 foot travel lanes, 8 foot shoulders, and 6 foot sidewalks. Both of these extensions would require additional ROW. Both options include drainage and illumination.

Concept 15, Option A Would include approximately 1,200 feet of reconfigured and new roadway, of which a significant portion would use existing but unimproved ROW that stretches westerly from Brittany Avenue to Grange Road. Additional ROW would still be required.

Concept 15, Option B Would include approximately 1,600 feet of reconfigured or new roadway primarily outside of the existing ROW.

Concept 15 – Environmental and Land Use Assessment

Concept 15, Option A Would have no impacts to existing structures but would re-route traffic to Brittney Avenue which is immediately adjacent to a school. There are no environmental impacts associated with this concept.

Concept 15, Option B Would include impacts to an existing structure, but would be in agreement with long-term Douglas County plans. There are no environmental impacts associated with this concept.

Concept 15 – Cost Opinions

Concept 15, Option A improvements are estimated at \$2.1 million. This estimate does not include ROW impacts.

Concept 15, Option B improvements are estimated at \$2.5 million. This estimate does not include ROW impacts.

5.6.4. Concept 16 – Improve Local Connectivity and Restrict Access to OR 42

Currently, public and private access along OR 42 between Rolling Hills Road and Landers Avenue is unrestricted because there is no frontage road or alternative access available. However, there have been numerous (7) crashes along this section of the expressway associated with these roadway and access points.

Concept 16 would provide improved local connectivity for east-west and north-south travel paired with access restrictions on OR 42. This concept includes connecting Melody Lane with Stella Street, Depriest Street, and Circle Drive. In addition, a frontage road or alternative access would be provided to connect with Rolling Hills Road for any current facilities that access OR 42 in this segment. Some of these improvements are included in a STIP project (Key no. 15006) that would signalize the intersection of Rolling Hills Road and create a frontage road between Rolling Hills Road and Jackie Avenue.

With the enhanced local street network, access management along the OR 42 corridor would include closing some private and public access points and restricting movements to right turns only at other locations. Access restrictions could be implemented incrementally or as part of a single projects.

Concept 16 – Traffic Operations and Safety

Current traffic demand along OR 42 in the vicinity of these roadway connections is approximately 17,000 vpd, with a higher 2035 forecast demand of approximately 24,000 vpd. There were 7 crashes reported in the segment between Rolling Hills Road and Landers Avenue and 7 crashes reported at Landers Avenue. Providing improved local connectivity would improve safety along the expressway by directing turning vehicles to targeted and signalized locations where they can be accommodated with a lesser crash risk.

Concept 16 – Basic Roadway Geometries and Right-of-Way Requirements

The proposed local connections would meet Douglas County local road standards. Additional ROW would be required. Some of these connections have been shown in approved development plans but have not yet been constructed.

Concept 16 – Environmental and Land Use Assessment

Depending on chosen alignments, there may be some impacts to existing residential structures in the area. Traffic volumes on some residential roadways may increase while they decrease on others as a result of changes in traffic circulation.

There are no environmental impacts associated with this concept.

Concept 16 – Cost Opinions

Costs associated with this improvement would be dependent upon the alignments chosen.

5.6.5. Concept 17 – Control Access at Winery Lane

Currently, Winery Lane has direct and full access to OR 42 that does not currently meet expressway access spacing standards. There were 6 crashes on OR 42 in the vicinity of Winery Lane. Some of these collisions are associated with Winery Lane itself although others may be related to positioning and lane changes associated with the OR 99/Grant Smith intersection with OR 42 and traffic to and from the freeway.

Concept 17 considers two access options at Winery Lane that support the effort to upgrade OR 42 to expressway standards:

- **Option A:** Create a new connection to Grant Smith Road and close all access to OR 42.
- **Option B:** Limit access at OR 42 to right-in right-out and provide U-turn opportunities.

Concept 17 – Traffic Operations and Safety

Current traffic demand along Winery Lane is very low, as this acts as a private driveway to several properties.

Concept 17, Option A would divert Winery Lane traffic to Grant Smith Road and the signalized intersection with OR 42. Because the traffic volumes on Winery Lane are so low, the diverted traffic would have no measurable impact on intersection operations. The closure of Winery Lane would eliminate the potential for crashes associated with the unsignalized intersection access.

Concept 17, Option B would convert all turning movements to and from Winery Lane to right turns only. Westbound vehicles that wished to access Winery Lane would need to turn around at the Carnes Road/Roberts Creek Road intersection and return eastbound to Winery Lane. Vehicles that wished to travel westbound on OR 42 from Winery Lane would need to turn eastbound onto OR 42 then turn around at the OR 99/Grant Smith Road intersection. Local drivers may also choose alternative routes rather than making U-turns on OR 42.

Concept 17 – Basic Roadway Geometries and Right-of-Way Requirements

Concept 17, Option A would include a Winery Lane connection that would meet Douglas County local road standards, which includes 11 foot paved travel lanes and 3 foot shoulders. This facility would require additional ROW.

Concept 17, Option B would include a raised median that could be installed within the existing painted median and no widening would be necessary. There would be no direct impacts to adjacent properties.

Concept 17 – Environmental and Land Use Assessment

With Option A, additional right of way would be required from adjacent property owners but there are no structures that would be impacted. Construction of this private connection could be coordinated with access to the vacant parcels on the south side of Grant Smith Road. There would be no environmental impacts associated with this concept.

With Option B, drivers would be inconvenienced by the turn restrictions and would have to travel further. The extent of the inconvenience would depend on local routing options and if the turn restrictions are paired with U-turns (Concept 18).

Concept 17 – Cost Opinions

Concept 17, Option A improvements are estimated at \$600,000. This estimate does not include ROW impacts.

Concept 15, Option B improvements are estimated at \$100,000 with ROW impacts anticipated.

5.6.6. Concept 18 – Provide U-Turn Opportunities at Key Locations along OR 42

OR 42 currently has few turning movement restrictions, in part because there are limited local network options for some roadways. At locations where access may be restricted, there are two key ways of maintaining all movements. Alternative access can be provided via local roads or left turns from side-streets can be replaced with right turns, with a U-turn opportunity on the mainline roadway. For the access points which maintain right-in, right-out movements, U-turn opportunities are a simple way to safely accommodate passenger vehicles.

Concept 18 would provide both midblock unsignalized and signalized U-turn opportunities to compliment access control measures. Local roads could provide alternative access to heavy vehicles that cannot make U turns because of large turning radius characteristics.

Concept 18 – Traffic Operations and Safety

Turning or angle related crashes are the primary crash types that are prevented by access management that converts direct left turns to right turns with a U-turn. In fact, providing U-turns instead of direct left turns can reduce the frequency of all crashes by approximately 20

percent. As a result of the proposed modifications, delay will increase slightly for left-turns from side-streets as a result of out-of-direction travel.

Concept 18 – Basic Roadway Geometries and Right-of-Way Requirements

Raised concrete medians or paint can be used to demarcate U-turn locations within the existing medians and ROW.

Concept 18 – Environmental and Land Use Assessment

This concept would not have environmental or land use impacts.

Concept 18 – Cost Opinions

U-turn improvements are estimated at \$100,000 per location, assuming raised concrete medians are chosen.

Attachments:

Figure 5-1. Existing 2011 Design Hour Traffic Volumes

Figure 5-2. Future Baseline 2035 Design Hour Traffic Volumes

Figure 5-3. Concept Locations