

MEMORANDUM

To: Jean Wallace – FHWA
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cc: Tom Anzia
Bob Felsburg
From: Todd Frisbie
Date: December 14, 2005
Subject: North I-25 EIS – Access Planning

The purpose of this memorandum is to first outline the proposed approach to completing access planning during the remainder of Level 3 screening for the North I-25 EIS. Second is to summarize the initial evaluation of existing interchanges in determining the improvement needs at each interchange. Ultimately, recommendations from this process would then be carried into the DEIS and the FEIS evaluations.

METHODOLOGY

There are two aspects of access planning: 1) modification of existing interchanges and 2) evaluation of potential for new interchanges. In this planning effort there are several guiding principles that direct the evaluation. These principles are described below:

- The focus of the evaluation will begin with the existing interchanges.
- Level of service D will be the minimal acceptable level of operation.
- At older existing diamond interchanges any I-25 improvement will require a complete reconstruction of the interchange. The reconstructed interchange would, at a minimum, be upgraded to a standard diamond configuration.
- Where the standard diamond interchange does not provide acceptable levels of service, an enhanced diamond interchange will be evaluated first. An enhanced diamond includes additional lanes above and beyond the standard diamond.
- If an enhanced diamond interchange still has a LOS E or F condition, then an assessment will be necessary of both a new interchange and a reconfiguration of the existing interchange.

Based on these guiding principles, a planning process for evaluating access has been developed. This process is depicted in the attached flowchart (see Figure 1) with a more detailed description of each step described in the section below. As shown in the flowchart, the evaluation of an existing interchange could go through several levels of analysis, but could also stop at any step in the process. The interchange evaluation process in Level III primarily focuses on the interchange operational processes; levels of service at the interchange and on

the mainline, and on queuing at the ramps. Other interchange characteristics (i.e. environmental, constructability, ROW, costs, etc.) are also evaluated in Level III on a fatal flaw basis and will receive further detailed evaluation and screening as the EIS continues.

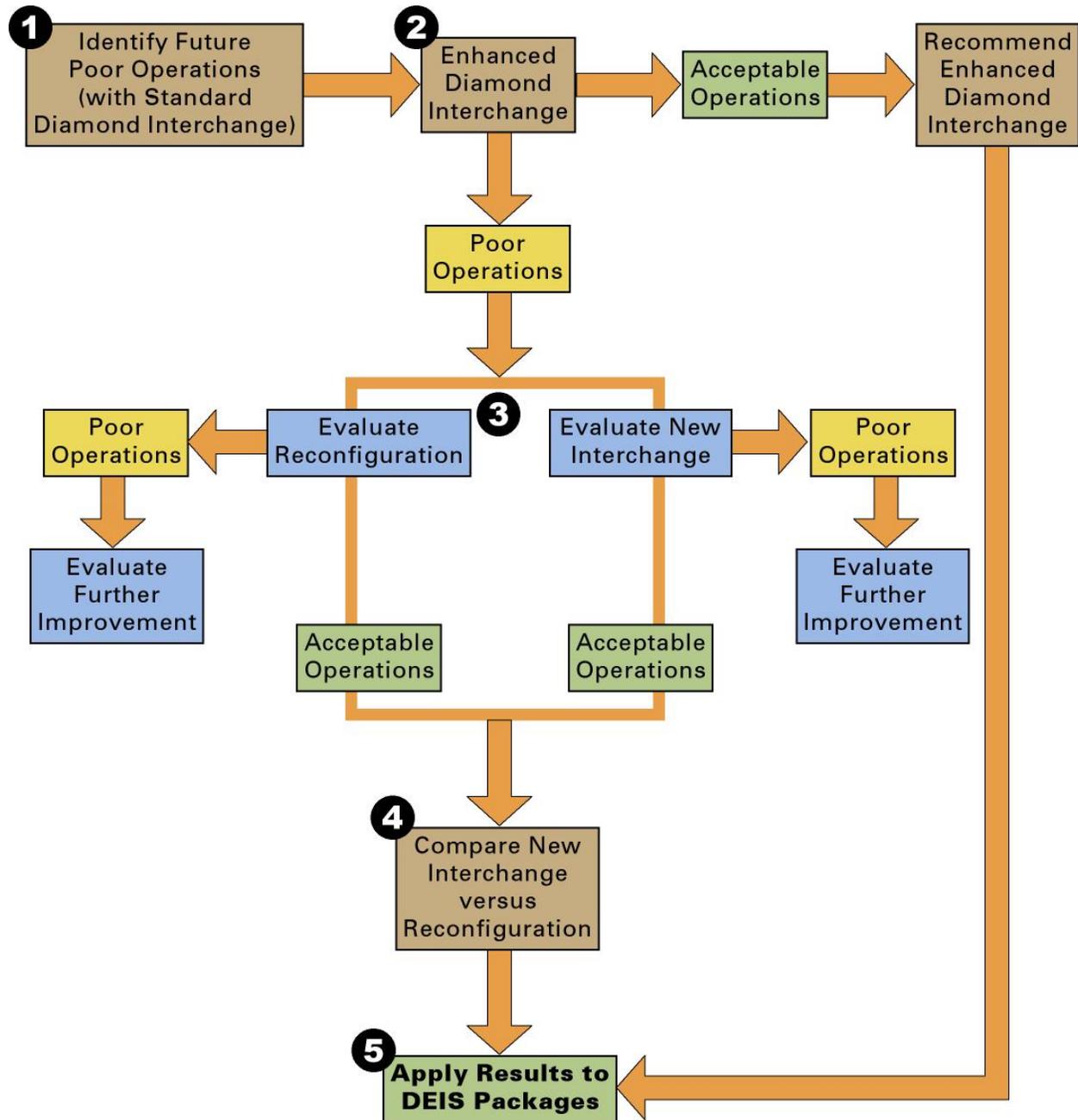


Figure 1. Process for Evaluating Access Modifications

1) Determine future traffic operations at existing interchanges with the standard diamond configuration and along the mainline. Base assumptions and analyses in this step would include the following:

- Future peak hour traffic projections at the existing interchanges will be based on a scenario with 8-lanes on I-25. The 8-lane scenario results in the highest level of traffic in the corridor.
- All existing diamond interchanges (all interchanges except those at US 34, Johnson Corner and SH 14 have diamond configurations) will be assumed to be upgraded to the standard diamond interchange. Figure 2 illustrates the standard diamond interchange which includes dual left and exclusive right turn lanes to/from the ramps and two through lanes in each direction on the cross street.
- On and off ramps will be assumed to be one-lane where they merge or diverge from the mainline.
- Levels of service will be determined and queuing will be evaluated at existing interchanges and along the mainline.
- Existing interchanges and mainline operations showing LOS D or better operations and exhibiting minimal queuing issues along ramps will not be further evaluated operationally.
- Existing interchanges or mainline operations showing LOS E or F conditions and/or exhibiting queuing issues along ramps will be further evaluated in the next step.

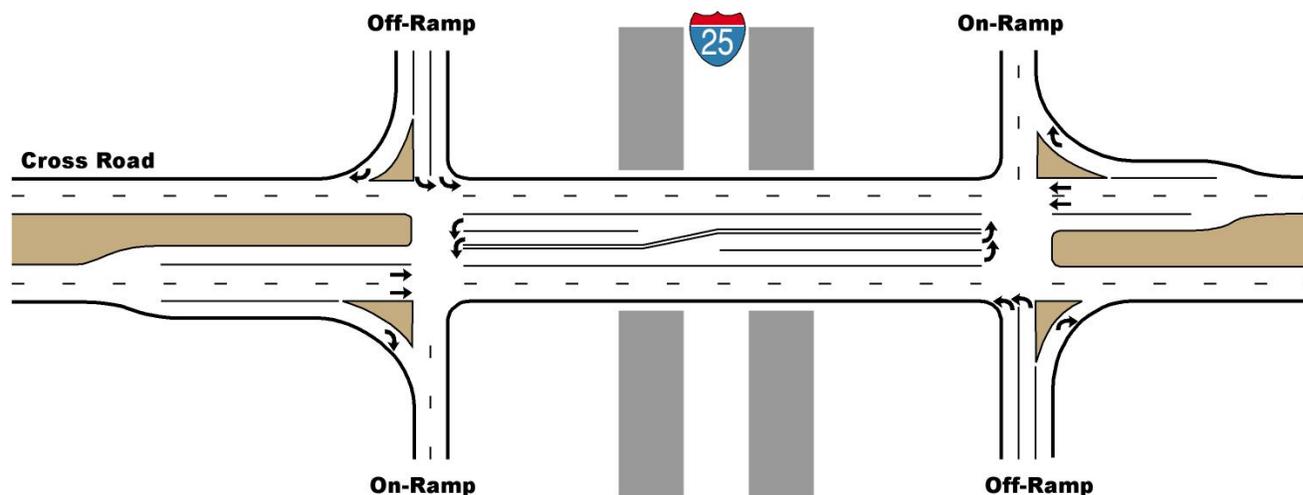


Figure 2. Standard Diamond Configuration

2) Identify an enhanced diamond interchange to mitigate unacceptable operations with the standard diamond configuration. Base assumptions and analyses in this step would include the following:

- An enhanced diamond interchange is an interchange with improvements above and beyond the standard diamond interchange, but maintaining the diamond configuration. Improvements considered in this step would include a reasonable number of additional turn lanes at ramp intersections or additional through lanes on the cross street.
- Reasonable lane additions above and beyond the standard diamond improvements are defined as:
 - One additional left-turn lane from the ramp
 - One additional right-turn lane from the ramp and from the cross street
 - One additional through lane in each direction on the cross street
 - One additional lane at ramp merge and diverge points
 - Free right-turn movements to/from the cross street
- Figure 3 illustrates the above improvements associated with an enhanced diamond interchange. These improvements would not all be applied, but would be applied to best address the specific traffic and operational needs at an interchange.
- Levels of service and queuing will be reevaluated with additional lanes. If improvement mitigates operational and queuing issues, then further evaluation of the interchange is not necessary.
- If an enhanced diamond interchange does not mitigate operational and queuing issues, then further evaluation is necessary.

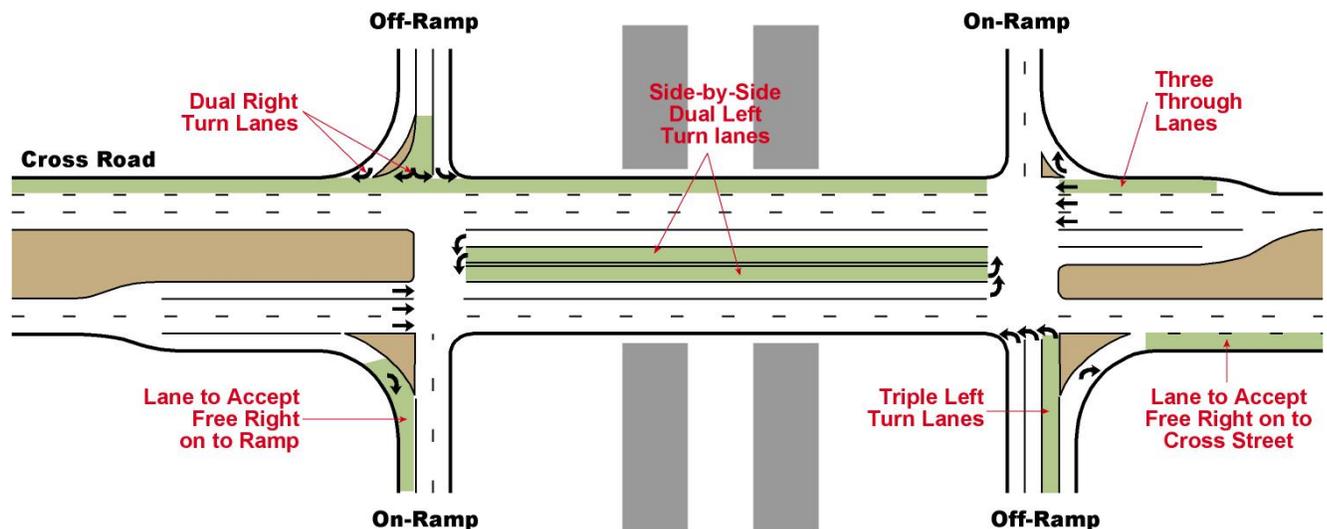


Figure 3. Enhanced Diamond Configuration Options

3) Evaluate reconfiguration of an existing diamond interchange and evaluate an adjacent new interchange. Base assumptions and analyses considered in this step would include the following:

- Reconfiguration of an existing interchange could include adding a single loop to a quadrant, upgrading to a partial cloverleaf or providing direct connect ramps for some or all movements.
- A new interchange can be no closer than one-mile from an existing interchange and must connect to an existing or planned regionally significant roadway.
- If a new interchange mitigates poor operations at the existing interchange, the new interchange also must have acceptable levels of service and minimal queuing issues.
- If an interchange reconfiguration and a new interchange both result in acceptable level of service at the existing interchange, then evaluation moves on to step 4.
- If neither the interchange reconfiguration nor a new interchange mitigate poor operations at the existing interchange, then evaluate the effects of both an interchange reconfiguration and a new interchange.

4) Compare interchange reconfiguration to new interchange. Evaluations considered in this step would include the following:

- A system level analysis of mainline operations.
- Assessment of environmental impacts of both the reconfiguration and the new interchange.
- Development of cost estimates.

5) Determine access modifications to be carried into the DEIS evaluation:

- This step would combine the results of all earlier steps into a recommended set of access modifications.

All access modifications (including new interchanges recommended through the access planning process) would be applied to the DEIS packages and evaluated to determine their applicability to each package. Any other potential new interchanges planned by local jurisdictions would be evaluated through the current CDOT 1601 process.

PRELIMINARY RESULTS

This section describes the preliminary results for the evaluation of existing interchanges in determining the improvement needs for each interchange. As described in the previous section, the process for evaluation is essentially an operations based analysis that focuses on improvements needed at the existing interchange and whether it is necessary to modify I-25 access with a reconfiguration of the existing interchange or with the addition of a new interchange. The evaluation was based on a 2030 planning horizon and on a worst case scenario of eight lanes on I-25 from E-470 to SH 14. Figure 4 depicts each interchange between E-470 and SH 14 and summarizes the results of analyses conducted to this point. As shown in Figure 4, various symbols are used to represent the level of improvement anticipated for each interchange. The following describes the meaning of each symbol.

- Blue Square With Green Circle. This symbol indicates the locations where reconstruction of the existing interchange is not necessary and the existing interchange can provide acceptable levels of service in 2030 without any modifications.
- Blue Square. This symbol indicates the locations where the existing interchange needs replacement and a standard diamond configuration would provide an acceptable level of service.
- White Square With Black Diamond. This symbol indicates the locations where the reconstruction of the existing interchange is not necessary but laneage enhancements are needed in order to provide acceptable levels of service.
- Black Diamond. This symbol indicates the locations where the existing interchange needs to be replaced with a diamond configuration; however, an enhanced diamond configuration is necessary to provide acceptable levels of service.
- Double Black Diamond. This symbol indicates that either a diamond configuration will not provide acceptable levels of service or other mitigating circumstances require the evaluation of a new interchange or the reconfiguration of the interchange to best provide adequate operations at the interchange.

Table 1. Preliminary Results

The following table provides a detailed description of the improvement needs and the next steps in the evaluation for all existing interchanges.

Interchange Location	Improvement Needs / Next Steps
SH 7	Reconstruct interchange to an enhanced diamond configuration. <ul style="list-style-type: none"> • Northbound to eastbound free right – need auxiliary lane on SH 7 from ramp to next major intersection. • Southbound to westbound free right - need auxiliary lane on SH 7 from ramp to next major intersection. • Eastbound to southbound free right – need three lanes on southbound on-ramp. 1601 for partial cloverleaf is being reviewed by FHU.
WCR 8	Maintain existing interchange with no enhancements.
SH 52	Enhance existing interchange. Improvements include: <ul style="list-style-type: none"> • Northbound to eastbound dual right
SH 119	Enhance existing interchange. Improvements include: <ul style="list-style-type: none"> • Additional westbound through lane • Northbound to westbound triple left turn lanes • Southbound to westbound dual right lanes
SH 66	Maintain future interchange improvements planned with I-25 widening to SH 66.
WCR 34	Reconstruct interchange to a standard diamond configuration.
SH 56	Reconstruct interchange to a standard diamond configuration.
SH 60	Reconstruct interchange to a standard diamond configuration.
Johnson Corner	Reconstruct interchange to a new configuration due to geometric reasons.
SH 402	Reconstruct interchange to a standard diamond configuration.
US 34	Reconstruct to a new fully directional interchange configuration.
Crossroads	Reconstruct interchange to a standard diamond configuration.
SH 392	Reconstruct interchange to a standard diamond configuration.
Harmony Road	Maintain existing interchange bridge but possibly provide a new configuration. Evaluate new interchange at Ketcher Road (LCR 36) to assess the effectiveness at relieving congestion at the Harmony Road interchange.
Prospect Road	Reconstruct interchange to a standard diamond configuration.
SH 14	Base assumption is interchange will be reconstructed to a standard diamond interchange. Analysis shows enhanced diamond improvements could provide good operations. These improvements include: <ul style="list-style-type: none"> • Eastbound to southbound dual right turn lanes • Additional westbound through lane • Southbound to westbound dual right turn lanes • Northbound to westbound triple left turn lanes These improvements would require extensive widening of SH 14 west of I-25. Therefore, recommend reconfiguration. Evaluate new interchange at Vine Street to assess the effectiveness at relieving congestion at the SH 14 interchange.

