Air Quality Technical Memorandum

New Pueblo Freeway

CDOT Project No. IM 0251-156

Project Control No.12831

Colorado Department of Transportation

Revised May 2010

In some cases, information in this Environmental Technical Report may have been refined or updated as preparation of the DEIS advanced. In such cases, the information and conclusions presented in the DEIS supersede all previous background material included in this Technical Report.

Contents

Exhibits

Appendix

Project Description

The Federal Highway Administration (FHWA), in cooperation with the Colorado Department of Transportation (CDOT), is preparing an Environmental Impact Statement (EIS) for the New Pueblo Freeway project, a proposal to improve a 7-mile segment of Interstate 25 (I-25) through Pueblo, Colorado. Improvements are necessary to address outdated roadway and bridges with inadequate geometrics, safety issues, and existing and future traffic demand.

Alternatives under consideration include taking no action (No Action Alternative), reconstruction of the interstate on essentially the existing alignment (Existing I-25 Alternative), and reconstruction of the interstate on existing and new alignments (Modified I-25 Alternative). The alternatives are further described as follows:

- **No Action Alternative –** This alternative provides only for minor improvements, repairs, and other maintenance actions. The existing four-lane highway will otherwise remain unchanged.
- **Existing I-25 Alternative –** This alternative consists of reconstructing I-25 to six lanes on essentially the same location, reconfiguring and eliminating access points to the interstate to improve safety, and providing other improvements to the local street system to enhance system connectivity and traffic movement near the interstate.
- **Modified I-25 Alternative –** This alternative consists of rebuilding I-25 to six lanes and providing the other improvements included in the Existing Alternative, except the alignment would be shifted to accommodate different interchange configurations.

Transportation Management strategies and design variations of grade and alignment are incorporated into the build alternatives.

Methods and Assumptions

Criteria Pollutants

Air quality impacts from the proposed project may result from construction activities and from the operation of motor vehicles. These activities would generate emissions of several "criteria" pollutants, primarily nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 microns in equivalent diameter (PM_{10}), particulate matter less than 2.5 microns in equivalent diameter ($PM_{2.5}$), and precursors to ozone (O_3). Criteria pollutants are those for which the U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS). The current NAAQS are shown in Exhibit 1.

EXHIBIT 1
National Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Violation Determination	Primary Standards	Secondary Standards
Carbon Monoxide	8-hour	Not to be exceeded more than once per year	9 ppm	9 ppm
	1-hour	Not to be exceeded more than once per year	35 ppm	35 ppm
Lead	Rolling 3-month Average	Not to be exceeded	0.15 µg/m^3	0.15 µg/m^3
	Quarterly	Not to be exceeded	1.5	1.5
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average concentration	0.075 ppm	0.075 ppm
Nitrogen Dioxide	Annual Arithmetic Mean	Annual arithmetic mean	0.053 ppm	0.053 ppm
	1-hour	3-year average of the 98th percentile of the daily maximum 1-hour average	0.100 ppm	--
Sulfur Dioxide	3-hour	Not to be exceeded more than once per year	--	0.50 ppm
	1-hour	3-year average of the 99th percentile of the daily maximum 1-hour average	0.075 ppm	--
PM_{10}	24-hour	The expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1 over a 3-year period	150 µg/m^3	150 µg/m^3
$PM_{2.5}$	Annual Average	3-year average of the annual arithmetic mean	15 µg/m^3	15 µg/m^3
	24-hour	3-year average of the 98th percentile of 24-hour concentrations	35 µg/m^3	35 µg/m^3

ppm = parts per million
µg/m^3 = micrograms per cubic meter
-- = no standard has been established
Source: EPA 2010 (40 CFR 50)

Because Pueblo County is currently in attainment for the NAAQS for CO, NO_2, PM_{10}, $PM_{2.5}$, O_3, and lead, no regional air quality conformity analysis or meso-scale corridor analysis was performed for this effort. A qualitative approach was used to compare impacts from the Build Alternatives to the No Build Alternative.

The analysis included an evaluation and description of the existing conditions within the study corridor and a review of historical ambient air monitoring data. It also included a description of the air basin and considered current air pollution data and trends, and the region's compliance with state and federal ambient air quality standards. A qualitative assessment of the air quality impacts of CO for the No Action Alternative was conducted and then compared to the other alternatives. The expected impacts of PM_{10} were also considered.

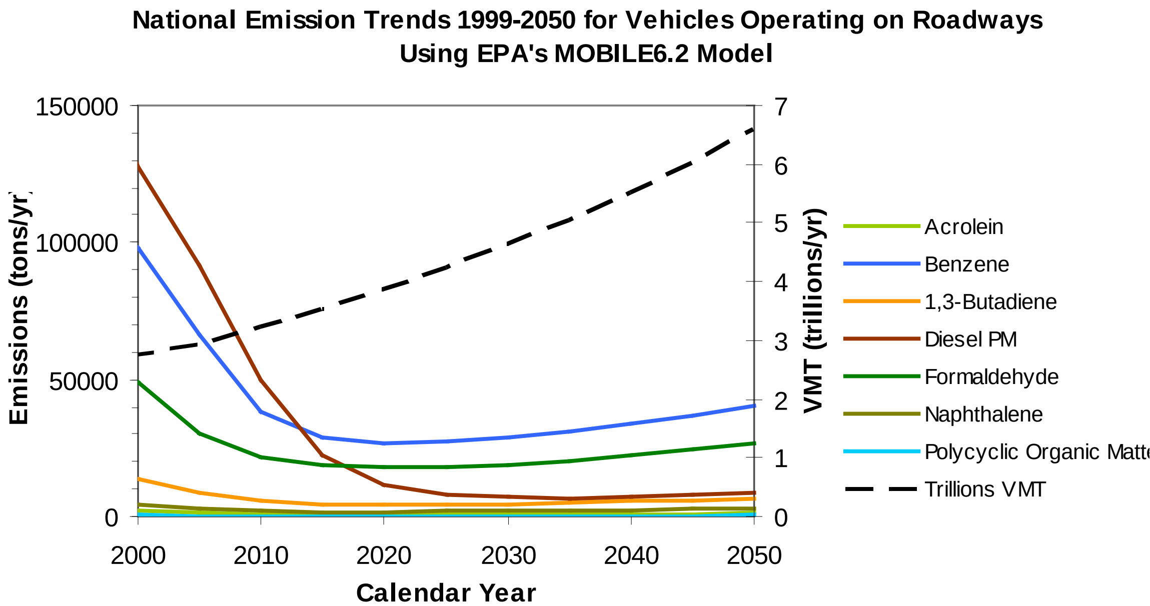
Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates certain air toxics. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., cars, trucks, buses), non-road mobile sources (e.g., airplanes, lawnmowers) and stationary sources (e.g., factories, refineries, power-plants), as well as indoor sources (e.g., building materials). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires. The health risks for people exposed to urban air toxics at sufficiently high concentrations or lengthy durations include an increased risk of cancer, damage to the immune system, as well as neurological, reproductive, developmental, respiratory and other health problems.

Mobile Source Air Toxics (MSATs)— acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter—are a subset of the 189 air toxics defined by Section 112 of the Clean Air Act (CAA). MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics result from engine wear or from impurities in oil or gasoline (EPA 2000). On September 30, 2009, the FHWA released its updated interim guidance on when and how to analyze MSATs in the National Environmental Protection Act (NEPA) process for highways. The following is a summary of the FHWA discussion in accordance with the interim guidance.

The EPA is the lead federal agency for administering the CAA. Because it has specific responsibilities regarding the health effects of MSATs, it issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (EPA 2001). This rule was issued under the authority granted in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low-emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, its proposed heavy duty engine and vehicle standards, and its on-highway diesel fuel sulfur control requirements. Between 2000 and 2050, FHWA projects that, even with a 145 percent increase in vehicle miles traveled (VMT), a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected, as shown in Exhibit 2.

EXHIBIT 2
Projected MSAT Trends



As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address motor vehicle MSAT emissions and motor vehicle fuels and could make adjustments to the full 21 and the seven priority MSATs.

Unavailable Information for Project Specific MSAT Impact Analysis

This EIS includes a basic analysis of the likely MSAT emission impacts of this project. However, the available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIS. Due to these limitations, a discussion is included as Appendix A in accordance with Council on Environmental Quality (CEQ) regulations (EPA 1978) regarding incomplete or unavailable information:

Project-Level MSAT Discussion

Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context. Therefore, a range of responses may be appropriate for addressing this issue in NEPA documentation

Federal Highway Administration (FHWA) guidance (FHWA, 2009) suggests a three-tiered approach to analyzing the effects of a transportation project in terms of public exposure to MSAT emissions. The level of analysis is related to the expected size and effect of the project, as follows:

1. No analysis for projects with no potential for meaningful MSAT effects; or
2. Qualitative analysis for projects with low potential MSAT effects; or

3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

The New Pueblo Freeway project does not meet the annual average daily traffic (AADT) volume to warrant a quantitative MSAT analysis. The estimated AADT volumes for the Build Alternatives were below the threshold of 140,000 AADT recommended by FHWA for a quantitative MSAT analysis. The effects from each alternative were evaluated qualitatively.

Existing Conditions

Historically, the collection of air quality data in the Pueblo area has been sporadic. The Colorado Air Pollution Control Division (APCD) managed the collection of CO data in the 1980s. This effort was discontinued in 1986 because the measured values were so far below air quality standards. Currently, the APCD maintains PM_{10} and $PM_{2.5}$ monitors in downtown Pueblo. Total suspended particulate matter (TSP) data were collected at the CF&I steel plant in the 1980s, but the air quality standard for TSP is no longer in place. Ozone data has not been collected in the Pueblo area. The closest ozone monitoring station is located at the U.S. Air Force Academy, north of Colorado Springs, approximately 50 miles from the project location.

Criteria pollutant levels have recently been measured at an industrial site (Rocky Mountain Steel Mills, formerly CF&I) located in the southeast portion of Pueblo, and very near to the Steel Mill area of the study corridor. This monitoring effort, overseen by the APCD, gathered CO, NO_2, PM_{10}, sulfur dioxide (SO_2), and lead (Pb) data for a 1-year period completed October 31, 2003.

Historical climate data is available from the Pueblo Memorial Airport as archived by the National Climatic Data Center (NCDC) and the Western Regional Climate Center (WRCC). The period of record for the airport for some parameters is more than 50 years. Additional data are also available from the Pueblo Army Depot and the Pueblo Reservoir, but on a more limited basis as compared to the airport data.

A general summary from the NCDC website states:

> "The National Weather Service Office is located at Pueblo Memorial Airport, 6 miles east of the Pueblo Post Office, and about 1 1/2 miles north of the Arkansas River. Terrain at the airport is relatively flat, and from 50 to 100 feet above the river. The air quality in Pueblo is rated the best of large Colorado cities along the Front Range. The climate is semi-arid and marked by large daily temperature variations. The temperature reaches 90 degrees or more about half the time during the summer, but thanks to the low relative humidity, the heat is not oppressive. Summer nights are invariably cool since mountain breezes prevail from shortly after sunset to about noon the following day. The sun shines about 76 percent of the time. Winter is comparatively mild due to the abundant sunshine and the protection afforded by the nearby mountains. Temperatures reach 50 degrees or higher in the winter. The temperature drops to zero or below about eight times during the winter. Cold spells are generally broken after a few days by

Chinook winds, a very dry, warm, downslope westerly wind. The probability of measurable precipitation in summer is one day out of four and in winter one out of eight. Summer rains usually occur in the form of afternoon thunderstorms."

Impacts

No Action Alternative

CO Impacts

CO is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion because CO emissions are greatest when vehicles are idling. If the project is not constructed, projected increases in traffic volumes on local streets and I-25 will increase delays and lower travel speeds of motor vehicles, both of which would mean higher emissions from vehicle exhaust. Considering the area is currently in attainment of the CO NAAQS, it is not expected that the No Action Alternative would cause a new violation of the standards.

PM_{10} Impacts

The PM_{10} impacts related to the No Action Alternative are expected to be minimal. This expectation, along with the existing levels of PM_{10} in the Pueblo area, indicates that the NAAQS for PM_{10} will not be threatened by the project. Pueblo is an attainment area for PM_{10}, with recently measured levels well below the 24-hour and annual NAAQS. Several of the monitoring stations were located at or near the Rocky Mountain Steel Mills. Although local effects from plant activities likely influenced these sites, the measured levels remained well below the NAAQS. Construction sites, excess roadside sand and any nearby land surface where vegetation has been disturbed or removed can add dust and dirt into the local air affected PM_{10} emission levels. Exhibit 3 presents a summary of recently collected monitoring data in the Pueblo area. As a result, NAAQS for PM_{10} are not expected to be threatened by the No Action Alternative. The 24-hour standard can be exceeded no more than once per year. The value shown in the table is the highest second-high value measured in any year during the period of record. The annual PM_{10} standard was revoked in December 2006, but the monitor values are presented in Exhibit 3 as a historical record of PM_{10} concentrations.

EXHIBIT 3
Monitored PM_{10} Data

Monitoring Site	Period of Record	24-Hour Value[a] (μg/m^3)	Annual Value[b] (μg/m^3)
APCD Main Monitor: 211 D Street	1999-2002	57	25
CDPHE Rocky Mountain Steel Mills: 1411 Santa Rosa	May-December 2002	64	26
CDPHE Rocky Mountain Steel Mills: 1141 Santa Fe	September-December 2002	40	21

EXHIBIT 3
Monitored PM_{10} Data

Monitoring Site	Period of Record	24-Hour Value[a] ($\mu g/m^3$)	Annual Value[b] ($\mu g/m^3$)
Rocky Mountain Steel Mills: Site 1	September 2002-August 2003	71	32
Rocky Mountain Steel Mills: Site 2	September 2002-August 2003	59	26

[a] High second-high concentration measured at the site. The NAAQS allows the standard to be exceeded no more than once per year. Therefore the highest of the second highest values for each year of the period of record is reported. This concentration is compared to the 24-hour NAAQS in accordance to the Clean Air Act.
[b] Annual PM_{10} NAAQS of 50 $\mu g/m^3$ was revoked in December 2006. Values are presented for historical record of PM_{10} monitoring in area.

Action Alternatives

CO Impacts

CO impacts were evaluated qualitatively, using intersection delay information presented in *Addendum to Traffic Report-September 2004 I-25 The New Pueblo Freeway – 2025 vs. 2035 Traffic Assessment* (CH2M HILL 2010).

Level of Service (LOS) is a measure of how well a signalized intersection operates using the letters A through F, with A being least congested and F being most congested. The EPA guidance states that “Intersections that are LOS A, B, or C probably do not require further analysis, i.e., the delay and congestion would not likely cause or contribute to a potential CO exceedance of the NAAQS” (EPA 1992). Exhibit 4 is a list of intersections in the project area that are projected to operate at LOS D or worse for the 2035 analysis year for at least one of the alternatives.

EXHIBIT 4
Intersections with Level of Service D or Worse for the Analysis Year 2035

Intersection	No Action Alternative	Existing I-25 Alternative	Modified I-25 Alternative
US 50 & Elizabeth	F	F	F
Us 50 & I-25 SB	D	D	D
US 50 & I-25 SPUI	E	E	F
US 50 & I-25 NB	C	E	E
US 50 & Dillon	F	F	F
13th & Santa Fe	C	D	C
4th & Bradford/4th and NB Frontage Road	E	B	B
1st & Santa Fe	C	D	C
1st & I-25 NB	D	B	A
Pueblo & I-25 NB	D	A	B
29th & Elizabeth	F	D	D

EXHIBIT 4
Intersections with Level of Service D or Worse for the Analysis Year 2035

Intersection	No Action Alternative	Existing I-25 Alternative	Modified I-25 Alternative
US 50B & Bonaforte	F	E	E
8th & Erie	B	D	D
4th & SB Frontage Road	--	C	D
1st and 4th	D	B	B
Pueblo & Lake	D	D	D
1st & Bradford	D	--	--

Notes: -- signifies that no signalized intersection exists under this alternative

Five intersections are projected to have a degradation in LOS as a result of the Existing I-25 Alternative or the Modified I-25 Alternative. However, the project as a whole would have the overall effect of improving intersection operations in the project area. With the 20 percent increase in traffic in 2035, the Existing Alignment and Modified Alignment Alternatives are projected to have better operations than the No Action Alternative. The percent LOS for each alternative is presented in Exhibit 5.

EXHIBIT 5
Intersection Level of Service Percent Summary for the Analysis Year 2035

LOS	No Action Alternative	Existing I-25 Alternative	Modified I-25 Alternative
LOS A to C	73%	81%	82%
LOS D	14%	11%	10%
LOS E	4%	5%	3%
LOS F	8%	4%	5%

Note: Values are rounded to nearest whole number and therefore may not add up to 100%

Based on the current attainment status of Pueblo, as well as the generally improved traffic congestion in 2035 compared to the No Build Alternative, it is not expected that the Action Alternatives for the New Pueblo Freeway project would cause or contribute to a new violation of the CO NAAQS.

PM_{10} Impacts

Pueblo is an attainment area for PM_{10}, with recently measured levels well below the 24-hour NAAQS (see Exhibit 2). As with the No Action Alternative described earlier, the PM_{10} impacts from the Existing I-25 Alternative are expected to be minimal. This expectation, along with the existing levels of PM_{10} in the Pueblo area, indicates that the NAAQS for PM_{10} will not be threatened by the project.

MSAT Impacts

For the project alternatives considered for this TM, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables, such as fleet mix, are the same for each alternative. Projected VMT for 2035 is summarized in Exhibit 6.

EXHIBIT 6
Vehicle Miles Traveled Summary for the Analysis Year 2035

Alternative	Total VMT	% Increase from No Action
No Action	68,652	
Existing I-25 Alternative	74,354	8
Modified I-25 Alternative	77,874	13

The VMT estimated for the Existing I-25 Alternative and Modified I-25 Alternative are slightly higher than that for the No Action Alternative because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The increase in VMT would lead to higher MSAT emissions for the two alternatives along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE 6.2 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The construction of additional travel lanes contemplated as part of the action alternatives will have the effect of moving some traffic closer to nearby homes and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under the build alternatives than the No Action Alternative. However, as discussed above, the magnitude and the duration of these potential increases as compared to the No Action Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves some traffic closer to receptors, the localized level of MSAT emissions for the alternatives could be higher relative to the No Action Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Mitigation

As no adverse air quality impacts are anticipated to occur as the result of the proposed improvement, mitigation is not required from an air quality standpoint. Temporary air quality impacts may occur during construction, including an increase in fugitive dust. Measures to reduce temporary air quality impacts during construction include:

- Contractors will be required to reduce fugitive dust emissions during construction by implementing BMPs, such as spraying exposed soils, covering trucks when transporting material, minimizing mud tracking by vehicles, controlling vehicle speeds on construction access roads, and stabilizing construction entrances per CDOT M-208-1 requirements.
- Contractors will be required to comply with BMPs to reduce air emissions from construction vehicles, such as reducing idling time of equipment and vehicles and using newer and well maintained construction equipment or equipment with add-on emission controls.

Global Climate Change

The issue of global climate change is an important national and global concern that is being addressed in several ways by the Federal government. The transportation sector is the second largest source of total greenhouse gases (GHG) in the US, and the greatest source of carbon dioxide (CO_2) emissions – the predominant GHG. In 2004, the transportation sector was responsible for 31 percent of all US CO_2 emissions. The principal anthropogenic (human-made) source of carbon emissions is the combustion of fossil fuels, which account for approximately 80 percent of anthropogenic emissions of carbon worldwide. Almost all (98 percent) of transportation-sector emissions result from the consumption of petroleum products such as gasoline, diesel fuel, and aviation fuel.

Recognizing this concern, FHWA is working nationally with other modal administrations through the DOT Center for Climate Change and Environmental Forecasting to develop strategies to reduce transportation's contribution to GHGs - particularly CO_2 emissions - and to assess the risks to transportation systems and services from climate changes.

At the state level, there are also several programs underway in Colorado to address transportation GHGs. The Governor's Climate Action Plan, adopted in November 2007, includes measures to adopt vehicle CO_2 emissions standards and to reduce vehicle travel through transit, flex time, telecommuting, ridesharing, and broadband communications. CDOT issued a Policy Directive on Air Quality in May 2009. This Policy Directive was developed with input from a number of agencies, including the CDPHE, EPA, FHWA, Federal Transit Administration, Denver Regional Transportation District, Denver Regional Air Quality Council. This Policy Directive addresses unregulated MSAT and GHGs produced from Colorado's state highways, interstates, and construction activities.

As a part of CDOT's commitment to addressing MSATs and GHGs, some of CDOT's program-wide activities include:

1. Developing truck routes/restrictions with the goal of limiting truck traffic in proximity to facilities, including schools, with sensitive receptor populations.
2. Continue researching pavement durability opportunities with the goal of reducing the frequency of resurfacing and/or reconstruction projects.
3. Developing air quality educational materials, specific to transportation issues, for citizens, elected officials, and schools.
4. Offering outreach to communities to integrate land use and transportation decisions to reduce growth in VMT, such as smart growth techniques, buffer zones, transit-oriented development, walkable communities, access management plans, etc.
5. Committing to research additional concrete additives that would reduce the demand for cement.
6. Expanding TDM efforts statewide to better utilize the existing transportation mobility network.
7. Continuing to diversify the CDOT fleet by retrofitting diesel vehicles, specifying the types of vehicles and equipment contractors may use, purchasing low-emission vehicles, such as hybrids, and purchasing cleaner burning fuels through bidding incentives where feasible. Incentivizing is the likely vehicle for this.
8. Exploring congestion and/or right-lane only restrictions for motor carriers.
9. Funding truck parking electrification (note: mostly via exploring external grant opportunities)
10. Researching additional ways to improve freight movement and efficiency statewide.
11. Committing to incorporating ultra-low sulfur diesel for non-road equipment statewide before June 2010 – likely using incentives during bidding.
12. Developing a low-VOC emitting tree landscaping specification.

Because climate change is a global issue, and the emissions changes due to project alternatives are very small compared to global totals, the GHG emissions associated with the alternatives were not calculated. Because GHGs are directly related to energy use, the changes in GHG emissions would be similar to the changes in energy consumption presented in Chapter 3 of the Draft Environmental Impact Statement (DEIS). The relationship of current and projected Colorado highway emissions to total global CO_2 emissions is presented in Exhibit 7. Colorado highway emissions are expected to increase by 4.7% between now and 2035. The benefits of the fuel economy and renewable fuels programs in the 2007 Energy Bill are offset by growth in VMT; the draft 2035 statewide transportation plan predicts that Colorado VMT will double between 2000 and 2035. Exhibit 7 also illustrates the size of the project corridor relative to total Colorado travel activity.

EXHIBIT 7
Relationship of Current and Projected Colorado Highway Emissions to Total Global CO_2 Emissions

Global CO_2 emissions, 2005, million metric tons (MMT)[1]	Colorado highway CO_2 emissions, 2005, MMT[2]	Projected Colorado 2035 highway CO_2 emissions, MMT[2]	Colorado highway emissions, % of global total (2005)[2]	Project corridor VMT, % of statewide VMT (2005)
27,700	29.9	31.3	0.108%	0.78%

Sources:
New Pueblo Freeway Project Team, 2010
[1] EIA, International Energy Outlook, 2007
[2] Calculated by FHWA Resource Center

Summary

The project is not expected to cause a violation of the NAAQS for the build or no build alternative. The project has a low potential for MSAT effects. Temporary effects from construction activities would be minimized by employing dust control and diesel idling controls.

References

CH2M HILL. 2010. *Addendum to Traffic Report-September 2004 I-25 The New Pueblo Freeway – 2025 vs. 2035 Traffic Assessment*. May 17, 2010.

Federal Highway Administration (FHWA). 2009. *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. September 30, 2009.

U.S. Environmental Protection Agency. 2008a. Code of Federal Regulations, 40 CFR 1502.22(b). November 29. http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=3c47991a9ac6a502984416f665cd0f30&rgn=div8&view=text&node=40:31.0.3.5.3.0.29.22&idno=40

U.S. Environmental Protection Agency. 2008b. Integrated Risk Information System (IRIS). http://cfpub.epa.gov/ncea/iris/index.cfm

U.S. Environmental Protection Agency (EPA). 2001. Control of Emissions of Hazardous Air Pollutants From Mobile Sources. *Federal Register*, Vol. 66, No. 61. March 29.

U.S. Environmental Protection Agency (EPA). 2000. Technical Support Document: Control of Emissions of Hazardous Air Pollutants from Motor Vehicles and Motor Vehicle Fuels. (EPA420-R-00-023). Assessment and Standards Division, Office of Transportation and Air Quality. December.

U.S. Environmental Protection Agency (EPA). 1992. Guideline For Modeling Carbon Monoxide From Roadway Intersections. Research Triangle Park, North Carolina: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. November.

APPENDIX A

MSAT Prototype Language for Compliance with 40 CFR 150.22

Prototype Language for Compliance with 40 CFR 1502.22 (Appendix C from *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents)*

Sec. 1502.22 INCOMPETE OR UNAVAILABLE INFORMATION

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

a. If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
b. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:
    1. a statement that such information is incomplete or unavailable;
    2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
    3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
    4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.
c. The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's MOVES model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country - three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with National Ambient Air Quality Standards for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality (CEQ) regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff Victoria Martinez (787) 766-5600 X231, Shari Schaftlein (202) 366-5570, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.