# OR 99 Corridor Plan

# DRAFT Technical Memorandum #5s

# Additional Concept Development and Evaluation

***(Supplement to Technical Memorandum 5)***

**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

## October 2013

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# 5. ADDITIONAL CONCEPT DEVELOPMENT AND EVALUATION

The improvement concepts identified for OR 99 are intended to address corridor deficiencies for all modes while meeting established goals and objectives. Initially, 31 improvement concepts were developed at various locations and the evaluation was presented in *Technical Memorandum #5: Concept Development and Evaluation (TM#5)*. Two additional concepts that consider road diets in Talent and between Talent and Ashland were presented in *Technical Memorandum #6: Talent Area Road Diet Analysis (TM#6)*. In this supplemental memorandum, six additional improvement concepts have been developed and evaluated.

## 5.1. Concept Development

After an initial set of improvement concepts were developed, additional improvement concepts were considered to augment the original set of improvements. Some of the new improvements are alternatives to concepts considered in the original evaluation. Others are entirely new concepts that address issues raised during the evaluation process.

See *Technical Memorandum #5: Concept Development and Evaluation* for details on project goals[1] and concept improvement categories.

## 5.2. Concept Evaluation

Similar to the original proposed improvement concepts, not all of the alternative 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 right-of-way (ROW) requirements, environmental and land use consequences, and cost opinions. Further descriptions of evaluation measures may be found in *Technical Memorandum #5: Concept Development and Evaluation.*

## 5.3. Additional Improvement Concepts

Six additional improvement concepts were developed for this supplemental evaluation. Each concept is summarized in Table 5-1 and then discussed in detail.

[1] Objectives associated with each goal can be found in *Technical Memorandum #1: Definition and Background*.

**Table 5-1. South Medford to Phoenix Segment Improvement Concepts**

| ID | Location | General Description | Purpose |
|---|---|---|---|
| 34 | Charlotte Ann Rd to Coleman Creek Culvert (MP 8.75-11.03) | Modify roadway cross section from 5 lanes to 3 lanes, add bike lanes, and construct continuous sidewalks | Provide facilities along OR 99 for all modes of travel |
| 35 | Coleman Creek Crossing (MP 11.03) | Provide bicycle and pedestrian facilities on or adjacent to the Coleman Creek Culvert.<br>▪ Option A: Modify lane striping and add sidewalks and bike lanes to each side of the roadway<br>▪ Option B: Modify lane striping and add multi-use paths to each side of the roadway<br>▪ Option C: Modify lane striping and add parallel path structures over Coleman Creek | Provide facilities along OR 99 for all modes of travel and enhance downtown environment |
| 36 | Phoenix South End of Couplet to South City Limits (MP 11.96-12.36) | Modify roadway cross section from 4 lanes to 3 lanes, add bike lanes, and construct continuous sidewalks | Provide facilities along OR 99 for all modes of travel |
| 37 | Phoenix South City Limits to Talent North City Limits (MP 12.36-13.75) | Modify roadway cross section from 4 lanes to 2 or 3 lanes and widen shoulders | Provide facilities along OR 99 for all modes of travel |
| 38 | Phoenix South City Limits to Colver/ Suncrest Rd (MP 12.36-13.86) | Install Pedestrian Crosswalk and Activated Crossing Device | Improve OR 99 crossing opportunities and connectivity |
| 39 | Various Corridor Locations | Enhance signage at existing Bear Creek Trail access points and add new trail access points for better connectivity through the study area | Increase visibility of, and connections to, the Bear Creek Trail |

### *5.3.1. Concept 34 – Charlotte Ann Rd to Coleman Creek Culvert – Implement a Road Diet and Add Bike Lanes and Sidewalks*

The south Medford to Phoenix section of OR 99 is a typical 5-lane urban arterial with a center left-turn lane, a posted speed 45 mph, limited bicycle facilities, and intermittent pedestrian facilities adjacent to the roadway.

Very few blocks have paved standard-width sidewalks and are generally limited to areas surrounding Garfield Street, South Stage Road, and new developments. The roadway concepts provide adjacent pedestrian facilities via ROW or easements. The majority of the pedestrian access in this segment is provided by narrow paths (gravel, dirt, and paved), parking lots, local circulation roads, or no path at all. For these sections, additional ROW or easements will be needed to provide a continuous pedestrian facility. In the locations where sidewalks are present, deterioration has been observed.

Currently, bicycle facilities along this segment of OR 99 are only located between Garfield Street and Charlotte Ann Road. This lack of bicycle facilities generally deters bike traffic, or forces users to ride along the edge of the outside travel lane. Bike lanes would clearly designate

a lane for bicyclists on the roadway. The lane must be wide enough to allow a bicyclist to avoid conflicts with passing vehicles and be far enough from the edge of pavement to avoid debris.

The purpose of this improvement concept is to provide facilities for all modes of travel along OR 99 from just north of Charlotte Anne Road (MP 8.75) to the improvements associated with the Fern Valley interchange (MP 11.03), as shown in Figure 5-1. This improvement concept would reduce the number of travel lanes on OR 99 from five lanes to three lanes, adding bike lanes through restriping, and constructing sidewalks. Concept 34 is directly comparable to the options presented in Concept 3 of TM#5.

## Concept 34 – Traffic Operations and Safety

Current traffic demand in this segment ranges from 17,000 vpd at the north end in Medford and 14,000 vpd at the south end near Phoenix. The 2034 forecast demand is expected to range from 22,000 vpd in Medford to 19,000 vpd near Phoenix.

Analysis of signalized intersections with the road diet resulted in v/c ratios of 1.0 at S Stage Road and 0.97 at Lowry Lane for the year 2034 which would exceed both the Oregon Highway Plan (OHP) target of 0.95 and the Highway Design Manual (HDM) standard of 0.85. These v/c results included the assumption of right-turn lanes on OR 99, which would negate some of the benefit of the road diet and would likely require ROW acquisition to construct sidewalks.

If the 15 percent increase in growth is applied for the sensitivity analysis, both intersections would have v/c ratios over 1.0 and the signal at Bear Creek Corporation Drive would also be approaching the OHP target with a forecast v/c ratio of 0.93 and exceeding the HDM standard.

Concept 34 would improve safety and mobility for both pedestrians and bicyclists by providing facilities that do not currently exist or improving substandard facilities. Analysis using the Highway Safety Manual (HSM) Part C - Predictive Method for Urban and Suburban Arterials indicates that the predicted number of bicycle and pedestrian crashes for the 3-lane cross section would be lower than the rate of the existing 5-lane cross section. This reflects the shorter crossing distances of the 3-lane cross section. With either cross section, the predictive rate has less than one pedestrian and one bicycle crash per year.

Concept 34 would likely result in more vehicular crashes based on the predictive method from the HSM Part C. Vehicular crashes are estimated to be higher for the 3-lane than 5-lane cross section primarily because there would be an increase in driveway-related crashes. If the road diet were accompanied by significant access control, the predicted crash rates would be comparable.

## Concept 34 – Basic Roadway Geometries and ROW Requirements

Concept 34 could implement the road diet through restriping of the existing paved surface; the physical impacts and costs of this option would be similar to those presented for Concept 3, Option A. However, the existing curb-to-curb paved surface ranges from 66 to 72 feet. Even with 6-foot bike lane with 3-foot buffers, travel lanes would likely be wide (14 to 18 feet) to

fully utilize the existing pavement. Widening the bike lanes too much could confuse drivers who might use a wide bike lane as a turn lane into driveways and side streets. Therefore, the concept cross-section focuses on narrowing the roadway to allow for improvements within existing ROW instead.

The 3-lane cross section for Concept 34 could have one 12-foot travel lane in each direction, a 16-foot painted median, and 6-foot bike lanes on each side of the road, as shown in Figure 5-1. The revised cross section would only need 52 feet of paved surface rather than the existing 66 to 72 feet that currently exists. The reduced roadway cross section width would allow for construction of 6-foot sidewalks on both sides of the roadway within the existing ROW without impact to adjacent properties except at signalized intersections where additional right-turn lanes are necessary. This basic facility width requirement of 64 feet in at 70-foot ROW would allow for the option to add bike lane buffers to the paved section or landscape buffers for the sidewalks.

Concept 34 would require relocating the existing curbs and constructing a new drainage system for OR 99. It would also require relocation or replacement of traffic control devices throughout the corridor..

The transition points between four travel lanes (two in each direction) and two travel lanes (one in each direction) should be located a sufficient distance from the signalized intersection of OR 99 at Garfield Road to safely merge southbound traffic at 45 mph. Access management measures may be needed in the transition areas to maintain safe operations.

### Concept 34 – Environmental and Land Use Assessment

This concept could be constructed primarily within the existing ROW but would result in some property impacts near traffic signals where right-turn lanes would be required. Some access modifications could occur that would also potentially impact properties. Concept 34 would not increase impervious surface and would not require the extension of culverts in the corridor.

### Concept 34 – Cost Opinions

The cost for this concept is estimated at $7.3 million. This estimate assumes excavation costs, drainage reconstruction, and relocation of most traffic control. It does not include any costs for ROW acquisition or utility relocation at some of the signalized intersections.

## *5.3.2. Concept 35 – Coleman Creek Crossing - Add Bicycle and Pedestrian Facilities*

The Fern Valley Interchange improvements stop just short of the OR 99 crossing over Coleman Creek. The culvert crossing includes 66 feet of paved surface and approximately 2 feet of curb and asphalt sidewalk on either side of the roadway. The paved roadway both north and south of the culvert is also 66 feet wide.

South of the crossing, the Fern Valley Interchange improvements include implementing a lane diet that would narrow travel lanes to 11 feet and allow for 5-foot bike lanes to be striped in each direction. The improvements also include 6-foot, curb-tight sidewalks along OR 99. Although these improvements required a design exception, the lane diet option was selected to avoid substantial ROW acquisition from businesses along OR 99.

The purpose of this improvement concept is to provide facilities for all modes of travel along OR 99 across Coleman Creek. Concept 35 has three separate options to consider:

- **Option A**: Modify travel lane striping (eliminate the center turn lane and narrow through travel lanes), add striped bike lanes, and widen sidewalks (Figure 5-2). A raised median may be necessary for access control.
- **Option B**: Modify travel lane striping (reduce center lane median width and narrow through travel lanes) and add a raised multi-use path on either side of the roadway (Figure 5-3). A raised median may be necessary for access control.
- **Option C**: Modify travel lane striping (narrow travel lanes), add striped bike lanes, and construct parallel pedestrian path structures over Coleman Creek on either side of the roadway (Figure 5-4).

## Concept 35 – Traffic Operations and Safety

Current traffic demand in this segment is approaching 16,000 vpd. The 2034 forecast demand is expected to range from 22,000 vpd in Medford to 19,000 vpd near Phoenix. The posted speed drops from 45 mph to 30 mph just north of the culvert.

Concept 35, Option A would result in minor changes to vehicular capacity due to narrower travel lanes. The addition of 5-foot wide bicycle lanes would provide a clearly defined travel way for bicyclists, allowing enough space from passing vehicles to avoid conflicts. The addition of continuous 6-foot wide sidewalks would improve safety and mobility for pedestrians. The elimination of the center median lane would impact access at four driveways and would likely require a continuation of the raised median and turn restrictions currently in place between the crossing and Cheryl Lane. Narrower travel lanes would likely have a negligible change to vehicular safety, and would encourage more modest travel speeds where the posted speed is 30 mph. Even with reduced widths, the bike lane combined with the travel lanes would still provide a 29-foot “hole in the air” to accommodate specialized freight needs.

Concept 35, Option B would also result in minor changes to vehicular capacity due to narrower travel lanes. The addition of a 10-foot wide multi-use path would accommodate both bicyclists and pedestrians and would improve safety and mobility for both. As with Option A, the elimination of the center median lane would impact access at four driveways and would likely require a raised median and turn restrictions. Narrower travel lanes would likely have a negligible change to vehicular safety, with a possibility of decreasing travel speeds. Even with reduced widths, the travel lanes would still provide a 25-foot “hole in the air” to accommodate specialized freight needs.

Concept 35, Option C would have a roadway cross section consistent with the restriping plans on OR 99 associated with the Fern Valley Interchange improvement. The narrower travel lanes would result in minor changes to vehicular capacity and the center turn lane would not require any access restrictions. The addition of 5-foot wide bicycle lanes would provide a clearly defined travel way for bicyclists, allowing enough space from passing vehicles to avoid conflicts. Instead of providing pedestrian facilities on the current crossing, Option C would provide parallel structures specifically designed for pedestrian use. The 8- to 10-foot wide paths would improve safety and mobility for pedestrians. Narrower travel lanes would likely have a negligible change to vehicular safety, and would encourage more modest travel speeds where the posted speed is 30 mph. Because Option C does not change the paved surface, it would provide the existing 33-foot "hole in the air" to accommodate specialized freight needs.

## Concept 35 – Basic Roadway Geometries and ROW Requirements

All three options for Concept 35 add bicycle and pedestrian facilities to the existing roadway while maintaining the existing number of through vehicular travel lanes. The highway ROW is approximately 90 feet in the vicinity of Coleman Creek itself but narrows to 70 feet north of the creek and 75 feet south of the creek. The culvert that carries Coleman Creek under OR 99 is 75 feet wide and currently supports approximately 70 feet of roadway structure.

Concept 35, Option A would narrow the paved surface from 66 feet to 58 feet to allow for the addition of a 6-foot curb and sidewalk on both sides of OR 99. The narrower paved surface would be striped with 5-foot bike lanes and 11-foot travel lanes. The center median lane would be reduced to a 4-foot median. The existing curb and asphalt sidewalks would be widened from approximately 2 feet to 6 feet. These changes would not result in any changes to the 70-foot wide roadway structure on the Coleman Creek culvert. The transitional striping from the 4-lane creek crossing to a 5-lane cross section would need to extend a minimum distance of 225 feet north of the crossing (assuming 45 mph speed) and 150 feet south of the crossing (assuming 30 mph speed). These minimum distances would overlap four driveway accesses and eliminate the left-turn refuge are on OR 99; therefore, a raised median should be considered to enforce turn restrictions for safety and operational reasons.

Concept 35, Option B would narrow the paved surface from 66 feet to 50 feet to allow for the addition of a 10-foot curb and path on both sides of OR 99. The narrower paved surface would be striped with 5-foot bike lanes and 11- to 12-foot travel lanes. The center median lane would be reduced to a 4-foot median. The existing curb and asphalt sidewalks would be widened from approximately 2 feet to 10 feet to provide a path for bicycles and pedestrians. The path would need ramps from OR 99 for bicycle access. These changes would not result in any changes to the 70-foot wide roadway structure on the Coleman Creek culvert. The transitional striping for Option B would be the same as described for Option A and a raised median should also be considered to enforce turn restrictions for safety and operational reasons.

Concept 35, Option C would not change the 66-foot paved surface but would restripe the roadway with 5-foot bike lanes and 11-foot travel lanes. The center median lane would be reduced to 12 feet. Instead of providing pedestrian facilities on the current crossing, Option C

would provide 8- to 10-foot parallel structures specifically designed for pedestrian use. The existing culvert cannot be extended without addressing fish passage issues; thus separate pedestrian structures have been assumed for this option. Connections from existing sidewalks to the pedestrian paths would be needed and would likely require ROW acquisition from adjacent property owners. The OR 99 ROW at the creek is approximately 90 feet and additional ROW would be required to construct the parallel structures. These structures could be constructed from a variety of materials; concrete would have higher construction costs but lower maintenance costs while timber would likely have lower construction costs but higher maintenance costs.

All three options for Concept 35 would likely require design exceptions for the lane width reductions.

## Concept 35 – Environmental and Land Use Assessment

The existing Coleman Creek culvert under OR 99 has fish passage issues that would need to be addressed if the roadway was widened to provide bicycle and pedestrian facilities. All three options assume that the existing culvert would remain untouched and that the improvements would not change the existing roadway structure width of approximately 70 feet. Thus, the fish passage through the culvert is not addressed and is not included in the cost estimates.

Concept 35, Options A and B would be constructed entirely within the existing roadway structure and ROW. With the elimination of the center median lane, turn restrictions at four driveways are recommended with a raised median limiting access to right turns only. Two of the impacted properties would have alternate access but one property with two driveways would not. These options could be constructed with minimal impact to environmental justice populations in the vicinity of the improvements.

Concept 35, Option C would have some ROW impacts to adjacent properties for the construction of the pedestrian path and bridges. The new structures would be designed to accommodate fish passage in Coleman Creek. Option C would not require any access restrictions because restriping would not eliminate the center median lane.

## Concept 35 – Cost Opinions

The estimates for this concept with different cross sections are:

- Concept 35, Option A: $350,000
- Concept 35, Option B: $300,000
- Concept 35, Option C: $1.3 million

The cost for Options A and B are considerably lower than Option C because both work within the existing roadway structure. None of these costs includes utility relocation or acquisition of additional ROW.

### *5.3.3. Concept 36 – Phoenix South End of Couplet to South City Limits - Implement a Road Diet and Add Bike Lanes and Sidewalks*

South of the couplet in Phoenix, OR 99 is a 4-lane roadway with neither bicycle nor pedestrian facilities. The posted speed is 40 mph although many northbound vehicles may still be traveling at faster speeds as they transition from the 55-mph rural section.

Concept 36 would reduce the number of travel lanes on OR 99 from 4 lanes to 3 lanes, adding bike lanes through additional restriping, and constructing sidewalks between the south end of the downtown couplet and the Phoenix south city limits (MP 11.96-12.36), as shown in Figure 5-5. The purpose of this improvement concept is to provide facilities for all modes of travel along OR 99. Concept 36 is directly comparable to the options presented in Concept 18 of TM#5.

#### Concept 36 – Traffic Operations and Safety

Current traffic demand in this segment ranges from 8,000 to 9,000 vpd. The 2034 forecast demand is expected to range from 13,000 to 14,000 vpd. There are currently no signalized intersections on this section of OR 99 and no need for future signals is anticipated at this time.

Analysis of unsignalized intersections with the road diet indicates that year 2034 v/c ratios on OR 99 would be well below the OHP mobility targets and HDM standards. Side street traffic may see operational improvements because of the shorter crossing distance but the benefit would be offset to some degree by a higher density of traffic in the through travel lanes on OR 99. The 3-lane cross-section could also accommodate additional traffic growth beyond that forecast for the year 2034.

Concept 36 would improve safety and mobility for both pedestrians and bicyclists by providing facilities that do not currently exist or improving substandard facilities. The crossing distances of the 3-lane cross section would not be substantially different than the current 4-lane cross section because the overall paved surface would remain the same. However, both pedestrians and bicyclists would only have to cross two lanes of flowing traffic rather four lanes.

Concept 36 would likely result in fewer vehicular crashes based on the predictive method from the HSM Part C. Vehicular crashes are estimated to be lower for the 3-lane than 4-lane cross section.

#### Concept 36 – Basic Roadway Geometries and ROW Requirements

Concept 36 would implement the road diet through restriping of the existing paved surface. The 3-lane cross section would include one 12-foot travel lane in each direction, a 14-foot painted median, and 6-foot bike lanes on each side of the road, as shown in Figure 5-5. The revised cross section would only use the existing 50 feet of paved surface rather than widening to add bike lanes or a center median as discussed for Concept 18. The reduced roadway cross section width would allow for construction of 6-foot sidewalks on both sides of the roadway

within the existing 75-foot ROW without impact to adjacent properties. There would be no change to the 25-foot "hole in the air" to accommodate specialized freight needs.

Depending on the roadway cross sections to the north and south, transitions between four travel lanes (two in each direction) and two travel lanes (one in each direction) will be necessary if implemented in conjunction with Concept 37. Transitions should be located a sufficient distance from the intersections to safely merge traffic at the posted speeds. Access management measures may be needed in the transition areas to maintain safe operations.

### Concept 36 – Environmental and Land Use Assessment

This concept could be constructed within the existing ROW with no impact to environmental justice populations in the vicinity of the improvements. Some access modifications could occur that would also potentially impact properties. Concept 36 would not increase impervious surface and would not require the extension of culverts in the corridor. The addition of sidewalks could require culvert extensions, thus fish passage would need to be considered.

### Concept 36 – Cost Opinions

The cost for this concept is estimated at $1.2 million.

## *5.3.4. Concept 37 – Phoenix South City Limits to Talent – Implement a Road Diet and Widen Shoulders*

The section of OR 99 between the South City Limits of Phoenix and North City Limits of Talent is a four-lane arterial through a rural area with a posted speed of 55 mph. This section of roadway has no median and shoulder widths are narrow at 2 feet for most of the segment, widening to 6 feet near the Colver/Suncrest Road intersection. Because of the narrow shoulders, bicyclists (and pedestrians) must use the outer lane to travel through the area.

Concept 37 would reduce the number of travel lanes on OR 99 from four lanes to two lanes (with some turn lanes at intersections) or three lanes with wider shoulders. The purpose of this improvement concept is to provide facilities for all modes of travel along OR 99. Concept 37 is directly comparable to the options presented in Concept 20 of TM#5.

### Concept 37 – Traffic Operations and Safety

Current traffic demand in this segment is approximately 10,000 vpd. The 2034 forecast demand is expected to be approximately 14,000 vpd. Eighteen collisions have been reported in this segment during the 5-year analysis period.

Analysis of unsignalized intersections with the road diet indicates that year 2034 v/c ratios on OR 99 would be well below the OHP mobility targets and HDM standards. Side street traffic may see operational improvements because of the shorter crossing distance but the benefit would be offset to some degree by a higher density of traffic in the through travel lanes on OR 99. If the 2-lane cross section is striped, then left-turn lanes should be included at major

intersections and driveways. The 2- to 3-lane cross section could also accommodate additional traffic growth beyond that forecast for the year 2034.

Concept 37 would improve safety and mobility for both pedestrians and bicyclists on this rural section of roadway by providing full-width shoulders rather than the substandard 2-foot shoulders currently provided. Although the overall paved surface would remain the same, the crossing distances of the 2- to 3-lane cross section would be shorter than the current 4-lane cross section. And both pedestrians and bicyclists would only have to cross two lanes of flowing traffic rather four lanes.

Concept 37 would likely result in fewer vehicular crashes based on the predictive method from the HSM Part C. Vehicular crashes are estimated to be lower for both the 2-lane and 3-lane cross sections as compared with the 4-lane cross section.

The wider shoulders would also provide space for vehicles to pull off the road in the event of a breakdown.

## Concept 37 – Basic Roadway Geometries and ROW Requirements

Concept 37 does not change the roadway cross-section but does reallocate the paved surface, as shown in Figure 5-6. The 2-lane cross section would include one 12-foot travel lane in each direction, an 8-foot painted median, and 10-foot shoulders on each side of the road. The 3-lane cross section would include one 12-foot travel lane in each direction, a 14-foot painted median (or left-turn lane at an intersection), and 7-foot shoulders on each side of the road. The revised cross section would only use the existing 52 feet of paved surface rather than widening to increase shoulder or median width as discussed for Concept 20. There would be no change to the 26-foot “hole in the air” to accommodate specialized freight needs.

The existing ROW varies between 70 and 130 feet which adequately accommodates either striping option.

The transition points between four travel lanes (two in each direction) and two travel lanes (one in each direction) should be located a sufficient distance from the Suncrest/Colver Road intersection to safely merge northbound traffic at 55 mph. Access management measures may be needed in the transition areas to maintain safe operations.

## Concept 37 – Environmental and Land Use Assessment

Since this improvement maintains the paved cross-section, environmental and land use impacts are not expected.

## Concept 37 – Cost Opinions

The estimated cost of Concept 37 is approximately $225,000.

### *5.3.5. Concept 38 – North of Hartley Rd – Install Midblock Pedestrian Crossing*

Concept 38 considers adding a midblock crosswalk and a pedestrian-activated crossing device, such as the Rectangular Rapid Flashing Beacon (RRFB) or a Pedestrian Hybrid Beacon to OR 99 north of Hartley Road between the cities of Phoenix and Talent. The purpose of this improvement is to improve OR 99 crossing safety for the Southern Oregon Education Service District building and connectivity to nearby transit stops.

#### Concept 38 – Traffic Operations and Safety

Current traffic demand in this segment is approximately 10,000 vpd. The 2034 forecast demand is expected to be approximately 15,000 vpd. The roadway currently has four travel lanes (two in each direction), 2-foot shoulders, and a posted speed of 55 mph. A transit stop located just north of Hartley Road serves the Southern Oregon Education Service District building as well as Jackson County Animal Care.

Concept 38 would install a midblock pedestrian crossing and pedestrian-activated crossing device at a location north of Hartley Road, as illustrated in Figure 5-7. The use of a pedestrian-activated crossing device increases driver awareness of when pedestrians are present at a crossing location. The RRFB and Pedestrian Hybrid Beacon have a higher compliance of vehicles stopping for pedestrians than a striped crosswalk alone or no crosswalk at all. The current 4-lane configuration could not accommodate a raised median in the center of the roadway. However, the road diet discussed in Concept 37 would allow for a raised median installation in conjunction with crosswalk striping.

While pedestrian-activated crossing devices have been installed at many urban and suburban locations, there have been few applications on 55 mph rural roadways. Additional warning measures, such as advance beacons and signage, would need to be a part of a rural installation.

A pedestrian-activated crossing device in a rural corridor could raise some safety concerns. From the vehicular perspective, stopping traffic in a rural corridor could result in an increase in rear end collisions. With the 4-lane section, vehicles changing lanes to avoid slowing traffic is a concern for pedestrian safety and visibility.

As noted with other crossing concepts in TM#5, facilities under state jurisdiction will likely require that pedestrian crossing warrants are met. Installation of crossing devices generally requires exceeding minimum pedestrian crossing thresholds which have not been evaluated in this process because of insufficient pedestrian data.

#### Concept 38 – Basic Roadway Geometries and ROW Requirements

For purposes of describing the crossing layout and estimating cost, the RRFB has been assumed for Concept 38. The pedestrian hybrid beacon requires overhead mast arms that may be less desirable for the rural highway corridor.

The crossing would need a minimum of three RRFB signs to be placed for each direction of traffic. One sign would be placed in advance of the crossing to warn drivers that the crossing has been activated and allow vehicles to safely come to a stop at the crossing. The other two would be placed on each side of the highway to indicate that pedestrians could be crossing from either side. The RRFBs would be synchronized to act together via interconnect. No passing zones prior to the crossing should be considered if the 4-lane section is maintained on OR 99. If the road diet from Concept 37 is implemented, a 10-foot raised median could be installed.

There would be no anticipated roadway or ROW impacts as a result of the proposed installation of pedestrian activated crossing devices.

### Concept 38 – Environmental and Land Use Assessment

There would be no anticipated environmental or land use impacts as a result of the enhancements associated with the proposed installation of pedestrian activated crossing devices.

### Concept 38 – Cost Opinions

The estimated cost of Concept 38 is approximately $50,000. This cost does not include construction of a raise median.

## *5.3.6. Concept 39 – Enhanced Bear Creek Greenway Connections*

OR 99 provides varying degrees of discontinuous bicycle and pedestrian facilities throughout the corridor. In some areas, bicycles have their own lane while in others they must share the road with traffic traveling between 30 and 55 mph. Similarly, pedestrian facilities vary from full width sidewalks to 2-foot pathways (both paved and unpaved) to walking on the roadway with traffic. There is an alternative to traveling along OR 99 for these modes: the Bear Creek Greenway Trail (BCG extends 17.5 miles and parallels OR 99 through the study area). It serves recreational needs and can provide a functional alternative for some non-auto traffic.

Direct trail access points are few and the proximity to OR 99 varies as the BCG meanders. For non-auto users, it is currently difficult to know how far away the nearest access point is, and in some cases the distance between OR 99 and the BCG. The corridor could benefit from increased visibility of and connectivity to the BCG.

Concept 39 considers enhanced signage along OR 99 at existing BCG access points and improved trail access throughout the study area, as shown in Table 5-2 and Figure 5-8. This improvement concept would add wayfinding signage to OR 99 at ten locations where local streets or paths connect with the BCG to increase visibility of the trail. It would also formalize currently informal pathways with pavement.

Concept 39 works well with Concept 13, which enhances connections from Bear Creek Drive to the BCG near 4$^{th}$ Street and Oak Street in downtown Phoenix. It is also compatible with

Concept 4, which installs median islands on OR 99 to facilitate crossing the highway. Improved highways crossings would allow BCG access for both northbound and southbound travelers.

**Table 5-2. Concept 39 Improvement Locations**

| Locations | Existing Facilities | Potential Improvements |
|---|---|---|
| **Enhanced Trail Signage** | | |
| OR 99 at Lowry Lane | Sidewalks on north side | Could add bicycle sharrows |
| OR 99 at South Stage Road | Existing bike lanes & sidewalks | No changes |
| OR 99 at E Glenwood Road | Unpaved easement | Consider paving to trail |
| OR 99 at Northridge Terrace | Sporadic sidewalks | Could add bicycle sharrows |
| OR 99 at Fern Valley Road | Bike lanes & sidewalks constructed as part of Interchange project | No changes |
| OR 99 at Bolz Road | | |
| OR 99 at 4th Street | Sidewalks on north side | Could add bicycle sharrows or possible bike lane striping |
| OR 99 at Oak Street | No facilities | Could add bike lane striping and sidewalks |
| OR 99 at Suncrest Road | Some bike lane striping, continuous sidewalk on one side | Could add bicycle sharrows |
| OR 99 at West Valley View Road | Existing bike lanes & sidewalks | No changes |
| **New Connection Opportunities** | | |
| Connection to Bear Creek Drive opposite 4th Street | Currently unpaved | Concept 13 includes paving gravel connection |
| Connection to Bear Creek Drive at entrance to Blue Heron Park | Currently use park entrance to connect to trail | Concept 13 includes constructing a new direct connection |
| Connection to OR 99 1650' south of Creel Road | Currently informal connection | Pave connection and include signage |

## Concept 39 – Traffic Operations and Safety

Concept 39 would improve safety and mobility for both pedestrians and bicyclists by improving access to parallel off-road facilities. Trail markers (signage) could also alert drivers to potential conflicts with other modes.

Impacts along OR 99 associated with vehicular traffic operation, access, transit, or lighting are not expected with this concept.

## Concept 39 – Basic Roadway Geometries and Right-of-Way Requirements

No roadway geometry changes are anticipated as part of this concept. Enhanced signage along OR 99 is assumed to be placed within ODOT ROW. Any striping or signage that may also be added to local streets could also be placed within public ROW. The new path connections may require additional ROW or easements.

## Concept 39 – Environmental and Land Use Assessment

The enhanced signage improvements on OR 99 could be constructed within the ODOT ROW with no property or environmental impacts.

The new access points may require some additional ROW. The amount of additional ROW is dependent on the design and can potentially be addressed with an easement or public/private partnership. One of the connections identified for Concept 13 would have some wetlands impacts that would require mitigation. Additionally, at the southernmost location (south of Creel Road) the new access point would likely be located within an ODFW Priority site (ranking 7-8) and near the 100-year flood plain. The three new access points would slightly increase the amount of impervious surface along the corridor.

## Concept 39 – Cost Opinions

The cost for the signage portion of Concept 39 depends on the number, location, and type of signs installed. A budget of $25,000 would easily allow for 25 to 50 signs to be installed on OR 99 and at trail connections to the street system. The one new paved trail connection identified south of Creel Road is estimated at less than $50,000 for the connection and space for a maintenance vehicle to park. Concept 13, which includes the two trail connections in downtown Phoenix, is estimated at $400,000. Costs for striping bike lanes (or sharrows), paving currently unpaved connections, or adding sidewalks have not been prepared for this concept..

*Attachments:*

*Figure 5-1. Concept 34 – South Medford to Phoenix Transition Segment Road Diet and Multimodal Improvements*
*Figure 5-2. Concept 35, Option A – Coleman Creek Crossing Multimodal Improvements*
*Figure 5-3. Concept 35, Option B – Coleman Creek Crossing Multimodal Improvements*
*Figure 5-4. Concept 35, Option C – Coleman Creek Crossing Multimodal Improvements*
*Figure 5-5. Concept 36 – South Phoenix Road Diet and Multimodal Improvements*
*Figure 5-6. Concept 37 – Phoenix to Talent Transition Segment Road Diet*
*Figure 5-7. Concept 38 – OR 99 North of Hartley Rd Midblock Pedestrian Crossing*
*Figure 5-8. Concept 39 – Enhance Trail Connections*