I-5 Exit 33 (Central Point):
Interchange Area Management Plan
Jackson County

DRAFT Technical Memorandum #5
Preferred Alternative

Prepared for

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5. PREFERRED ALTERNATIVE

This technical memorandum summarizes the recommendations for the improvements that would constitute the preferred alternative for the I-5 Exit 33 IAMP. These recommendations are based on feedback from the Technical and Citizen Advisory Committees, comments received at the Public Open House, and input from ODOT, City, and County staff.

5.1. Alternatives Considered

The alternatives analysis presented in Technical Memorandum #4 focused on four areas for consideration within the interchange study area:

- Enhanced Network
- Interchange Improvements
- West Side Improvements
- East Side Improvements

During and following the presentations of the alternatives analysis, several other ideas were identified for consideration. These have been assessed and recommendations are presented in a new category of improvements: *Additional Improvements*. A table at the end of the memorandum summarizes the recommendations for all of the concepts considered.

The figures illustrating the alternatives previously discussed in Technical Memorandum #4 have not been repeated in this memorandum; however, new figures illustrating the additional improvements are attached.

5.1.1. Enhanced Network

The Enhanced Network concept combines the future financially-constrained (funded) projects from the RTP with the improvements identified in the City of Central Point TSP. The Enhanced Network provides additional connectivity, supports development of lands north and south of E Pine Street, and addresses some of the operational issues highlighted in the future baseline analysis.

Discussion

The Enhanced Network improvements that were assumed in this alternative include:

- New connections across Bear Creek: Connect Peninger Road to Beebe Road north of E Pine Street and connect Peninger Road to Hamrick Road south of E Pine Street (Central Point TSP Project #240, Tier 2 and Project #245, Tier 2)
- New north-south street: Connect Beebe Road across E Pine Street to the east-west collector street (Hamrick Road) south of E Pine Street (East Pine Street Plan – assumed to be development driven)
- Peninger Road/E Pine Street Intersection: Remove traffic signal and convert to right-in/right-out (Central Point TSP Project #245, Tier 2)

- E Pine Street from I-5 NB Ramp to Table Rock Road: Widen to add third westbound through lane (Central Point TSP Project #233, Tier 2, Project #236, Tier 2, and Project #255, Tier 2)
- Hamrick Road: Extend to Peninger Road connection south of E Pine Street (Central Point TSP Project #234, Tier 2)
- E Pine Street/Table Rock Road intersection: Add a second eastbound left-turn lane (Central Point TSP Project #218, Tier 1, Long)

Because of the additional network capacity created by the third westbound through lane on E Pine Street, traffic volume forecasts with the enhanced network are higher than estimated for the future baseline scenario. Traffic that would otherwise travel using different roadways in the larger regional network would be attracted to this higher capacity route.

Although the improvements associated with the Enhanced Network concept would improve operations at many of the study area intersections, operations and queues at many locations would remain a significant safety concern.

Recommendation

The improvements in the Enhanced Network concept are recommended as an element of the I-5 Exit 33 IAMP. However, many of these projects are Tier 2 projects with no clear funding available. Thus, additional analysis should consider how the timing of project completion could affect other elements of the IAMP.

5.1.2. Interchange Improvements

Seven potential interchange improvements were identified during the conceptual development to bring the operations up to state standards, provide additional capacity, or address safety concerns. Some of these projects are standalone concepts while others may ultimately be combined into an overall interchange concept.

Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes

Concept I-1 is one of two concepts that address safety and operations at the northbound ramp terminal (see also Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp). It considers widening the I-5 northbound off-ramp to add a second right-turn lane at the approach to E Pine Street. The purpose of the improvement is to address safety concerns associated with queuing on the off-ramp by increasing intersection capacity.

Discussion

The current northbound off-ramp has three lanes (left turn only, left-through, and right turn only). Concept I-1 would add a second right-turn lane to provide approximately 350 feet of additional storage for the right-turn movement. Most of the improvement could be accommodated within the existing ROW; however, the second right-turn lane could require some additional ROW at the intersection.

With the 2034 RTP forecasts and Concept I-1, the intersection would meet state mobility standards for both AM and PM peak hours and reduce the length of the queues on the northbound off-ramp while also providing additional storage capacity. As a result, the vehicular safety issues associated with long queues extending in the deceleration zone on the ramp would not be a concern. Furthermore, improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes. This improvement would create a wider pedestrian crossing distance on the south side of the intersection that would need to be addressed in the design process.

Recommendation

Concept I-1 is recommended as an element of the I-5 Exit 33 IAMP. Ramp safety is the primary reason for this improvement with intersection capacity as an important factor. Queuing on the northbound off-ramp should be monitored at this location to maintain safe operations. In the short term, traffic signal timing may be used to manage queues on the ramps. In the long term, additional storage and capacity for the right-turn movement will be needed, particularly if lands within the area develop more quickly than currently forecast in the 2034 RTP model. At this time, Concept I-1 should be a medium to low priority project.

Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp

Concept I-2 considers adding a looping northbound off-ramp on the north side of the interchange. The existing northbound off-ramp would remain in place but would be restriped to allow the through movement across E Pine Street and dual right turns for northbound highway traffic heading eastbound on E Pine Street. Similarly to Concept I-1, the purpose of the improvement is to address safety concerns associated with queuing on the northbound off-ramp.

Discussion

Concept I-2 would add a loop off-ramp on the north side of the interchange to accommodate high demand from northbound I-5 to westbound E Pine Street. Construction of the loop ramp would be complicated by the existing roadway geometry. Substantial structural work on the overpass would be needed to achieve minimum design standards, the on-ramp would need to be relocated, and Peninger Road would potentially be impacted as well.

The safety and operational benefits of Concept I-2 would be similar to Concept I-1. However, an additional conflict point between vehicles and pedestrians would be added on the north side where the sidewalk would cross the new ramp.

Recommendation

Concept I-2 is not recommended for the I-5 Exit 33 IAMP. Although it would address safety and operational deficiencies, it would do so at substantially higher cost that Concept I-1.

Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes

Concept I-3 is one of two concepts that address safety and operations at the southbound ramp terminal (see also Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp). It considers widening E Pine Street to add dual westbound left-turn lanes onto the I-5 southbound on-ramp. The purpose of the improvement is to address safety concerns associated with queuing on the off-ramp by increasing intersection capacity.

Discussion

Concept I-3 would widen the southbound on-ramp to provide two receiving lanes that merge before traffic enters the freeway. E Pine Street would be widened to add a second westbound left-turn lane. This improvement was initially conceived with the widening of E Pine Street beginning just west of the freeway overpass bridge structure to provide a second left-turn lane with up to 200 feet of additional storage. However, it could be considered the first phase of a more extensive project that would involve widening the freeway overpass structure to provide additional left-turn lane storage. Most of the improvement could be accommodated within the existing ROW; however, some additional ROW would likely be needed along E Pine Street west of the southbound ramp to accommodate the second left-turn lane.

With the 2034 RTP forecasts and Concept I-3, the intersection would meet state mobility standards for both AM and PM peak hours and reduce the length of the queues on the southbound off-ramp by improving overall intersection capacity. As a result, the safety issues associated with long queues extending in the deceleration zone on the off-ramp would not be a concern. Furthermore, improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes.

Because there is no sidewalk on the south side of E Pine Street between the freeway ramps, there are no concerns about the increased pedestrian crossing distance with the ramp widening. If a sidewalk is added to the south side of E Pine Street, as discussed under Concept A-1, then the wider pedestrian crossing distance would need to be addressed in design.

Recommendation

Concept I-3 is recommended as an element of the I-5 Exit 33 IAMP. Ramp safety is the primary reason for this improvement with intersection capacity as an important factor. Queuing on the southbound off-ramp should be monitored at this location to maintain safe operations. In the short term, traffic signal timing may be used to manage queues on the ramps. In the long term, additional intersection capacity will be needed, particularly if lands within the area develop more quickly than currently forecast in the 2034 RTP model. At this time, Concept I-3 should be a medium to low priority project.

Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp

Concept I-4 considers adding a looping southbound on-ramp on the north side of the interchange that would serve traffic heading westbound on E Pine Street. The existing southbound on-ramp would remain in place but would only serve traffic heading eastbound on

E Pine Street. Similarly to Concept I-3, the purpose of the improvement is to address safety concerns associated with queuing on the southbound off-ramp.

Discussion

Concept I-4 would add a loop ramp on the north side of the interchange to accommodate high demand from traffic heading westbound on E Pine Street to southbound I-5. Construction of the loop ramp would be complicated by the existing roadway geometry. Substantial structural work on the overpass would be needed to achieve minimum design standards and the existing southbound entrance ramp would need to be extended to meet standard spacing for consecutive entrance ramps. Extending the existing ramp would have significant ROW requirements from the parcels adjacent to the ramp and along the highway. It will also require some retaining walls because of the grade differential with the adjacent properties.

Although not included in the basic roadway geometry for Concept I-4, a sidewalk on the south side of E Pine Street could be added because there would be fewer travel lanes on the bridge. Some widening on the south side would be needed near the northbound ramp terminal.

The safety and operational benefits of Concept I-4 would be similar to Concept I-3. However, an additional conflict point between vehicles and pedestrians would be added on the north side where the sidewalk would cross the new ramp.

Recommendation

Concept I-4 is not recommended for the I-5 Exit 33 IAMP. Although it would address safety and operational deficiencies, it would do so at substantially higher cost that Concept I-3.

Concept I-5 – Diverging Diamond Interchange with No Bridge Widening

Concept I-5 is one of two concepts that address safety and operations at the ramp terminals using a diverging diamond interchange (DDI) design. Concept I-5 considers a DDI using the existing bridge across the freeway (two travel lanes in each direction, bike lanes in both directions, and a pedestrian pathway in the center) while Concept I-6 considers a DDI with bridge widening the existing freeway overpass. The purpose of the improvement is to address safety and long-term operational concerns at both ramp terminals.

Discussion

A DDI provides a number of operational and safety benefits over traditional interchange designs. However, because of the lane limitations imposed by maintaining the existing bridge cross-section, operations with Concept I-5 could not meet state mobility standards during both the AM and PM peak hours with the 2034 RTP forecasts.

Concept I-5 would eliminate many of the conflicts that can result in turning or angle collisions. With fewer vehicles stopping at the traffic signals, there may also be some reduction in rear end collisions. Bicycle safety would be improved with fewer conflict points. Shorter crossing

distances and few simultaneous conflict points could improve pedestrian safety but the benefits could be off-set by more unsignalized pedestrian crossings.

Although the DDI design can sometimes result in a smaller footprint at high volume interchange locations, additional ROW would be needed on both sides of the interchange and impacts to adjacent properties would be realized.

Recommendation

Concept I-5 is not recommended for the I-5 Exit 33 IAMP. It would not address operational concerns and has high costs and impacts to adjacent lands.

Concept I-6 – Diverging Diamond with Bridge Widening

Concept I-6 would also modify the entire interchange to a diverging diamond interchange (DDI) design but would widen the bridge across the freeway to provide a third westbound travel lane and a wider center pathway. Similarly to Concept I-5, the purpose of the improvement is to address safety and long-term operational concerns at both ramp terminals.

Discussion

With the additional capacity associated with Concept I-6, operations would meet state mobility standards during both the AM and PM peak hours with the 2034 RTP forecasts. Safety benefits of Concept I-6 would be similar to those identified for Concept I-5.

In addition to all of the construction costs and ROW impacts associated with Concept I-5, Concept I-6 would require widening the bridge across the freeway.

Recommendation

Concept I-6 is not recommended for the I-5 Exit 33 IAMP. Although it would address operational concerns, it has much higher costs and impacts to adjacent lands than the combination of Concepts I-1 and I-3. Furthermore, it would have to be constructed all at once with no option to phase projects in response to need and available funding.

Concept I-7 – Bridge (Overpass) Widening or Replacement

Concept I-7 considers what bridge (freeway overpass) improvements may be needed depending on how deficiencies at the ramp terminals were addressed. The purpose of the concept was to address the sidewalk deficiency on the south side of the overpass.

Discussion

Concept I-7 identified four options to be paired with some combination of the first four interchange concepts. The extent of the bridge improvements would depend on the different pairings of concepts.

With the recommended pairing of Concepts I-1 and I-3, Concept I-7 includes the following improvement elements:

- Widen bridge to add sidewalk to south side of E Pine Street
- Potentially widen more extensively to extend second WB left-turn to provide greater storage distance

Recommendation

Since no design-specific evaluation was performed for this improvement, Concept I-7 is not recommended as an element of the I-5 Exit 33 IAMP. However, based on the preferred combination of Concepts I-1 and I-3, an improvement to address the sidewalk deficiency on the south side of the bridge is needed. Concept A-1 under Additional Improvements addresses this recommendation.

5.1.3. West Side Improvements

Four potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns west of the interchange.

Concept W-1 – 10th Street/Freeman Road Improvements – Option 1

Concept W-1 is one of two concepts that address operations at the 10th Street/Freeman Road intersection through increased capacity (see also Concept W-2 – 10th Street/Freeman Road Improvements – Option 2). It considers capacity improvements at the 10th Street/Freeman Road intersection combined with access restrictions along E Pine Street. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

Concept W-1 would add a second westbound left-turn lane from E Pine Street to Freeman Road and minimize ROW impacts by reducing the number of eastbound through travel lanes from three lanes to two lanes through the intersection. A second southbound receiving lane would be added on Freeman from E Pine Street to Oak Street. Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road, including Jewett School Road, would be restricted to right-in/right-out or possibly closed.

With the 2034 RTP forecasts and Concept W-1, the intersection would meet City and County mobility standards for the PM peak hour. The benefits of the dual left-turn lanes associated with this concept would be limited by the reduction in eastbound through travel lanes.

Access at Jewett School Road would be restricted to right-in/right-out movements only. This action would not require any construction although a raised median should be considered for enforcement because of the dual left-turn lanes on E Pine Street at Freeman Road. To minimize the impacts to adjacent businesses, a public connection or easement, potentially through the school property, to 10th Street opposite Manzanita Street would be desirable.

Some additional ROW would likely be needed along both E Pine Street and Freeman Road. Concept W-1 focuses on minimizing ROW impacts to adjacent properties but there would still be some potential minor impacts along E Pine Street.

Recommendation

Concept W-1 is recommended as an element of the I-5 Exit 33 IAMP. The access management measures between the southbound ramp terminal and 10th Street/Freeman Road could be implemented at any time and should be considered if a clear pattern of crashes develops. A public connection or easement, potentially through the school property, to 10th Street opposite Manzanita Street would be desirable to offset the impacts of access restrictions. The need for the second westbound left-turn lane is principally driven by the queuing of the westbound left-turning vehicles during the PM peak hour. As long as the queuing does not interfere with the southbound ramp terminal operations, the second left-turn lane on E Pine Street and second receiving lane on Freeman Road should be considered a medium- to long-term priority improvement.

Concept W-2 – 10th Street/Freeman Road Improvements – Option 2

Concept W-2 considers improvements similar to Concept W-1 but does not reduce the number of eastbound travel lanes on E Pine Street in order to maximize capacity at the intersection. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

Concept W-2 would widen E Pine Street to add a second westbound left-turn lane from E Pine Street to Freeman Road. A second southbound receiving lane would be added on Freeman from E Pine Street to Oak Street. Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road, including Jewett School Road, would be restricted to right right-in/right-out or possibly closed.

Concept W-2 would provide a greater increase in capacity than Concept W-1 because there would be no reduction in travel lanes on E Pine Street. With the 2034 RTP forecasts and Concept W-2, the intersection would meet City and County mobility standards for the PM peak hour and have substantial reserve capacity for future growth.

Access management and the associated issues would be the same as those for Concept W-1. However, with the additional ROW required for the second westbound left-turn lane, more extensive property and access impacts would occur.

Recommendation

Concept W-2 is not recommended for the I-5 Exit 33 IAMP. Although it would address operational concerns at the 10th Street/Freeman Road intersection, the additional ROW impacts make this option less desirable than Concept W-1.

Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1

Concept W-3 considers turn movement restrictions that would shift traffic demand at the 10th Street/Freeman Road intersection rather than increasing capacity. It is one of two concepts that address operations at the 10th Street/Freeman Road intersection through shifts in traffic demand (see also Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2). The purpose of this concept is to address capacity and operational concerns.

Discussion

Concept W-3 would add a median barrier along E Pine Street to restrict turning movements to right-in/right-out/left-in at the intersection with 10th Street/Freeman Road. Left-turn movements from 10th Street and Freeman Road would not be permitted onto E Pine Street and through movements between the two roadways would also be prohibited. Traffic that previously made these movements (left-turn and through) would need to divert to other roadways. Traffic demand at 7th Street would likely increase with traffic diverted from 10th Street and Freeman Road; as a result, a traffic signal would need to be installed on E Pine Street at 7th Street. Concept W-3 assumes that the existing four-lane cross-section on E Pine Street would remain in place to maintain capacity through the intersection. (Note that Concept W-4 assumes the conversion to three lanes.) Other access control measures are also assumed to be in place along E Pine Street between the freeway ramps and 10th Street/Freeman Road as part of the plan to improve safety and capacity.

While the 10th Street/ Freeman Road intersection would meet the mobility standards with Concept W-3, the new traffic signal at 7th Street would cause additional downtown queuing that could sometimes affect operations at other nearby intersections. Traffic volumes on 7th Street, Manzanita Street, and Oak Street would all be higher with this concept than other concepts under consideration.

Access issues associated with Concept W-3 would be more extensive than discussed for Concepts W-1 and W-2 because of the additional turn restrictions at 10th Street and Freeman Road.

The changes in traffic control and turn prohibitions could largely be achieved within existing ROW.

Recommendation

Concept W-3 is not recommended for the I-5 Exit 33 IAMP. The changes in traffic circulation would have generally adverse impacts to adjacent neighborhoods and downtown Central Point.

Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2

Concept W-4 considers similar changes as Concept W-3 but assumes conversion of E Pine Street from a four-lane roadway to a three-lane roadway in downtown Central Point. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

The elements of Concept W-4 are the same as Concept W-3 but are based on conversion of E Pine Street from a four lanes to three lanes in downtown. Because of the three-lane cross-section on E Pine Street, 7th Street would be widened to include separate left-turn lanes with at least 100 feet of storage for left-turning vehicles. The other changes to traffic control and access would be the same as Concept W-3.

The benefits and impacts of Concept W-4 are very similar to those of Concept W-3.

Recommendation

Concept W-4 is not recommended for the I-5 Exit 33 IAMP. The changes in traffic circulation would have generally adverse impacts to adjacent neighborhoods and downtown Central Point.

5.1.4. East Side Improvements

Three potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns.

Concept E-1 – Hamrick Road – Dual Eastbound Left-Turn Lanes

Concept E-1 considers adding a second left-turn lane on the eastbound approach of E Pine Street and a second northbound receiving lane on Hamrick Road. The Central Point TSP already includes this improvement (reference number 216) as a medium-term, Tier 1 project, and it is also included in the RTP. Concept E-1 evaluates this improvement for comparison with other options with the purpose of addressing an identified capacity deficiency.

Discussion

Concept E-1 would add a second eastbound left-turn lane on E Pine Street and a second northbound receiving lane on Hamrick Road. This concept effectively addresses the operational issues associated with the high eastbound left-turning traffic volume. Most of the improvement could be addressed within existing ROW although some minor ROW impacts on E Pine Street east of the intersection may be necessary to provide for the taper and lane alignment.

The concerns raised about this improvement are associated with facilitating through traffic movements through residential neighborhoods with a major park abutting a portion of the roadway. Hamrick Road runs north-south at E Pine Street but eventually turns east-west and becomes Vilas Road north of E Pine Street, an arterial through Medford. These two roads together provide a slightly shorter route than using the arterial routes (E Pine Street and Table Rock Road) to reach Vilas Road. . As these neighborhoods continue to develop, there may be increasing conflicts between residents accessing the park as pedestrians and traffic traveling through the area to get somewhere else. There is a 25 mph posted speed in the vicinity of the park entrance on New Haven Road.

Recommendation

As long as the intersection operations at Hamrick Road are not adversely affecting the interchange almost ½ mile away, the decision to add this second left-turn lane can be addressed through the local agency TSP process. Therefore, Concept E-1 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

Concept E-2 – Table Rock Road Improvements

Although the Table Rock Road intersection with Biddle Road (E Pine Street) is not part of the IAMP study area, it does play an important role in the transportation network. Concept E-2 considers the types of improvements that would be needed to accommodate the forecast demand at Table Rock Road with the purpose of addressing capacity deficiencies.

Discussion

Concept E-2 includes two improvements already identified in the RTP and the local TSPs. One improvement is the addition of a second eastbound left-turn lane on Biddle Road at Table Rock Road (Central Point TSP Project #218, Tier 1 Long Term). The second improvement would widen Table Rock Road from two lanes to five lanes south of Biddle Road. The RTP has Jackson County project 821 to "widen to 3 & 5 lanes, curb, gutter, & sidewalk + bike lanes" listed as long-term, Tier 1. It's not clear from this description where the five-lane sections would be located but Concept E-2 does appear to be consistent with County plans in the corridor.

With the Concept E-2 improvements, Table Rock Road intersection with Biddle Road would be well below the County mobility standards for the PM peak hour with the 2034 RTP with substantial reserve capacity for future growth.

Recommendation

The Table Rock Road intersection with Biddle Road is more than 0.8 miles east of the interchange and intersection operations are not expected to adversely affect the interchange. The decision to implement these improvements can be addressed through the local agency TSP process. Therefore, Concept E-2 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts

Concept E-3 considers what improvements would be needed if through traffic were discouraged from using Hamrick Road and encouraged to use Table Rock Road instead. The purpose of this concept is to address capacity deficiencies that could arise from a shift in traffic demand.

Discussion

Concept E-3 would change traffic patterns through a combination of traffic calming measures on Hamrick Road, turning capacity restrictions at the Hamrick Road/E Pine Street intersection, and increased capacity at the Table Rock Road/Biddle Road intersection.

The traffic analysis for Concept E-3 assumed that the eastbound left-turn volume and southbound right-turn volumes at the Hamrick Road/E Pine Street intersection were each reduced by 30 percent. With that reduction, the intersection would meet operational standards with the 2034 RTP forecasts and the existing lane configurations. Further analysis indicates that a shift in at least 15 percent would be necessary to meet forecast demand.

As traffic is assumed to shift from Hamrick Road to Table Rock Road, additional capacity would be needed at the Table Rock Road/Biddle Road intersection. The extent of these improvements depends on how much traffic is assumed to shift. The traffic evaluation assumes that capacity would be in place to accommodate changing demand. In reality, traffic will not shift from one route to another unless there are measurable travel time benefits.

Recommendation

As with Concepts E-1 and E-2, the decision to implement these improvements can be addressed through the local agency TSP process. Therefore, Concept E-3 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

5.1.5. Additional Improvements

During and following the presentations of the alternatives analysis, several other ideas were identified for consideration. These ideas are discussed below with recommendations for those improvements that would be included in the preferred alternative for the I-5 Exit 33 IAMP.

Concept A-1 – South Sidewalk

Concept A-1 considers the addition of a sidewalk on the south side of E Pine Street between the northbound and southbound ramp terminals. The purpose of this improvement is to address the existing pedestrian network deficiency. Figure 5-1 illustrates the concept showing the location of the improvement and potential cross-sections on and off the bridge.

Discussion

E Pine Street has sidewalks through the study area with the exception of the segment on the south side between the northbound and southbound ramp terminals. This section is part of the original freeway overpass bridge that was constructed in the 1960's. The 5-foot sidewalk on the north side was added when the bridge was widened in the 1990's.

Comments at meetings have indicated that some pedestrians use the bike lane on the south side of E Pine Street rather than crossing over to the north side of the roadway, as indicated by signage at both ramp terminals. This anecdotal information is supported by field observations of several pedestrians using the bike lane.

Additional investigation into the bridge dimensions indicates that it may be possible to add a sidewalk on the south side of the bridge without widening the structure. Currently, the existing sidewalk on the north side is 5 feet wide and the paved surface is 74 feet (6-foot bike lane, 12-

foot travel lane, 12-foot travel lane, 14-foot median lane, 12-foot travel lane, 12-foot travel lane, 6-foot bike lane). The total width is 79 feet inside the bridge railings.

If the existing railing on the south side of the bridge was replaced with a railing similar to the one on the north side of the bridge, it may be possible to obtain another 2 feet of width between the railings for a total of 81 feet. With a 5-foot sidewalk added to the south side of the bridge and the existing 5-foot sidewalk on the north side, there would be 71 feet for bike lanes and travel lanes. If the bike lanes are narrowed to 5 feet, the bridge could have four 12-foot travel lanes (2 in each direction) and a 13-foot center median. Although these lane widths would require a design exception, they are within the range of acceptable widths.

Once a sidewalk is added to the bridge structure, it can be connected to the rest of the network with relative ease. A more typical 6-foot sidewalk could be constructed to connect to the existing facilities at the ramp terminals and the bike and vehicle lanes could resume standard widths.

The cost opinion for Concept A-1 is estimated at $1.2 million. On the bridge, this estimate assumes removal of the existing railing and some decking and construction of a 5-foot sidewalk, railing, and fencing. No seismic retrofitting is included in the cost estimate. Off the bridge, the estimate assumes a new 6-foot sidewalk extending to the I-5 ramp terminals, with new curb and relocated drainage inlets, but not complete reconstruction of the drainage system. New guardrail would be required at the bridge approach with widened slopes to minimize guardrail needs. Some signal and lighting poles would need to be relocated.

Recommendation

Concept A-1 is recommended as an element of the I-5 Exit 33 IAMP. The pedestrian system deficiency is present today and the improvement is recommended as a high- to medium priority project.

Concept A-2 – Bike Lane Improvements

Concept A-2 considers the addition of a bicycle signal at the I-5 southbound ramp terminal intersection to address the existing conflict between vehicles and bicyclists in the eastbound direction. The purpose of this improvement is to address the existing safety concern for bicyclists. Figure 5-2 illustrates the concept showing the location of the improvement and examples of bicycle signal installations elsewhere in Oregon.

Discussion

The existing safety concern focuses on the block between Freeman Road and the I-5 southbound on-ramp. The eastbound bike lane on E Pine Street is located on the outside of the vehicular travel lanes and adjacent to the curb, as is typical for most bike lanes. However, east of Freeman Road, the outermost travel lane becomes a right-turn lane and all traffic most turn right onto the I-5 southbound on-ramp. Bicyclists trying to travel eastbound along E Pine Street

become trapped by the right-turn lane and must cross a stream of right-turning vehicles to continue through the intersection.

Typically, this conflict is addressed by striping the bike lane between the through travel lanes and the right-turn lane but the complex traffic patterns in this block make this transition very difficult to implement safely. Therefore, options to modify the traffic signal were considered as an alternative because bicyclists on the roadway follow the traffic signal indications like vehicles.

Concept A-2 would provide additional traffic control to the southbound ramp terminal signal in the eastbound direction to separate the two movements, specifically a bicycle signal. The bicycle signal would be tied to the existing signal, similar to a pedestrian phase, and could be activated with sensors in the pavement, by pushbutton, or video detection. Prior to activation the signal would appear in the stop mode (red), once activated the eastbound right-turn traffic would be stopped to allow the cyclists to safely continue through the intersection. See examples in Figure 5-2.

Some impacts to intersection operations would occur when the bicycle signal is activated. Additional delay would be experienced for the eastbound right-turn traffic and other movements might be affected by signal timing adjustments as well. Prohibiting right-turn-on-red movements may also be required for the eastbound movement onto the southbound ramp.

The cost opinion for Concept A-2 is estimated at $25,000. This improvement would require new signal heads for the eastbound right-turn traffic and the bicycle lane and ideally some type of automated bicycle detection. Additional signage would be needed as well.

Recommendation

Concept A-2 is recommended as an element of the I-5 Exit 33 IAMP. The bicycle system deficiency is present today and the improvement is recommended as a high-priority project. Ultimately, Concept W-1 – 10th Street/Freeman Road Improvements – Option 1 would allow restriping for the bike lane that would address the conflict between vehicular and bicycle traffic; however, it is a longer-term project and will not address the current safety concern.

5.1.6. Summary of Recommendations

The following table summarizes each of the concepts and the recommendations for implementation.

Table 5-1. Summary of IAMP 33 Concepts

Concept	Recommendation
ENHANCED NETWORK	
Enhanced Network	Recommended
Interchange Improvements	
Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes	Recommended
Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp	Not Recommended
Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes	Recommended
Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp	Not Recommended
Concept I-5 – Diverging Diamond Interchange with No Bridge Widening	Not Recommended
Concept I-6 – Diverging Diamond with Bridge Widening	Not Recommended
Concept I-7 – Bridge (Overpass) Widening or Replacement	See Additional Improvements
West Side Improvements	
Concept W-1 – 10th Street/Freeman Road Improvements – Option 1	Recommended
Concept W-2 – 10th Street/Freeman Road Improvements – Option 2	Not Recommended
Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1	Not Recommended
Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2	Not Recommended
East Side Improvements	
Concept E-1 – Hamrick Road – Dual Eastbound Left-Turn Lanes	Defer to Local TSP
Concept E-2 – Table Rock Road Improvements	Defer to Local TSP
Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts	Defer to Local TSP
ADDITIONAL CONSIDERATION CONCEPTS	
Concept A-1 – South Sidewalk	Recommended
Concept A-2 – Bike Lane Improvements	Recommended

5.2. Operations with Recommended Improvements

Although operations at relevant intersections were evaluated with all of the concepts considered, traffic operations with the combined recommendations have not been evaluated. Table 5-2 summarizes operations for the intersections using the 2034 RTP forecasts. Operational results are also presented for the forecasts based on the alternative land use scenario (ALUS) developed to represent more intense or accelerated rates of growth than assumed in the RTP model.

All improved intersections would meet mobility standards with the 2034 RTP forecasts but two intersections would exceed mobility standards with the ALUS forecasts. The intersection with I-5 northbound ramps at E Pine Street would meet the Highway Design Manual standard under the 2034 RTP scenario but would just exceed the mobility standard with the ALUS forecasts. Furthermore, the intersection would meet the Oregon Highway Plan standard even with the more intense land use scenario. The intersection of 10th Street/Freeman Road at E Pine Street would just exceed the County mobility standard. Because the ALUS forecasts are only intended to provide a sensitivity analysis to address more rapid development, this result is not anticipated to be an issue when developing the project.

Table 5-2: Operations with Recommended Improvements

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.65	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.55	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with 2034 RTP Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.83	LOS = C	Queuing – SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.65	LOC = A	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.72	LOC = B	Queuing – None	V/C <= 0.80[1]
Hamrick:	V/C = 0.91	LOC = B	Queuing – None	V/C <= 0.95[2]
Operations with ALUS Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.72	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.62	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with ALUS Forecasts (PM Peak Hour)				
10th/Freeman:	**V/C = 0.96**	LOS = D	Queuing – SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.73	LOC = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	**V/C = 0.81**	LOC = B	Queuing – None	V/C <= 0.80[1]
Hamrick:	V/C = 0.95	LOC = B	Queuing – None	V/C <= 0.95[2]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
3. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

5.3. Project Phasing

In addition to the elements of the enhanced network already included in the City of Central Point TSP, five concepts are recommended for the I-5 Exit 33 IAMP. Some of these improvements address existing operational or safety deficiencies while others would address future deficiencies. Overall, the combination of state and local improvements will eventually provide a multi-modal network that would meet forecast traffic demand based on adopted comprehensive plans and regional population and employment forecasts.

With the recommended improvements for the IAMP now identified, two phasing questions need to be answered:

- What happens if the local system improvements (i.e., the enhanced network) are not implemented within the 20-year planning horizon?
- What transportation system management measures can be implemented before more substantial capital investments must occur?

Each of these questions is answered in the following sections.

5.3.1. Slower Implementation of Tier 2 TSP Projects

Only one of the projects in the enhanced network concept is included in the financially constrained list of projects in the Central Point TSP. According to the financing program in the TSP, Tier 2 projects have no specifically identified funding sources. Thus, while some of these projects may be constructed during the 20-year planning horizon, there is a possibility that many will not.

To understand how slower implementation of the local system improvements would affect the projects identified in the IAMP preferred alternative, additional analysis was performed. For this analysis, the recommended capacity improvements from the preferred alternative were added to the network without any of the elements identified in the enhanced network. The analysis used the future baseline traffic forecasts which do not include traffic pattern shifts due to enhanced network improvements. (See the discussion under Section 5.1.1 Enhanced Network.) The results are summarized in Table 5-3.

Table 5-3: Operations with Recommended Improvements but Delayed TSP Projects

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.70	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.54	LOS = A	Queuing – None	V/C <= 0.80[1]
Operations with 2034 RTP Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.84	LOS = D	Queuing – SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.64	LOC = A	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.72	LOC = B	Queuing – None	V/C <= 0.80[1]
Peninger:	V/C = 0.85	LOC = C	Queuing – NB Left, WB	V/C <= 0.95[2]
Hamrick:	**V/C = 0.98**	LOC = D	Queuing – EB Left, WB, SB	V/C <= 0.95[2]
Operations with ALUS Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.72	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.62	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with ALUS Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.93	**LOS = E**	Queuing – EB, WB, SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.69	LOC = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	**V/C = 0.88**	LOC = B	Queuing – None	/C <= 0.80[1]
Peninger:	**V/C = 1.02**	LOC = F	Queuing – All approaches	V/C <= 0.95[2]
Hamrick:	**V/C = 1.23**	LOC = F	Queuing – All approaches	V/C <= 0.95[2]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
3. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Even with a delay in the construction of City TSP projects, intersections with the recommended capacity improvements would meet mobility standards with the 2034 RTP forecasts except for the Hamrick Road intersection. This intersection would have measurable queuing on several

approaches because the TSP Project #233 (E Pine Street from I-5 NB Ramp to Table Rock Road: Widen to add third westbound through lane) was not included in the analysis. The Peninger Road intersection would remain signalized with full turning movements and would meet the mobility standard but would have some long queues building on some approaches.

Four intersections would exceed mobility standards with the ALUS forecasts and a delay in the construction of City TSP projects. Although the ALUS forecasts are only intended to provide a sensitivity analysis, these results indicate that implementation of the City TSP projects is critical to supporting more rapid development in the study, particularly on the vacant lands to the east of the interchange.

5.3.2. Potential Transportation System Management Measures

To manage the intersections in the study area most efficiently and delay the need for more substantial capital investments which must occur, several transportation system management (TSM) strategies and investments were investigated. These TSM measures focus on the signalized intersections in the corridor.

E Pine Street at 10th Street/Freeman Road

Prior to adding the design features recommended in Concept W-1 – 10th Street/Freeman Road Improvements – Option 1, several TSM measures should be considered:

- Change from protected left-turn phasing on the northbound (Freeman Road) and southbound (10th Street) approaches to protected/permissive left-turn phasing.

  This measure would potentially increase capacity for the north-south movements and reduce queuing in the left-turn lanes. Protective/permissive phasing is already allowed on E Pine Street. Under existing conditions, this phasing change could improve the overall intersection v/c ratio from 0.78 to 0.73. Under future baseline conditions, without construction of any elements of the preferred alternative, the overall intersection v/c ratio could improve from 0.89 to 0.87.

- Extend the left-turn lane on E Pine Street striping to provide more queue storage for the westbound left-turn movement and restrict access points between 10th Street and Jewett School Road to right turns only.

  This measure would reduce the likelihood that vehicles queuing for the westbound left-turn movement will block the adjacent through travel lane. Although the two-way center lane can accommodate longer queues, some drivers are reluctant to use this lane because it is supposed to serve as a refuge for stopped vehicles not vehicles that will continue to travel towards the intersection.

I-5 Southbound Ramp Terminal

Prior to adding the design features recommended in Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes, the following TSM measure should be considered:

- Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp.

  This measure would prevent queues on the off-ramp from extending into the deceleration zone from the freeway by allocating more green time to the southbound ramp. It would also reduce delays for vehicles using the off-ramp, particularly during the morning peak period. However, shifting green time from E Pine Street to the off-ramp would eventually impact operations on E Pine Street and some vehicles would experience more queuing and delays.

I-5 Northbound Ramp Terminal

Prior to adding the design features recommended in Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes, the following TSM measure should be considered:

- Monitor queuing on the northbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp.

  This measure would prevent queues on the off-ramp from extending into the deceleration zone from the freeway by allocating more green time to the northbound ramp. It would also reduce delays for vehicles using the off-ramp, particularly during the evening peak period. However, shifting green time from E Pine Street to the off-ramp would eventually impact operations on E Pine Street and some vehicles would experience more queuing and delays.

E Pine Street at Peninger Road

Until the City of Central Point can construct the bridges that would connect Peninger Road to other roadways east of Bear Creek, Peninger Road must remain a signalized intersection to serve the landlocked businesses on the south side of E Pine Street. Several TSM measures should be considered to increase the capacity of this intersection:

- Restripe the northbound Peninger Road approach to provide a left-turn lane and a left-through-right lane and change the northbound-southbound signal timing to split phasing.

  This measure would increase capacity for the northbound Peninger Road left-turn movement and reduce delays and queuing for vehicles making left turns although vehicles making right turns may experience some more delay. Vehicles traveling southbound would also have longer delays as green times would be reduced with the split phasing. This lane configuration may also reduce weaving movements in the short segment between Peninger Road and the I-5 northbound ramp terminal by allowing vehicles to legally turn from two lanes rather than one. Additional consideration would be needed for the pedestrian crosswalk timing with the dual left-turn movement. Under

existing conditions, this phasing change could improve the overall intersection v/c ratio from 0.71 to 0.67. Under future baseline conditions, without construction of any elements of the preferred alternative, the overall intersection v/c ratio could improve from 0.85 to 0.81.

E Pine Street at Hamrick Road

The preferred alternative recommends deferring to the City TSP process to address this intersection. The City's TSP includes two improvements at the intersection of E Pine Street and Hamrick Road: 1) a second eastbound left-turn lane from E Pine Street to a second northbound lane on Hamrick Road and 2) a third westbound through lane on E Pine Street (through Peninger Road to the I-5 northbound ramp terminal). Prior to implementing either of these projects, several TSM measures should be considered:

- Modify the signal phasing to include an overlap of the southbound right-turn movement with the eastbound left-turn phase.

  This measure would potentially increase capacity for the southbound right-turn movement even though right turns on red are already permitted because vehicles would not be required to stop to look for oncoming traffic. Under existing conditions, this phasing change could improve the overall v/c ratio from 0.70 to 0.68. Under future baseline conditions, this improvement would not change the overall v/c ratio for the intersection but it would reduce queuing for the southbound approach by allowing the movement to flow more smoothly.
- Extend the left-turn lane on E Pine Street striping to provide more queue storage for the eastbound left-turn movement. The lane cannot be significantly extended without interfering with driveways on E Pine Street; therefore, driveway access restrictions to right turns only may also need to be a part of this measure.

  This measure would reduce the likelihood that vehicles queuing for the eastbound left-turn movement will block the adjacent through travel lane. Although the two-way center lane can accommodate longer queues, some drivers are reluctant to use this lane because it is supposed to serve as a refuge for stopped vehicles not vehicles that will continue to travel towards the intersection.

5.3.3. Recommended Project Phasing

Through the concept analysis with and without the TSP projects, a preferred alternative and potential project phasing plan have been developed for the IAMP. The elements of the plan have been broken into groups: 1) recommendations for coordination and/or modification of related Central Point TSP projects and 2) additional improvements recommended as part of the IAMP development.

Table 5-4 summarizes related projects in the Central Point TSP and provides comments and recommendations. Some of the recommendations include changes to TSP projects for better coordination with the IAMP preferred alternative. Other projects have no recommended changes but options for phasing and coordination are suggested.

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Category/Purpose	Comments and Recommendations
Tier 1 TSP Projects		
TSP #216 – E Pine St & Hamrick Rd • Widen west and south approaches to add a second eastbound left-turn lane and second receiving lane • Restripe northbound approach to include dual left-turn lanes and a single through-right lane • Restripe southbound approach to include left-turn, through, and right-turn lanes	• Tier 1, Medium Term • Safety • Operations	• No changes recommended • Project should be reconsidered with update to TSP because of concerns raised about cut-through traffic volumes on Hamrick Rd • Interim TSM measures identified under IAMP projects could delay need for this improvement • Without this project, modified projects #236 and #233 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection • Implementation of this project is not necessary for other IAMP projects
Tier 2 TSP Projects		
TSP #233 – E Pine Street: Hamrick Rd to Bear Creek Bridge • Widen for deceleration/acceleration lanes • Add bike lanes and sidewalks	• Tier 2 (Unfunded) • Safety • Urban Upgrade	• Delete project as described and replace with: *E Pine St: Bear Creek Bridge to east of Hamrick Rd* *- Widen bridge and roadway to accommodate third westbound through travel lane* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented after modified #236 and prior to modified #255 • Without project #216, this project along with modified project #236 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection • Implementation of this project is not necessary for other IAMP projects
TSP #234 – E-W Hamrick Rd extension (south of E Pine St) • Extend Hamrick Rd westerly to intersect with Peninger Rd (collector standards)	• Tier 2 (Unfunded) • Operations	• No changes recommended • Implementation of this project is not necessary for other IAMP projects
TSP #236 – E Pine Street: Bear Creek Bridge to Peninger Rd • Widen for turn lanes, bike lanes, add sidewalks • Add third lane	• Tier 2 (Unfunded) • Safety	• Delete project as described and replace with: *E Pine St: West of Peninger Rd to west of Bear Creek Bridge* *- Widen roadway to accommodate third westbound through travel lane that will feed into right-turn lane at I-5 northbound on-ramp* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented prior to modified #233 and modified #255 • Interim TSM measures identified under IAMP projects could delay need for this improvement • Implementation of this project is not necessary for other IAMP projects

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Category/Purpose	Comments and Recommendations
TSP #240 - Peninger Rd Extension, South • Extend Peninger Rd south across Bear Creek to Hamrick Rd • Construct new bridge across Bear Creek	• Tier 2 (Unfunded) • Operations	• No changes recommended • Implementation of this project is not necessary for other IAMP projects
TSP #245 – Peninger Rd Project • Extend Peninger Rd across Bear Creek to Beebe Road • Remove signal at Peninger/E Pine St • Construct bridge across Bear Creek	• Tier 2 (Unfunded) • Operations	• No changes recommended • Interim TSM measures identified under IAMP projects could address operations until this project and project #240 are constructed • Implementation of this project is not necessary for other IAMP projects
TSP #255 – E Pine St: I-5 to Table Rock Rd • Widen E Pine St to add third westbound through lane from east side of Table Rock Rd to I-5 SB off-ramp	• Tier 2 (Unfunded) • Operations • Truck Traffic	• Delete project as described and replace with: *E Pine St: East of Hamrick Rd to east of Table Rock Rd* *- Widen roadway to accommodate third westbound through travel lane* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented after modified #233 and modified #236 • Implementation of this project is not necessary for other IAMP projects
TSP #916 – I-5 & E Pine St, SB Off-Ramp • Extend and channelize southbound off-ramp	• Tier 2 (Unfunded)	• Delete project and replace with IAMP project at I-5 southbound ramp terminal
TSP#917 – I-5 Central Point Interchange (Exit 33) • Interchange reconfiguration	• Tier 2 (Unfunded)	• Delete project
TSP #918 – I-5 & E Pine St, NB Ramp • Northbound and eastbound capacity improvements	• Tier 2 (Unfunded)	• Delete project and replace with IAMP project at I-5 northbound ramp terminal

Table 5-5 summarizes the preferred improvements developed through the concept analysis for the IAMP as well as recommendations for timing and triggers. Notes provide additional information related to each improvement including whether or not the improvement is contingent upon another improvement (TSP or IAMP) or development.

Table 5-5. Summary of Recommended IAMP Improvements

Concept	Phasing	
	Timing/Trigger	**Notes**
Roadway Improvements		
E Pine St/10th St/ Freeman Rd Improvements • TSM Measures: - Change from protected left-turn phasing on the northbound and southbound approaches to protected/permissive left-turn phasing - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the westbound left-turn movement and restrict access points between 10th Street and Jewett School Road to right turns only • Capital Improvement: - Add a second westbound left-turn lane from E Pine St to Freeman Rd - Reduce the eastbound through travel lanes from three lanes to two lanes from 9th St through Freeman Rd - Add a second southbound receiving lane on Freeman Rd from E Pine St to Oak St - Restrict or close access points along E Pine St between the freeway ramps and 10th St/Freeman Rd	• TSM measures can be implemented when needed in response to queuing and congestion • Capital improvement should be medium to low priority triggered by excessive queuing on westbound approach (i.e., interfering with I-5 southbound ramp operations)	• A public connection or easement, potentially through the school property, to 10th St opposite Manzanita St would be desirable to offset the impacts of access restrictions • Improvement is not contingent on other projects but should be coordinated with improvements at the I-5 southbound ramp terminal
E Pine St/I-5 Southbound Ramp Terminal Improvements • TSM Measures: - Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp • Capital Improvement: - Widen E Pine St beginning at the west end of the freeway overpass to add a second westbound left-turn lane with up to 200 ft of additional storage - Widen the southbound on-ramp to provide two receiving lanes that merge to a single lane	• TSM measures would be an ongoing effort until funding for the capital improvement could be designated • Capital improvement should be a medium to low priority triggered by unmanageable queuing on the ramp	• Bridge widening would allow for longer dual left-turn lanes • Improvement is not contingent on other projects but should be coordinated with improvements at 10th St/Freeman Rd
E Pine St/I-5 Northbound Ramp Terminal Improvements • TSM Measures: - Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp • Capital Improvement: - Widen northbound off-ramp to provide a second right-turn lane with approximately 350 ft of storage	• TSM measures would be an ongoing effort until funding for the capital improvement could be designated • Capital improvement should be a medium to low priority triggered by unmanageable queuing on the ramp	• Improvement is not contingent on other projects

Table 5-5. Summary of Recommended IAMP Improvements

Concept	Phasing	
	Timing/Trigger	**Notes**
E Pine St/Peninger Rd Improvements • TSM Measures - Restripe the northbound Peninger Road approach to provide a left-turn lane and a left-through-right lane and change the northbound-southbound signal timing to split phasing. • Capital Improvements - Implement TSP Project #236 - Implement TSP Project #240 - Implement TSP Project #245	• TSM measures can be implemented when needed in response to queuing and congestion • TSP Project #236 should be low priority unless the nearby vacant lands develop more intensively than anticipated in the TSP • TSP Projects #240 and #245 should be low priority and many not be necessary within 20-year planning horizon	• Improvement is not contingent on other projects • TSP Projects #240 and #245 could be implemented prior to Project #236
E Pine St/Hamrick Rd Improvements • TSM Measures - Modify the signal phasing to include an overlap of the southbound right-turn movement with the eastbound left-turn phase - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the eastbound left-turn movement • Capital Improvements - Implement TSP Project #216 - Implement TSP Project #233	• TSM measures can be implemented when needed in response to queuing and congestion • TSP Project #216 should be medium priority unless the nearby vacant lands develop more intensively than anticipated in the TSP • TSP Project #233 should be low priority and may not be necessary within the 20-year planning horizon	• Improvement is not contingent on other projects • Left-turn lane striping cannot be significantly extended without considering driveway restrictions on E Pine Street • If TSP Project #216 is not implemented because of concerns about cut-through traffic volumes on Hamrick Rd, Project #233 may become more elevated in priority
Bicycle and Pedestrian Improvements		
South Sidewalk between Ramp Terminals: • Add a 5-ft sidewalk to south side of bridge by replacing railing and restriping roadway with narrower travel lanes • Connect bridge sidewalk to the existing sidewalk network and the ramp terminals	• High priority to address current deficiency	• Improvement is not contingent on other projects • Lane width reductions would only be necessary on the bridge itself
Bicycle Signal at I-5 Southbound Ramp Terminal: • Install a bicycle signal on the eastbound approach to regulate the eastbound right-turn movement when bicyclists are present	• High priority to address current deficiency	• Improvement is not contingent on other projects

Attachments:

Figure 5-1. Concept A-1 – South Sidewalk
Figure 5-2. Concept A-2 – Bike Lane Improvements