Addendum to Traffic Report-September 2004

I-25 New Pueblo Freeway – 2025 vs. 2035 Traffic Assessment

TO: CDOT Region 2

FROM: CH2M HILL

DATE: December 7, 2010

PROJECT NUMBER: 158128

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Purpose

The purpose of this memorandum is to document the sensitivity analysis for the proposed build alternatives for the New Pueblo Freeway using forecasted 2035 traffic volumes. The process included an analysis of the freeway levels of service (LOS) with the expected 2035 traffic volumes.

Background

The *2004 New Pueblo Freeway Traffic Report* (CH2M HILL, 2004) documented the traffic analysis completed to support the evaluation of the design and operational alternatives for the Interstate 25 (I-25) New Pueblo Freeway project. The project considered a wide range of alternatives. The initial alternatives were screened based on a broad range of community, environmental, technical, and financial criteria to select the project recommended alternatives (Existing Alignment and Modified Alignment). The traffic analysis focused on the 2025 travel demand forecasting and evaluation of traffic operations for the No Build and the recommended alternatives.

Evening peak traffic was analyzed for the I-25 corridor from US 50/SH 47 to Pueblo Boulevard, including all interchanges, intersections, major crossroads, and parallel arterials. The build alternatives included widening I-25 to six through lanes with interchange realignments throughout the corridor.

Travel demand forecasting for the year 2025 was performed using the Pueblo Area Council of Governments (PACOG) TransCAD travel demand model. The Highway Capacity Software (HCS) and the CORSIM simulation model were used to assess the operational measures of effectiveness (e.g., LOS and delay) for the freeway sections and intersections within the project limit. Throughout the modeling process, interim results were reviewed by a technical group comprised of City of Pueblo and Colorado Department of Transportation (CDOT) staff.

The results of the 2025 traffic operations analysis, presented in Exhibit 1, indicated that both the Existing Alignment and Modified Alignment alternatives adequately accommodate

expected 2025 traffic, with all freeway segments predicted to operate at LOS C or better. Based on this analysis, both build alternatives are expected to provide improved operations compared to the No Action alternative. Between the two build alternatives, operations are expected to be very similar, both on the freeway and surface streets.

EXHIBIT 1
System Data Summary for the Analysis Year 2025

System Data	No Action	Exist Align	Mod Align
Total Vehicle-Miles	65574	68814	70685
Vehicle Hours of Move Time	1403	1525	1599
Vehicle Hours of Delay Time	1352	1133	1253
% of Travel Time Delayed	49%	43%	44%
Vehicle Hours of Total Time	2755	2658	2852
Average Speed (mph)	24	26	25
Ratio of Move/Total Time	0.51	0.57	0.56
Minute/Mile of Delay Time	1.24	0.99	1.06
Number of Intersections w/ E (HCM/CORSIM)	2/2	0/1	1/3
Number of Intersections w/ F (HCM/CORSIM)	2/2	0/2	0/2
Percentage of Freeway Miles at LOS D	25%	0%	0%
Percentage of Freeway Miles at LOS E	**7%**	0%	0%
Percentage of Freeway Miles at LOS F	**10%**	0%	0%

Results of the travel demand model and traffic operational analysis for the year 2025 were presented to the Urban Transportation Planning Division in 2002 and 2004. The PACOG Board of Directors approved the analysis and its results by unanimous consent. These resolutions served as the Board's official endorsement of the use of the model and results of the traffic operational analysis.

2035 Traffic Operations Analysis

Since completion of the 2004 traffic report, PACOG has updated their travel demand model to the year 2035. Since the project is on-going, the new horizon year necessitates a traffic sensitivity analysis to determine if the proposed build alternatives can accommodate the expected 2035 traffic volumes. Generally, changes in traffic mirror that of population, employment, and household growth. Therefore, the sensitivity analysis was completed using the updated 2035 socio-economic projections from the travel demand model. .

Based on the 2035 socioeconomic data in the travel demand model, the growth in population from 2025 to 2035 was determined to be approximately 33,000 people, or a 15 percent increase, region wide. Employment growth is expected to be 20 percent (20,000 jobs) regionwide from 2025 to 2035. Using the more conservative employment growth, the sensitivity analysis for 2035 was conducted assuming a 20 percent increase in traffic from the 2025 to the 2035 traffic forecast. The following presents the results of the 2035 traffic operations analysis.

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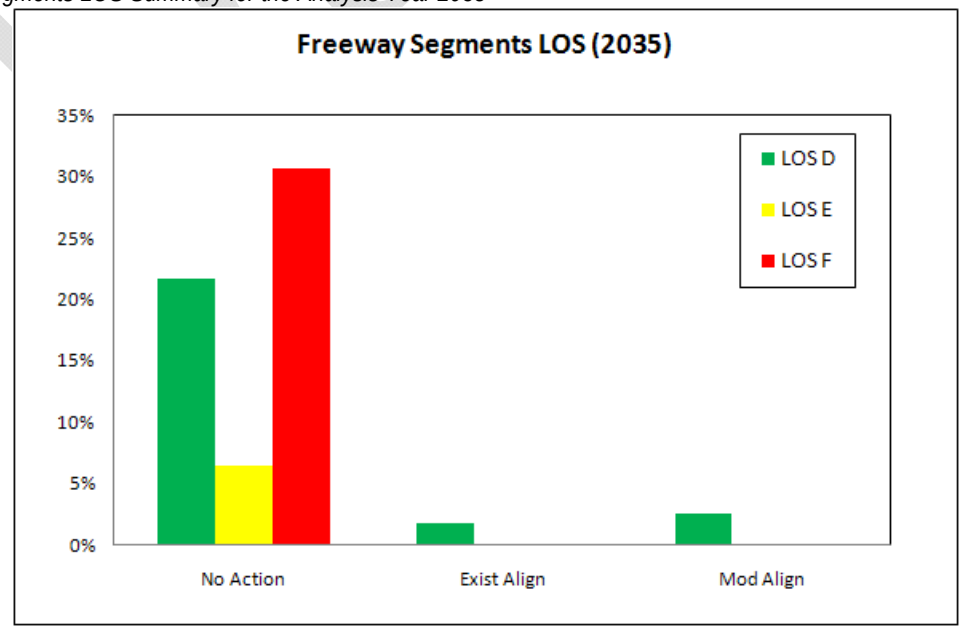
2035 Freeway Analysis

Table 1 and Exhibit 2 are summaries of the projected 2035 LOS on the I-25 freeway. For 2035, the CORSIM simulation modeling indicates that nearly 60 percent of the freeway segments analyzed for the No Action alternative are projected to operate at LOS D or worse with nearly 40% operating at LOS E or F. For the Existing Alignment and Modified Alignment build alternatives, less than 3 percent of all freeway segments are projected to operate at LOS D and the rest at LOS C or better. No freeway segments in the build alternatives are projected to operate at LOS E or F. Thus, the build alternatives can accommodate the projected 2035 freeway volumes.

TABLE 1
Freeway LOS for the Analysis Year 2035

Freeway Segment	No Action (NB/SB)	Exist Align (NB/SB)	Mod Align (NB/SB)
North of 29th Street	F/D	B/B	B/C
29th Street to US 50B	F/D	B/C	B/C
US 50B to 13th Street	F/E	C/C	C/C
13th Street to 6th Street	F/E	B/C	B/C
6th Street to 1st Street	F/F	C/C	C/C
1st Street to Ilex Street	F/F	B/C	B/C
Ilex Street to Abriendo Avenue	F/D	B/C	B/C
Abriendo Avenue to Central Avenue	E/D	B/C	B/C
Central Avenue to Indiana Avenue	C/D	B/B	B/B
Illinois Avenue to Pueblo Boulevard	A/C	A/A	A/A
Note: LOS reported for 2035 PM peak, using CORSIM model output			

EXHIBIT 2
Freeway Segments LOS Summary for the Analysis Year 2035



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2035 System Analysis

Exhibit 3 is a summary of the overall system performance projected for 2035. The build alternatives are projected to have speeds that are 40 percent higher and delays that are 50 percent lower, as compared to the No Action alternative. Comparing these results to the 2025 traffic analysis, the percentage of travel time delayed and the ratio of move time to total time in the network increase only slightly even though the volumes increase 20 percent and the vehicle-miles increase approximately 8 percent for the Existing Alignment and approximately 14 percent for the Modified Alignment.

EXHIBIT 3
System Data Summary for the Analysis Year 2035

System Data	No Action	Exist Align	Mod Align
Total Vehicle-Miles	68652	74633	80491
Vehicle Hours of Move Time	1470	1670	1819
Vehicle Hours of Delay Time	2625	1351	1476
% of Travel Time Delayed	64%	45%	45%
Vehicle Hours of Total Time	4095	3021	3296
Average Speed (mph)	17	25	24
Ratio of Move/Total Time	0.36	0.55	0.55
Minute/Mile of Delay Time	2.29	1.1	1.1
Number of Intersections w/ E (HCM/CORSIM)	2/2	0/2	1/2
Number of Intersections w/ F (HCM/CORSIM)	2/4	0/1	0/1
Percentage of Freeway Miles at LOS D	22%	2%	3%
Percentage of Freeway Miles at LOS E	**6%**	0%	0%
Percentage of Freeway Miles at LOS F	**31%**	0%	0%

Summary of Results and Conclusions

This sensitivity analysis was conducted to determine if the proposed build alternatives can accommodate projected 2035 traffic volumes. The 2035 traffic volumes were forecast using projected population and employment growth between the 2025 and 2035 travel demand models. Based on this socioeconomic data, the traffic growth is projected to be 20 percent between 2025 and 2035. The traffic analysis results indicate that the build alternatives can accommodate the projected 2035 traffic volumes. Furthermore, the projected freeway, and system delay and levels of service will be significantly better for the two build alternatives, as compared to the No Action alternative. In particular, all of the freeway segments analyzed show substantial improvement over the No Action alternative in both the Existing and Modified Alignment alternatives. These results reinforce the conclusions of the original traffic study, indicating that both the Modified and Existing Alignment build alternatives will provide substantial traffic operations benefits through 2035.

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