I-5 Rogue Valley Corridor Plan

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Technical Memorandum #4:
Alternative Corridor Concept Analysis

Prepared by:

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Prepared for:

Oregon Department of Transportation

I-5 Rogue Valley Corridor Plan

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Technical Memorandum #4:
Alternative Corridor Concept Analysis

Prepared for

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1. OVERVIEW

This technical memorandum is the fourth in a series of memoranda that will be prepared for the *I-5 Rogue Valley Corridor Plan* (Corridor Plan). Technical Memorandum #4 builds on the finding of the first three memorandums and identifies concepts and corridor alternatives to improve future traffic operation and safety deficiencies on I-5.

As discussed in Technical Memorandum #1, the Corridor Plan was initiated by the Oregon Department of Transportation (ODOT) to assess existing and future transportation conditions along the Interstate 5 (I-5) and Oregon Highway 99 (OR 99) corridors from Interchange 11 south of Ashland to Interchange 35 north of Central Point**.**

Technical Memorandum #2 documented existing plans and policies, identified environmental and land use constraints, assessed existing traffic operations and crash history, discussed rail service, and inventoried the existing Intelligent Transportation Systems (ITS) infrastructure along the Corridor Plan area.

Technical Memorandum #3 summarized the future baseline traffic conditions along the Corridor Plan area for the years 2034 and 2050. The 2034 baseline scenario uses the Rogue Valley Metropolitan Planning Organization (RVMPO) financially constrained Regional Transportation Plan (RTP) land use and roadway assumptions. The 2050 baseline scenario also uses the RTP roadway network but with estimated year 2050 land use derived from the RVMPO Regional Problem Solving (RPS) concept. The future baseline scenarios serve as the basis for comparison to future concepts and alternative corridor concepts identified in this technical memorandum.

The purpose of Technical Memorandum #4 is to identify a preferred alternative corridor concept for I-5. The methodology to identify the preferred concept uses the following five steps.

1. Identify concept selection criteria
2. Identify potential improvement concepts
3. Evaluate concept impacts
4. Identify high performing concepts
5. Evaluate corridor concepts using the evaluation criteria

This draft memorandum encompasses steps 1-4, identifying the high performing concepts. The draft will be used to identify a preferred corridor concept in the final version of Technical Memorandum #4.

2. CONCEPT DEVELOPMENT

Concepts for the analysis were developed based on the goals and objectives of the concept as identified in Technical Memorandum #1 and the results of the existing conditions and future year analysis. With these findings in hand, concepts were discussed with the Project Management Team (PMT) and government staff. Through these discussions, several issues and objectives rose to the top as priorities to be addressed in the concept analysis. These include:

- Explore options to mitigate impacts caused by delays at the Siskiyou Pass summit (e.g., delays caused by winter weather conditions).
- Explore options to improve alternate north-south connections east of I-5.
- Improve efficiency of the existing transportation system through Transportation Demand Management (TDM) strategies, Transportation System Management (TSM) measures, and Intelligent Transportation System (ITS) technology.
- Identify potential improvements to the Medford viaduct that incorporate incident management and other measures to maximize efficiency.
- Coordinate with the Rogue Valley Metropolitan Planning Organization (RVMPO) efforts to assess the OR 99 corridor and develop strategies that reduce vehicular congestion and support economic development.
- Maintain efficient operations of the I-5 mainline through interchanges by identifying capacity constraints and implementing physical improvements.
- Explore improvement options for the southbound weigh station and northbound Port of Entry ramps.
- Limit the impacts of arterial system on I-5 mainline operations.
- Identify truck layover areas and implement improvements to enable staging of freight trucks during Siskiyou Pass closures.
- Develop expedited methods of informing truck operators of pending roadway changes ahead, such as construction or the closure of, or delays on, the Siskiyou Pass due to inclement weather.

Based on these priorities, 20 concepts were identified for the I-5 corridor under five concept categories.

- Safety Enhancement Measures
- Transportation System Management (TSM) Measures
- Capacity Enhancement Measures
- Least Cost Planning Solutions
- Transportation Demand Management (TDM) Measures

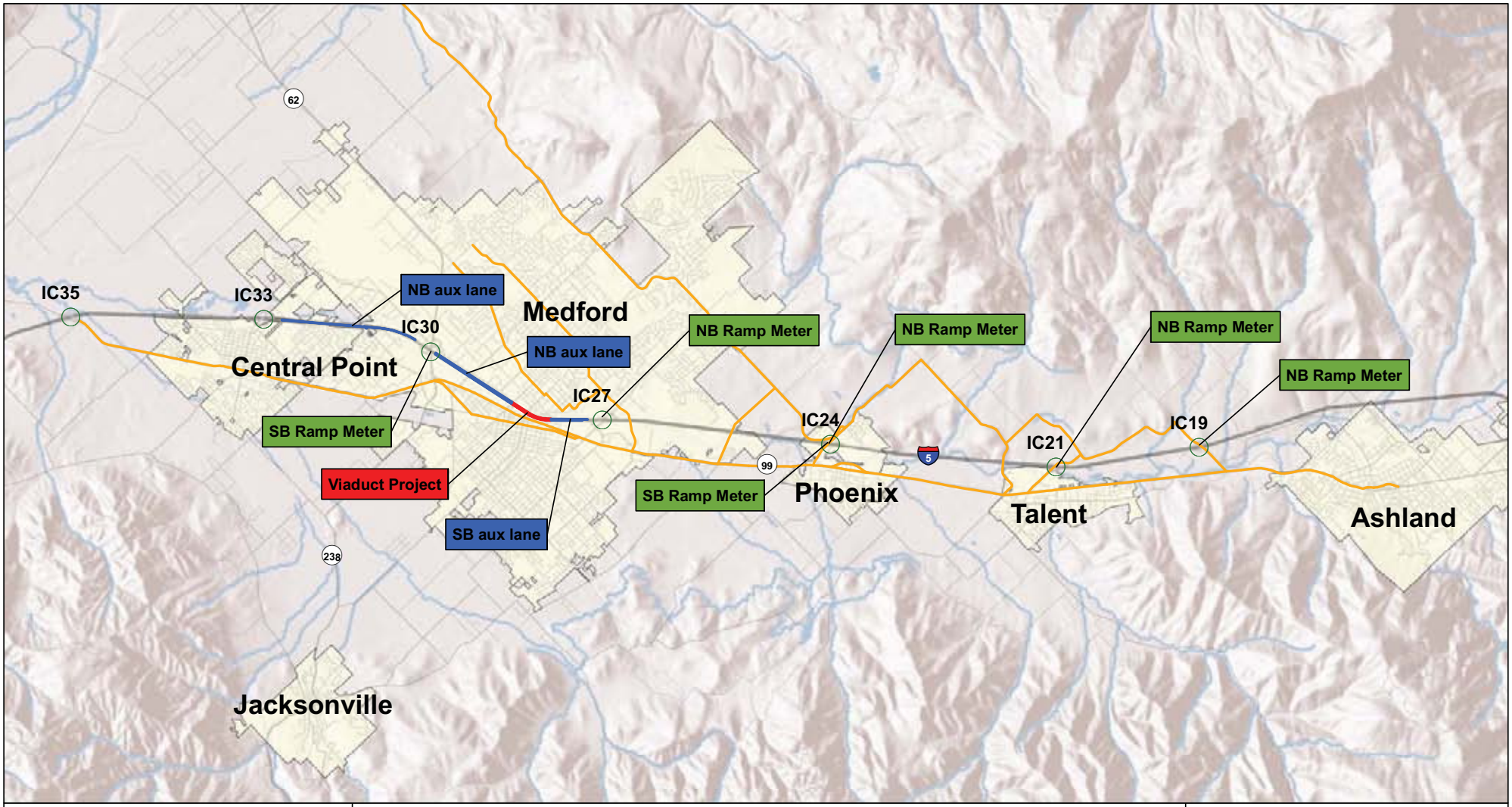
3. CONCEPT ANALYSIS

A general description of each concept and an overview of concept strengths and weaknesses are presented in this section of the document. Many of the concepts could only be evaluated qualitatively because the tools or level of detail was not sufficient to develop the information needed to complete a more technical analysis. The other concepts were evaluated quantitatively for traffic performance, physical impacts, and environmental consequences as well as potential cost. These findings are summarized in this section and the details of the quantitative analysis are included in Appendix A.

Table 3-1 provides a list of the proposed concepts and the level of evaluation for each concept. The locations of each physical improvement are shown graphically in Figure 3-1 for 2034 and Figure 3-2 for 2050.

Table 3-1. Corridor Concepts and Level of Analysis

Corridor Concept	Analysis Level of Detail
Safety Enhancement Measures	
Port of Entry	Quantitative
Southbound Weigh Station	Quantitative
Temporary Overnight Truck Facilities	Qualitative
Emergency Turn-Around	Qualitative
Medford Viaduct Shoulder	Quantitative
Incident Response	Qualitative
Transportation System Management (TSM) Measures	
Designated Alternate Truck Route	Qualitative
OR 99 Corridor Coordinated Traffic Signal System	Qualitative
Ramp Metering	Quantitative
Capacity Enhancement Measures	
Additional Mainline Travel Lane	Quantitative
Auxiliary Travel Lanes	Quantitative
Enhanced Local Arterial/Collector Connections	Quantitative
Expanded Medford Viaduct	Quantitative
Directional High Occupancy Vehicle Lane	Qualitative
Least Cost Planning Solutions	
Peak Hour Shoulder Use	Qualitative
Variable Speed Limits	Qualitative
Transportation Demand Management	
Intermodal Freight Hub	Qualitative
Transit Service Improvements	Qualitative
Commuter Rail	Qualitative
Bus Rapid Transit	Qualitative



0 0.5 1 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Interchange
- Enhanced Local Street Alternatives
- Auxilliary Lane Concepts
- Viaduct Concepts

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I-5: Rogue Valley Corridor Study
Figure 3-1

2034 Potential Concepts

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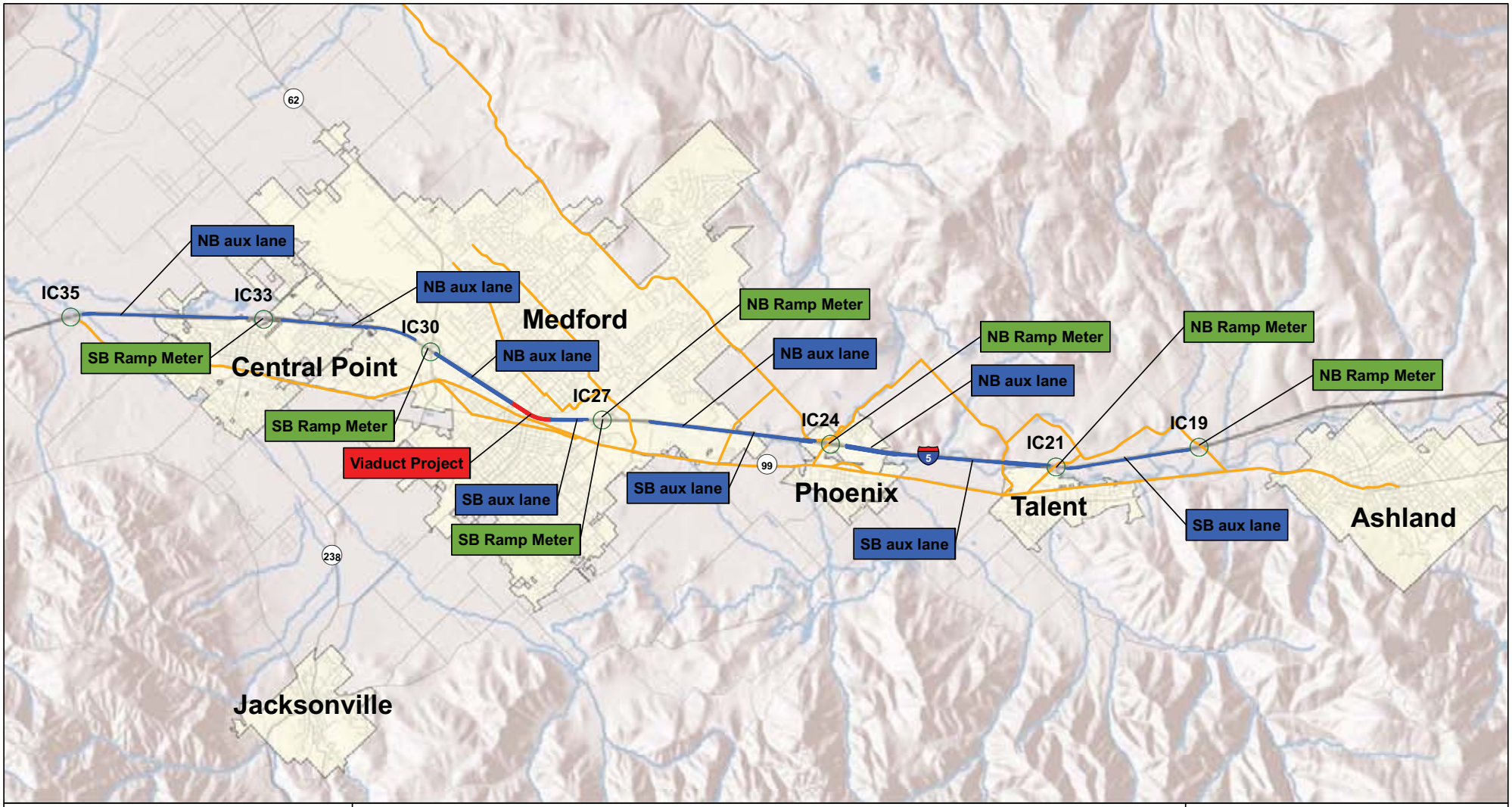
Date 11/10/2010 7:56 AM



0 0.5 1 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Interchange
- Enhanced Local Street Alternative
- Auxilliary Lane Concepts
- Viaduct Concepts

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I-5: Rogue Valley Corridor Study
Figure 3-2

2050 Potential Concepts

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Date 11/10/2010 8:08 AM

Safety Enhancement Measures

Addressing safety concerns is always a high priority when managing any part of the transportation system. Four concepts targeted at specific safety concerns on the freeway were developed:

- Port of Entry
- Southbound Weigh Station
- Temporary Overnight Truck Facilities
- Medford Viaduct Shoulder

Port of Entry

Two alternatives were evaluated to address the safety concerns[1] associated with the substandard distance between the northbound on-ramp from the Port of Entry weigh-station and the northbound off-ramp at Interchange 19. One of these options includes an auxiliary land between the on- and off-ramps. The other option reconfigures the weigh station to begin the on-ramp further south on the site to allow from a longer acceleration distance before entering the freeway. Both are discussed below.

Auxiliary Lane Option

This option adds an auxiliary lane between the on-ramp of the northbound weigh station (Port of Entry) facility and the northbound off-ramp at Interchange 19. The existing on-ramp does not provide enough acceleration distance for heavy trucks to reach freeway speeds before having to merge with through traffic, which disturbs traffic flow on the freeway reducing freeway capacity and increasing the potential for crashes. The auxiliary lane would provide additional room for trucks to accelerate up to freeway speeds before having to merge into the mainline travel lanes. The auxiliary lane would further lengthen the acceleration lane and enable safer merging for trucks entering the mainline travel lanes.

Adding the auxiliary lane northbound would require widening and shifting through lanes to the median side for most of the length to allow the widening under the Butler Creek Road Bridge, as shown in Figure 3-3. Constructing the widened pavement in the median would also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts would likely be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier.

[1] As noted in Technical Memorandum #2: Data Collection and Review of Existing Plans, the approximate 2,500-foot distance between the weigh station on-ramp and the off-ramp to Interchange 19 is well below recommended interchange spacing standards, which—combined with the inadequate acceleration length on the weigh station on-ramp—results in poor weaving and merging operations at this location.

0 165 330 Feet

Source Data: Jackson County, ESRI, Oregon GEO

Legend

New Pavement

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I-5: Rogue Valley Corridor Study

Figure 3-4

Modified Port of Entry Auxiliary Lane Option

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Date 11/10/2010 7:56 AM

0 165 330 Feet

Source Data: Jackson County, ESRI, Oregon GEO

Legend

New Pavement

Remove Existing Pavement

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I-5: Rogue Valley Corridor Study
Figure 3-3

Modified Port of Entry On-ramp

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Strengths

The addition of an auxiliary lane between the northbound on-ramp for the Port of Entry facility and the northbound off-ramp at Interchange 19 would immediately improve safety on the freeway and would provide additional freeway capacity to accommodate future growth in northbound traffic approaching Interchange 19. Constructing the widened pavement in the median should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. The identified land use and environmental impacts would be minor for this concept.

Weaknesses

This concept maintains the existing on-ramp, which has horizontal and vertical curves that impact the ability of heavy trucks to accelerate. Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier. There is minor potential for land use and environmental impacts identified for this concept. There may be impacts to the Butler Creek 100-year floodplain which intersects the Interstate and then flows into Bear Creek just before it reaches OR 99. The concept would also add 1.2 acres of impervious surface to the concept area, increasing stormwater runoff. Finally, an archaeological site has been identified within 200 feet of MP 17.28-17.45. Therefore, a survey for archaeological resources is recommended prior to construction.

Achieves Corridor Plan Goals and Objectives

The Auxiliary Lane Option (northbound) at the Port of Entry achieves all 4 established project goals and was specifically created to directly meet Objective 2.A. The Auxiliary Lane Option would meet Objective 1.C because it could be considered a TSM measure by improving the operations of I-5 and its related facilities between the Port of Entry and Interchange 19 improving traveling conditions and enhancing system capacity, reliability, and safety. The Option would also meet Objective 2.B as the Option will improve safety for this section of the freeway by allowing additional distance for trucks to accelerate and gain the necessary speed to merge fluidly with traffic. The Option meets Objective 3.A because during the IAMP 19 Planning process, the conflict between passenger vehicles and trucks due to the proximity of the interchange and the Ashland Port of Entry entrance ramp was identified as a deficiency for the interchange. The Auxiliary Lane Option eases this conflict by allowing more room for trucks and passenger vehicles to merge. The Option would generally meet Objective 4.E by improving the operations of the Port of Entry facility by making it easier for trucks to enter back into the freeway flow and Objective 4.F by providing for more capacity near the Interchange 19 north-bound exit ramp. Although the Auxiliary Lane Option does not apply to all the objectives identified for each goal, it also is not in conflict with any of the objectives.

Cost Opinion

The Auxiliary Lane Option would have an estimated cost of between $1 to 2 million to complete.

Modified On-Ramp Option

This option would relocate the Port of Entry on-ramp approximately 1,000 feet to the south of its current location, thus creating a longer acceleration lane which would enable safer merging of trucks onto the freeway. Shifting the on-ramp to the south would require changing the internal circulation at the Port of Entry to allow trucks in the parking area to circle back around to the new on-ramp location, which would be just north of the truck scales, as shown in Figure 3-4. Extending the ramp at the merge point on the freeway is not an option because of the Butler Creek Road Bridge, which prohibits widening the freeway to the outside. Shifting the through lanes to the median side would allow lengthening the acceleration lane, but the impacts and cost would be similar to a full auxiliary lane.

Strengths

Shifting the on-ramp for the Port of Entry facility farther to the south would immediately improve safety on the freeway and would improve the poor horizontal and vertical curvature of the existing ramp for trucks not using the parking facilities. Constructing the widened pavement in the median should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. The Modified On-Ramp Option would avoid the potential floodplain impacts of the Auxiliary Lane Option.

Weaknesses

The modified on-ramp option would add traffic on the north side of the scale house, which may not be desirable for the site operations. Trucks using the parking facility would need to loop around and backtrack to re-enter the freeway. With this option, a loop ramp would be required from the truck parking area back to the south, which could potentially require some right-of-way. Minor potential for land use and environmental impacts has been identified for this concept. The concept would also add 1.8 acres of impervious surface to the concept area, increasing stormwater runoff. Finally, an archaeological site has been identified within 200 feet of MP 17.28-17.45. Therefore, a survey for archaeological resources is recommended prior to construction.

Achieves Corridor Plan Goals and Objectives

The Modified On-Ramp Option at the Port of Entry achieves Goals 1, 2, 3. The concept was created to meet Objective 2.A. Besides fulfilling Objective 2.A, the Modified On-Ramp Option generally meets Objectives1.C, 2.B, and 3.A, similar to the Auxiliary Lane Option. Yet, the Modified On-Ramp Option does not provide additional capacity (on freeway) to the extent of the Auxiliary Lane Option as its intended use is only for freight exiting the Port of Entry Facility. The Modified On-Ramp Option also, because it focuses solely on providing ramp space for the

freight trucks to gain speed, does not improve safety in the area of the freeway to the extent of the Auxiliary Lane Option. The Modified On-Ramp Option at the Port of Entry will generally achieve Goal 4 by improving freight operations for trucks leaving the facility; however, the internal reconfigurations may hinder the facility operations therefore potentially negating any benefit of freight operations from the options design.

Cost Opinion

The Modified On-Ramp Option would have the same estimated cost of between $1 to 2 million to complete.

Southbound Weigh Station

This concept would add an auxiliary lane between the southbound on-ramp at Interchange 19 and the southbound off-ramp at the weigh station. Installation of the auxiliary lane is intended to mitigate the cross-weaving traffic movement caused by vehicles merging onto the I-5 southbound mainline while trucks are positioned in the same section of the right travel lane in preparation to exit at the weigh station. The auxiliary lane would further lengthen the acceleration lane and enable safer merging for vehicles entering the mainline travel lanes.

Strengths

The addition of an auxiliary lane between the southbound on-ramp at Interchange 19 and the southbound off-ramp for the weight station facility would immediately improve safety on the freeway and would provide additional freeway capacity to accommodate future growth in southbound traffic approaching the weigh station. Adding the auxiliary lane southbound would require widening and shifting through lanes to the median side for most of the length, similarly to the northbound side. This will allow the widening under the Butler Creek Road bridge and should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the entrance ramp area where the widening shifts to the outside to align with the existing ramp. The identified land use and environmental impacts would be minor for this concept.

Weaknesses

Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier. There is minor potential for land use and environmental impacts identified for this concept. There may be impacts to the Butler Creek 100-year floodplain which intersects the Interstate and then flows into Bear Creek just before it reaches OR 99. The concept would also add 0.77 acres of impervious surface to the concept area, increasing stormwater runoff. An archaeological site has been identified within 200 feet of MP 17.28-17.45; therefore, a survey for archaeological resources is recommended prior to construction. Finally, there may be noise impacts associated with bringing the interstate closer to sensitive noise receivers.

Achieves Corridor Plan Goals and Objectives

The Southbound Weigh Station Concept achieves all 4 established project goals. The Concept generally meets the same Objectives as the Auxiliary Lane Option and was also created to meet Objective 2.A. Although the Concept does not apply to all the objectives identified for each goal, it also is not in conflict with any of the objectives.

Cost Opinion

Constructing an auxiliary lane between Interchange 19 and the weigh station to its south would cost an estimated $1 to 2 million to complete. The scope and costs of this project are similar to the northbound auxiliary lane from the Port of Entry, but the southbound side is likely to have a higher cost because of the probable need to construct a new weigh-in-motion scale for the additional lane.

Temporary Overnight Truck Facilities

When the I-5 Siskiyou Pass closes, turmoil results from numerous trucks parked along the I-5 shoulder, ramp terminals, and nearby local streets. The safety concerns arising from the parked vehicles could partially be alleviated by temporarily diverting the trucks to the Jackson County Fairgrounds, distribution centers, industrial parks, and other public and private properties that have ample space for staging large vehicles. Led by RVCOG, implementing this measure would require identifying the key locations in the vicinity of the corridor that could accommodate large trucks and negotiating an agreement among the various property owners, businesses, and/or institutions to coordinate efforts to provide staging grounds. ODOT currently has an informal arrangement with Jackson County to use the Fairgrounds. Directional signage and use of VMS along I-5 would alert drivers of the pending road closure and direct them to available staging areas where they could safely wait for reopening of the summit.

This concept was not evaluated quantitatively since it would only be effective intermittently and for variable durations, depending on the severity of weather conditions.

Strengths

No considerable land use and/or environmental impacts are anticipated for this concept because physical improvements would be limited to the installation of signage, which have a relatively small footprint, within existing, disturbed right-of-way. The overnight parking facilities could be in locations already equipped to accommodate large trucks and could be located to avoid impacts such as noise. Facilities designated to serve trucks could be equipped with amenities (electrical hookups) that would reduce the number of idling diesel engines, and therefore greatly decreasing emissions and wasted fuel. Furthermore, locating many or all trucks in one or two areas, while concentrating emissions due to idling vehicles, could reduce the overall impact area created by having trucks along several miles of I-5. In addition, some trucks opt to use a longer alternative route rather than park overnight on the shoulder, ramp terminals, or local streets. The temporary overnight truck facilities would provide an attractive alternative to alternate routes, thereby reducing VMT.

Weaknesses

This concept requires substantial coordination by RVCOG and the cooperation needed to negotiate an agreement among the various property owners, businesses, and/or institutions to coordinate efforts to provide staging grounds. Because the temporary facilities would only be needed intermittently due to inclement weather and pass closures, potential conflicts in usage could arise. Providing one or more locations to serve trucks during inclement weather events may increase VMT over what occurs today, where trucks merely pull over to the side of the highway.

Achieves Corridor Plan Goals and Objectives

The Temporary Overnight Truck Facilities Concept directly achieves Goals 1, 2 and 4. The Concept was specifically created to address Objectives 1.A and 4.H. The Concept also meets Objective 2.C. The Temporary Overnight Truck Facilities does not specifically apply to or fulfill any of Goal 3 Objectives, but may indirectly meet the Goals intent by providing a safe place, off of I-5 facilities, for trucks to wait out inclement weather putting less stress on interchanges.

Cost Opinion

None calculated.

Emergency Turn-around

There is one designated emergency vehicle turnout in the corridor at mile point 16.7 near the North Mountain Avenue overpass. Expanding this turnaround to accommodate trucks also would provide a turnaround location when the I-5 Siskiyou Pass is closed due to weather conditions. The turnaround mainly would be used by southbound trucks.

This concept was not evaluated quantitatively since it would only be effective during Siskyiou Pass closure.

Strengths

The expanded turnaround area would potentially enable law enforcement or ODOT to signal trucks to turn off I-5 southbound and move out of the flow of traffic in the event of pass closure, which has both operational and safety benefits.

Weaknesses

Trucks can turn around at any interchange, and do not need a specific turnaround area.

Achieves Corridor Plan Goals and Objectives

The Emergency Turn-around Concept meets Goal 1 and was specifically developed to fulfill Objective 1.A. The Concept also generally meets Objective 1.C by providing a TSM measure to improve freeway operations. The Emergency Turn-around Concept marginally achieves Goals 2, 3, and 4 by providing an additional area outside of the I-5 traffic flow for trucks to turnaround

which could improve freight mobility and safety as well as alleviate additional freight traffic interchanges during inclement weather although it does not specifically fulfill any of the objectives.

Cost Opinion

Expanding the existing turnaround would cost an estimated $100,000-$300,000.

Medford Viaduct Shoulder

The existing Medford Viaduct contains no shoulder resulting in diminished operation efficiency, particularly when incidents, such as a vehicle break-down or collision, close one or both travel lanes. Adding a 12-foot right side shoulder would require reconstruction and widening of the existing viaduct structure to accommodate the shoulder. Roadway geometry at both ends of the viaduct currently incorporate right side shoulders; therefore, adding a shoulder to the viaduct would provide a continuous shoulder along most of I-5 through the Rogue Valley.

Strengths

The shoulder would potentially enable a vehicle to move out of the flow of traffic in the event of an emergency or breakdown, which has both operational and safety benefits. It would also allow some extra flexibility should a motorist need to take evasive action, as it serves as a buffer area between the main thoroughfare and the edge of the road. Emergency vehicles such as ambulances and police cars may also use the shoulder to bypass traffic congestion.

Weaknesses

Adding a 12-foot right side shoulder would not measurably change the capacity of the viaduct or improve traffic operations under normal free flow conditions.

Any reconstruction of the viaduct structure would be highly expensive. This construction would include footings, columns and crossbeams, in addition to the widened deck and replacement of the bridge rail. There are several additional issues with this widening, which further add to the complexity and cost of implementing this concept.

Furthermore, improvements that widen the existing structure will encroach upon adjacent residential and commercial properties. Additional environmental impacts would include impacts to Bear Creek Park and Bear Creek Greenway, floodplain impacts (1 acre), additional impervious surface (1.6 acre), which would increase runoff to Bear Creek unless mitigated. Impacts associated with widening the viaduct are described further in the appendix. There is a potential for socioeconomic and environmental justice impacts due to the high percentage of minority and persons living below the poverty in the immediate area of the viaduct. Displacements due to the need for additional right-of-way are possible with this project. Because the Medford downtown Historic District abuts some of the viaduct right-of-way, there is a high potential for historical and cultural impacts.

Given the likely high cost and impacts associated with proposing major improvements to the facility, the benefits of adding a shoulder weighed against the cost may not be as attractive as adding an additional travel lane.

Achieves Corridor Plan Goals and Objectives

The Medford Viaduct Shoulder Concept achieves Goal 2. The Concept fulfills Objective 2.C by allowing emergency vehicles access should an accident occur on the viaduct. The Concept only measurably fulfills the full intent of Goal 1, specifically Objective 1.D, because it does not substantially maximize efficiency of the viaduct and would be considered a considerable physical improvement. The Concept does not meet Goals 3 and 4 although it also does not conflict with their intent or objectives.

Cost Opinion

Adding a 12-foot right side shoulder to the Medford Viaduct would require reconstruction and widening of the existing viaduct structure to accommodate the shoulder at an estimated cost of $30 to 40 million to complete.

Incident Response Vehicles

Incident response vehicles are equipped with flat tire repair gear, gasoline, jumper cables, water, traffic control devices, portable dynamic message signs, and other essentials for assisting motorists and responding to incidents. Vehicles are equipped with automated vehicle locators. Deploying an incident response vehicle could reduce incident response time and improve operations on I-5 during incidents. Additional evaluation would be needed to determine optimum times of day, based on time of day crash analysis. In addition, potential to expand the existing Traffic Operations Center would need to be evaluated. Currently located within a shared facility with the Oregon Police Dispatch in Central Point, the Traffic Operations Center is utilized to manage and coordinate response to incidents and to dispatch ODOT personnel throughout south central Oregon. Dispatchers in the center are responsible for posting messages on the dynamic message signs located throughout the Rogue Valley region.

This concept was not evaluated quantitatively since it would only be effective intermittently and for variable durations, depending on the severity of the incident.

Strengths

Deploying an incident response vehicle to patrol I-5 during peak crash periods would increase response time and improve flow of traffic in the event of an incident, which has both operational and safety benefits.

Weaknesses

In order to be functional, incident response vehicles need a point of dispatch that can detect incidents along the entire corridor. ODOT would need to increase the number of closed circuit television cameras to cover the entire corridor. Also, the existing Traffic Operations Center

would need to be expanded and upgraded, and receive data from the City of Medford cameras to be able to better monitor the transportation system.

Achieves Corridor Plan Goals and Objectives

The Incident Response Vehicles Concept meets Goal 1 and Goal 2. The Concept was purposefully created to meet Objective 2.C by providing a measure to improve incident response time and simultaneously meets Objective 1.C by providing a TSM measure to improve efficiency of existing facilities. The Concept may indirectly improve I-5 operations at interchanges (Goal 3) and improve Freight Mobility (Goal 4) in the event of an incident but does not specifically fill any of the Goal 3 or 4 Objectives.

Cost Opinion

Deploying an incident response vehicle, including adding cameras and Traffic Operations Center expansion, would cost an estimated $60,000-$150,000 per vehicle depending on the level of support equipment carried by each vehicle, plus operating costs, which will depend on the number of vehicles per day and the hours per day the vehicles would be deployed.

Transportation System Management Measures

Transportation system management measures (TSM) focus on improving operations by changing the way the system is managed rather than adding capacity to the system. Three TSM concepts using Intelligent Transportation Systems (ITS) technology were developed for the corridor analysis:

- Designated Alternate Truck Route
- OR 99 Corridor Coordinated Traffic Signal System
- Ramp Metering

Designated Alternate Truck Route

This concept is intended to mitigate disruptions caused by closures of the Siskiyou Pass due to inclement weather. Variable message signs (VMS) located along I-5 throughout the Willamette Valley would alert southbound traffic to pending pass closures due to weather conditions in the Siskiyou Mountain Range and advise an alternate route onto OR 58 from Interchange 188 to U.S. 97 south past Klamath Falls, into California where the route reconnects to I-5 southbound at the interchange to Week, California. Northbound traffic would detour along the same route and be alerted via VMS as far south as the Redding-Red Bluff vicinity.

Strengths

Although the specific effects cannot easily be quantified, the potential benefits can be articulated. These include potential improvements in safety and operations during storm events where the I-5 Siskiyou Pass is closed as well as potential economic benefits.

The intention of this concept would be to reduce the number of trucks impacted by closure of the I-5 Siskiyou Pass through the usage of signage directing them to an alternative route. If

fewer trucks are trapped in the southern Oregon by a pass closures, then impacts of trucks parking along the I-5 shoulder, interchange ramps, and local arterials and collectors would likely be reduced. Consequently, the operations of both the freeway and local system and the safety of their users could be improved.

The economic benefits would stem from reduced delays and less out-of-direction travel for trucks. Lost time can affect productivity, longer travel distances cost truckers money, and delays can impact other parts of a supply chain. The implementation of VMS and alternate truck route could reduce the number of trucks impacted by closure of the Siskiyou Pass.

The OR 58/U.S. 97 route would not add a substantial amount of vehicle miles traveled when compared with the I-5 route because they are almost exactly the same length.

Weaknesses

Although the OR 58-U.S. 97 corridor is already used as an alternate route to I-5 to some degree, most of the corridor is limited to a single lane of traffic in each direction. Furthermore OR 58 comprises numerous tight curves and narrow lanes as it crosses the Cascade Range summit. Substantial upgrades would be needed in order for the corridor to serve as a viable designated alternate route to I-5. Upgrades to OR 58-U.S. 97 could result in considerable environmental and land use impacts along the alternate route depending on the type, extent, and location of the upgrades. I-5 allows for faster and more constant travel speeds. Vehicle emissions are generally lower at higher speeds that are constant for a longer duration.

Achieves Corridor Plan Goals and Objectives

The Designated Alternate Truck Route Concept purposefully meets Objective 1.A and 1.B. Yet, it is probable that implementing the Concept would require substantial physical improvements therefore conflicting with part of the overall intent of Goal 1 to improve efficiency through limited physical improvements. The Concept could generally achieve Goals 2, 3, and 4. As described above, the Concept would, during storm events, improve the operations and safety of both the freeway and local system by alleviating the problem of trucks parking along the I-5 shoulder, interchange ramps, and local arterials and collectors during closure of the Siskiyou Pass. This could also improve freight mobility in the area during the winter months. However, the Concept does not directly fulfill any Goals 2, 3, and 4 Objectives.

Cost Opinion

None calculated.

OR 99 Corridor Coordinated Traffic Signal System

The normal function of traffic signals requires sophisticated control and coordination to ensure that traffic moves as smoothly and safely as possible and that pedestrians are protected when they cross the roads. Control systems used to accomplish this range from simple clockwork mechanisms to sophisticated computerized control and coordination systems that self-adjust to minimize delay to people using the road.

Implementing a more comprehensive coordinated and adaptive traffic signal system through urbanized areas of OR 99 between Interchanges 11 and 35 would potentially improve traffic flow by enabling groups of cars traveling on the highway to proceed through multiple intersections without stopping.

This concept was not evaluated quantitatively since it was not anticipated to result in a substantial shift in traffic demand from I-5. To gain an understanding of how capacity enhancements on the arterial and collector system can quantitatively affect freeway operations, see the findings for Capacity Enhancement Measures - Enhanced Local Arterial/Collector Connections concept.

Strengths

A well coordinated signal system can enhance traffic flow, reduce delay and minimize pollution and the benefits would be immediate. Improved traffic flow could improve OR 99 as a viable alternative for local traffic in place of using I-5. Because this measure would not require physical improvements, no considerable land use or environmental impacts are anticipated. Synchronizing traffic signals would have the benefit of improving travel speeds, reducing vehicle stops and idling time. All these benefits would result in a decrease in vehicle emissions.

Weaknesses

It is not always possible to retain progression throughout a network of signals. It is also difficult to maintain signal progression on two-way streets where congestion during rush hours can interfere with any coordination. Analysis of other concepts with more extensive enhancements to the capacity of the local arterial and collector system showed little affect on traffic demand on I-5. Improved travel speeds along OR 99 may encourage travelers to use this route for trips rather than I-5, which may increase VMT and emission slightly over similar trips taken on free-flowing I-5.

Achieves Corridor Plan Goals and Objectives

The OR 99 Corridor Coordinated Traffic Signal System Concept achieves Goals 1 and 3. Specifically, it fulfills Objectives 1.C by using ITS Systems to improve the efficiency of OR 99 and Objective 3.C by improving traffic flow on OR 99 the major local arterial. The Concept may marginally improve freight operations (Goal 4) by providing an option for local traffic therefore easing congestion and enhancing traffic flow on I-5 and OR 99 for freight traffic but does not fulfill any of the Goal 4 objectives. The OR 99 Corridor Coordinated Traffic Signal System is not anticipated to have any effect on the safety conditions of the corridor facilities (Goal 2) and does not meet any of the Goal 2 objectives.

Cost Opinion

None calculated.

Ramp Metering

Ramp meters are installed to restrict the total flow of traffic entering the freeway, temporarily storing it on the ramps and thus regulating traffic flow along the mainline. Ramp meters may be used to maintain a higher level of service along the freeway or to keep the interstate from exceeding capacity. They can be employed only at certain locations and at certain times of day.

Ramp meter signals activate depending on current traffic conditions as monitored by detectors imbedded into the roadway of both the ramp and the mainline that measure and calculate traffic flow, speed, and occupancy levels. The processed information is then used to alter the number of vehicles that can leave the ramp. The more congested the interstate mainline, the fewer vehicles are allowed to leave the ramp, thus increasing delay for vehicles waiting to enter the freeway.

To determine where ramp meters could be most effectively implemented, volumes on the freeway on-ramps were adjusted until all of the freeway segments were able to achieve acceptable operations with the resulting peak hour freeway demand. Based on this evaluation, ramp metering at the locations summarized in Table 3-2 could offset the need to add freeway capacity in the future. Future ramp meter rates (as shown in Table 3-2 in the 2050 column) are lower than in 2034 because long distance trips increase in 2050. In order to maintain freeway operations, the volume of short distance trips is reduced by metering local ramps.

Table 3-2. Potential Ramp Meter Locations

Interchange Number[1]	Ramp Direction	2034 Ramp Meter Rate (vph)	2050 Ramp Meter Rate (vph)
Northbound Direction of Travel on I-5			
19	NB On-Ramp	860	650
21	NB On-Ramp	600	600
24	NB On-Ramp	600	600
27	NB On-Ramp	1200	1160
Southbound Direction of Travel on I-5			
33	SB On-Ramp	--	620
30	WB to SB On-Ramp	795	600
30	EB to SB On-Ramp	600	600
27	EB to SB On-Ramp	--	600
24	SB On-Ramp	700[2]	--

Acronyms: NB = northbound, SB = southbound, EB = eastbound, and WB = westbound.

Notes:

1. The interchange locations and directions in this table are based on a PM peak hour analysis; additional location and directions may be needed in the AM peak hour.
2. Interchange 24 shows a need for ramp metering to meet demand in 2034 but shifts in traffic patterns under the 2050 RPS scenario resulted in no metering need at this location.

The analysis performed for the corridor plan focuses on the PM peak hour conditions. Because the peak travel patterns may differ during the AM peak hour, analysis to develop recommendations for a ramp meter program to address morning congestion is recommended.

Strengths

Ramp meters increase the effective freeway capacity by eliminating multiple, closely spaced cars from entering the freeway as a dense group, which can impact mainline traffic flow. Ramp metering would improve operations on the I-5 mainline by increasing travel speeds, decreasing travel times, and improving traffic flow. All of these benefits would result in a decrease in vehicle emissions, which would reduce pollutant emissions along mainline I-5. Through the implementation ramp meters at targeted locations, future mainline traffic speeds and operations can be maintained without adding additional capacity. Furthermore, the delay caused by the ramp meter waiting period may cause some drivers to choose other routes thereby reducing demand for the freeway.

Although minor widening of existing on-ramps would be required to create adequate space for queuing, this widening can generally be accommodated within existing right-of-way. Other physical improvements would be limited to the installation of the meters, which have a relatively small footprint, within existing, disturbed right-of-way.

Compared to concepts that require roadway widening, the ramp metering concepts have limited environmental impacts. Individually, none of the ramp metering concepts would result in wetland or floodplain impacts, or would add more than 0.25 acre of impervious surface to the concept area.

Weaknesses

The ramp metering rates would reduce the volumes traveling the freeway facility and improve operations on the freeway. However, the decreased capacity of the ramps would create queuing on the ramps that could extend onto the local street system. Potential queuing impacts were identified for the northbound Interchange 21 and 27 on-ramps and the southbound Interchange 30 and 33 on-ramps. Drivers diverting to local routes could have some impacts to operations on other parts of the roadway system. Ramp metering would force vehicles to stop before they entered and merged onto the highway; these stops would offset any air quality benefits gained to a certain extent. Providing ramp metering in conjunction with the enhanced parallel routes options would decrease corridor-wide VMT approximately two to three percent.

The new entrance ramps at Interchange 27 would likely include some widening of bridge structures to provide the design storage.

Minor widening of existing on-ramps would be required to create adequate space for queuing which will create additional impervious surface, causing new sources of stormwater runoff.

Achieves Corridor Plan Goals and Objectives

The Ramp Metering Concept achieves Goal 1. Specifically, it fulfills Objectives 1.C by using ITS Systems to improve the efficiency of I-5 traffic flow. The Concept could achieve Goal 3 by improving operations of I-5 through management of the interchanges but would also create

capacity issues for the interchanges and may conflict with prepared and pending IAMPs. The Concept may indirectly meet Goal 2 by improving traffic flow by not having cars enter the facility in dense groups during high traffic times and Goal 4 by increasing travel speeds, decreasing travel times, and improving traffic flow therefore improving freight operations. However, the Ramp Metering Concept does not directly fulfill any of the Goal 2, 3, or 4 Objectives.

Cost Opinion

Table 3-3 summarizes the cost opinions for each of the ramp metering projects identified above. For the majority of the proposed ramp meters, estimated costs would range between $150,000 and $400,000. For the ramp meter at Interchange 27 northbound, costs would range between $1 and 4 million. This higher cost is due to widening of the elevated ramp structures that would be required to accommodate the project and the associated vehicle queuing.

Table 3-3. Cost Opinion, Ramp Metering Projects

Interchange & Ramp Direction	Cost Opinion Range (2010 $)
Northbound Direction of Travel on I-5	
Interchange 19 On-Ramp	$200,000-400,000
Interchange 21 On-Ramp	$150,000-300,000
Interchange 24 On-Ramp	$150,000-300,000
Interchange 27 On-Ramp	$1,000,000-4,000,000
Southbound Direction of Travel on I-5	
Interchange 33 On-Ramp	$150,000-300,000
Interchange 30 WB to SB On-Ramp	$250,000-400,000
Interchange 30 EB to SB On-Ramp	$150,000-300,000
Interchange 27 On-Ramp	$1,000,000-4,000,000
Interchange 24 On-Ramp	$200,000-400,000

Capacity Enhancement Measures

Five concepts developed around enhance the capacity of the transportation system were developed for the corridor analysis:

- Additional Mainline Travel Lane
- Auxiliary Travel Lanes
- Enhanced Local Arterial/Collector Connections
- Expanded Medford Viaduct
- Directional High Occupancy Vehicle Lanes

Additional Mainline Travel Lane

This concept would add a continuous third travel lane in both directions between interchanges 21 (Talent) and 33 (Central Point). Implementation would entail widening of the Medford

viaduct to accommodate the additional travel lane plus potential reconfiguration of five interchanges (21, 24, 27, 30, and 33), multiple structures, one I-5 bridge underpass, and four I-5 stream crossing bridges.

Strengths

With the additional travel lane on I-5, the analysis indicates the freeway system would operate with free flow operations during the PM peak hour under both 2034 and 2050 scenarios.

Weaknesses

Physical, land use, and environmental impacts were not evaluated for this concept because other concepts under consideration could effectively address operational needs in the freeway corridor with far fewer anticipated impacts. It can be assumed that the impacts would be substantial due to the extent of the concept which would include widening the viaduct. Through lanes would require widening through the interchange areas, which are likely to include substantial bridge impacts and could require new retaining walls. In the short term, VMT and emissions likely would not change as trips would be shifted from local roadways to the freeway. However, in the long term, VMT and emissions likely would increase. The impacts would be similar to those described for the auxiliary lanes between MP 19 to 35, below.

Achieves Corridor Plan Goals and Objectives

Due to the breadth of the physical improvement of the Additional Mainline Travel Lane Concept, it would, most likely, generally achieve Goals 1, 2, 3, and 4; however, it does not purposefully fulfill any single objective of the goals. The Concept would also be considered a major physical improvement project and therefore conflict with the intent of Goal 1 to improve efficiency through limited physical projects.

Cost Opinion

No cost calculated.

Auxiliary Travel Lanes

Auxiliary lanes as they relate to the I-5 Rogue Valley Corridor are travel lanes of limited duration that feed traffic onto and off of the mainline from the on ramp of one interchange to the off ramp of the next successive interchange. The potential locations for auxiliary lanes were identified based on whether or not a current four-lane freeway between two interchanges would meet ODOT mobility standards in the future or whether additional capacity would be needed. The potential locations are summarized in Table 3-4.

Table 3-4. Potential Auxiliary Lane Locations

Location	2034 Auxiliary Lane Need	2050 Auxiliary Lane Need
Northbound Direction of Travel on I-5		
Interchange 21 to 24	No	Yes
Interchange 24 to 27	No	Yes
Interchanges 27 to 30	Yes	Yes
Interchanges 30 to 33	Yes	Yes
Interchanges 33 to 35	No	Yes
Southbound Direction of Travel on I-5		
Interchanges 30 to 27	Yes	Yes
Interchanges 27 to 24	No	Yes
Interchanges 24 to 21	No	Yes
Interchanges 21 to 19	No	Yes

Strengths

Because the *Auxiliary Travel Lanes* concept targets improvements at segments that are expected to exceed ODOT's mobility standards, the impacts are far more limited with similar benefits to the *Additional Mainline Travel Lane* concept. At the same time, operations can still meet the mobility standards in the future with relatively free flow operations.

Another strength of this concept is that auxiliary lanes can be added in response to need and need not all be implemented as a single project. This ultimately means much more flexibility to fund improvements.

Weaknesses

While the impacts of constructing auxiliary lanes would be less extensive than widening the highway for a fixed distance, each auxiliary lane would require widening of the roadway and would need to address constraints at each site. Issues that arise with the various elements include substantial structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition. These physical impacts are described further in the appendix.

There would be substantial environmental and land use impacts as a result of this project. Bear Creek traverses I-5 for most of the project area and crosses under I-5 several times. Bear Creek supports endangered fish species, and the additional impervious surface associated with the project would have potential to harm these species. The additional impervious surface ranges from 4.4 to 7.1 acres, depending on the segment. The project would also have impacts on the floodplain of Bear Creek (all but one segment has impacts ranging from 0.1 to 1.8 acre). Additionally, there are potential cultural resource impacts due to proximity of the adjacent Medford downtown Historic District. Finally, several archeological sites have been identified within 200 feet of I-5 where the travel lanes would be located, and further investigation is required. These environmental impacts are described further in the appendix.

Achieves Corridor Plan Goals and Objectives

The Auxiliary Travel Lanes Concept would achieve the project Goals similar to the Additional Mainline Travel Lane. However, it would not conflict with Goal 1 to the extent of the Additional Mainline Travel Lane because it could be implemented in phased, limited improvements as necessary.

Cost Opinion

Table 3-5 provides cost opinions for each of the auxiliary travel lane projects identified above. Adding auxiliary travel lanes between interchanges would cost between $4 and 15 million for most segments identified above; the exception is the viaduct segments. Most of the variability in cost is associated with the differing number of bridges in each section, as well as probable costs for retaining walls or roadside barriers. For example, adding auxiliary lanes for the Interchanges between miles 27 and 30 would cost over $40 million for either the northbound or southbound project. The majority of the cost variation for the viaduct relates to the widening of the viaduct itself. Adding an auxiliary lane with full shoulders would be the safest, but most expensive option.

Table 3-5. Cost Opinion, Auxiliary Travel Lane Projects

Auxiliary Lane Location	Cost Opinion Range (2010 $)
Northbound Direction of Travel on I-5	
Interchange 21 to 24	$10-15 million
Interchange 24 to 27	$8-10 million
Interchanges 27 to 30	$27-64 million[1]
Interchanges 30 to 33	$8-10 million
Interchanges 33 to 35	$5-7 million
Southbound Direction of Travel on I-5	
Interchanges 30 to 27	$26-63 million[2]
Interchanges 27 to 24	$7-9 million
Interchanges 24 to 21	$10-15 million
Interchanges 21 to 19	$4-6 million

Notes:

1. Total cost depends on type of Viaduct improvements. At grade northbound auxiliary lane segments would cost 7 to 9 million.
2. Total cost depends on type of Viaduct improvements. At grade southbound auxiliary lane segments would cost 6 to 8 million.

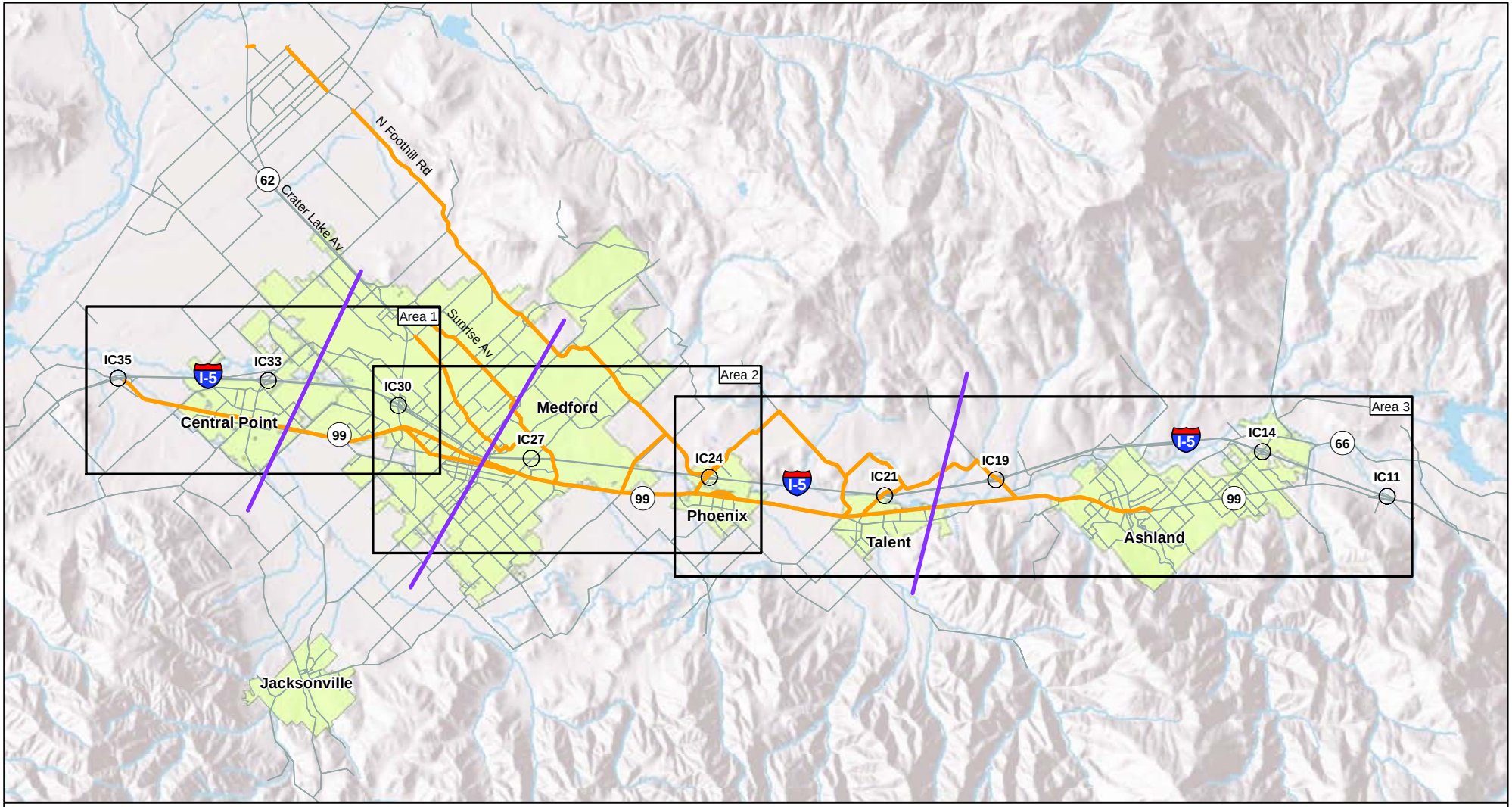
Enhanced Local Arterial/Collector Connections

With this concept, the region would enhance and/or extend key existing roadways that could provide viable alternatives to using I-5 for local trips. The primary alternate route to I-5 within the RVCP area is OR 99, which parallels I-5 west of the interstate. Potential enhancements of this corridor include widening to accommodate three continuous travel lanes in each direction. An additional improvement to better coordinate the traffic signals could enable more free flowing traffic along OR 99 as described under the TSM improvements. East of the interstate,

three potential future connectors, all discussed in the Medford TSP, could potentially lure local traffic off of I-5.

Figure 3-5 is a map of the study area with the enhanced local arterial/collector connections. The three boxes demarcate subareas used to describe the localized effects of the various alternatives. When evaluating the potential enhanced local connectors' operational benefits to I-5 on a corridor-wide level, the displacement and environmental effects mask the benefits to I-5 operations in some segments. It was apparent that the operational benefits versus impacts needed to be evaluated on a smaller scale. In the Medford area, the traffic analysis of enhancing local connectors shows a movement of traffic off I-5 to use of the local roadways, a benefit to I-5 operations. In the areas north and south of Medford, analysis shows a mixed or negative effect to I-5, or that more vehicles would use the local roads to access I-5 and add traffic to the highway. Based on the results of the analysis and the population centers, the I-5 corridor was divided into three segments:

- Central Point and North Medford—interchange 30 to interchange 35
- Medford— interchange 24 to interchange 30
- Phoenix to Ashland— interchange 11 to interchange 24



1 0.5 0 1 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Interchange
- Local Arterial or Collector with increased capacity and/or speed
- Analysis Subarea
- Screenline Location

DRAFT

I-5: Rogue Valley Corridor Study

Figure 3-5
Enhanced Local Arterial / Collector Connections
Analysis Subareas and Screenline Locations

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The segments overlap so that the traffic analysis could include operations on entire interchanges, instead of attempting to divide operations on ramps into different segments.

Area 1: Central Point and North Medford – Interchanges 30 - 35

The only road proposed in this area for enhancement is OR 99.

Strengths

In addition to the overall strengths described below, OR 99 connecting Medford and Central Point would carry additional traffic in 2034 and 2050. Other roads that would be expected to carry additional traffic are Crater Lake Avenue/OR-62 and Sunrise Avenue.

Weaknesses

In addition to the overall weaknesses described below, I-5 would experience very little change or a decrease in traffic volume between interchanges 30 and 35 for the peak and daily periods. The expansion of OR 99 to provide more capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 1 Option may achieve Goal 1 by marginally increasing efficiency of traffic operations through the Corridor. However, it does not specifically fulfill any of Goal 1 Objectives and would require substantial physical improvements therefore conflicting with the intent of Goal 1 to improve efficiency through limited physical projects. The Option would most likely, indirectly, achieve Goals 2, 3, and 4 by taking pressure off the I-5 facility including its interchanges and providing ease of freight movement in the Corridor but would not fulfill any specific objectives of those goals.

Cost Opinion

Not calculated.

Area 2: Medford to Phoenix – Interchanges 24 - 30

Three main roads in this section have proposed improvements under the enhanced local arterials/collector connections concept: N. Phoenix Road/N. Foothills Road, Crater Lake Avenue, and Highland Drive/Sunrise Avenue/Springbrook Road. These roadways are described below.

N. Phoenix Road/N. Foothills Road

The southern end of the corridor, designated as N. Phoenix Road, connects to Fern Valley Road east of Interchange 24 and tracks north, traversing eastern sections of the Medford Urban Growth Boundary (UGB). Transitioning into N. Foothills Road north of Hillcrest Road, the corridor continues north toward White City where it currently truncates at Corey Road. From Corey Road, N. Foothills Road would be extended north to Atlantic Avenue through White City as described in the Jackson County TSP. Where Atlantic Avenue currently truncates at Avenue

H, the roadway would cross and extend northwestward to E. Dutton Road where it would connect with OR 62 (Crater Lake Highway).

Crater Lake Avenue

Mostly a four-lane arterial from E Main Street north to Delta Waters Road, Crater Lake Avenue links Medford's central, eastern, and northeastern neighborhoods plus a direct connection to OR 62 (Crater Lake Highway). The existing corridor truncates at E Main Street, which provides good connections to downtown Medford and eastern neighborhoods. However, direct access to I-5 and south Medford would require an extension of the corridor south. The Corridor Plan assumes the route of this corridor extension would follow E Main Street south on Willamette Avenue, then east onto Siskiyou Boulevard to Highland Drive, then south on Highland Drive to Interchange 27.

Highland Drive/Sunrise Avenue/Springbrook Road

This two- to three-lane collector north-south corridor cuts a path through the east neighborhoods of Medford between the Crater Lake and Phoenix-Foothills corridors. The southern end of the corridor originates at Interchange 27, north on Highland Drive, forks right onto S Barneburg Road to Sunrise Avenue, eventually transitioning into Springbrook Road to Delta Waters Road. North beyond Delta Waters Road, the corridor could eventually continue to Coker Butte Road.

Strengths

With ramp meters, I-5 would experience a decrease in traffic volume through Medford and the viaduct area between interchanges 27 and 33 for the peak and daily periods. Without ramp meters, I-5 would experience a decrease in traffic volumes beginning further south at interchange 24 when compared to the ramp metering alternative. This is likely due to the improved freeway operations in the ramp metering alternative that attract additional longer distance trips while the shorter trips shift to the local street system. Also, in 2050, OR 99 through parts of downtown Medford would experience a decrease in traffic volumes.

Weaknesses

In 2034 and 2050, a number of arterials and collectors would experience an increase in traffic. The expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 2 Option would meet Goal 4 and fulfill Objective 4.G by providing more direct freight travel routes and overall improving traffic flow on I-5. The Option would achieve Goal 1 by increasing efficiency of traffic operations through the corridor, and fulfill Objective 1.B by improving north-south connections east of I-5. However, the Option would require substantial physical improvements and therefore not meet the full intent of Goal 1. The Option would most likely, indirectly meet Goals 2 and 3 by taking

pressure off the I-5 facility including its interchanges during high traffic times but not fulfill any specific Objectives of Goals 2 and 3.

Cost Opinion

Not calculated.

Area 3: Phoenix to Ashland – Interchanges 11 - 24

The potential for enhanced connectors south of Medford, besides OR 99, consist largely of rural roads that crisscross along the east side of the I-5 corridor between Phoenix and north Ashland. Existing roads that can potentially serve as connectors include South Valley View Road, West Valley View Road, Suncrest Road, Payne Road, and Fern Valley Road. A planned extension of S. Stage Road east of OR 99 and over/under I-5 to N. Phoenix Road recommended in the Medford and Jackson County TSPs would provide a new connection between Interchanges 24 and 27.

Strengths

In 2050, OR 99 through Talent and Phoenix would experience a decrease in traffic volumes.

Weaknesses

With and without ramp meters, I-5 would experience additional traffic volume between interchanges 19 and 24 during the peak and daily period. These volume changes are likely because the enhancements to local roads allow drivers to quickly reach I-5, their desired route. OR 99 between interchange 19 and downtown Ashland would carry additional traffic in 2034 and 2050. The expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 3 Option would achieve the same goals and meet the same objectives similar to the Area 2 Option.

Cost Opinion

Not calculated.

Overall

Strengths

Enhancing the local arterial/collector network is expected to have benefits to the improved roadways and potentially other nearby facilities. Similar to the findings for the OR 99 Corridor Coordinated Traffic Signal System concept, this concept may enhance traffic flow within the system, reduce delay in many areas, and minimize overall pollution.

Weaknesses

The analysis shows that the *Enhanced Local Arterial/Collector Connections* concept alone provides little benefit to relieving traffic demand on I-5. Therefore, operations of the freeway would not be substantially improved with only this concept.

For any of the local system enhancements, there could be substantial environmental and land use impacts associated with construction and operation of the roadway improvements. For example, Goal 5 impacts would be likely as numerous creeks with associated 100-year floodplain are in the area of the concepts including Bear Creek which comes in close proximity to OR 99 in several areas. There are also historical resources and districts in close proximity of the concepts making historical impacts likely. Displacements associated with widening and road network improvements could adversely impact environmental justice communities in the concept area. Noise impacts are likely due to extending roads into new areas and widening roads bringing them closer to sensitive noise receivers. Extending roads which are at the edge of the Urban Growth Boundary could have overall environmental impacts associated with taking previously rural land and changing the use of the land to transportation use, an urbanized use.

Achieves Corridor Plan Goals and Objectives

Overall, the Enhanced Local Arterial/Collector Connections Concept would achieve Goal 4 and fulfill Objective 4.G by providing a more direct freight travel routes and overall improving traffic flow on I-5 in specific areas. The Concept would achieve Goal 1 and fulfill Objective 1.B by increasing efficiency of traffic operations through the corridor, and improve north-south connections east of I-5. However, it would require substantial physical improvements and therefore not meet the full intent of Goal 1. The Concept could, indirectly, meet Goals 2 and 3 by taking pressure off the I-5 facility including its interchanges during high traffic times but does not directly fulfill any of Goal 2 or 3 Objectives.

Cost Opinion

Not calculated. The traffic analysis shows that VMT would increase much faster on the enhanced arterial and collector road network than it would on I-5 without the enhanced connections.

Expanded Medford Viaduct

The Medford Viaduct is a 3,229-foot long steel beam and girder bridge that carries the I-5 corridor over Bear Creek then parallel to its north bank opposite downtown Medford. The geographic, physical, and built features surrounding the viaduct pose challenging constraints for any effort to expand capacity at the existing corridor site. In acknowledgement of these constraints, this concept explores the possibility of expanding or replacing the existing viaduct structure to accommodate six lanes of through traffic – three lanes northbound and three lanes southbound – plus provide for the ODOT standard roadway shoulders. Two structural possibilities were explored for construction. One possibility would provide a new viaduct that is

essentially double the width of the existing structure while the other option would provide for the same highway capacity but stack the opposing travel lanes (i.e. northbound travel lanes stacked directly over the southbound travel lanes).

Strengths

As discussed in the *Auxiliary Travel Lanes c*oncept, expanding the Viaduct to provide an auxiliary lane would allow the freeway section between Interchange 27 and Interchange 30 to meet ODOT operational standards in 2034 and 2050. The resulting smoother traffic flow with less stop-and-go travel would result in lower emissions. If full shoulders are provided, the safety of the viaduct would also be improved.

Weaknesses

Adding a third lane while retaining the current 3-foot non-standard shoulders would require a widening of about 13.5 feet, so the impacts would be similar to those for widening the outside shoulders. If the viaduct is widened for three lanes plus standard shoulders on both the outside and median, the list of issues is similar, but the likely impact is far more substantial because the widening would be about 31.5 feet on each side and would likely require more substructure work.

Any reconstruction of the viaduct structure would be highly expensive. Furthermore, improvements that widen the existing structure will encroach upon adjacent residential and commercial properties. Additional environmental impacts would include impacts to Bear Creek Park (0.1 to 0.5 acre) and Bear Creek Greenway (crossings and routings under and adjacent to I-5 may require relocation), floodplain impacts (1.2 to 2.6 acres), and the addition of new impervious surface (2.0 to 4.7 acres), which would increase runoff to Bear Creek unless mitigated. The scale of impacts would be smaller for adding a third lane while retaining the existing 3-ft shoulders compared to the option of adding the third lane with standard 12-ft shoulders. Impacts associated with widening the viaduct are described further in the appendix.

Achieves Corridor Plan Goals and Objectives

The Expanded Medford Viaduct Concept provides a potential improvement both for operations and safety on the Medford Viaduct and therefore achieves Goal 1 and fulfills Objective B. However, it would require substantial physical improvements due to the need to expand the viaduct and therefore not meet the full intent of Goal 1. The improved flow of traffic on the viaduct would overall meet Goals 2, 3 and 4 by improving the safety of the viaduct to the benefit of freight operations, and ease traffic at the interchanges but does not fulfill any of Goals 2, 3 or 4 Objectives.

Cost Opinion

For planning purposes only, as detailed below, the proposed widening of the Medford Viaduct would range between $40 and 110 million, depending on the amount of widening required. Adding a third lane while retaining the current 3-foot non-standard shoulders would require a widening of about 13.5 feet at an estimated cost of $40 to 50 million to complete. Widening the

viaduct for three lanes plus standard shoulders on both the outside and median would require approximately 31.5 feet of width at an estimated cost of $90 to 110 million to complete.

Creating a stacked viaduct is assumed to be prohibitively expensive and cost opinions were not prepared.

Directional High Occupancy Vehicle Lanes

Sometimes referred to as reversible lanes, directional high occupancy vehicle (HOV) lanes are typically incorporated into a highway system for traffic flow in one direction during the morning rush hour, then reversed in the afternoon and evening. Overhead traffic lights and lighted street signs notify drivers which lanes are open or closed to driving or turning. Typically, there is a 30- to 60-minute transition period between reversals intended to prohibit traffic of any kind in the reversing lane and thus prevent collisions.

Strengths

The HOV lane would result in some operational improvements on the freeway as additional capacity would be provided in the peak direction during peak hours. The benefits would be more limited than adding a traditional mainline travel lane because the capacity would only be available in one direction of travel at a time and the added capacity would be limited to certain users.

One reason for installing HOV lanes is to encourage carpooling and transit modes. There could be some reductions in single-occupancy vehicle mode share that would result from this option. Transit routes using the freeway might benefit as well.

The addition of a directional HOV lanes through the I-5 corridor would add capacity and improve operations. The additional capacity would be expected to increase VMT. This would likely be more than offset by the reduction in single-occupancy vehicle trips and increased transit use. Operationally, the HOV lanes generally have higher average speeds than general purpose lane in the same corridor, and emissions decrease at higher vehicle operating speeds.

Weaknesses

While HOV lanes do provide operational benefits, the additional lane tends to be underutilized compared to the adjacent travel lanes because of the limited number of potential users.

As with other concepts that require widening the freeway, the impacts of constructing the HOV lane would be considerable although they could be less extensive than widening the highway to provide additional travel lanes in each direction. Issues to consider include substantial structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition.

Widening would occur to accommodate the HOV lane, which could result in substantial land use and environmental impacts including 4(f) and 6(f) impacts to Bear Creek, Goal 5 impacts because of impacts to Bear Creek's floodplain and associated wetland impacts, increases in

impervious surface and attendant runoff, and potential environmental justice impacts particularly in Medford's downtown area. Most of the concept area does not have full-width shoulders that could be used for a HOV lane, so some widening would be required. However, much of the area has a wide median, which could generally be used to create the new travel lane. An exception would be in the viaduct area, or across bridges.

Achieves Corridor Plan Goals and Objectives

The Directional High Occupancy Vehicle Lanes Concept would improve the efficiency of the existing transportation system through a TDM measure meeting Goal 1 and fulfilling Objective C. However, the Concept would also require substantial widening and therefore physical improvements in many areas. The Concept may indirectly achieve Goals 2 and 4 by improving the safety in the Corridor and freight operations during high traffic times; however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any substantial negative or beneficial impacts to operations at interchanges (Goal 3).

Cost Opinion

No cost calculated.

Least Cost Planning Solutions

Successfully used in electrical power planning, implementation of least cost planning measures can potentially help solve complex transportation problems as well. With the aim of developing transportation plans that are socially optimal, least cost planning is a process of comparing direct and indirect costs of demand and supply options to meet transportation goals and/or policies where the intent of the process is to identify the most cost effective mix of options. Apply the practice to managing freeway congestion could mitigate the need to build more travel lanes to add capacity, opting instead to better manage the existing freeway so that it operates more efficiently. No cost opinions were calculated for the these concepts.

Peak Hour Shoulder Use

Widely used throughout Europe and increasingly being explored in the United States, the flexible use of hard shoulders as auxiliary travel lanes is an option for providing temporary highway capacity while minimizing the need for acquiring right-of-way or major reconstruction. The interval placement of interchanges along the I-5 corridor would limit the use of hard shoulders exclusively to temporary auxiliary lanes. Dynamic message signs (DMS) would provide motorists with an early warning of queues or incidents ahead and inform motorists of the availability of the hard shoulder for travel. The DMS could also trigger activation of the hard shoulder for travel when detected speeds at typical congestion points drop below a set level. Emergency turnouts are typically placed at regular intervals in order to facilitate efficient operation while maintaining safety.

Strengths

By using the shoulders as an additional travel lane during periods of peak demand, capacity can be added to the freeway on a targeted, as needed basis. The additional capacity could improve

travel flow in a similar way to adding mainline travel lanes although perhaps slightly less effectively because utilization may not be as high and incidents, such as crashes or stalls, would have a greater impact without a shoulder.

This option could potentially be accomplished with minimal construction, which would result in fewer environmental impacts than other identified capacity enhancement measures.

Opening the shoulder for peak hour usage would reduce congestion and increase travel speeds, therefore reducing vehicle emissions. VMT increase is unlikely as shoulder use would be limited to peak times and likely only over a short segment of the system because of the difficulties operating on- and off-ramps with a temporary shoulder lane.

Weaknesses

Most of the corridor does not have continuous 12-foot outside shoulders, which would be required for their use as a peak-hour travel lane. Because of this, many locations would require widening, and the impacts would be similar to those associated with the auxiliary lane and viaduct concepts.

Although the use of parking lanes as peak-hour travel lanes is common on some urban roadways, there are many additional considerations that would be required to design a similar facility on a freeway. A shoulder through-lane would encroach on the entrance and exit ramp lengths and gore striping. Vehicle break downs in the shoulders would need to be closely monitored and removed immediately to avoid the potential for high speed crashes. The addition of ITS systems to control and warn traffic about changes to traffic patterns should be carefully considered as part of this concept alternative.

If roadway widening would occur to accommodate an improved shoulder or emergency turnout area, particularly if the widening was outside the median, there could be land use and environmental impacts including 4(f) and 6(f) impacts to Bear Creek, Goal 5 impacts because of impacts to Bear Creek's floodplain and associated wetland impacts, and environmental justice impacts particularly in Medford's downtown area. Presumably, some of these impacts could be avoided by strategically placing the emergency turnout areas in areas with fewer environmental resources.

Oregon Revised Statute 801.477 (2) establishes failure to drive within a lane as a serious traffic violation, and Section 811.370 establishes failure to drive within a lane as a Class B traffic violation. Although the ORS does not define "lane" or "travel lane", it does define a roadway as being exclusive of the shoulder in Section 801.450. The Legislature would need to add an exception to failure to drive within a lane in Section 801.370 and redefine "shoulder" in Section 801.480 to include use of hard shoulders as temporary auxiliary lanes.

Achieves Corridor Plan Goals and Objectives

The Peak Hour Shoulder Use Concept would improve the efficiency of the existing transportation system through a TDM measure meeting Goal 1 and fulfilling Objective C.

However, the Concept would also require substantial widening and therefore physical improvements in many areas. The Concept may indirectly achieve Goals 2 and 4 by improving the safety in the Corridor and freight operations during high traffic times; however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any negative or beneficial impacts to operations at interchanges (Goal 3).

Variable Speed Limits

Variable speed limits (VSL) are speed limits that change based on road, traffic, and weather conditions. Variable speed limits can both improve capacity by maintaining smooth traffic flow during congested time periods or improve safety by restricting speeds during adverse conditions. Digital signage is used to display posted speeds. When congestion starts building along a stretch of the freeway, the posted speed is then modified to indicate a travel speed that can more safely and effective accommodate the freeway demand. Speed limits might range from current posted speeds of 55 or 65 mph during extremely light traffic to as low as 40 mph during extreme congestion. This would also include congestion due to crashes along I-5.

Strengths

Variable speed limits can enhance traffic flow, reduce delay, and minimize pollution by maintaining smooth traffic flow during congested time periods or improve safety by restricting speeds during adverse conditions. The benefits could be recognized immediately.

This concept could have positive impacts on localized air quality if the variable speed limits help traffic flow more smoothly. Because this measure would not require physical improvements, no considerable land use or environmental impacts are anticipated.

Variable speed limits have the potential to reduce traffic congestion by actively managing vehicle flows - speed limits are dynamically changed based upon traffic conditions. The results are smoother, more consistent traffic flows, a longer period of free flow conditions before congestion occurs, and an overall decrease in the duration of congestion before free flow conditions return. A net effect of variable speed limits is to reduce emissions caused by slow moving or gridlocked vehicles. There would not likely be a change in VMT, as vehicles would still be taking the same routes.

Weaknesses

Although VSL has been widely implemented in Europe, projects in the United States have been more limited and not all transportation departments have rated the implementation to be highly successful. In a limited number of cases, more congestion was reported with the VSL than without.

Achieves Corridor Plan Goals and Objectives

The Variable Speed Limits Concept would achieve Goal 1; specifically Objective 1.C. The Concept would also generally achieve Goals 2 and 4 by improving the safety in the Corridor by restricting speeds during adverse conditions and improving freight operations by reducing

congestion however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any substantial negative or beneficial impacts to operations at interchanges (Goal 3).

Transportation Demand Management Measures

Transportation demand management measures (TDM) focus on improving operations by reducing the vehicular demand on the roadway system. Four TDM concepts were developed for the corridor analysis:

- Intermodal Freight Hub
- Transit Service Improvements
- Commuter Rail
- Bus Rapid Transit

No cost opinions were calculated for the measures.

Intermodal Freight Hub

Intermodal freight transportation is defined as a system that carries freight from origin to destination by using two or more transportation modes. In this system, hubs are one of the key elements that function as transferring points of freight between different modes. The location of hubs is one of the most crucial success factors in intermodal freight transportation and needs to be considered very carefully as it has direct and indirect impacts on different stakeholders including investors, policy makers, infrastructure providers, hub operators, hub users, and the community.

An intermodal approach to freight mobility means shippers will have a choice of cost-effective shipping options, which reduces their reliance on any single mode of transport. By more closely matching each trip purpose to the optimal mode, we can reduce freight's environmental and community footprints as well.

Interchange 35 has been identified as a strategic transportation hub where the Central Oregon & Pacific Railroad (CORP) and three state highways (OR 99, OR 140, and Interstate 5) converge. The Central Point Comprehensive Plan cites proximity to the interchange as an opportunity to develop transportation-dependent uses in the area. The area has long been recognized as an Area of Mutual Planning Interest for the City of Central Point and for Jackson County. The Erickson Air Crane manufacturing facility has operated at the interchange for a decade and there is presently a City-County effort underway to create a truck-train freight transfer site on the north side of Seven Oaks.

Strengths

The establishment of an intermodal freight hub at Interchange 35 could provide economic benefits to the region. Rail freight has a much lower rate of emissions on a per ton basis than trucks, and there would be a reduction in regional emissions if trucks were able to transfer a

noteable amount of their loads onto rail - this would also have the effect of reducing overall truck VMT and overall emissions in the corridor.

Weaknesses

The main north-south rail route through Oregon is located east of the Cascades. West of the Cascades, a variety of barriers from travel speeds and terrain issues to a patchwork of ownership have limited the use of rail through the Rogue Valley. Currently, no rail traffic travels south of the City of Ashland. Therefore, all railroad traffic north of Ashland must go through Eugene. As a result, Oregon freight shipments destined to go south into California via rail must go north through Eugene and then divert onto the UP line.

If the intermodal hub were to be implemented, container truck traffic on I-5 though the Rogue Valley could increase as containers are moved southward through Oregon on rail and then transferred to truck to continue in to California.

The freight hub may increase local truck trips, which would create additional local VMT and vehicle emissions. The freight hub itself would be a source of emissions - there would be trucks, trains and other equipment operating and idling, and there would likely be an increase in total vehicle trips to and from the facility.

Achieves Corridor Plan Goals and Objectives

The Intermodal Freight Hub Concept achieves Goal 4 and most purposefully Objective 4.D. Overall, the Concept may conflict with Goals 1, 2, and 3 by adding more freight traffic on I-5 and through the Corridor impacting the safety and capacity of the roadway network and facilities including interchanges.

Bus Service Improvements

Improving bus service through reduced headways, expanded coverage and hours of service, and new routes to destinations not currently served can help improve operations of the transportation system by reducing vehicular demand on roadway facilities. The RVMPO is conducting a study intended to develop a long-term multimodal concept plan for the OR 99 Corridor Area as an alternative to I-5 north-south travel from Crowson Road in Ashland to Interchange 35 north of Central Point. The plan will include strategies that reduce vehicular traffic congestion, greenhouse gases, and support economic development along the north-south corridor and beyond the study area. In recognition of the strong influence of land use and multimodal transportation on peak-hour travel, the study will determine the appropriate population density and land use patterns necessary to support transit alternatives such as enhanced commuter transit, bus rapid transit, and commuter rail. The study will also identify transportation options and ITS strategies to reduce vehicle trips and improvements needed to improve bicycle and pedestrian connectivity. The study will develop and evaluate various alternatives to improve mobility of all modes within the study area.

Strengths

Improving bus service through reduced headways, expanded coverage and span of service, and new routes to destinations not currently served could help improve operations of the transportation system by reducing vehicular demand on roadway facilities. Improved transit service (excluding bus rapid transit and commuter rail) generally would not result in negative environmental or land use impacts since most improvements would not require new infrastructure or construction. If the shortened headways result in higher transit use, local air quality could be improved.

Improvements in bus headways, service hours, routes and other variables have the potential to attract trips away from automobiles. According to Technical Memorandum #3 of the RVMPO North-South Travel Demand Study, transit demand is not currently met within the corridor. Route 10 (Ashland) runs along Highway 99 serving Ashland, Talent, Phoenix, and Medford. This route was shown to operate over capacity (passengers exceeded seating) in 2007-2008, suggesting there may be latent demand for transit that would benefit from more frequent service in the corridor. Depending on the quality and quantity of service proposed, VMT and vehicle emissions would be expected to decrease, offset by any pollution or VMT generated from the transit vehicles themselves.

Weaknesses

A large percentage of trips in the I-5 corridor begin or end outside of the transit service area. Consequently, local transit cannot serve these trips, limiting its ability to shift travel demand off of I-5 and into an alternative mode of travel to the automobile. In addition, freight trips cannot shift to transit trips and truck traffic will remain on the highway.

Transit ridership is affected by land use patterns (mix of uses, residential density, and employment density), parking availability and cost at the destination end, and travel time. Typically, transit is not supported in an area where the housing density is less than seven dwelling units per acre. In the City of Medford, half of the eight residential zoning designations are for fewer than seven units per acre. The portion of the city that is designated for more than seven residential units per acre is relatively small. Job density is also a major factor in increasing transit ridership. In particular, dense downtowns generate riders, and employment densities in the corridor are fairly low. Parking in the corridor is free and abundant except in a few locations in Medford and Ashland. Finally, with limited congestion on the freeway, travel times for automobiles would remain faster than most transit trips.

Therefore, transit service improvement will have a limited ability to shift traffic off of I-5 and is unlikely to improve freeway operations.

Achieves Corridor Plan Goals and Objectives

Improving bus service frequency and coverage supports Goal 1, and most purposefully Objective 1.E., by increasing capacity (person capacity) on OR 99 and improving circulation and access within the corridor. It would also support the local economy by improving job access for people without personal automobiles and makes use of the existing transportation system. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

Commuter Rail

As communities seek ways to enhance their transit services and attract more riders, many are considering whether commuter rail may be a viable option. The CORP rail line in the Rogue Valley from Ashland to Central Point has been the focus on different concepts over the years. In early 2006, the RVMPO evaluated a new commuter rail operation between Central Point and Ashland over the rails of the CORP Railroad using self-propelled diesel multiple units (DMUs) owned by the Rail Division of ODOT. The idea was to develop a limited-duration "demonstration" project to assess costs and ridership levels that would require low capital and operating costs. No project has moved forward but, as noted under the *Transit Service Improvements* concept, the RVMPO is conducting a study intended to develop a long-term multimodal concept plan for the OR 99 Corridor Area, which includes examination of commuter rail.

Strengths

The strengths of this option are similar to those described for the *Transit Service Improvements* concept but perhaps more limited to the north-south travel corridor. Some minor improvements in operations of the transportation system might result from reduced vehicular demand on roadway facilities. In addition, commuter rail riders would benefit from reliable travel times not impacted by congestion on the roadways.

Unless it includes park-and-ride facilities, this concept would not result in negative environmental or land use impacts; the commuter rail would be placed within existing railroad right-of-way. If the commuter rail could attract consistent ridership, local air quality could be improved. Given the existing and projected levels of congestion on I-5, commuter rail has some potential (though less than transit service generally) to reduce VMT and emissions in the corridor.

Weaknesses

Travel speeds on the track are already low and, with stops along the route, travel times between destinations may be considerably longer than using auto or even other transit modes.

While the commuter rail would be placed within existing railroad right-of-way, track upgrades and the development of commuter rail stations are likely to have very high costs per rider. If rail stations are developed, right-of-way may need to be acquired and rail crossing issues by both pedestrians and vehicles will need to be considered. Pedestrian environments adjacent to

rail right-of-ways are usually poor with buildings facing away from the rail line and lower density industrial uses nearby. Pedestrian connections are a major consideration for transit riders. Commuter rail ridership is usually highest when there is a high density downtown employment center and park-and-ride facilities. The job densities of Medford and Ashland are much lower than those typically served with commuter rail systems.

A park-and-ride facility would likely require the acquisition of property, can have environmental impacts, and can generate its own traffic issues.

Achieves Corridor Plan Goals and Objectives

A commuter rail system would support Goal 1, and most purposefully Objective 1.E., by increasing person capacity and by adding auto capacity (shifting riders off of OR 99 and I-5 and onto the rail). The Concept would also support the local economy by improving job access for people without personal automobiles, although it would provide less access than bus service which can cover more area. The Concept also takes advantage of existing infrastructure that is not being used as part of the transportation system. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

Bus Rapid Transit

Like commuter rail, Bus Rapid Transit (BRT) is often considered by communities as a way to enhance their transit services and attract more riders. BRT systems come in a variety of forms but the one under consideration with this concept is a dedicated bus lane that allows the bus to operate separately, without interference from other modes of traffic. The *BRT* concept would create a dedicate bus lane(s) on portions of OR 99 from Ashland to Central Point. The dedicated lane(s) would be installed in areas where roadway congestion impacts operations so that buses could travel with limited traffic delay. Signal prioritization in those areas would also improve travel times. There may be some more rural segments of OR 99 where the BRT buses could share the road with other vehicles.

Strengths

The strengths of this option are similar to those described for the *Commuter Rail* concept. However, BRT would likely have higher ridership, since buses can cover a wide area then converge on the dedicated lanes for part of their trip to avoid congestion. Some minor improvements in operations of the transportation system might result from reduced vehicular demand on roadway facilities.

If the BRT could attract consistent ridership, local air quality could be improved. Bus rapid transit has some potential (more than commuter rail, most likely similar to general bus service improvements) to reduce VMT and emissions in the corridor. The quality and quantity of service would make a big difference in evaluating the ability of BRT to attract trips (thus reducing VMT) and reduce emissions (related to usage, travel speeds and other factors).

Weaknesses

Weaknesses of this option are similar to bus service improvements discussed above. However, due to more reliable service and better travel times relative to the automobile, the corridor ridership would likely be higher than with improvements to regular bus service.

In addition, if the BRT would require widening of existing roadways to add the dedicated bus lane, there would be environmental impacts associated with increased impervious surface, stormwater runoff, and potential other impacts (e.g., displacements, cultural resource disturbance, etc.). Since the additional lanes would be needed in the most urbanized areas, these impacts and the costs are likely to be high. A BRT may also include park-and-ride lots which could result in similar environmental impacts.

Achieves Corridor Plan Goals and Objectives

The Bus Rapid Transit Concept would help achieve Goal 1, and most purposefully Objective 1.E., by improving efficiency of traffic operations through added person capacity and vehicular (bus) capacity on OR 99. It could shift some automobile traffic off of I-5, but due to existing and future travel patterns, land use, travel times, and parking conditions, the shift would likely be small. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

4. NEXT STEPS

Three additional components of this memo will be developed following the Project Management Team meeting scheduled for November 18, 2010. These components include:

- A matrix comparing the alternatives and rates their effectiveness. This matrix will be completed at the meeting in order to incorporate input from the PMT.
- A description of the selection process and why some concepts are recommended and other dropped from further consideration.
- A description of the "preferred alternative" which shall consist of a combination of the concepts that have been identified. The components of the preferred alternative will be combined and a quantitative analysis prepared.