

**Interstate 25 / United States 24 / Cimarron Street
Interstate Access Request Re-Evaluation**

August 2014



REGION 2 – North Program

1.0 Summary

This technical memorandum serves as an update to the approved Interstate Access Report (IAR), April 2003, for the I-25/Cimarron interchange. The updates to the IAR presented in this document not only address the 8-year expiration of the previous IAR but also addresses two additional alternatives considered and the effects of the preferred alternative on the freeway and adjacent interchange traffic operations. The operational analyses were completed for 2014 and 2035.

The I-25 Environmental Assessment identified a tight urban diamond interchange as the preferred alternative at the I-25/US 24/Cimarron interchange and was approved as such in the 2003 IAR. The US 24 Environmental Assessment, May 2012, identified the preferred alternative as a single point urban interchange (SPUI) which the Colorado Department of Transportation (CDOT) has used as the basic configuration for a future design-build project. As part of the IAR reevaluation, required to obtain approval for the SPUI, FHWA staff have requested CDOT review the feasibility of a diverging diamond interchange (DDI) as well.

Comparative traffic operations analysis for I-25 EA Preferred Alternative tight urban diamond, the 2012 US 24 EA Preferred Alternative single point urban diamond and the diverging diamond served to rule out only one of the alternatives, the tight urban diamond as a less appropriate solution for the future issues at this location. The Analysis confirmed however, that while there are nuances between the two remaining alternatives, neither the DDI nor the SPUI stood out from a purely traffic operations standpoint. Taking into account right-of-way, environmental, and regional plan compatibility issues, the SPUI became the clear choice moving forward.

2.0 Introduction

The interchange of Interstate 25 (I-25) and US 24/Cimarron Road located on the south edge of Colorado Springs' Downtown Area serves as a vital connection from Colorado Springs to points west including many ski areas as well as residential and commercial areas such as Manitou Springs, Old Colorado City, and Woodland Park. I-25 is the primary north-south corridor providing local, regional and statewide connectivity through the Colorado Springs area, while US 24 serves numerous areas to the west of Colorado Springs. Historically, along both corridors, traffic volumes have been steadily increasing and continued growth is anticipated. A primary concern is the continued regional growth and the resulting potential increase of congestion. As this greater regional demand is placed on the transportation infrastructure, improvements are being sought to alleviate the burden, not just now but in the future.

The proposed interchange improvements will provide an interchange configuration that improves safety and operations between I-25 and the US 24 corridor to the west and Cimarron Street to the east. The new interchange will provide the improved safety and operations until such a time that the US 24 corridor improvements (defined in the US 24 EA) can be constructed. At that time the US 24 corridor improvements will include the ultimate build out of the I-25, US 24, 8th Street interchange complex. As a result, the interchange improvements for the current project will need to be designed for compatibility with the future build-out to maximize both its near term and long term effectiveness.

A Tight Urban Diamond Interchange (TUDI) was recommended in the previous IAR completed in 2003 for this interchange, associated with the I-25 Environmental Assessment and FONSI in 2005. The primary purpose of this IAR Re-evaluation will be to update an IAR that has exceeded its 8 year limitation, and to confirm that a revised interchange configuration that is consistent with the I-25 EA Reevaluation and US 24 Environmental Assessment will provide equal or better performance than the original proposed TUDI, until such a time as additional improvements can be implemented with the build out of the US 24 Corridor.

It should be noted that the magnitude of the demand on I-25 and US 24 is such that unless corridor improvements are made to US 24, triple lefts and associated receiving lanes are added to this interchange, and intersection improvements are made to the intersection of US 24 and Eighth Street, US 24 will act as a bottleneck west of I-25 and the projected traffic reaching the I-25/US 24/Cimarron Interchange will be less than what is shown in this analysis. This IAR Re-Evaluation is analyzing the worst case traffic demand for 2035 which assumes the additional network improvements are made.

2.1 Project Location

As shown in Figure 1, the I-25/Cimarron interchange is located on the southwest corner of the City of Colorado Springs' Downtown Area.

Figure 1: I-25/Cimarron Site Map



3.0 Policy Point 2:

“All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.”

Volume 1, Section 1 of the original Interstate Access Request for the I-25 Corridor considered interchange alternatives for the Cimarron interchange. Five different interchange configurations were considered for the Cimarron interchange and an additional four alternatives were considered, that included Cimarron Street, Colorado Avenue and Bijou Street in combined complexes. The study concluded with the selection of diamond interchange configuration for the Cimarron interchange, based on the following parameters:

- Preferred by the public
- Minimizes property impacts
- Longer on and off ramps
- Cost effective
- Adequate traffic operations

The US 24 Environmental Assessment (EA) broadened the perspective of the I-25/Cimarron (US 24) interchange. The US 24 EA proposes significant corridor improvements on US 24 to the west from the interchange location. The US 24 EA also extended the design year analysis from 2025 to 2035. These changes combine to result in the preferred alternative of the original I-25 IAR being operationally inadequate over the long term. As a result a new set of alternatives were evaluated for the I-25/Cimarron interchange as a part of the US 24 EA.

The interchange conditions at I-25 and Cimarron are further complicated by the intersection of 8th Street and US 24 just 1,720 feet west of the interchange. The 8th Street arterial road carries substantial traffic volume in its own right, warranting a grade-separated interchange condition with US 24 as long term improvements at that location. Given 8th Street's proximity to the I-25 interchange it was necessary to develop combined interchange complex to address the long term needs of I-25, US 24 and 8th Street.

The US 24 Environmental Assessment identified a preferred alternative for the combined interchange complex, as is shown in Exhibit 1. At I-25 the interchange included a Single Point Urban Configuration (SPUI) with the addition of a direct flyover ramp to accommodate the heavy eastbound to northbound movements through the interchange. The 8th Street interchange was also determined to be SPUI configuration, providing a consistency of driver expectation between the two closely spaced interchanges.

The improvements identified in the US 24 EA are not currently funded and are not foreseen in the immediate future. As a result the interchange improvements currently funded for the I-25/Cimarron

ULTIMATE CIMARRON SPUI

CONCEPT

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project are interim improvements that must provide compatibility with the ultimate interchange configuration proposed in the US 24 EA.\

This IAR Re-evaluation re-assesses Policy Point 2 taking into consideration the changed conditions described above. It evaluates interchange alternatives that are both consistent with the long term improvement to the I-25 corridor and the US 24 corridor. Three interchange alternatives are considered:

The diamond configuration of the original IAR (the preferred alternative the original I-25 EA)(Exhibit 2)

1. The SPUI configuration (the preferred alternative of the US 24 EA) (Exhibit 3)
2. A Diverging Diamond Interchange (DDI) Configuration(Exhibit 4)

The DDI alternative was added to the analysis because the new interchange configuration was not a part of the original US 24 alternative analysis.

The alternatives were evaluated relative to the following factors:

- Traffic Operations – I-25 Mainline and Ramps
- Traffic Operations – US 24 and interchange intersections
- Compatibility with Full Build-out
- ROW and Utility Impacts
- Stakeholder Input and Consensus
- Safety and Driver Expectations
- Historical Performance

3.1 Traffic Operations

The evaluation of the traffic operations for the three alternatives is a critical element of the analysis. In particular the evaluation of the alternatives effect on traffic on the interstate mainline and its ramp merges and diverges and weave segments is a point of focus of all Interchange Access Requests. The traffic operations analysis is discussed in detail in the following section that addresses Policy Point 3. The results are summarized in the Alternatives Evaluation Matrix provided at the end of this section.

Compatibility with Full Build-Out

Compatibility with the full build out of the I-25/US 24/8th Street interchange is a primary consideration of the interchange configuration. Exhibit 5 and Exhibit 6 show full build out interchange concepts for both the SPUI and the DDI. The diamond configuration of the original IAR was not incorporated into a full build out concept as it was eliminated from consideration in the US 24 EA analyses in part due to its incompatibility with the full build out. The primary compatibility concern of the diamond interchange is the spacing of its ramp intersections crowding the adjacent 8th street intersection.

The proximity of the 8th street interchange creates similar compatibility problems with the DDI alternative. Due to the proximity of Fountain Creek on the east side of I-25 the DDI configuration is shifted approximately 250 feet to the west. The western shift of the DDI (toward 8th Street) creates

CIMARRON DIAMOND

PROPOSED

ACTION



- Preferred by public
- Minimizes property impacts
- Longer on-and off-ramps
- Cost effective
- Adequate traffic operations

US HIGHWAY 24

FOUNTAIN CREEK

MONUMENT CREEK

CONFLUENCE PARK

CIMARRON ST

COLORADO AVE

Creeks	Bridges, Structures
Parks	Proposed Highway
Buildings	By Others
Edge of Pavement	Retaining Walls



CIMARRON - BIJOU PROJECT

Exhibit 2

WILSON & COMPANY
PLANNING
ENGINEERS
& ARCHITECTS

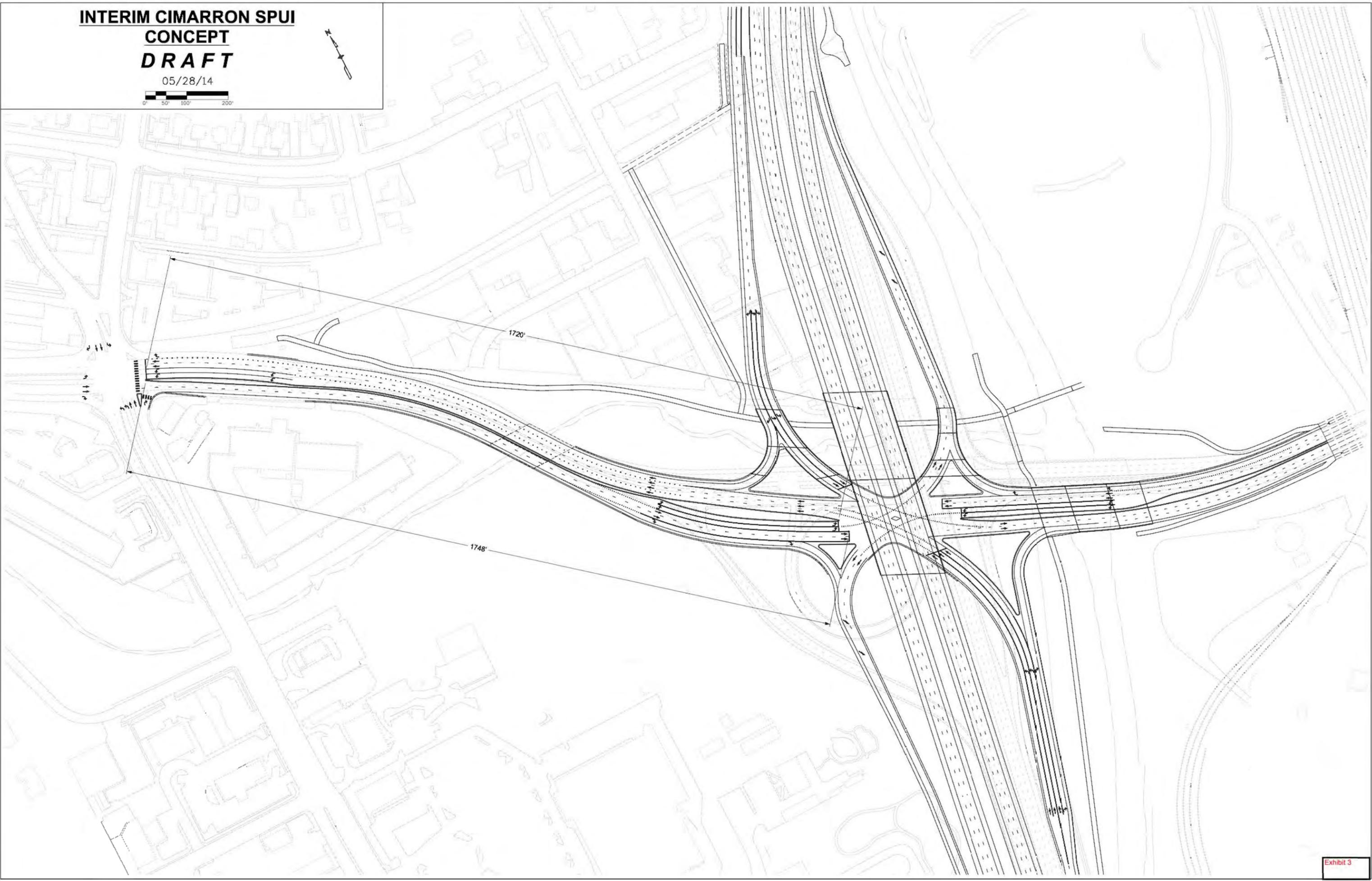
CDOT

INTERIM CIMARRON SPUI

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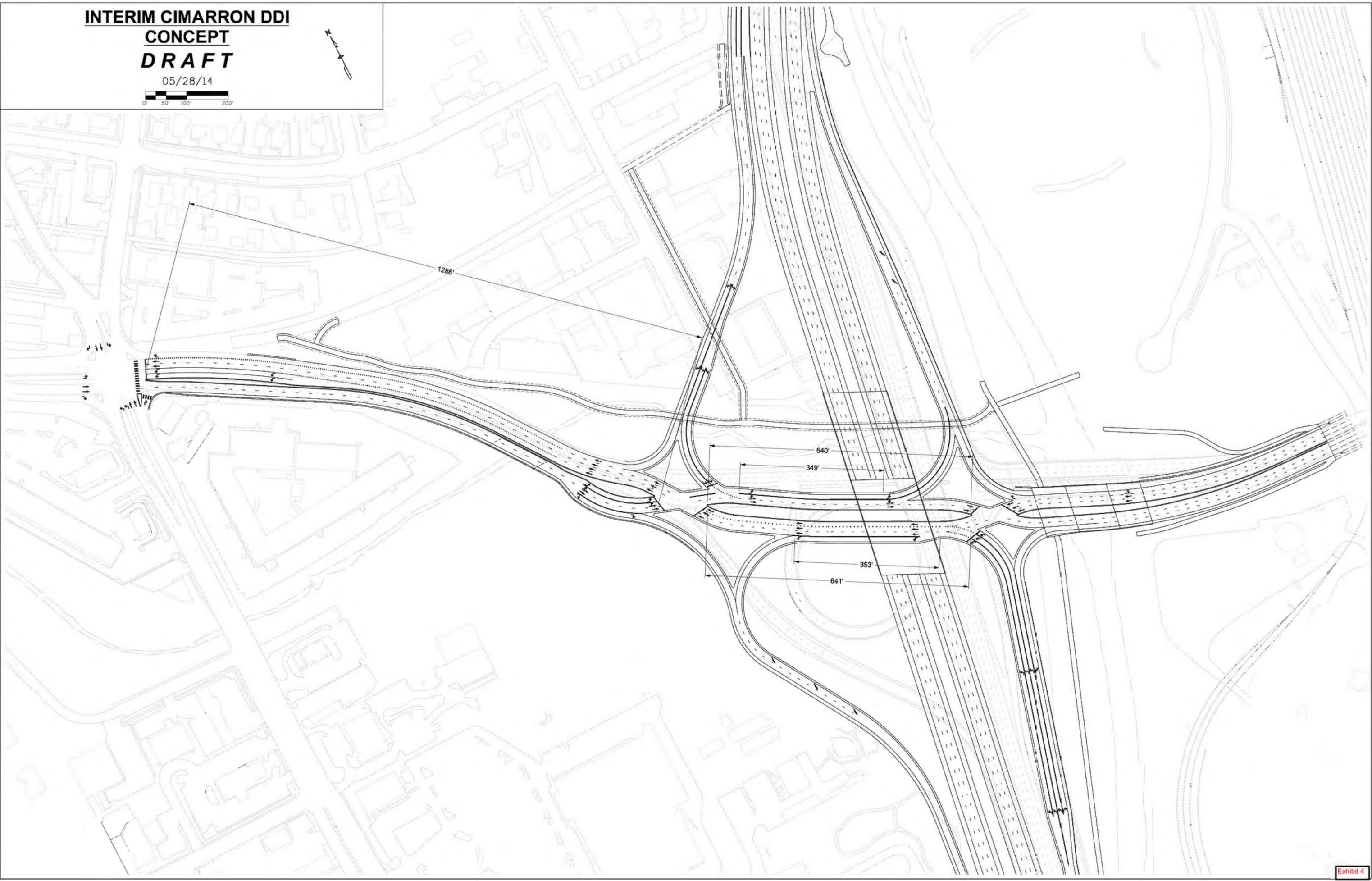
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**INTERIM CIMARRON DDI
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ULTIMATE CIMARRON SPUI

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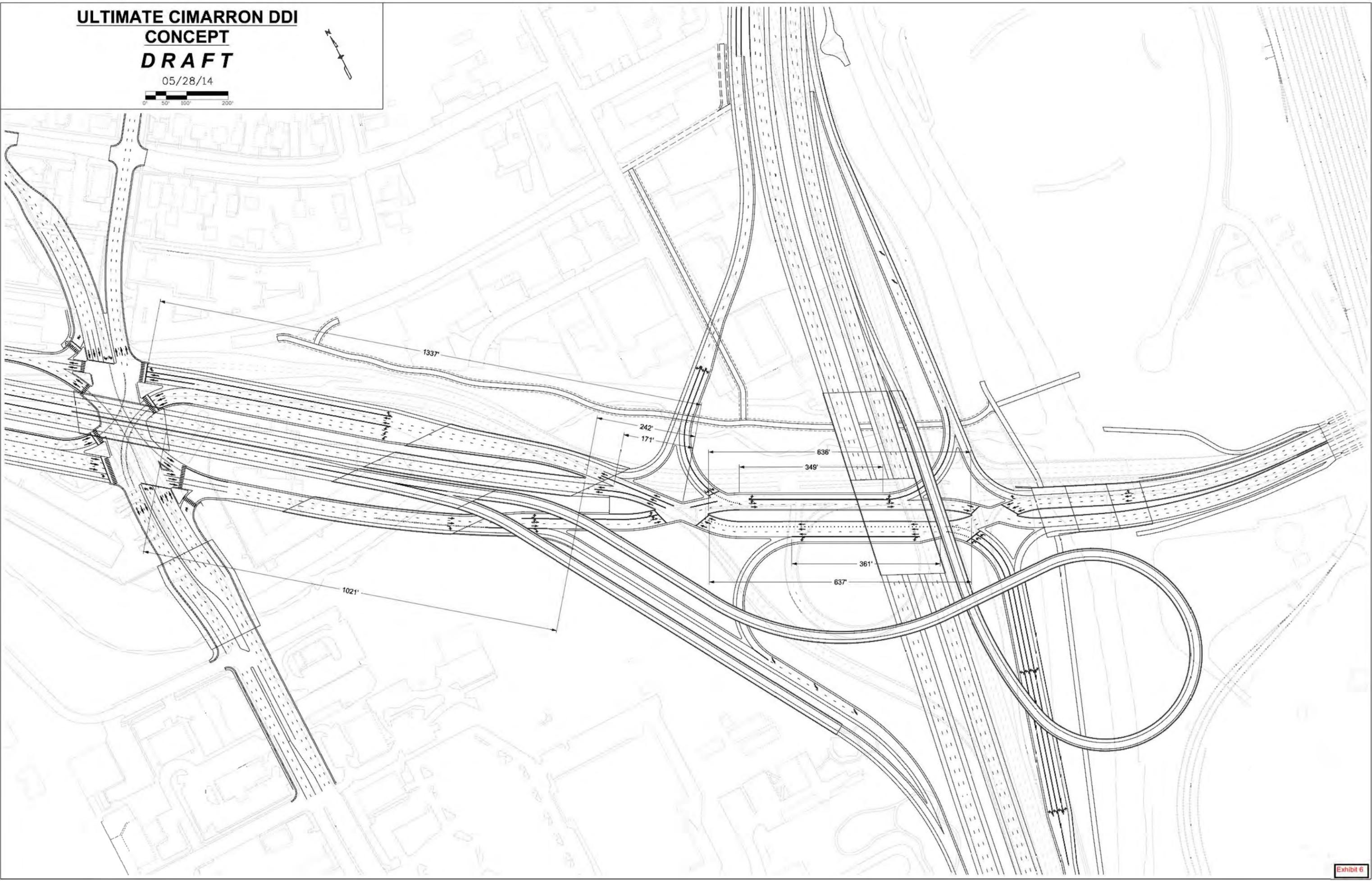
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ULTIMATE CIMARRON DDI
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several geometric challenges present with the ultimate configuration. In order to ensure adequate grades for the mainline over 8th Street the decision distance between the west DDI crossover and the split for the 8th Street and through traffic is reduced from approx. 500' with the SPUI to less than 200' with the DDI. This is likely to create confusion and compromise operations.

The SPUI configuration offers the best compatibility with the ultimate build out. The single point intersection provides the most compact configuration, thus allowing the most available space between the 8th Street interchange and the Cimarron Interchange to accommodate the multiple decision points between the interchanges.

Right of Way and Utilities Impacts

The more spread out configuration of the DDI also creates more right of way impacts. As previously noted proximity of the Fountain Creek on the eastside of I-25 the DDI configuration is shifted approximately 250' further west. As a result the DDI alternative requires the acquisition of the "Air Gas" property on the west side of Chestnut Street. The acquisition will add a significant cost to the alternative. The DDI will also require additional right of way to accommodate the alignment of the southbound on ramp, with acquisitions from the Pikes Peak Broadcasting and Humane society properties and potentially the Walmart further to the south.

A SPUI option was proposed as part of the US 24 Corridor EA in order to effectively handle the large turning movements to and from I-25 in a more compressed configuration, thus minimizing right of way acquisitions.

3.2 Stakeholder Input and Process

The US 24 Environmental Assessment included a significant public involvement process. More than 100 stakeholder, public and local business meetings were held throughout the corridor over a period of 8 years to develop a consensus for the preferred alternatives. That process sanctioned the preferred SPUI configuration of the I-25/Cimarron interchange (over the diamond configuration of the original IAR).

The process did not address the DDI configuration as it was not an alternative under consideration at that time. If the DDI is determined to be the preferred alternative for other reasons it will be necessary to conduct a public process to develop a consensus for the alternative. It is a critical matter of public trust that cannot be ignored. From the perspective of public involvement the SPUI is the preferred alternative.

The City of Colorado Springs is a key stakeholder in the project. The interchange is located within the City limits and will obviously have a substantial impact on the City traffic network. In addition, the City is contributing funding to the project. The City of Colorado Springs has expressed significant reservations about the DDI alternative. Their concern is focused on the use of a relatively new transportation interchange concept in a complex, high traffic urban condition where the concept does not have an historical record of performance.

3.3 Safety and Driver Expectation

One common thread for all of the alternatives is substantial safety improvement to I-25 that they provide. They all incorporate a shift of I-25 alignment to the west by approximately 75' in order to improve the horizontal geometry of the I-25 Mainline to provide an improved design speed of 65-70 MPH. The existing alignments to the north and south of Cimarron/US 24 are historically high accident locations due to the tight curves that are currently posted for 50 MPH. There is a history of severe rollover crashes in both the northbound and southbound lanes that regularly close I-25 for hours creating significant congestion issues. Regardless of the interchange alternative the project will greatly enhance safety on the I-25 mainline corridor through Colorado Springs.

Traffic safety concerns on US 24 are more sensitive to the interchange alternatives. As can be seen in Exhibit 5 and Exhibit 6, the complexity of the interchange system will result in many decision points for motorists to react to. The concern is significantly amplified by the nature of the motorists that travel through the interchange. US 24 provides a "gateway" to the western mountains that is heavily used by tourists throughout the summer months. Tourist traffic will not have the opportunity to learn how to drive the interchange that is more typical of commuter traffic on complex urban interchange. As a result, the atypical configuration will create more of a safety hazard at the I-25/Cimarron/8th Street interchange.

The SPUI interchanges at both the 8th Street interchange and the Cimarron interchange will provide a consistency of expectations for traffic traveling through the interchange.

The current "newness" of the DDI configuration will not meet drivers' expectations, potentially jeopardizing safety.

3.4 Historical Performance

This evaluation criteria was included to account for the current state of the use of DDI interchanges. Though the interchange concept has a strong potential to provide improved operations in many situations, it is to date relatively un-tested. There are currently less than 50 DDIs in operation in the United States. Though they are for the most part performing well and meeting expectations the historical data is still minimal. The DDIs currently in operation are in relatively simple service types of interchanges, and not as integral elements of interchange complexes. The ultimate build out of I-25/US 24 and 8th would likely represent one of the most complex applications of a DDI configuration to date. As such there is a higher level of performance risk than for the more commonplace SPUI configuration.

3.5 Alternative Evaluation Matrix

The Alternative Evaluation Matrix below summarizes the alternative evaluation of the interchange alternatives. As shown on the matrix the SPUI interchange is the recommended alternative.

I-25/Cimarron Interchange Alternative Evaluation Matrix			
	Diamond Configuration (I-25 EA and IAR)	Single Point Urban (SPUI) (US 24 EA)	Diverging Diamond (DDI)
Traffic Operations I-25 Mainline	-	+	+
Traffic Operations US 24 & Ramp Intersections	-	+	+
Compatibility with Full Build-out	-	+	-
ROW and Utility Impacts	+	+	-
Stakeholder Input and Consensus	-	+	-
Safety and Driver Expectations	+	+	-
Historical Performance	+	+	-



3.0 Policy Point #3:

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in the analysis to the extent necessary to fully evaluate the safety and operation impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a), 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a), 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

3.1 Methodology

The re-evaluation analyses utilized a VISSIM model to determine traffic operations in both the existing condition, 2014, and the 20 year future operations, 2035. FHWA's requirement's as outlined in their *Guidance on the Level of Effort Required to Conduct Traffic Analysis Using Microsimulation*, FHWA, March 2014, and their *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software*, FHWA, July 2004, were closely followed. A full description of the Methods and Assumptions used for the analysis of the re-evaluation are outlined in Appendix A.

4.0 2014 Existing Data

To adequately model the transportation network surrounding the interchange at I-25 and Cimarron, existing data was collected on April 24, 2014 at the intersections and interchanges immediately adjacent to the US24/Cimarron Interchange. The intersections and interchanges evaluated within that study area include the following:

1. I-25 Northbound Ramps at US 24/Cimarron Street
2. I-25 Southbound Ramps at Cimarron Street
3. I-25 Northbound Ramps at Bijou Street
4. I-25 Southbound Ramps at Bijou Street
5. I-25 Northbound On-Ramp from Tejon Street
6. I-25 Southbound Off-Ramp to Tejon Street
7. US 24/Cimarron Street at 8th Street
8. Cimarron Street at Sierra Madre Street

The existing counts are summarized in the following figures. This data was primarily utilized for VISSIM model calibration, however the data for the I-25/US 24/Cimarron interchange intersections was also used to develop comparison analyses of the intersection operations.

Figure 2: I-25 and Cimarron Study Area Traffic Volumes: AM Peak

I-25 and Cimarron Study Area Traffic Volumes: AM Peak

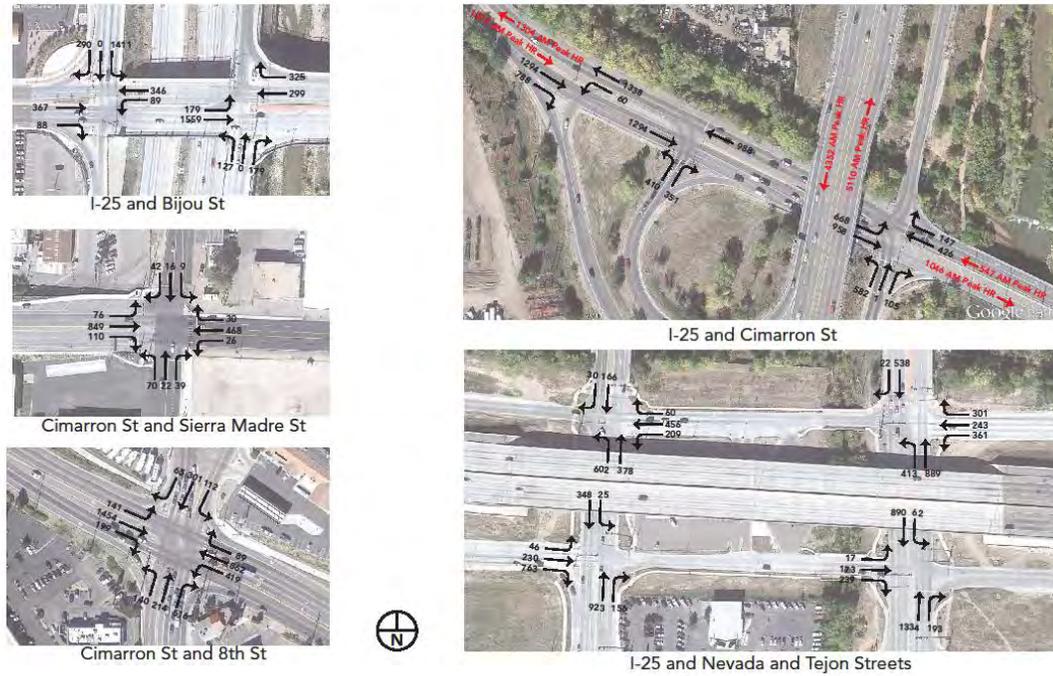
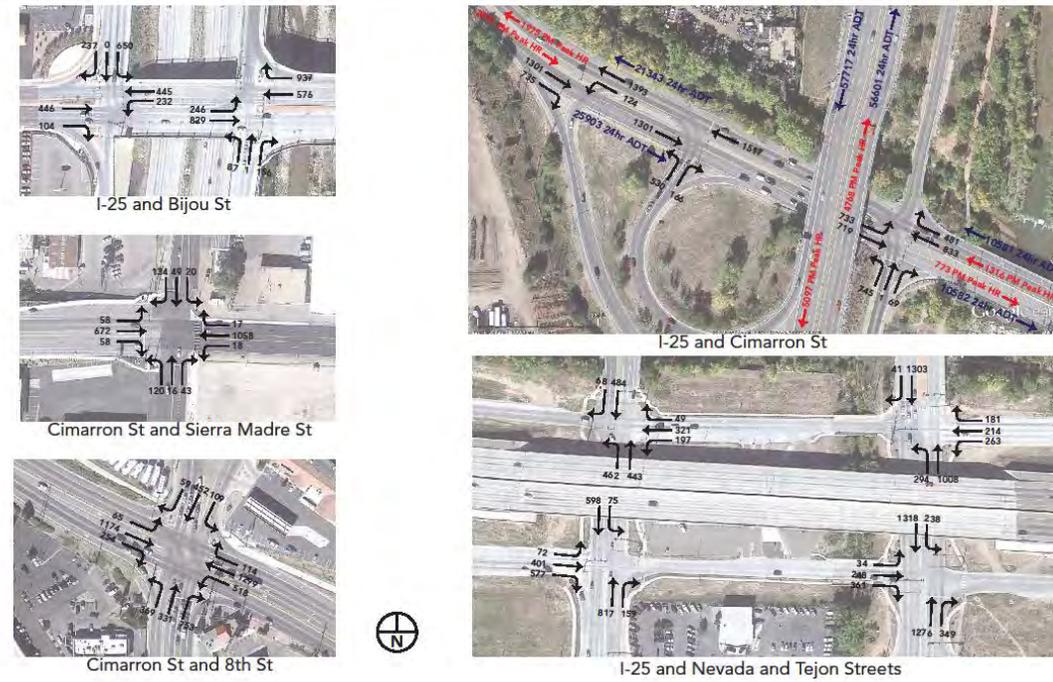


Figure 3: I-25 and Cimarron Study Area Traffic Volumes: PM Peak

I-25 and Cimarron Study Area Traffic Volumes: PM Peak



4.1 2014 Operations Performance

The purpose of an analysis such that was undertaken in this re-evaluation is to determine the comparative operations between the SPUI and no-build scenarios primarily under future conditions. Additionally looking at the two scenarios in the current year (2014) affords CDOT and FHWA with determining if either will create unintended operations under current conditions. The following tables summarize existing operations.

Table 1 summarizes the intersection operations of the two alternatives under current conditions. These results show that if the SPUI were installed with today’s traffic demand, it would operate with over 18 less seconds of delay on average than the current configuration at I-25/US 24/Cimarron. This is an expected result given that the SPUI utilizes only one signal, no coordination with another closely spaced signal is required to make the interchange in and of itself work.

Table 1: 2014 Intersection Operations

2014 SPUI	
	Average Vehicle Delay (seconds)
Average Intersection Delay	26.38

2014 No Build	
	Average Vehicle Delay (seconds)
Average Intersection Delay - SB Ramps Intersection	14.99
Average Intersection Delay - NB Ramps Intersection	29.79
Cumulative Average Delay for both Intersections	44.79

While most motorists understand that there will be delay at a signalized intersection, they commonly over estimate the amount of time they actually wait. Therefore, analyzing travel times through a section of roadway, a series of signalized intersections or even just one intersection offers the analyst a slightly better metric to use when explaining the impact of an intersection or interchange on a motorists’ travel. Table 2 shows the simulated travel time through the entire network analyzed as well as only the interchange. It can readably be seen that the SPUI provides better travel times through all but one of the routes through it; eastbound US 24/Cimarron to NB I-25. Traveling through 8th street in the eastbound direction and continuing through the interchange to northbound I-25 is shown to take an addition 8 seconds (less than 4%) more time than in the NO-Build scenario. Likewise, when traveling in the same direction but only accounting for the time through the interchange itself, the SPUI adds only 8 seconds to the travel time.



Table 2: Travel Times - Existing Year 2014 VISSIM Simulation Analysis					
Travel Time Sections	Limits for Measurement	2014 No Build		2014 SPUI	
		Vehicles Serviced	Travel Time (seconds)	Vehicles Serviced	Travel Time (seconds)
Full Network System					
1: From Cimarron EB to I-25 NB	West of 8th Street to North of Bijou On-ramp	828	242.73	823	250.40
2: From Cimarron WB to I-25 NB	East of Sierra Madre to North of Bijou On-ramp	647	136.84	645	129.82
3: From Cimarron EB to I-25 SB	West of 8th Street to South of Tejon Off-ramp	761	180.12	778	171.18
4: From Cimarron WB to I-25 SB	East of Sierra Madre to South of Tejon Off-ramp	149	256.86	150	195.87
5: From I-25 SB to Cimarron WB	North of Bijou Off-ramp to West of 8th Street	626	201.56	624	134.44
6: From I-25 SB to Cimarron EB	North of Bijou Off-ramp to East of Sierra Madre	218	187.58	221	175.61
7: From I-25 NB to Cimarron WB	South of Tejon On-ramp to West of 8th Street	910	234.01	912	205.93
8: From I-25 NB to Cimarron EB	South of Tejon On-ramp to East of Sierra Madre	105	139.58	109	111.05
9: From W. Cimarron to E. Cimarron	West of 8th Street to East of Sierra Madre	559	173.44	554	170.52
10: From E. Cimarron to W. Cimarron	East of Sierra Madre to West of 8th Street	619	177.49	605	167.40
TOTAL VEHICLES SERVICED (NETWORK w/o I-25)		5422		5421	
I-25 Only					
11: From I-25 South to I-25 North	South of Tejon On ramp to North of Bijou On-ramp	6446	124.49	6426	117.58
12: From I-25 North to I-25 South	North of Bijou Off ramp to South of Tejon Off-ramp	5822	119.39	5823	118.67
TOTAL VEHICLES SERVICED (I-25 ONLY)		12268		12249	
I-25/US 24/Cimarron Interchange Only					
1: I-25 NB to Cimarron WB		1504	105.31	1508	99.84
2: I-25 NB to Cimarron EB		140	60.76	143	32.64
3: Cimarron WB to I-25 SB		214	177.98	220	118.57
4: Cimarron WB to I-25 NB		838	54.08	832	53.74
5: I-25 SB to Cimarron WB		1021	110.84	1014	27.76
6: I-25 SB to Cimarron EB		286	109.33	293	97.57
7: Cimarron EB to I-25 SB		1438	48.80	1423	43.74
8: Cimarron EB to I-25 NB		1441	109.54	1432	117.15
TOTAL VEHICLES SERVICED (INTERCHANGE ONLY)		6882		6865	



Similar to travel times, travel speeds and speed differentials by lane offer measures of effectiveness that motorists tend to understand best. As shown in Table 3, the SPUI provides for the same or better travel speeds and differential of speed by lane on I-25 than the No-Build alternative.

Table 3: 2014 Freeway Travel Speeds

2014 SPUI						
NB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Average Speed
Tejon On-Ramp	Merge	48	59	61	62	58
Cimarron Off-Ramp	Weave	62	61	61	61	61
Cimarron On-Ramp	Weave	59	59	60	61	60
Bijou On-Ramp	Merge	47	50	54	56	52
SB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Average Speed
Bijou Off-Ramp	Diverge	62	60	61	62	61
Cimarron Off-Ramp	Weave	61	61	61	62	61
Cimarron On-Ramp	Weave	62	61	62	62	62
Tejon Off-Ramp	Diverge	62	61	61	62	62

2014 NO-BUILD						
NB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Average Speed
Tejon On-Ramp	Merge	47	59	61	62	57
Cimarron Off-Ramp	Weave	59	60	61	61	60
Cimarron On-Ramp	Weave	50	52	51	52	51
Bijou On-Ramp	Merge	51	49	49	50	50
SB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Average Speed
Bijou Off-Ramp	Diverge	62.08	60.39	60.95	61.59	61
Cimarron Off-Ramp	Weave	57.39	61.02	61.73	62.02	61
Cimarron On-Ramp	Weave	27.04	51.98	57.85	59.97	49
Tejon Off-Ramp	Diverge	62.87	61.19	61.26	61.42	62



4.2 Existing Safety Conditions

CDOT Safety and Traffic Engineering Branch, Safety Engineering and Analysis Group prepared Special Safety study of this interchange in December 2012, see Appendix B. Of note are the conclusions found in this document:

In the three year period, 261 crashes were reported within the I-25/Cimarron St interchange area. There were 35 crashes that caused injuries and two that resulted in fatalities. Although most of the interchange area has a level of service of safety performance that is better than expected, there are multiple target areas that have a potential for crash reduction. These target areas include the ramp entry and exit points (most notably the southbound entrance point), the I-25 southbound on and off ramps and both the signalized ramp intersections along Cimarron St. Consideration towards increasing delineation of concrete barrier and guardrail along I-25, geometric improvements to the interchange ramps and upgrading the signalized intersections would be the most effective way to reduce crash activity at this interchange.

5.0 Operational Performance

While the SPUI demonstrated better operations overall than the No-Build in 2014, it is still of major importance to determine how these alternatives compare twenty years in the future. Table 4 shows that the SPUI intersection still operates better than the No-Build under 2035 conditions. It is understandable with the growth in traffic volumes expected through twenty years that delays would increase, but again, the SPUI continues to operate approximately 10% better than the No-Build alternative.

Table 4: 2014 Intersection Operations

2035 SPUI	
	Average Vehicle Delay (seconds)
Average Intersection Delay	77.61

2035 No Build	
	Average Vehicle Delay (seconds)
Average Intersection Delay - SB Ramps Intersection	37.55
Average Intersection Delay - NB Ramps Intersection	47.45
Cumulative Average for both intersections	85.00

Table 5 summarizes the travel times and vehicles served for each alternative in the year 2035. Once again, the SPUI overall demonstrates better travel times than the No-Build alternative with few exceptions. When considering the entire network analyzed, the northbound to west bound movement as well as the eastbound Cimarron to west of Eighth Street both show longer travel times for the SPUI than the No-Build alternative. Likewise when looking at only the interchange operations the northbound exit ramp from I-25 shows longer travel times. It should be noted that the vehicles services (overall throughput of vehicles through any particular movement) is much higher for the SPUI than No-Build. This is the primary reason that the travel times are higher; the SPUI configuration can “pass” more vehicles through it than the downstream transportation system at Eighth Street can handle causing delays at that intersection to effect delays at the interchange.

Looking at the freeway speeds as well as the lane differentials indicate the largest difference between the SPUI and No-Build alternatives. Table 6 shows that in all cases the SPUI far out performs the No-Build by as much as 25 mph on average across all lanes

Of particular concern is the potential for traffic to queue back onto the freeway from the ramp terminal intersection at the interchange. Observations of the simulations show that with the SPUI configuration there are no queues extending past the gore points of the exit ramps. Under both analysis periods (2014 and 2035) the No-Build alternative causes queues to repeatedly extend to the freeway mainlines during peak travel times.

5.1 Safety

As noted in Section 4.2 Existing Safety Conditions, “*the ramp entry and exit points (most notably the southbound entrance point), the I-25 southbound on and off ramps and both the signalized ramp intersections along Cimarron St.*” are in need of upgrade to improve the safety of the interchange and the interstate in this area. The SPUI alternative does just that, the interstate is moved approximately 60-70 feet to the west allowing for the curves north and south of the interchange to be increased to meet current standards for the design speed of the facility. Additionally one sub-standard loop ramp (southbound to east and westbound US 24/Cimarron) is replaced with a standard exit ramp with appropriate tapers. All other ramps are improved to provide adequate weaving distances and both ramps to the south (northbound exit and southbound entry) are enhanced with auxiliary lanes extending to the Tejon Street Interchange.

5.2 Guide Sign Conceptual Plan

The proposed I-25 SPUI Interchange at US 24/Cimarron is replacing an existing non-standard interchange and, as such, advanced guide signs already exist for the current location. The new configuration will require four new guide signs on Interstate 25 to guide motorists through the new exit ramp configurations. These new signs are shown in Exhibit 7.

Table 5: Travel Times - Future Year 2035 VISSIM Simulation Analysis

Travel Time Sections	Limits for Measurement	2035 No-Build		2035 SPUI	
		Vehicles Serviced	Travel Time (seconds)	Vehicles Serviced	Travel Time (seconds)
Full Network System					
1: From Cimarron EB to I-25 NB	West of 8th Street to North of Bijou On-ramp	817	517.43	853	398.36
2: From Cimarron WB to I-25 NB	East of Sierra Madre to North of Bijou On-ramp	771	318.62	764	284.91
3: From Cimarron EB to I-25 SB	West of 8th Street to South of Tejon Off-ramp	1076	297.77	1121	247.20
4: From Cimarron WB to I-25 SB	East of Sierra Madre to South of Tejon Off-ramp	210	409.81	221	297.89
5: From I-25 SB to Cimarron WB	North of Bijou Off-ramp to West of 8th Street	926	474.58	1142	287.46
6: From I-25 SB to Cimarron EB	North of Bijou Off-ramp to East of Sierra Madre	371	436.17	477	188.27
7: From I-25 NB to Cimarron WB	South of Tejon On-ramp to West of 8th Street	1034	512.08	1221	722.12
8: From I-25 NB to Cimarron EB	South of Tejon On-ramp to East of Sierra Madre	74	426.73	93	354.25
9: From W. Cimarron to E. Cimarron	West of 8th Street to East of Sierra Madre	567	300.63	589	263.90
10: From E. Cimarron to W. Cimarron	East of Sierra Madre to West of 8th Street	653	304.91	604	525.25
TOTAL VEHICLES SERVICED (NETWORK w/o I-25)		6499		7085	
I-25 Only					
11: From I-25 South to I-25 North	South of Tejon On ramp to North of Bijou On-ramp	5611	479.32	7388	353.37
12: From I-25 North to I-25 South	North of Bijou Off ramp to South of Tejon Off-ramp	6302	248.80	8077	122.39
TOTAL VEHICLES SERVICED (I-25 ONLY)		11913		15465	
I-25/US 24/Cimarron Interchange Only					
13: Short I-25 NB to Cimarron WB		1790	175.03	2084	344.46
14: Short I-25 NB to Cimarron EB		100	125.66	122	138.39
15: Short Cimarron WB to I-25 SB		301	321.73	316	155.56
16: Short Cimarron WB to I-25 NB		997	96.47	993	84.90
17: Short I-25 SB to Cimarron WB		1890	252.22	2286	104.59
18: Short I-25 SB to Cimarron EB		539	253.47	657	93.00
19: Short Cimarron EB to I-25 SB		2198	68.09	2078	44.99
20: Short Cimarron EB to I-25 NB		1509	166.62	1443	119.32
TOTAL VEHICLES SERVICED (INTERCHANGE ONLY)		9324		9979	



2035 SPUI							
NB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Lane 5 (Inner)	Average Speed
South of Nevada	Basic	12.73	14.18	16.94	61.91		26.44
Cimarron Off-Ramp	Weave	10.02	9.89	13.99	21.00	48.00	20.58
Cimarron On-Ramp	Weave	28.62	23.79	29.58	31.70	52.73	33.29
Bijou On-Ramp	Merge	32.39	22.67	32.14	32.79	50.24	34.05
North of Bijou	Basic	56.32	56.07	53.84	59.64		56.47
SB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Lane 5 (Inner)	Average Speed
North of Bijou		46.41	43.73	44.44	46.86	60.28	48.34
Bijou Off-Ramp	Diverge	54.23	43.12	44.26	46.83	60.27	49.74
Cimarron Off-Ramp	Weave	16.26	36.93	48.42	52.42	61.56	43.12
Cimarron On-Ramp	Weave	61.75	59.86	60.96	61.47	62.06	61.22
South of Nevada	Basic	61.42	61.57	61.62	62.02		61.66

2035 NO-BUILD							
NB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Lane 5 (Inner)	Average Speed
South of Nevada	Basic	7.80	9.17	12.31			9.76
Cimarron Off-Ramp	Weave	17.98	13.18	16.58	19.37		16.78
Cimarron On-Ramp	Weave	17.35	9.67	14.64	18.70		15.09
Bijou On-Ramp	Merge	29.39	15.76	27.31	33.47		26.48
North of Bijou	Basic	57.22	58.16	58.27			57.88
SB	Section Type	Lane 1 (Outer)	Lane 2	Lane 3	Lane 4	Lane 5 (Inner)	Average Speed
North of Bijou		23.45	16.06	16.88	20.49		19.22
Bijou Off-Ramp	Diverge	40.59	17.34	19.71	21.52		24.79
Cimarron Off-Ramp	Weave	17.75	12.19	19.77	24.44		18.54
Cimarron On-Ramp	Weave	45.80	46.77	49.08	50.20		47.96
South of Nevada	Basic	62.06	61.68	61.39			61.71



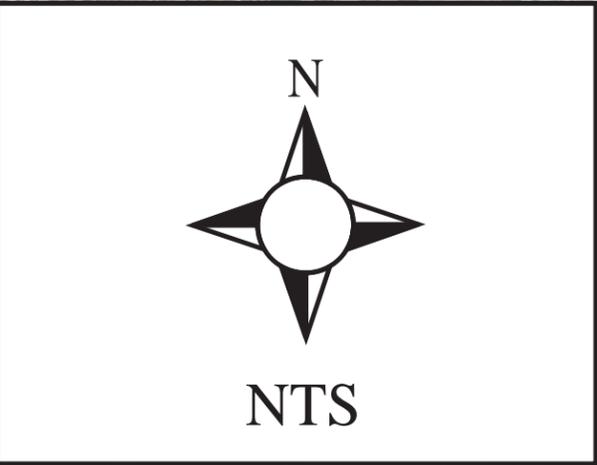


EXHIBIT 7
I-25/US24/CIMARRON
GUIDE SIGNS

6.0 Recommendations

The analysis and review provided above show that in virtually all cases the Single Point Urban Diamond Interchange (SPUI) alternative operates equal or better than the other alternatives analyzed. The Measures of Effectiveness (MOEs) all show that operations of both I-25 and US 24/Cimarron Street are equal or improve with the enhancements offered by the SPUI over that of the No-Build condition:

- A. Total Intersection Delay 2014 – 41% less delay (18.41 seconds overall)
- B. Total Intersection Delay 2035 – 10% less delay (7.39 seconds overall)
- C. Travel Times 2014
 - i. Cumulative through all network routes – 11% better travel time
 - ii. Cumulative through I-25 only routes – 3% better travel time
 - iii. Cumulative through interchange only – 24% better travel time
- D. Travel Times 2035
 - i. Cumulative through all network routes – 11% better travel time
 - ii. Cumulative through I-25 only routes – 35% better travel time
 - iii. Cumulative through interchange only – 26% better travel time
- E. Vehicles Serviced 2014
 - i. Cumulative through all network routes – 0.02% less vehicles
 - ii. Cumulative through I-25 only routes – 0.16% less vehicles
 - iv. Cumulative through interchange only – 0.25% less vehicles
- F. Vehicles Serviced 2035
 - i. Cumulative through all network routes – 9% more vehicles
 - ii. Cumulative through I-25 only routes – 30% more vehicle
 - iii. Cumulative through interchange only – 7% more vehicles
- G. I-25 Average Travel Speeds 2014
 - i. Northbound – 5% higher speeds
 - ii. Southbound – 6% higher speeds
- H. I-25 Average Travel Speeds 2014
 - i. Northbound – 36% higher speeds
 - ii. Southbound – 53% higher speeds
- I. Observed Queues – There is no queuing of ramp vehicles onto the freeway in either year

Additionally, given the existing safety issues with the geometrics of this section of Interstate I-25, the shifting of the freeway mainline approximately 70 feet to the west combined with the significantly enhanced diverge and merge areas will greatly improve the deficiencies that exist today. Therefore, the SPUI is recommended as the preferred alternative for the I-25/Cimarron/US 24 interchange.

APPENDIX A

I-25 Cimarron IAR Methods and Assumptions

Date: July 11, 2014

To: Dahir Egal - FHWA

From: David Watt– CDOT Region 2, Project Director

Subject: I-25/Cimarron IAR Re-evaluation: Traffic Operations Analysis Methods & Assumptions

The following document outlines the methods and assumptions for conducting the traffic operations analyses to be used as the basis for preparing the Interchange Access Request (IAR) Re-evaluation for the proposed interim I-25/US 24/Cimarron interchange improvements. The Cimarron interchange is located on I-25 near mile post 141 (MP 141) and, in its current configuration, is a partial clover-leaf interchange. The original IAR was completed for the interchange in 2003 as a part of the *I-25 Environmental Assessment for Improvements Through the Colorado Springs Urbanized Area, March 2004 (I-25 EA)*. The IAR Re-evaluation is necessary to address proposed interchange improvements to be constructed in an upcoming project.

This memo addresses all comments received to date from The Federal Highway Administration (FHWA) as well as direction received from FHWA at coordination meetings on July 1, 2014 at FHWA Colorado Division Offices and July 2, 2014 at the Wilson & Company office in Denver.

Project Description

The Project generally consists of the reconstruction of the I-25/US 24/Cimarron Interchange, including realignment of I-25 mainline from north of the Tejon Street interchange to Colorado Avenue; and realignment of US 24 from the US 24 bridge over Fountain Creek west of the interchange to the Cimarron Street bridge over Conejos Street east of the interchange.

FHWA, in cooperation with Colorado Department of Transportation (CDOT), is in the process of completing a reevaluation of the previous I-25 EA and Finding of No Significant Impact issued in 2004. The reevaluation will encompass the first decision document's project area along with elements of the preferred alternative for the interchange presented in the US 24 Environmental Assessment.

The preferred alternative presented in the *US 24 West Environmental Assessment and Section 4(f) Evaluation, May 2012 (US 24 EA)*, proposed an integrated interchange complex including I-25, US 24/Cimarron and 8th Street (crossing US 24 west of I-25). The complex includes single point interchanges at both US 24 and 8th Street and I-25 and US 24, with additional direct connection ramps to I-25. A detailed traffic analysis was performed validating the operational benefits of the proposed alternative. An IAR has not been completed for the ultimate interchange complex as the full improvements are not expected to be constructed until after the 8 year limit of IAR validity.

Funding has been obtained to construct initial improvements to the interchange. The project will be designed and constructed using Design-Build delivery. A formalized goal setting process has been completed for the project with the number one goal for the project being:

1. Maximize overall safety, capacity and operation of the interchange and the surrounding transportation network within the Project budget.

Within this goal are the primary objectives of:

- a. Maximize interchange safety, capacity and operational improvements.



- b. Correct existing safety and operational deficiencies along I-25 and US 24/Cimarron to ensure the smooth flow of traffic in the corridors.

To obtain this goal and these objectives the I-25 corridor will be reconstructed in the vicinity of the I-25 US 24/Cimarron interchange to improve its alignment and laneage, consistent with the improvements identified in the I-25 EA. This work will correct substandard mainline alignment issues and significantly improve the safety of the interstate highway at the location of the project.

The proposed interchange improvements will provide an interchange configuration that improves safety and operations between I-25 and the US 24 corridor to the west and Cimarron Street to the east. The improved interchange will provide the improved safety and operations until such a time that the US 24 corridor improvements (defined in the US 24 EA) can be constructed. At that time the US 24 corridor improvements will include the ultimate build out of the I-25, US 24/Cimarron, 8th Street interchange complex. As a result, the interchange improvements for the current project will need to be designed for compatibility with the future build-out to maximize both its near term and long term effectiveness.

A Tight Urban Diamond Interchange (TUDI) was recommended in the previous IAR completed in 2003 for this interchange, associated with the I-25 EA. The primary purpose of this IAR Re-evaluation will be to update an IAR that has exceeded its 8 year limitation, and to confirm that a revised interchange configuration, that is consistent with the I-25 EA Reevaluation and US 24 EA, will provide equal or better performance than the original proposed TUDI, until such a time as additional improvements can be implemented with the build out of the US 24 Corridor.

Study Limits

The study area to be evaluated for the IAR re-evaluation is generally focused on the I-25/US 24/Cimarron interchange and will extend from the entry/exit ramps at Tejon St to the south, to approximately ¼ mile north of Bijou Street on I-25 as well as one signalized intersection immediately to the east and west of the I-25/US 24/Cimarron interchange. The intersections evaluated and reported on within that study area are only those directly associated with the interchange; I-25 Northbound Ramps at US 24/Cimarron Street and I-25 Southbound Ramps at US 24/Cimarron Street.

Proposed Current and Future Analysis Years

While the US 24 EA acknowledges the PPACG long range transportation plan has committed funding for the build out of the improvements identified in the EA, the proposed SPUI interchange is an interim condition until additional improvements can be constructed as a part of the US 24 corridor build out. Even with the proposed improvements being an interim condition, the analysis will still focus on an assessment of the interchange operation over the required twenty year horizon. Therefore, the analysis scenarios will include 2014 (existing) and 2035 (horizon). Additionally, Year 2014 will be utilized to determine the existing conditions of the I-25 and US 24/Cimarron interchange as well as to calibrate the traffic simulation model.

Proposed Peak Period Analysis

Based on a review of daily traffic volumes from June 1, 2013 through May 31, 2014, collected by CDOT, as well as the future traffic volumes as reported in the I-25 and Cimarron IAR, and the US 24 EA, the evening peak period has consistently higher traffic volumes than the morning peak period and generally extends from approximately 3:00 pm to 6:00 pm. Average daily traffic counts were collected on April 24, 2014 on I-25 south of Cimarron Street and indicated that the traffic volumes were split almost evenly between the morning peak hour and the evening peak hour. The morning peak hour volume on I-25 was approximately 9,460 vehicles per hour (vph) or 49% of the total daily peak (AM and PM combined) traffic, while the evening peak hour traffic volume on I-25 was approximately 9,865 vph, or 51% of the total daily peak traffic. From a directional split the traffic volumes on I-25 south of Cimarron Street are as follows:



- Morning Peak Hour Northbound I-25 – 5,110 vph (54% of the total morning peak traffic)
- Morning Peak Hour Southbound I-25 – 4,352 vph (46% of the total morning peak traffic)
- Evening Peak Hour Northbound I-25 – 4,768 vph (48% of the total evening peak traffic)
- Evening Peak Hour Southbound I-25 – 5,097 vph (52% of the total evening peak traffic)

Furthermore, a review of the morning and evening peak hour turning movement counts at the I-25 and US 24/Cimarron Street interchange indicate that all of the left turn movements and the majority of the through movements are higher in the evening peak hour than the morning peak hour. There are a few right turn movements that are higher during the morning peak period, however these movements are not considered critical to the future design as they will more than likely become free movements in all future design scenarios.

Given the traffic volume information provided above, the evening peak period (3:00 pm to 6:00 pm) will be analyzed to determine the I-25 and Cimarron interchange study area operations. The results of this evening period analysis will be utilized to conduct an evaluation of the proposed interim SPUI interchange that is compatible with the ultimate interchange complex, and the No-Build alternative.

Traffic Operations Analysis

For the detailed evaluation we propose to utilize the VISSIM modeling software to analyze the operations for the recommended I-25 and US 24/Cimarron SPUI alternative. VISSIM will be able to provide defensible performance measure such as travel time, volume served, spot speeds, and queues that are required by FHWA. Furthermore, the VISSIM platform can provide a simulation of the existing and future year traffic operations within the study area to analyze weaving and queuing areas as well as provide a visual reference tool for individuals unfamiliar with traffic operations analysis, but familiar with the study area. VISSIM models will be developed for the following scenarios in the evening peak period:

- Existing Conditions (Year 2014) No Build
- Existing Conditions (Year 2014) SPUI
- Horizon Year (Year 2035) No Build
- Horizon Year (Year 2035) SPUI

The operational characteristics of the proposed action will be measured against the no-build alternative for several parameters or Measures of Effectiveness (MOEs). The MOEs for this analysis are as follows:

- Travel times through the analysis area
- Travel speeds through the analysis area
- Volume served at critical locations
- Queuing
- Speed differential by lanes
- Lane changes in the through lanes adjacent to the merge and diverge areas.

Required Traffic Data

The data required to develop and calibrate an accurate and reliable VISSIM model include the following:

- Hourly traffic volumes, including vehicle classification, along I-25, and Cimarron Street broken down into 15 minutes intervals
- Peak period turning movement counts at all previously mentioned study intersections, collected on the same day as the hourly traffic volumes. Turning movements were collected for a three hour period determined by the peaks identified from the hourly traffic counts on I-25. Based upon the hourly traffic volumes that were collected in 15 minute intervals on I-25, the evening peak period occurs from 3:00 to 6:00 PM.
- Travel Speeds on I-25 and US 24/Cimarron Street during the core of the PM peak period from 3:30 to 5:30 PM. The number of travel speed runs will be determined utilizing the z-test method as outlined in the



publication *Guidance on the Level of Effort Required to Conduct Traffic Analysis Using Microsimulation*, FHWA, March 2014.

- Travel Times on key segments of I-25, and US 24/Cimarron Street during the core of the PM peak period from 3:30 to 5:30 PM. The number of travel time runs will be determined using the same method as for the travel speed runs.
- Existing Queuing Data taken from video of the study area.

Calibration Efforts

Calibration of the existing PM peak period VISSIM model will be performed per the methodology identified in the *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software*, FHWA, July 2004, prior to beginning the analysis of future year for the recommended interchange configuration. Calibration of the existing PM peak period VISSIM model will be conducted utilizing the following procedures:

- Calibrate the existing condition VISSIM model to replicate existing conditions of the study area. The VISSIM model will be calibrated based upon a comparison of the model results to the following data:
 - Average Travel Speed along I-25 and Cimarron Street within the study area.
 - Average Travel Time along I-25 and Cimarron Street within the study area.
 - Observed queues
 - VISSIM throughput volumes (volume served) along I-25 and US 24/Cimarron Street to actual field measured traffic volumes.
- The Model will be calibrated and analyzed to a level of confidence of 90 percent.
- When any VISSIM parameters such as (but not limited to) default driver behavior parameters for lane change equations or car following equations are modified, provide a description of the modification and a justification of the modification

A visual inspection of the calibrated base model shall be performed and compared to observations of field operations to verify that the model is accurately replicating field conditions.

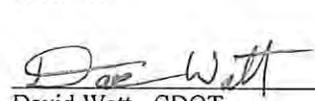
Forecasted Volumes

The 2035 No Build Traffic volumes documented in the US 24 Environmental Assessment will be utilized to conduct the evaluation of the interchange alternatives. Use of the No Build volumes recognizes that the interim interchange configuration will only be in effect until additional improvements are provided as a part of the US 24 corridor build out.

I concur:


Dajir Egal - FHWA
Date 7/16/14

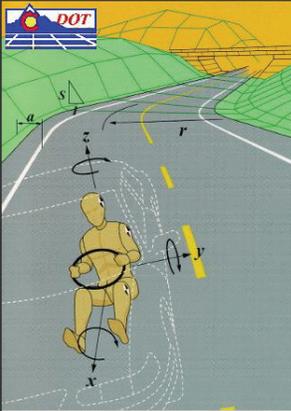
I concur:


David Watt - CDOT
Project Director
Date 7/11/2014



APPENDIX B
SAFETY ASSESSMENT REPORT
I-25 / Cimarron St (US 24) Interchange
Region 2
Special Study

CDOT Safety Engineering
and Analysis Group



Committed to Excellence in
Transportation Engineering
and Science

SAFETY ASSESSMENT REPORT

I-25 / Cimarron St (US 24) Interchange
Region 2
Special Study

December 2012



Prepared by: The Colorado Department of Transportation
Safety and Traffic Engineering Branch
Safety Engineering and Analysis Group
4201 E. Arkansas Ave.
Denver, CO 80222

*Reproduction of any Portion of this Document is Prohibited Without Expressed
Written Authority from the CDOT Safety Engineering and Analysis Group*

This report is prepared solely for the purpose of identifying, evaluating and planning safety improvements on public roads. It is subject to the provisions of 23 U.S.C.A. 409, and therefore is not subject to discovery and is excluded from evidence. Applicable provisions of 23 U.S.C.A. 409 are cited below:

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 152 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists or data.

Any intentional or inadvertent release of this report, or any data derived from its use shall not constitute a waiver of privilege pursuant to 23 U.S.C.A. 409.

Site Location

This safety assessment study addresses the interchange of I-25 and Cimarron St (US 24) located within the City of Colorado Springs in El Paso county. I-25 crosses Cimarron St at milepoint (MP) 141.14. US 24 crosses I-25 at MP 303.82.

Overall Accident History

The crash history for the period of January 1, 2009 through December 31, 2011 (a total of three years) was examined to locate crash clusters and identify crash causes. In the three year period, 261 crashes were reported within the I-25/Cimarron St interchange area. There were 35 crashes that caused injuries and two that resulted in fatalities. **Table 1** summarizes the number and severity of crashes for mainline I-25, I-25/Cimarron St interchange ramps and Cimarron St (US 24).

Table 1
Overall Crash Summary

Year	I-25 Mainline Crashes (MP 140.64-141.64)			
	PDO	INJ	FAT	Total
2009	44	14	0	58
2010	35	4	0	39
2011	47	7	1	55
Total	126	25	1	152
Average/Year	42.0	8.3	0.3	50.7

Year	I-25/Cimarron St Interchange Ramp Crashes			
	PDO	INJ	FAT	Total
2009	11	1	1	13
2010	22	2	0	24
2011	11	1	0	12
Total	44	4	1	49
Average/Year	14.7	1.3	0.3	16.3

Year	Cimarron St (US 24) Crashes (MP 303.71-303.84)			
	PDO	INJ	FAT	Total
2009	14	2	0	16
2010	20	3	0	23
2011	20	1	0	21
Total	54	6	0	60
Average/Year	18.0	2.0	0.0	20.0

Overall Total	224	35	2	261
Average/Year	74.7	11.7	0.7	87.0

Mainline I-25

In the three year period, 152 crashes were reported along mainline I-25 within a half mile of the Cimarron St interchange (not including the interchange ramps). There were 25 crashes that caused injuries and one fatal crash. The fatal event occurred at 4:20 AM on December 15, 2011 just north of the interchange at MP 141.50 where a northbound vehicle collided with a median barrier and then overturned. The driver eventually died from the injuries sustained in the crash. Adverse road conditions and driver impairments were not factors in this crash. However, the crash did occur in what was described as dark-unlighted conditions along a curved portion of the interstate.

The Safety Performance Function (SPF) graph for the interstate segments north and south of the interchange show that the frequency of total accidents over the three year study period were slightly below expected as compared to other 6-lane urban freeways statewide (**Figure 1**). From a frequency standpoint, this would indicate that the segments of I-25 adjacent to the Cimarron St interchange are performing better than expected in terms of level of service of safety (LOSS II).

- LOSS I - Indicates a Low Potential for Crash Reduction
- LOSS II - Indicates a Better than Expected Safety Performance
- LOSS III - Indicates a Less than Expected Safety Performance
- LOSS IV - Indicates a High Potential for Crash Reduction

Figure 1

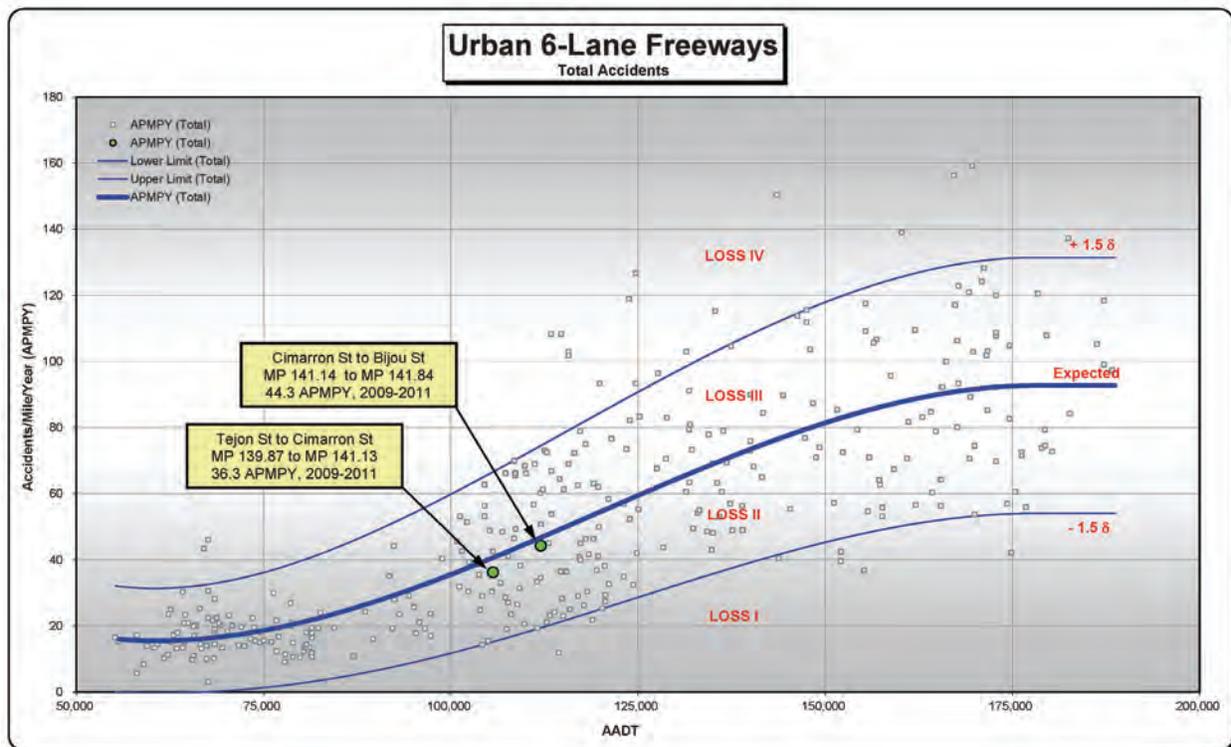


Figure 2a lists the accident type distribution for mainline I-25 crashes over the three year study period. Fixed object collisions (41 percent), rear end crashes (24 percent) and sideswipes (same direction) crashes (23 percent) were the most common accident types.

Figure 2a

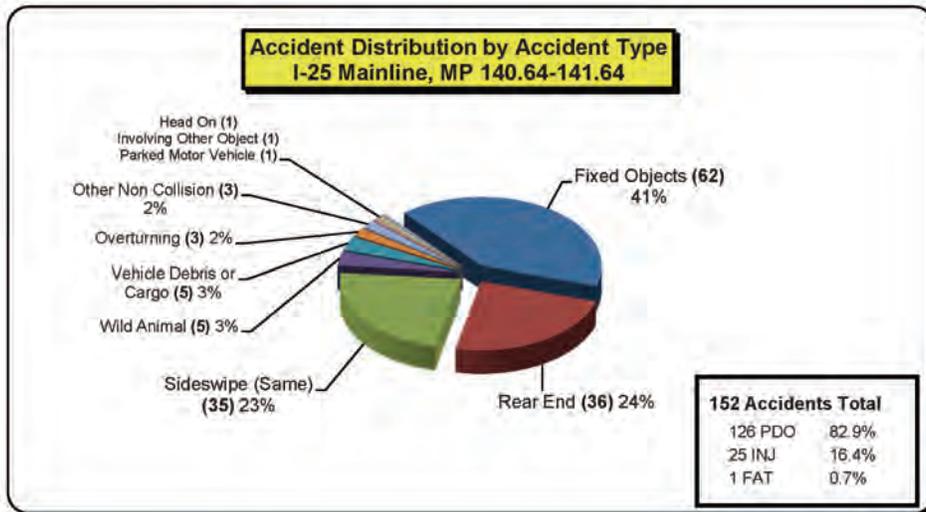


Figure 2b shows the breakdown of fixed object accidents. Barrier (50 percent) and guardrail (35 percent) collisions were the most frequent.

Figure 2b

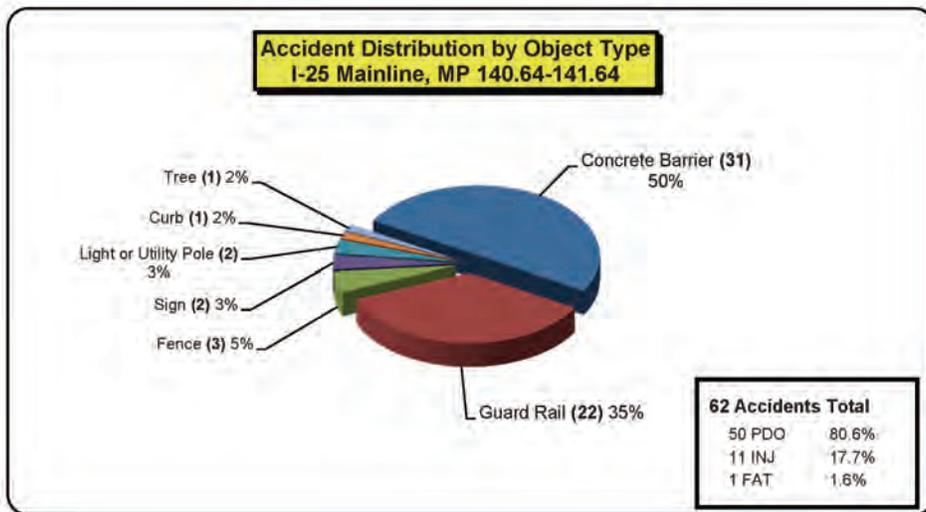


Figure 3
I-25 Mainline Crash Diagrams

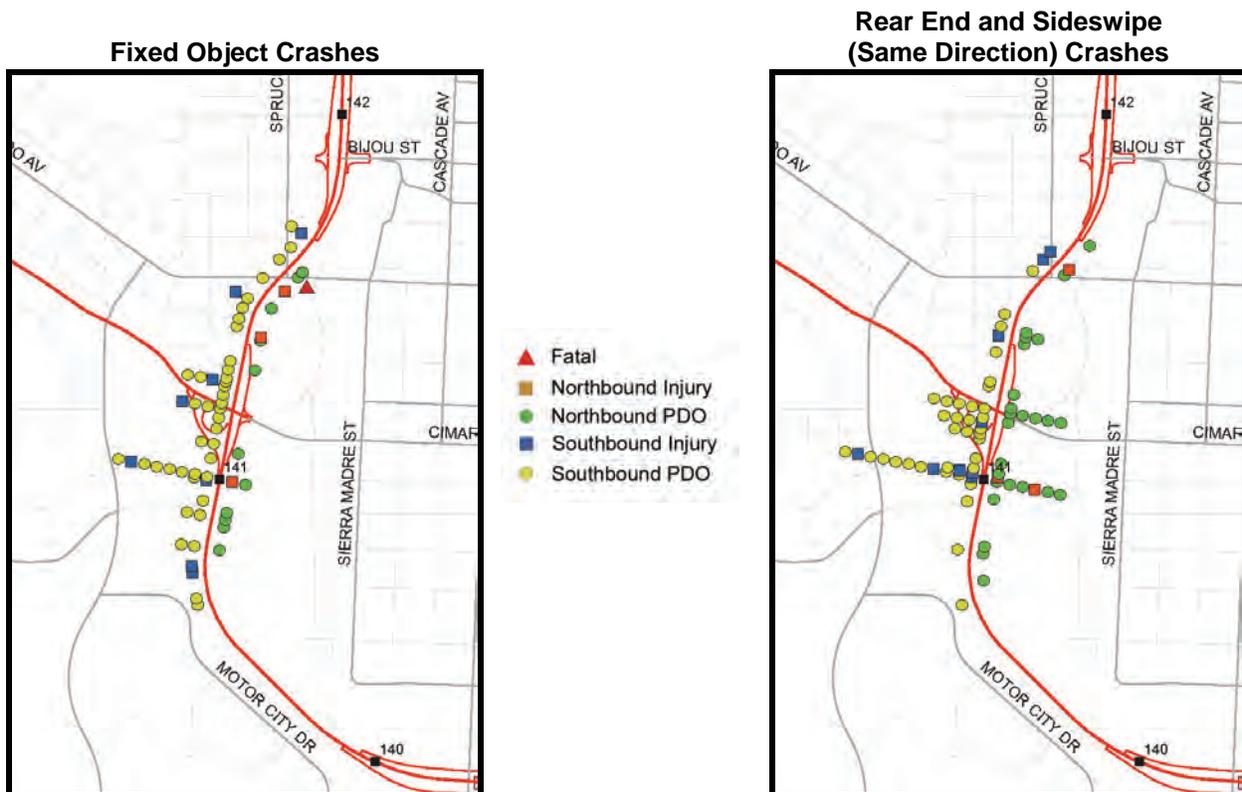


Figure 3 shows a crash diagram for fixed object collisions and another crash diagram for rear end and same direction sideswipe collisions. For each of these crash types, it is apparent that there is significantly more crash activity occurring along southbound I-25 than northbound I-25. Crash concentration is heaviest near the southbound ramp entry point from Cimarron St near milepoint 141. To a lesser extent, there were also some crash concentrations at both I-25 northbound and southbound ramp exit points. This indicates that the ramp configuration and geometry for this interchange is a contributing factor to crashes along I-25 and that there may be potential for crash reductions if improvements are considered for the interchange ramp exit and entry points, especially in the southbound direction. It is also suggested that delineation be improved for the concrete barriers and guardrails along I-25 for better nighttime visibility (reflective panels).

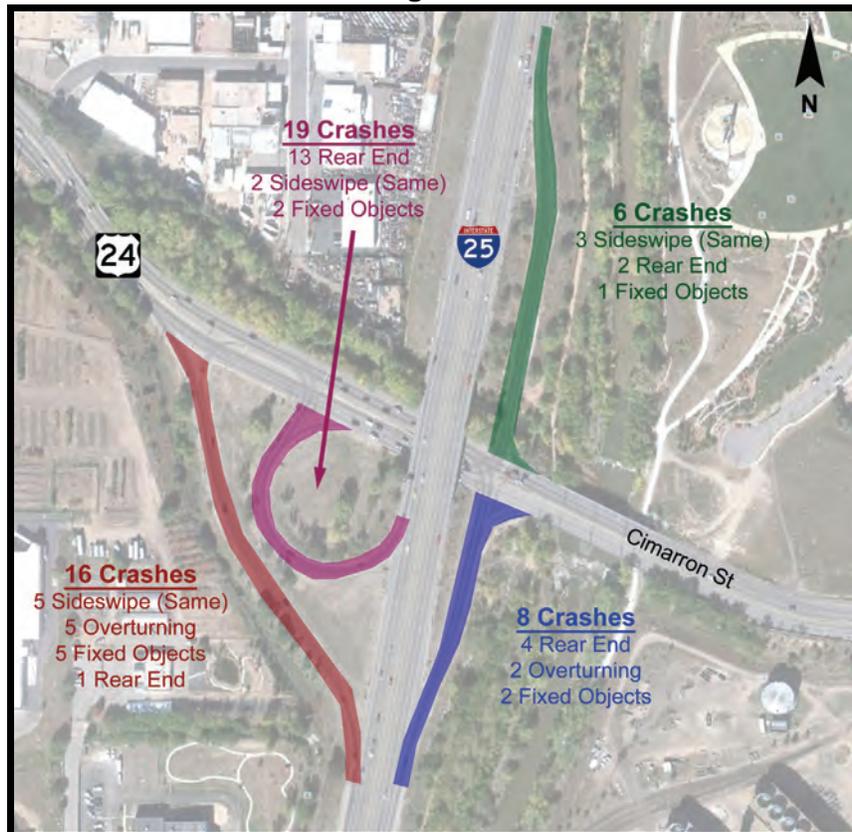
I-25/Cimarron St Interchange Ramps

In the three year period, 49 crashes were reported along I-25/Cimarron St interchange ramps. There were 4 crashes that caused injuries and one fatal crash. The fatal event occurred at 10:26 AM on May 5, 2009 along the southbound on ramp to I-25 at MP 141.02 where a motorcycle failed to negotiate a curve near the entry point onto I-25. The motorcycle crossed over a dirt median into the I-25 southbound travel lanes where it sideswiped a larger vehicle, ejecting the driver of motorcycle onto the roadway who sustained fatal injuries. Adverse road conditions and driver impairments were not factors in this crash. **Table 2** summarizes the number and severity of crashes for each ramp and **Figure 4** shows the accident type distribution for each ramp.

Table 2
I-25/Cimarron St Interchange Ramp Crashes By Location

Ramp	Crashes			
	PDO	INJ	FAT	Total
I-25 Northbound Off Ramp to Cimarron St	7	1	0	8
I-25 Northbound On Ramp from Cimarron St	6	0	0	6
I-25 Southbound Off Ramp to Cimarron St (Loop)	17	2	0	19
I-25 Southbound On Ramp from Cimarron St	14	1	1	16
Total	44	4	1	49

Figure 4



The relatively higher frequency of crashes along the southbound I-25 on and off ramps further reinforces the notion that geometric improvements to the ramps should be considered for this interchange. This would be especially helpful to the southbound I-25 on ramp where the tight roadway curvature is a significant contributing factor to crashes as vehicles coming from Cimarron St attempt to access southbound I-25.

Cimarron St (US 24)

In the three year period, 60 crashes were reported along Cimarron St within the I-25 interchange area. There were six crashes that caused injuries and no fatal crashes. **Table 3** summarizes the number and severity of crashes for each intersection.

Table 3 - Cimarron St Intersection Related Crashes by Location

US 24 MP	Intersection	Legs	Signalized	Crashes			
				PDO	INJ	FAT	Total
303.73	I-25 Southbound On Ramp	3	No	3	0	0	3
303.77	I-25 Southbound Off Ramp	3	Yes	13	1	0	14
303.83	I-25 Northbound On/Off Ramps	4	Yes	32	3	0	35
Non Intersection Related Crashes				6	2	0	8
Total				54	6	0	60

The crashes along US 24 are concentrated at the two signalized intersections within the I-25 interchange area. The SPF's for each intersection (**Figures 5 and 6**) show that both of the signalized intersections are performing better than expected as compared to other 4-lane signalized ramp intersections statewide (LOSS II).

Figure 5

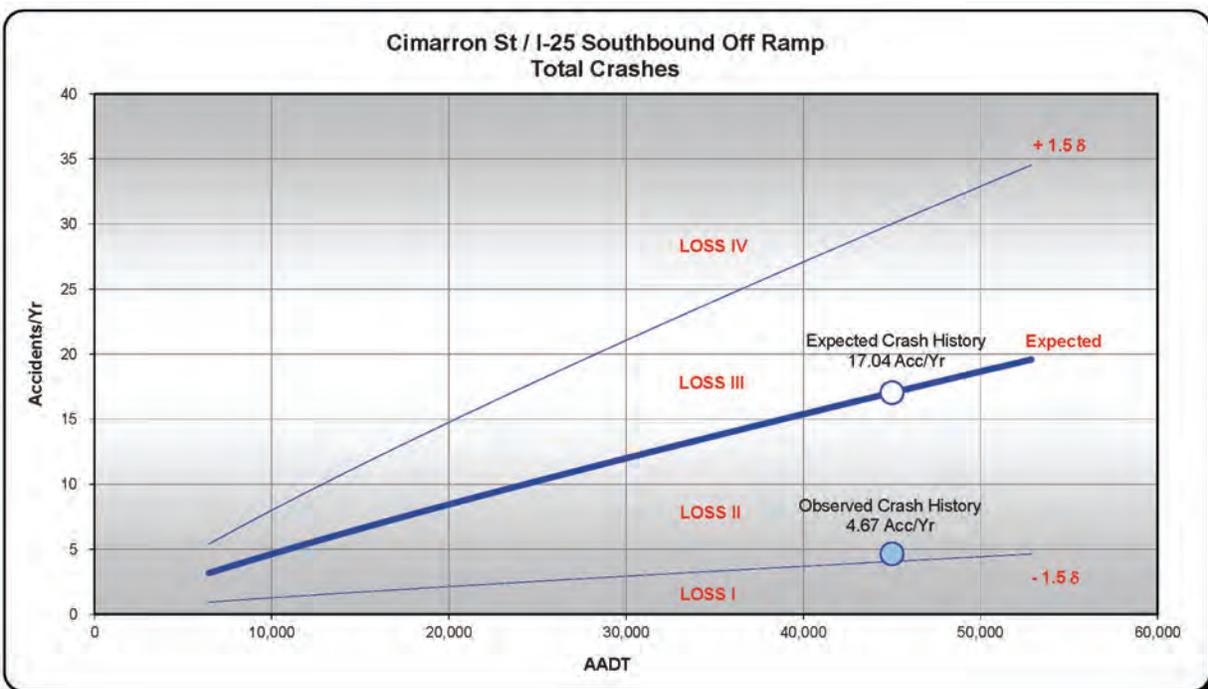


Figure 6

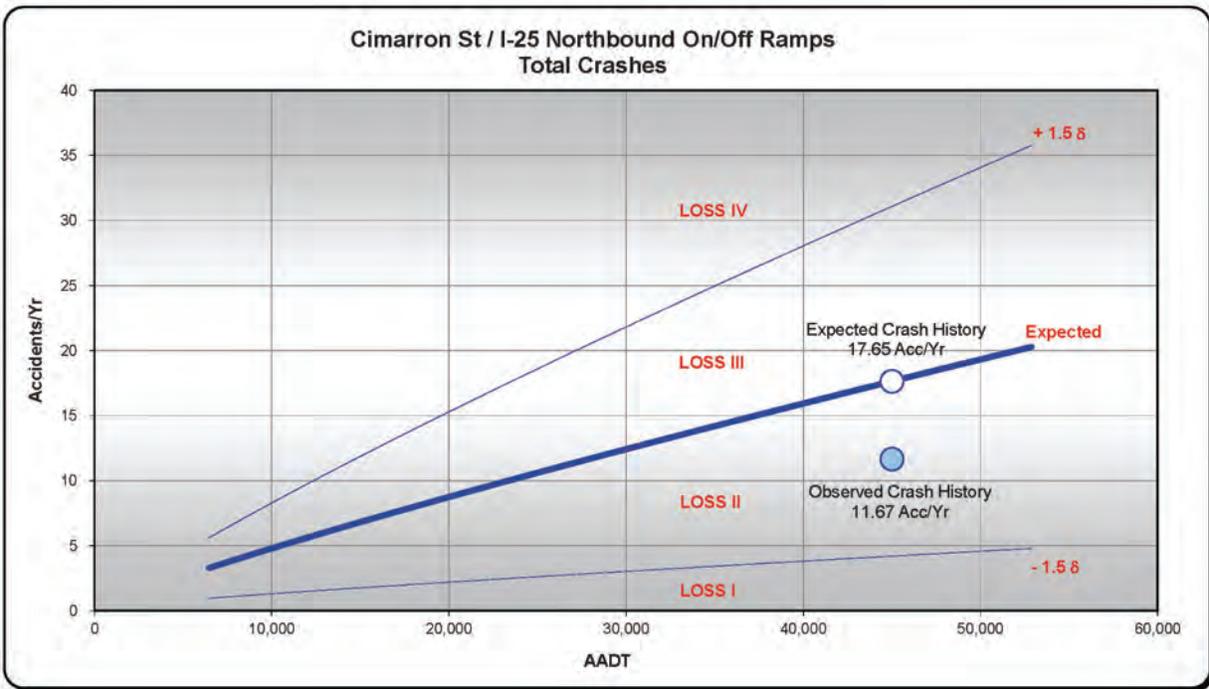


Figure 7 shows the accident type distribution for the I-25 southbound off ramp intersection over the three year study period. Broadside collisions (57 percent) and rear end crashes (29 percent) were the most common crash types.

Figure 7

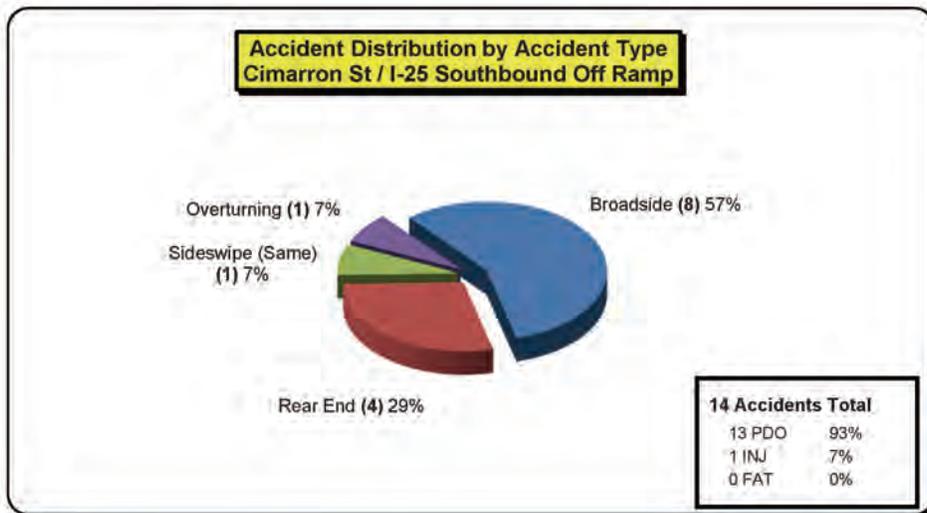
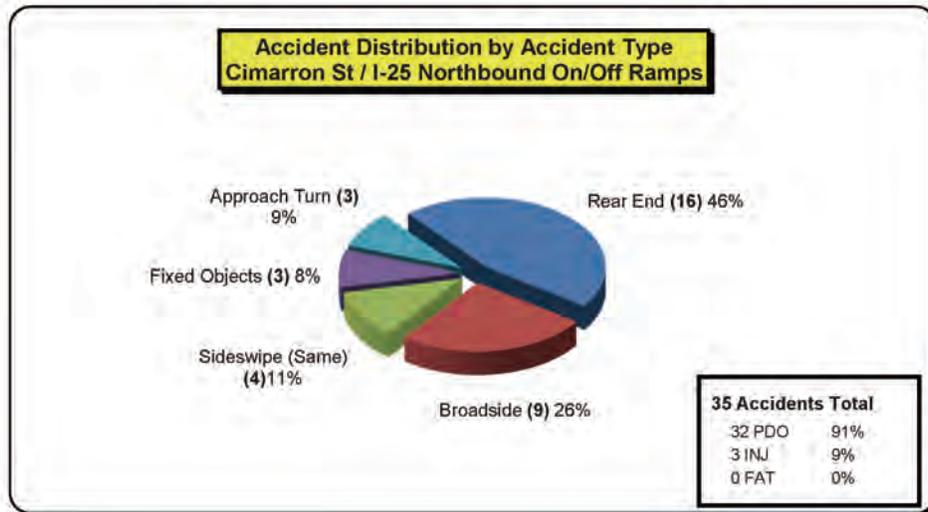


Figure 8 shows the accident type distribution for the I-25 northbound on/off ramp intersection over the three year study period. Rear end crashes (46 percent) and broadsides collisions (26 percent) were the most common crash types.

Figure 8



Direct diagnostics show that the percentage of broadsides for each of the signalized intersections is higher than expected. Most of the broadsides were caused by eastbound Cimarron St vehicles running a red light. The overhead signals hang from span wire without backplates which may detract from the visibility of the signals to oncoming traffic (see **Figure 9**). Consideration towards upgrading the signals to a mast arm configuration and providing backplates may help reduce broadsides. The yellow and all red clearance phase of the signals should also be checked to see if there is sufficient time to clear the intersection between movements.

Figure 9
Cimarron St / I-25 SB Off Ramp (Left) and Cimarron St / I-25 NB On/Off Ramp (Right)



Conclusions and Recommendations

These conclusions and recommendations are based on the analysis of three years of crash history and review of the video log. The Region is advised to verify through field survey, the observations made in this report regarding physical features, roadside characteristics and traffic control devices.

In the three year period, 261 crashes were reported within the I-25/Cimarron St interchange area. There were 35 crashes that caused injuries and two that resulted in fatalities. Although most of the interchange area has a level of service of safety performance that is better than expected, there are multiple target areas that have a potential for crash reduction. These target areas include the ramp entry and exit points (most notably the southbound entrance point), the I-25 southbound on and off ramps and both the signalized ramp intersection along Cimarron St. Consideration towards increasing delineation of concrete barrier and guardrail along I-25, geometric improvements to the interchange ramps and upgrading the signalized intersections would be the most effective way to reduce crash activity at this interchange.

Attachments:

Detailed Summary of Accident History - I-25 Mainline
Detailed Summary of Accident History - I-25 / Cimarron St Ramps
Detailed Summary of Accident History - Cimarron St (US 24)



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Job #: 20121217185352

Highway: 25A **Begin:** 140.64 **End:** 141.64 **From:** 01/01/2009 **To:** 12/31/2011

I-25 Mainline

Severity	Multi-Vehicle	Location
PDO: 126	One Vehicle: 70	On Road: 88 Off in Median: 0
INJ: 25 39 :Injured	Two Vehicles: 66	Off Road Left: 37 Private Property: 0
FAT: 1 1 :Killed	Three or More: 16	Off Road Right: 27 Unknown: 0
Total: 152	Unknown: 0	Off Road at Tee: 0 Total: 152
	Total: 152	

Accident Type			
Overtuning: 3	Road Maintenance Equipment: 0	Fence: 3	
Other Non Collision: 3	Domestic Animal: 0	Tree: 1	
School Age Peds: 0	Wild Animal: 5	Large Rocks or Boulder: 0	
Ped on Toy Motorized Vehicle: 0	Light/Utility Pole: 2	Railroad Crossing Equipment: 0	
Other Pedestrians: 0	Traffic Signal Pole: 0	Barricade: 0	
Head On: 1	Sign: 2	Wall/Building: 0	
Rear End: 36	Guard Rail: 22	Crash Cushion/Traffic Barrel: 0	
Broadside: 0	Cable Rail: 0	Mailbox: 0	
Approach Turn: 0	Concrete Highway Barrier: 31	Other Fixed Object: 0	
Overtaking Turn: 0	Bridge Structure: 0	Involving Other Object: 1	
Sideswipe (Same): 35	Vehicle Debris/Cargo: 5	Unknown: 0	
Sideswipe (Opposite): 0	Culvert/Headwall: 0	Total: 152	
Parked Motor Vehicle: 1	Embankment: 0	Total Fixed Objects: 62	
Railway Vehicle: 0	Curb: 1	Total Other Objects: 6	
Bicycle: 0	Delineator Post: 0		

Lighting Conditions	
Daylight: 97	
Dawn or Dusk: 7	
Dark - Lighted: 38	
Dark - Unlighted: 10	
Unknown: 0	
Total: 152	

Weather Conditions		
None: 123	Dust: 0	
Rain: 13	Wind: 1	
Snow/Sleet/Hail: 15	Unknown: 0	
Fog: 0		
Total: 152		

Road Description	
At Intersection: 0	
At Driveway Access: 0	
Intersection Related: 0	
Non Intersection: 152	
Alley Related: 0	
Roundabout: 0	
Ramp: 0	
Parking Lot: 0	
Unknown: 0	
Total: 152	

Road Conditions	
Dry: 117	
Wet: 14	
Muddy: 0	
Snowy: 4	
Icy: 14	
Slushy: 0	
Foreign Material: 0	
Dry w/Icy Road Treatment: 1	
Wet w/Icy Road Treatment: 0	
Snowy w/Icy Road Treatment: 1	
Icy w/Icy Road Treatment: 0	
Slushy w/Icy Road Treatment: 1	
Unknown: 0	
Total: 152	

Mainline/Ramps/Frontage Rds	
Mainline: 152	
Crossroad (Ramp A): 0	
Frontage Rd: 0	
Ramps	
B: 0	H: 0
C: 0	I: 0
D: 0	J: 0
E: 0	K: 0
F: 0	T: 0
G: 0	
Intsx Frontage/Ramps	
M: 0	N: 0
O: 0	P: 0
HOV Lanes: 0	
Uknwn: 0	
Total: 152	

Accident Rates	
PDO: 1.05 MVMT	Total: 1.26 MVMT
Injury: 0.21 MVMT	
Fatal: 0.83 100 MVMT	

ADT: 110,027 Length: 1.00 Coris File: tcoris2010.dbf



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Job #: 20121217185352

Highway: 25A **Begin:** 140.64 **End:** 141.64 **From:** 01/01/2009 **To:** 12/31/2011

I-25 Mainline

Vehicle Types	Veh 1	Veh 2	Veh 3	Direction	Veh 1	Veh 2	Veh 3
Vehicle/Vehicle Combo (> 10k Lbs):	6	10	1	North:	51	32	4
School Bus (All School Busses):	0	0	0	Northeast:	0	0	0
Non-School Bus (> 8) in Commerce:	0	0	0	East:	0	0	0
Transit Bus:	0	0	0	Southeast:	0	0	0
Passenger Car/Van:	82	33	10	South:	101	50	11
Passenger Car/Van w/Trailer:	0	0	0	Southwest:	0	0	0
Pickup Truck/Utility Van:	16	16	1	West:	0	0	0
Pickup Truck/Utility Van w/Trailer:	4	0	1	Northwest:	0	0	0
SUV:	37	23	2	Unknown:	0	0	1
SUV w/Trailer:	0	0	0	Total:	152	82	16
Motor Home:	0	0	0				
Motorcycle:	5	0	0				
Bicycle:	0	0	0				
Motorized Bicycle:	0	0	0				
Farm Equipment:	0	0	0				
Hit and Run - Unknown:	1	0	0				
Light Rail:	0	0	0				
Other:	1	0	1				
Unknown:	0	0	0				
Commercial Vehicle	Total:	152	82	16			

Contributing Factor	Veh 1	Veh 2	Veh 3	Vehicle Movement	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	66	76	14	Going Straight:	59	52	4
Asleep at the Wheel:	1	0	0	Slowing:	8	8	1
Driver Fatigue:	2	0	0	Stopped in Traffic:	1	14	7
Illness/Medical:	0	0	0	Making Right Turn:	0	1	0
Driver Inexperience:	18	0	0	Making Left Turn:	0	0	0
Agressive Driving:	5	0	0	Making U-Turn:	0	0	0
Driver Unfamiliar with Area:	5	0	0	Passing:	3	0	0
Driver Emotionally Upset:	0	1	0	Backing:	0	0	0
Evading Law Enforcement Officer:	0	0	0	Enter/Leave Parked Pos:	0	0	0
Physical Disability:	0	0	0	Parked:	0	1	1
DUI, DWAI, DUID:	15	0	0	Changing Lanes:	31	0	0
Distracted/Passenger:	2	0	0	Avoiding Object in Road:	8	4	1
Distracted/Cell Phone:	0	0	0	Weaving:	2	0	0
Distracted/Radio:	0	0	0	Spun Out of Control:	32	0	0
Distracted/Other:	6	1	0	Drove Wrong Way:	1	0	0
Other Factor:	32	4	2	Other:	7	2	2
Unknown:	0	0	0	Unknown:	0	0	0
Total:	152	82	16	Total:	152	82	16

Driver Condition (Alcohol)	Veh 1	Veh 2	Veh 3	Driver Condition (Drugs)	Veh 1	Veh 2	Veh 3
No Alcohol Suspected:	129	82	15	No Drugs Suspected:	132	82	15
Alcohol Suspected:	9	0	0	Drugs Suspected:	6	0	0
Unknown Alcohol:	14	0	1	Unknown Drugs:	14	0	1
Alcohol Sub-Total:	152	82	16	Drugs Sub-Total:	152	82	16

ADT: 110,027 **Length:** 1.00 **Coris File:** tcoris2010.dbf



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Job #: 20121218185253

Highway: 25A **Begin:** 140.64 **End:** 141.64 **From:** 01/01/2009 **To:** 12/31/2011

I-25 / Cimarron Interchange Ramps

Severity	Multi-Vehicle	Location
PDO: 44	One Vehicle: 17	On Road: 33 Off in Median: 0
INJ: 4 4 :Injured	Two Vehicles: 26	Off Road Left: 7 Private Property: 0
FAT: 1 1 :Killed	Three or More: 6	Off Road Right: 9 Unknown: 0
Total: 49	Unknown: 0	Off Road at Tee: 0 Total: 49
	Total: 49	

Accident Type			
Overtuning: 9	Road Maintenance Equipment: 0	Fence: 0	
Other Non Collision: 0	Domestic Animal: 0	Tree: 0	
School Age Peds: 0	Wild Animal: 0	Large Rocks or Boulder: 0	
Ped on Toy Motorized Vehicle: 0	Light/Utility Pole: 1	Railroad Crossing Equipment: 0	
Other Pedestrians: 0	Traffic Signal Pole: 0	Barricade: 0	
Head On: 0	Sign: 1	Wall/Building: 0	
Rear End: 20	Guard Rail: 1	Crash Cushion/Traffic Barrel: 0	
Broadside: 0	Cable Rail: 0	Mailbox: 0	
Approach Turn: 0	Concrete Highway Barrier: 0	Other Fixed Object: 0	
Overtaking Turn: 0	Bridge Structure: 0	Involving Other Object: 0	
Sideswipe (Same): 10	Vehicle Debris/Cargo: 0	Unknown: 0	
Sideswipe (Opposite): 0	Culvert/Headwall: 0	Total: 49	
Parked Motor Vehicle: 0	Embankment: 1	Total Fixed Objects: 10	
Railway Vehicle: 0	Curb: 6	Total Other Objects: 0	
Bicycle: 0	Delineator Post: 0		

Lighting Conditions	
Daylight: 37	
Dawn or Dusk: 2	
Dark - Lighted: 7	
Dark - Unlighted: 2	
Unknown: 1	
Total: 49	

Weather Conditions		
None: 44	Dust: 0	
Rain: 4	Wind: 1	
Snow/Sleet/Hail: 0	Unknown: 0	
Fog: 0		
Total: 49		

Road Description	
At Intersection: 0	
At Driveway Access: 0	
Intersection Related: 0	
Non Intersection: 1	
Alley Related: 0	
Roundabout: 0	
Ramp: 48	
Parking Lot: 0	
Unknown: 0	
Total: 49	

Road Conditions	
Dry: 44	
Wet: 3	
Muddy: 0	
Snowy: 0	
Icy: 0	
Slushy: 0	
Foreign Material: 1	
Dry w/Icy Road Treatment: 1	
Wet w/Icy Road Treatment: 0	
Snowy w/Icy Road Treatment: 0	
Icy w/Icy Road Treatment: 0	
Slushy w/Icy Road Treatment: 0	
Unknown: 0	
Total: 49	

Mainline/Ramps/Frontage Rds			
Mainline: 0			
Crossroad (Ramp A): 0			
Frontage Rd: 0			
Ramps			
B: 8	H: 0		
C: 6	I: 0		
D: 0	J: 0		
E: 16	K: 0		
F: 19	T: 0		
G: 0			
Intsx Frontage/Ramps			
M: 0	N: 0		
O: 0	P: 0		
HOV Lanes: 0			
Uknwn: 0			
Total: 49			

Accident Rates	
PDO: 0.37	MVMT Total: 0.41
Injury: 0.03	MVMT
Fatal: 0.83	100 MVMT

ADT: 110,058 Length: 1.00 Coris File: tcoris2011.dbf



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Highway: 25A **Begin:** 140.64 **End:** 141.64 **From:** 01/01/2009 **To:** 12/31/2011

I-25 / Cimarron Interchange Ramps

Vehicle Types	Veh 1	Veh 2	Veh 3	Direction	Veh 1	Veh 2	Veh 3
Vehicle/Vehicle Combo (> 10k Lbs):	2	3	0	North:	15	14	3
School Bus (All School Busses):	0	0	0	Northeast:	7	4	0
Non-School Bus (> 8) in Commerce:	0	0	0	East:	0	0	0
Transit Bus:	0	0	0	Southeast:	2	1	0
Passenger Car/Van:	28	13	1	South:	22	11	3
Passenger Car/Van w/Trailer:	0	0	0	Southwest:	2	2	0
Pickup Truck/Utility Van:	7	4	2	West:	1	0	0
Pickup Truck/Utility Van w/Trailer:	1	2	0	Northwest:	0	0	0
SUV:	5	9	3	Unknown:	0	0	0
SUV w/Trailer:	0	1	0	Total:	49	32	6
Motor Home:	0	0	0				
Motorcycle:	5	0	0				
Bicycle:	0	0	0				
Motorized Bicycle:	0	0	0				
Farm Equipment:	0	0	0				
Hit and Run - Unknown:	1	0	0				
Light Rail:	0	0	0				
Other:	0	0	0				
Unknown:	0	0	0				
Commercial Vehicle	Total:	49	32	6			

Contributing Factor	Veh 1	Veh 2	Veh 3	Vehicle Movement	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	28	31	5	Going Straight:	26	16	2
Asleep at the Wheel:	0	0	0	Slowing:	0	3	2
Driver Fatigue:	0	0	0	Stopped in Traffic:	2	13	2
Illness/Medical:	0	0	0	Making Right Turn:	3	0	0
Driver Inexperience:	6	0	0	Making Left Turn:	0	0	0
Agressive Driving:	3	0	0	Making U-Turn:	0	0	0
Driver Unfamiliar with Area:	3	0	0	Passing:	3	0	0
Driver Emotionally Upset:	0	0	0	Backing:	0	0	0
Evading Law Enforcement Officer:	0	0	0	Enter/Leave Parked Pos:	0	0	0
Physical Disability:	0	0	0	Parked:	0	0	0
DUI, DWAI, DUID:	1	0	0	Changing Lanes:	4	0	0
Distracted/Passenger:	0	0	0	Avoiding Object in Road:	0	0	0
Distracted/Cell Phone:	1	0	0	Weaving:	2	0	0
Distracted/Radio:	0	0	0	Spun Out of Control:	5	0	0
Distracted/Other:	2	0	0	Drove Wrong Way:	0	0	0
Other Factor:	5	1	1	Other:	4	0	0
Unknown:	0	0	0	Unknown:	0	0	0
Total:	49	32	6	Total:	49	32	6

Driver Condition (Alcohol)	Veh 1	Veh 2	Veh 3	Driver Condition (Drugs)	Veh 1	Veh 2	Veh 3
No Alcohol Suspected:	42	32	6	No Drugs Suspected:	41	32	6
Alcohol Suspected:	1	0	0	Drugs Suspected:	0	0	0
Unknown Alcohol:	6	0	0	Unknown Drugs:	8	0	0
Alcohol Sub-Total:	49	32	6	Drugs Sub-Total:	49	32	6

ADT: 110,058 **Length:** 1.00 **Coris File:** tcoris2011.dbf



Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report

Job #: 20121219124513

Highway: 24A **Begin:** 303.71 **End:** 303.84 **From:** 01/01/2009 **To:** 12/31/2011

Cimarron St (US 24)

Severity	Multi-Vehicle	Location
PDO: 54	One Vehicle: 7	On Road: 54 Off in Median: 0
INJ: 6 7 :Injured	Two Vehicles: 48	Off Road Left: 1 Private Property: 0
FAT: 0 0 :Killed	Three or More: 5	Off Road Right: 5 Unknown: 0
Total: 60	Unknown: 0	Off Road at Tee: 0 Total: 60
	Total: 60	

Accident Type			
Overtuning: 1	Road Maintenance Equipment: 0	Fence: 0	
Other Non Collision: 0	Domestic Animal: 0	Tree: 0	
School Age Peds: 0	Wild Animal: 0	Large Rocks or Boulder: 0	
Ped on Toy Motorized Vehicle: 0	Light/Utility Pole: 0	Railroad Crossing Equipment: 0	
Other Pedestrians: 0	Traffic Signal Pole: 0	Barricade: 0	
Head On: 0	Sign: 2	Wall/Building: 0	
Rear End: 25	Guard Rail: 2	Crash Cushion/Traffic Barrel: 1	
Broadside: 17	Cable Rail: 0	Mailbox: 0	
Approach Turn: 5	Concrete Highway Barrier: 1	Other Fixed Object: 0	
Overtaking Turn: 0	Bridge Structure: 0	Involving Other Object: 0	
Sideswipe (Same): 5	Vehicle Debris/Cargo: 0	Unknown: 0	
Sideswipe (Opposite): 0	Culvert/Headwall: 0	Total: 60	
Parked Motor Vehicle: 0	Embankment: 0	Total Fixed Objects: 6	
Railway Vehicle: 0	Curb: 0	Total Other Objects: 0	
Bicycle: 1	Delineator Post: 0		

Lighting Conditions	
Daylight: 48	
Dawn or Dusk: 0	
Dark - Lighted: 12	
Dark - Unlighted: 0	
Unknown: 0	
Total: 60	

Weather Conditions		
None: 56	Dust: 0	
Rain: 3	Wind: 0	
Snow/Sleet/Hail: 1	Unknown: 0	
Fog: 0		
Total: 60		

Road Description	
At Intersection: 47	
At Driveway Access: 0	
Intersection Related: 5	
Non Intersection: 8	
Alley Related: 0	
Roundabout: 0	
Ramp: 0	
Parking Lot: 0	
Unknown: 0	
Total: 60	

Road Conditions	
Dry: 54	
Wet: 4	
Muddy: 0	
Snowy: 0	
Icy: 0	
Slushy: 0	
Foreign Material: 0	
Dry w/Icy Road Treatment: 1	
Wet w/Icy Road Treatment: 1	
Snowy w/Icy Road Treatment: 0	
Icy w/Icy Road Treatment: 0	
Slushy w/Icy Road Treatment: 0	
Unknown: 0	
Total: 60	

Mainline/Ramps/Frontage Rds		
Mainline: 60		
Crossroad (Ramp A): 0		
Frontage Rd: 0		
Ramps		
B: 0	H: 0	
C: 0	I: 0	
D: 0	J: 0	
E: 0	K: 0	
F: 0	T: 0	
G: 0		
Intsx Frontage/Ramps		
M: 0	N: 0	
O: 0	P: 0	
HOV Lanes: 0		
Uknwn: 0		
Total: 60		

Accident Rates	
PDO: 1.10 MVMT Total: 1.22 MVMT	
Injury: 0.12 MVMT	
Fatal: 0.00 100 MVMT	



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Highway: 24A **Begin:** 303.71 **End:** 303.84 **From:** 01/01/2009 **To:** 12/31/2011

Cimarron St (US 24)

Vehicle Types	Veh 1	Veh 2	Veh 3	Direction	Veh 1	Veh 2	Veh 3
Vehicle/Vehicle Combo (> 10k Lbs):	4	2	1	North:	9	21	3
School Bus (All School Busses):	0	0	0	Northeast:	0	0	0
Non-School Bus (> 8) in Commerce:	0	0	0	East:	30	18	0
Transit Bus:	0	0	0	Southeast:	0	0	0
Passenger Car/Van:	28	27	2	South:	0	0	0
Passenger Car/Van w/Trailer:	0	0	0	Southwest:	0	0	0
Pickup Truck/Utility Van:	15	7	0	West:	21	14	2
Pickup Truck/Utility Van w/Trailer:	1	1	0	Northwest:	0	0	0
SUV:	10	16	2	Unknown:	0	0	0
SUV w/Trailer:	0	0	0	Total:	60	53	5
Motor Home:	0	0	0				
Motorcycle:	1	0	0				
Bicycle:	1	0	0				
Motorized Bicycle:	0	0	0				
Farm Equipment:	0	0	0				
Hit and Run - Unknown:	0	0	0				
Light Rail:	0	0	0				
Other:	0	0	0				
Unknown:	0	0	0				
Commercial Vehicle	Total:	60	53	5			

Contributing Factor	Veh 1	Veh 2	Veh 3	Vehicle Movement	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	25	52	5	Going Straight:	40	9	0
Asleep at the Wheel:	0	0	0	Slowing:	4	2	0
Driver Fatigue:	0	0	0	Stopped in Traffic:	1	20	3
Illness/Medical:	0	0	0	Making Right Turn:	2	1	0
Driver Inexperience:	1	0	0	Making Left Turn:	10	21	2
Agressive Driving:	0	0	0	Making U-Turn:	0	0	0
Driver Unfamiliar with Area:	5	0	0	Passing:	0	0	0
Driver Emotionally Upset:	0	0	0	Backing:	0	0	0
Evading Law Enforcement Officer:	0	0	0	Enter/Leave Parked Pos:	0	0	0
Physical Disability:	0	0	0	Parked:	0	0	0
DUI, DWAI, DUID:	9	0	0	Changing Lanes:	1	0	0
Distracted/Passenger:	0	0	0	Avoiding Object in Road:	0	0	0
Distracted/Cell Phone:	2	0	0	Weaving:	1	0	0
Distracted/Radio:	0	0	0	Spun Out of Control:	0	0	0
Distracted/Other:	5	0	0	Drove Wrong Way:	1	0	0
Other Factor:	13	1	0	Other:	0	0	0
Unknown:	0	0	0	Unknown:	0	0	0
Total:	60	53	5	Total:	60	53	5

Driver Condition (Alcohol)	Veh 1	Veh 2	Veh 3	Driver Condition (Drugs)	Veh 1	Veh 2	Veh 3
No Alcohol Suspected:	51	53	5	No Drugs Suspected:	53	53	5
Alcohol Suspected:	8	0	0	Drugs Suspected:	2	0	0
Unknown Alcohol:	1	0	0	Unknown Drugs:	5	0	0
Alcohol Sub-Total:	60	53	5	Drugs Sub-Total:	60	53	5

ADT: 45,000 **Length:** 1.00 **Coris File:** tcoris2010.dbf