HIGHWAY 199 EXPRESSWAY UPGRADE
CITY OF GRANTS PASS
JOSEPHINE COUNTY
OREGON

Final
AIR QUALITY REPORT

October 2006

HIGHWAY 199 EXPRESSWAY UPGRADE

PM10 CONFORMITY DETERMINATION & MOBILE SOURCE AIR TOXICS ANALYSIS

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Purpose and Need for the Project

The proposed project is designed to address vehicular and pedestrian safety, and current and future congestion and operational deficiencies along Highway 199 between Midway Avenue and Tussey Lane. The need for the project is based on the accident history, congestion, access, growth of surrounding area, and system efficiency of Highway 199.

An area of potential impact (API) defined for the project is depicted in Figure 1. The API is defined as the general area of Highway 199 bounded by: Midway Avenue to the west and Tussey Lane to the east; Hubbard Lane from Highway 199 to Demaray Drive to the south; Redwood Avenue from Highway 199 to Dowell Road, and 500 feet north of Highway 199 along Ringuette Street.

The following alternatives are being considered:

No Build Alternative

Highway 199 in the project's API has two travel lanes in each direction, with signalized intersections at Dowell Road, Allen Creek Road, Redwood Avenue, Fairgrounds Road, and Ringuette Street. Unsignalized intersections include: Midway Avenue, Rogue Community College, Hubbard Lane, Willow Lane, Henderson Lane, and Tussey Lane. In addition, Arbor Ridge Drive, Dawn Drive, and many private driveways currently have direct and uncontrolled access onto Highway 199. From Midway Avenue to Willow Lane there is no median restricting vehicular movements across travel lanes. At the intersection of Highway 199 and Willow Lane there is a median curb, which provides westbound traffic on Highway 199 with one left-turn-only lane onto southbound Willow Lane and prohibits traffic on Willow Lane from crossing Highway 199. Between Allen Creek Road and Tussey Lane the westbound and eastbound travel lanes on Highway 199 are separated by a large median. There are limited and unconnected dedicated bicycle and pedestrian facilities in the API.

The No Build Alternative, under future conditions, includes other programmed and funded projects in and adjacent to the API, regardless of whether this project is constructed.

Alternative A

Alternative A (Figure 2) would be designed and constructed in two phases. Phase 1 would add a median barrier (Midway Avenue to Rogue Community College) and then a raised curb median (Rogue Community College to Tussey Lane) to separate four travel lanes from Midway Avenue to Dowell Road and six travel lanes from Dowell Road to Tussey Lane. Improvements would occur at several Highway 199 intersections, including: Midway Avenue, Arbor Ridge Drive, Dawn Drive, Rogue Community College entrance, Hubbard Lane, Allen Creek Road, Redwood Avenue, Fairgrounds Road, and Ringuette Street. Allen Creek Road would be extended north to a new four-legged intersection with Redwood Avenue, a new access road from Allen Creek Road to Pansy Lane, and a realigned Highway 199 slip ramp.

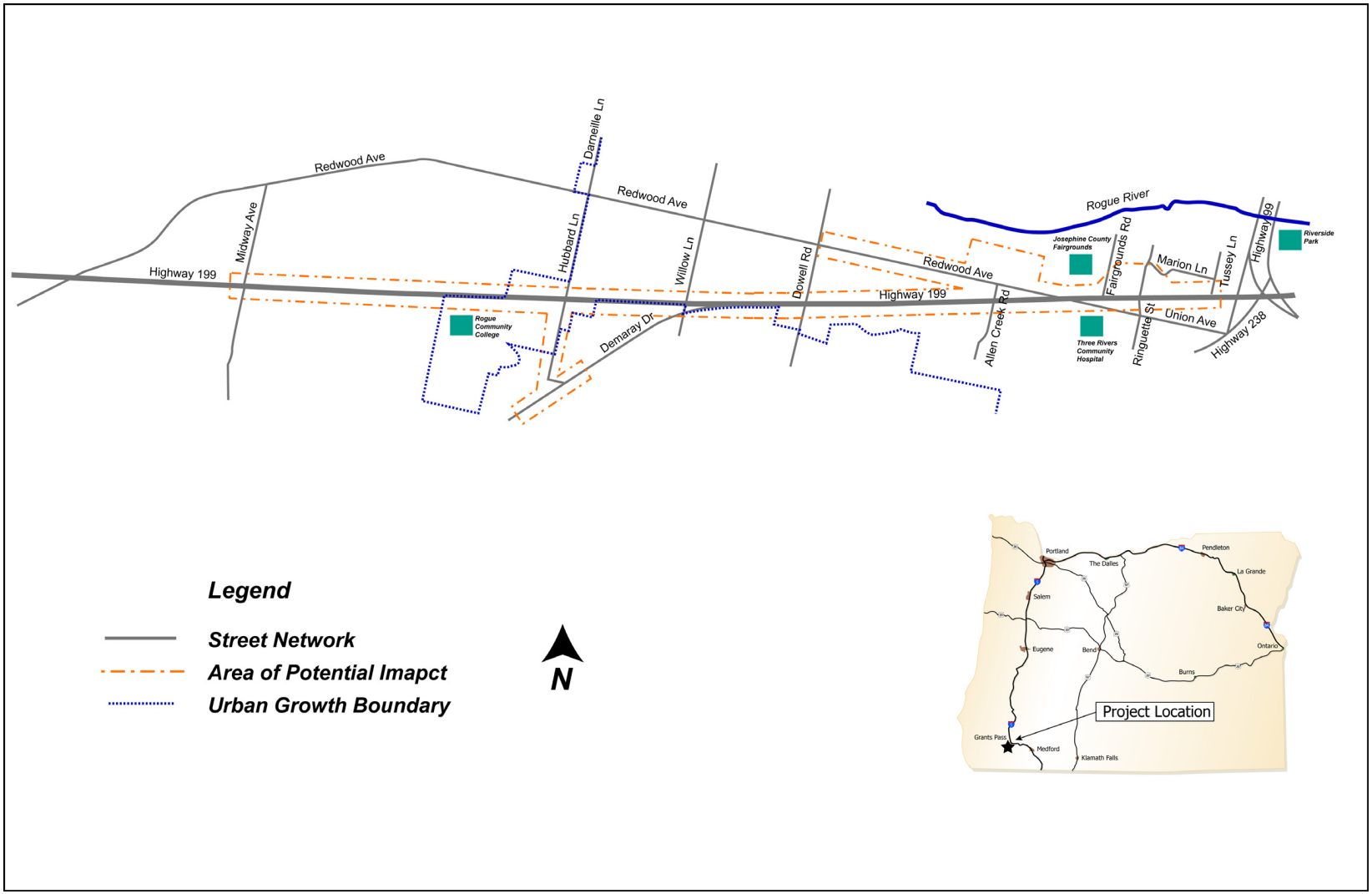


Figure 1: Area of Potential Impact

The median barrier, raised curb median, and other access control measures would restrict turning movements to and from Highway 199 at multiple intersections and driveways. Pedestrian and bicycle improvements would include a shared use path separated from Highway 199, bicycle lanes on Highway 199, and sidewalks along Highway 199 and Hubbard Lane separated from the travel lanes by a landscape strip. New or improved connections to other existing and proposed pedestrian and bicycle facilities would also be constructed.

Phase 2 could extend the access road east to Tussey Lane. Construction of Phase 2, and the actual alignment, would not be set unless this access road concept is found to be part of the overall solution for the South Y Interchange Planning Study scheduled to begin in 2007.

Alternative C

Alternative C (Figure 2) would also be designed and constructed in two phases. Phase 1 would add a median barrier (Midway Avenue to Rogue Community College) and then a raised curb median (Rogue Community College to Tussey Lane) to separate four travel lanes from Midway Avenue to Dowell Road and six travel lanes from Dowell Road to Tussey Lane. Improvements would occur at several Highway 199 intersections, including: Midway Avenue, Arbor Ridge Drive, Dawn Drive, Rogue Community College entrance, Hubbard Lane, Allen Creek Road, Redwood Avenue, Fairgrounds Road, and Ringuette Street. Allen Creek would be curved to connect at a new three-legged intersection with Redwood Avenue and a new access road connecting to Pansy Lane.

The median barrier, raised curb median, and other access control measures would restrict turning movements to and from Highway 199 at multiple intersections and driveways. Pedestrian and bicycle improvements would include a shared use path separated from Highway 199, bicycle lanes on Highway 199, and sidewalks along Highway 199 and Hubbard Lane separated from the travel lanes by a landscape strip. New or improved connections to other existing and proposed pedestrian and bicycle facilities would also be constructed.

Phase 2 could extend the access road east to Tussey Lane. Construction of Phase 2, and the actual alignment, would not be set unless this access road concept is found to be part of the overall solution for the South Y Interchange Planning Study scheduled to begin in 2007.

Alternatives A and C differ mainly in the alignment near Allen Creek Road.

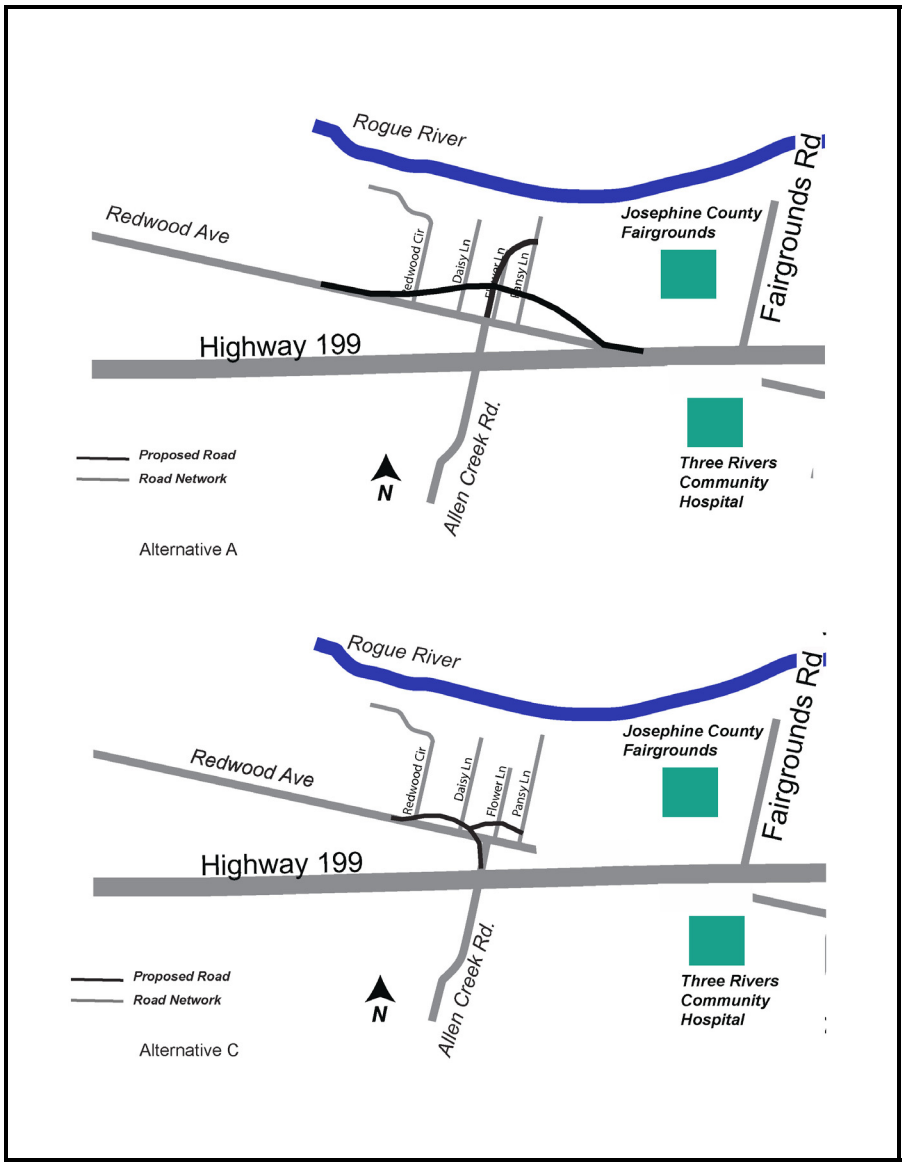


Figure 2. Alternatives A and C near Allen Creek Road and Redwood Avenue

Traffic Data

A traffic analysis was conducted that estimated conditions on the major roadway intersections within the API that would be affected by the project. Estimated annual average daily traffic (AADT) and truck percentages on these roadways under 2010 and 2030 Build conditions are provided in Table 1 for Alternative A.

While these values are the same for both alternatives at most of the affected intersections there are minor differences in traffic conditions at the intersection of Highway 199 and Allen Creek Road. The values at this intersection in Table 1 are for Alternative A because, while the overall volumes at this intersection are slightly (approximately one percent) higher under this Alternative C, overall truck percentages and overall truck volumes are higher under Alternative A.

Table 1
Traffic Volumes and Truck Percentages under Future Build Conditions

Intersection of Highway 199 and Allen Creek Road (Alternative A)						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
Hwy 199 West of Allen Creek Rd	28,600	1,859	2.0	36,800	2,392	2.0
Hwy 199 East of Allen Creek Rd	29,700	1,901	2.0	38,200	2,445	2.0
South of Hwy 199	22,500	925	1.0	29,100	1,196	1.0
North of Hwy 199	14,000	336	0.4	18,000	432	0.4
Total	**94,800**	**5,021**	**1.3**	**122,100**	**6,465**	**1.3**
Intersection of Highway 199 and Ringuette Street						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Ringuette St	31,400	1,947	2.5	40,500	2,511	2.5
East of Ringuette St	33,000	1,782	2.3	42,400	2,290	2.3
South of Hwy 199	6,400	557	0.7	8,200	720	0.7
North of Hwy 199	6,600	681	0.9	8,400	864	0.9
Total	**77,400**	**4,967**	**1.6**	**99,500**	**6,385**	**1.6**
Intersection of Highway 199 and Tussey Lane						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Tussey Ln	26,100	1,305	2.4	33,600	1,680	2.4
East of Tussey Ln	26,100	1,305	2.4	33,600	1,680	2.4
North of Hwy 199	1,800	23	0.01	2,100	26	0.01
Total	**54,000**	**2,633**	**1.6**	**69,300**	**3,386**	**1.6**
Intersection of Highway 199 and Dowell Road						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Dowell Rd	26,200	1,310	2.1	33,600	1,680	2.1
East of Dowell Rd	28,600	1,859	3.0	36,800	2,392	3.0
North of Hwy 199	4,100	373	0.6	5,300	482	0.6
South of Hwy 199	2,800	196	0.3	3,600	252	0.3
Total	**61,700**	**3,738**	**1.5**	**79,300**	**4,806**	**1.5**

Table 1 (Continued)

Intersection of Highway 199 and Willow Lane						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Willow Ln	15,900	954	2.2	20,500	1,230	2.2
East of Willow Ln	20,800	1,082	2.5	26,700	1,388	2.5
South of Hwy 199	3,900	32	0.1	5,000	43	0.1
North of Hwy 199	2,200	0	0	2,900	0	0
Total	**42,800**	**2,068**	**1.2**	**55,100**	**2,661**	**1.2**
Intersection of Highway 199 and Hubbard Road						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Hubbard Rd	15,900	1,113	3.3	20,500	1,435	3.3
East of Hubbard Rd	15,900	954	2.8	20,500	1,230	2.8
South of Hwy 199	600	42	0.1	700	49	0.1
North of Hwy 199	1,800	148	0.4	2,200	180	0.4
Total	**34,200**	**2,257**	**1.6**	**43,900**	**2,894**	**1.6**
Intersection of Highway 199 and Midway Avenue						
Roadway Link	**2010 Build**			**2030 Build**		
	AADT	**Trucks**	**Trucks,%**	**AADT**	**Trucks**	**Trucks,%**
West of Midway Avenue	15,200	1,094	3.3	16,600	1,195	3.1
East of Midway Avenue	16,000	3,008	9.2	20,500	3,854	9.9
North of Hwy 199	600	43	0.1	700	50	0.1
South of Hwy 199	1,000	40	0.1	1,300	52	0.1
Total	**32,800**	**4,185**	**3.2**	**39,100**	**5,151**	**3.3**

Source: Highway 199 Expressway Upgrade Transportation Planning Analysis Unit EIS, Traffic Data, August 15, 2006.
Note: With the exception of the values for the Highway 199/Allen Creek intersection, the values in this table apply to both Alternative A and Alternative C.

Conformity Analysis

The Clean Air Act section 176(c) requires that federally supported highway and transit project activities be consistent with state air quality goals, found in the state implementation plan (SIP). The process to ensure this consistency is called Transportation Conformity. Conformity to the SIP means that transportation activities will not cause new violations of the national ambient air quality standards (NAAQS), worsen existing violations of the standard, or delay timely attainment of the relevant standard.

Transportation conformity is required for federally supported transportation projects that are located in areas that have been designated by the U.S. Environmental Protection Agency (EPA) as not meeting a NAAQS. These areas are called nonattainment areas if they currently do not meet air quality standards or maintenance areas if they have previously violated air quality standards but currently meet them and have an approved Clean Air Act section 175A maintenance plan.

Designated nonattainment and maintenance areas must have in place both a long range transportation plan and transportation improvement program (TIP) that complies with the conformity rule, and federally supported projects must also demonstrate conformity. Project-level conformity may also require an assessment of localized emission impacts, known as a hot-spot analysis, for certain projects.

Project Setting

The Grants Pass area is currently designated as a maintenance area for the pollutants carbon monoxide (CO) and particulate matter with a diameter of 10 microns or less (PM-10). The CO maintenance boundary is defined as the Grants Pass central business district (CBD). The PM-10 maintenance boundary is defined as the Grants Pass Urban Growth Boundary (UGB). The Highway 199 Expressway Upgrade project is located outside the CO boundary but within PM_{10} maintenance area. As such, the proposed project is required to meet Transportation Conformity requirements found in Oregon Administrative Rules OAR 340-252. This report addresses whether the proposed project complies with these requirements.

Background

Particulate Matter

Air pollutants called particulate matter include dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as sulfur dioxide (SO_2) and volatile organic compounds (VOCs) are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease,

alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment in the United States.

Annual and 24-hour NAAQS for particulate matter were first set in 1971. Total suspended particulate (TSP) was the first indicator used to represent suspended particles in the ambient air. Since July 1, 1987, however, EPA has used the indicator PM_{10}, which includes only those particles with aerodynamic diameter smaller than 10 micrometers. These smaller particles are likely responsible for most of the adverse health effects of particulate matter because of their ability to reach the thoracic or lower regions of the respiratory tract (Source: http://www.epa.gov/air/particlepollution/health.html).

National Ambient Air Quality Standards

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen oxides (NOx), lead (Pb), and particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). With the exception of SO_2, Oregon's standards are equivalent for each of these pollutants but also include a standard for total suspended particulate (TSP). The standards are listed below in Table 2.

The primary standards have been established to protect the public health. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare.

Table 2. State and National Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	State Standard
Total Suspended Particulate (TSP)*	Annual Geometric Mean 24 Hour	N/A N/A	60 µg/m^3 150 µg/m^3
Particulate Matter Less than 10 microns**	Annual Arithmetic Mean 24 Hour	50 µg/m^3 150 µg/m^3	50 µg/m^3 150 µg/m^3
Particulate Matter Less than 2.5 Microns***	Annual Arithmetic Mean 24 Hour	15 µg/m^3 65 µg/m^3	15 µg/m^3 65 µg/m^3
Ozone (O_3)	8 Hour****	0.08 ppm	0.08 ppm
Carbon Monoxide (CO)	8 Hour 1 Hour	9 ppm 35 ppm	9 ppm 35 ppm
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean 24 Hour 3 Hour	0.03 ppm 0.14 ppm 0.5 ppm	0.02 ppm 0.10 ppm 0.5 ppm
Nitrogen Dioxide (NO_x)	Annual Arithmetic Mean	0.053 ppm	0.053 ppm
Lead (Pb)	Calendar Quarter	1.5 µg/m^3	1.5 µg/m^3

Notes: µg/m3 = micrograms per cubic meter of air
ppm = parts per million
* The federal standard was dropped in 1987. Oregon retained the state standard.
** Effective September 21, 2006, EPA is revoking the annual standard, but retaining the 24 Hour standard
*** Effective September 21, 2006, EPA is strengthening the 24 Hour standard to 35 µg/m^3
**** The 8-hour ozone standard is a 3 year 4th high rolling average.

A brief description of each criteria pollutant and its affect on public health and welfare are listed in Table 3.

Table 3. Air Pollution Descriptions and Effects

POLLUTANT	WHAT IS IT?	WHERE IT COMES FROM	WHAT DAMAGE IT CAUSES
Particulates (TSP, PM_{10} & $PM_{2.5}$)	Solid and liquid particles of soot, dust, aerosols and fumes ranging from 0.1 to 100 microns in size (1 micron = 1/2540")	Combustion sources, cars industrial emissions, residential woodburning, fugitive dust, field and slash burning; and natural sources, such as ocean spray, wind-raised dust, and volcanic eruptions	Aggravates chronic lung diseases, heart and lung disease symptoms. Causes material damage, soiling and visibility reduction
Sulfur Dioxide	A colorless, pungent, irritating gas	Oil and Coal combustion and industrial emissions	Aggravates asthma, heart and lung disease in the elderly; irritated lungs; is corrosive to metals and marble; and causes plant damages
Carbon Monoxide	A colorless, odorless gas that replaces oxygen in the blood stream	Incomplete combustion sources, mostly cars and woodstoves	Interferes with the bloods ability to carry oxygen, causing heart difficulties in those with chronic diseases; reduces lung capacity; and impairs mental abilities
Ozone	A toxic gas, associated with photochemical smog	Photochemical reactions in the atmosphere between oxides of nitrogen and hydrocarbons in the presence of direct sunlight and worm temperatures	Causes eye irritation; damage to lung tissue and lung function; and material and plant damage
Nitrogen Dioxide	A reddish brown gas, toxic in high concentrations	Formed by conversion of nitric oxide (from autos and combustion sources), and from industrial sources	Increases chronic bronchitis and irritates lungs
Lead	A gray metal derived from ore bearing minerals	Cars burning leaded fuel and some industrial sources	Interferes with the operation of the hematopoietic (blood forming), nervous and renal (kidney) systems. Sensitive populations include infants and expectant mothers

Source: *EPA http://epa.gov/air/criteria.html (May 24, 2006)*

Statutory and Regulatory Requirements for PM Nonattainment Areas

On March 10, 2006, the EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter, entitled "$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New PM2.5 and Existing PM_{10} National Ambient Air Quality Standards" (71 FR 12468). These amendments require the assessment of localized air quality impacts of federally-funded or approved transportation projects that are deemed to be projects of air quality concern that are located in PM_{10} nonattainment and maintenance areas. This assessment of localized impacts (i.e., "hot-spot analysis") examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act conformity requirements to support state and local air quality goals.

A qualitative hot-spot analysis is required for these projects until EPA releases its future quantitative modeling guidance and announces that quantitative PM_{10} hot-spot analyses are required under 40 CFR93.123(b)(4).

Construction Activities

Emissions resulting from construction of the project are not required to be considered in the hot-spot analysis if such emissions are considered temporary according to 40 CFR 93.123(c)(5). The project's construction contractor's, however, will be required to comply with all local, state, and federal regulations concerning air pollution abatement related to construction activities.

PM_{10} Regional Conformity Determination

Section 176(c) of the Clean Air Act and the federal conformity rule require that transportation plans and programs conform to the intent of the state implementation plan (SIP) through a regional emissions analysis in PM_{10} nonattainment areas.

The Grants Pass, Oregon, Urban Growth Boundary was designated nonattainment for PM_{10} and classified as moderate upon enactment of the Clean Air Act Amendments in 1990. Oregon submitted a PM_{10} attainment plan on November 15, 1991, and EPA announced its proposed approval of the plan (58 FR 13230). EPA approved the plan on December 17, 1993 (58 FR 65934). On November 5, 1999, Oregon submitted a complete rule renumbering and relabeling package to EPA for approval in the SIP. On January 22, 2003, EPA approved the re-codified version of Oregon's rules to remove and replace the outdated numbering system (68 FR 2891).

The plan relies on control strategies needed to assure attainment of the PM_{10} NAAQS. The strategy focuses on control of industrial emissions and residential wood combustion. Additional reductions are expected from statewide efforts to reduce slash burning smoke.

On November 4, 2002, the State of Oregon submitted a PM_{10} maintenance plan for Grants Pass to EPA for approval and concurrently requested that EPA re-designate the

Grants Pass nonattainment area to attainment for the NAAQS for PM_{10}. The Grants Pass nonattainment area was redesignated as a maintenance area in 2003.

The Grants Pass area has a population of less than 50,000; therefore, Grants Pass does not have a metropolitan planning organization (MPO) and has no requirement to develop a regional transportation plan (RTP) or transportation improvement program (TIP). In the conformity rule, areas without an MPO are identified as "isolated rural areas." Criteria and procedures applicable to conformity determinations can only be satisfied in these areas if:

- A regional emissions analysis is performed which includes all regionally significant projects in the nonattainment or maintenance area.
- References in the conformity rule to the 'transportation plan' are taken to mean the Statewide Transportation Plan.
- References in the conformity rule to the 'transportation improvement program' are taken to mean those projects in the Statewide Transportation Improvement Program (STIP) which are in the nonattainment or maintenance area.

The Highway 199 Expressway Upgrade project has been determined to be regionally significant. An air quality regional emissions analysis must be completed for the preferred alternative prior to the completion of the FHWA NEPA decision. The regional conformity has not yet been established; it is the responsibility of the Rogue Valley Council of Governments (RVCOG) to complete the regional conformity determination.

PM_{10} Hot Spot Analysis

Project of Air Quality Concern

As noted previously, EPA's final rule on PM_{10} hot-spot analyses requires localized assessment for projects of air quality concern. The final rule defines the projects of air quality concern that require a $PM_{2.5}$ or PM_{10} hot-spot analysis in 40 CFR 93.123(b)(1) as:

(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Examples of projects of air quality concern that would be covered by 40 CFR 93.123(b)(1)(i) and (ii) include:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8% or more of such AADT is diesel truck traffic;
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks; and
- Similar highway projects that involve a significant increase in the number of diesel transit buses and/or diesel trucks.

Based on traffic projections at the major locations within the API that will be affected by the proposed project, as shown in Table 1, it has been determined that the Highway 199 project does not meet the criteria set forth in 40 CFR 93.123(b)(1) as a project of air quality concern. This is because the estimated AADTs and trucks percentages on the affected roadways are less than the threshold values of 125,000 AADT and 8 percent diesel truck traffic. However, according to EPA and FHWA March 29, 2006 *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA420-B-06-902), a hot-spot analysis must still be performed because Oregon's conformity SIP has not as yet been revised to incorporate the hot-spot requirements of the March 10, 2006 Final Conformity Rule.

Year of Peak Emission Burden

As clarified in the preamble to the July 1, 2004 revision to the transportation conformity rule (64 FR 40056), the conformity rule requires that project-level analyses consider the year of expected peak emissions from the project. For PM_{10}, this is expected to be a near-term year, such as the first year of operation of the project, because emission rates from diesel vehicles are predicted to substantially decline between the opening year (2010) and the design year (2030) and these decreases would more than offset any increase in projected traffic volumes. The decline in emissions in future years are due in part to improvements in tailpipe emissions, national vehicle emissions control programs and the mandated use of ultra-low sulfur diesel-fuel.

Traffic Data

Overall traffic and truck data have been analyzed to assess the location associated with the project that is most likely to have the highest emissions burden. Table 1 provides the estimates AADT, truck volumes, and truck percentages on the major roadways affected by the project alternatives.

PM_{10} Qualitative Methodology

According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until the EPA releases modeling guidance in the Federal Register. However, a qualitative hot-spot analysis is still required. For this project, a qualitative project-level hot-spot assessment was therefore conducted following the joint EPA and

FHWA *Transportation Conformity Guidance* in order to assess whether the project will cause or contribute to any new localized PM_{10} violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the PM_{10} NAAQS.

Following the methodologies provided in the March 2006 guidance, an attempt was made to compare future roadway AADTs at the intersections affected by the proposed project to existing AADTs at roadways near the ambient PM_{10} monitors to determine whether the project has the potential to cause or exacerbate a violation of the PM_{10} NAAQS.

Table 1 summarizes the traffic and truck characteristics the major roadways affected by the project alternatives. The intersection of Highway 199 and Allen Creek Road has the highest overall vehicular volume and the highest truck volumes of all of these roadways. For this analysis, therefore, it was determined this location would be analyzed as the worst case site for this project. Thus, the conditions at this intersection would be used in the qualitative comparison approach to determine if the project has the potential to cause or exacerbate a violation of the PM_{10} NAAQS.

Existing Conditions – PM_{10} Monitored Levels near the Study Area

The Oregon Department of Environmental Quality (DEQ) is required to conduct air quality monitoring by both federal and state regulations. Regional operators routinely service the monitoring instrumentation, perform the quality assurance checks necessary to ensure that the analyzers are operating properly, and perform various types of preventive maintenance. The current PM_{10} monitoring network for Oregon has been developed following the requirements of 40 CFR Part 58 and applying the EPA's "Guidance for Network Design and Optimum Site Exposure for $PM_{2.5}$ and PM_{10}".

Representative Monitor

Following the March 2006 guidance, monitoring data collected at a monitor located in an area similar to the area affected by the proposed project should be used to represent the air quality in the study area. However, as traffic data near nearby monitoring sites in Oregon either does not exist or is not representative of the conditions near the worst case analysis site for this project, a more general approach, based on data collected at multiple monitors in Oregon and the future Build volumes at the worst case analysis site, was taken.

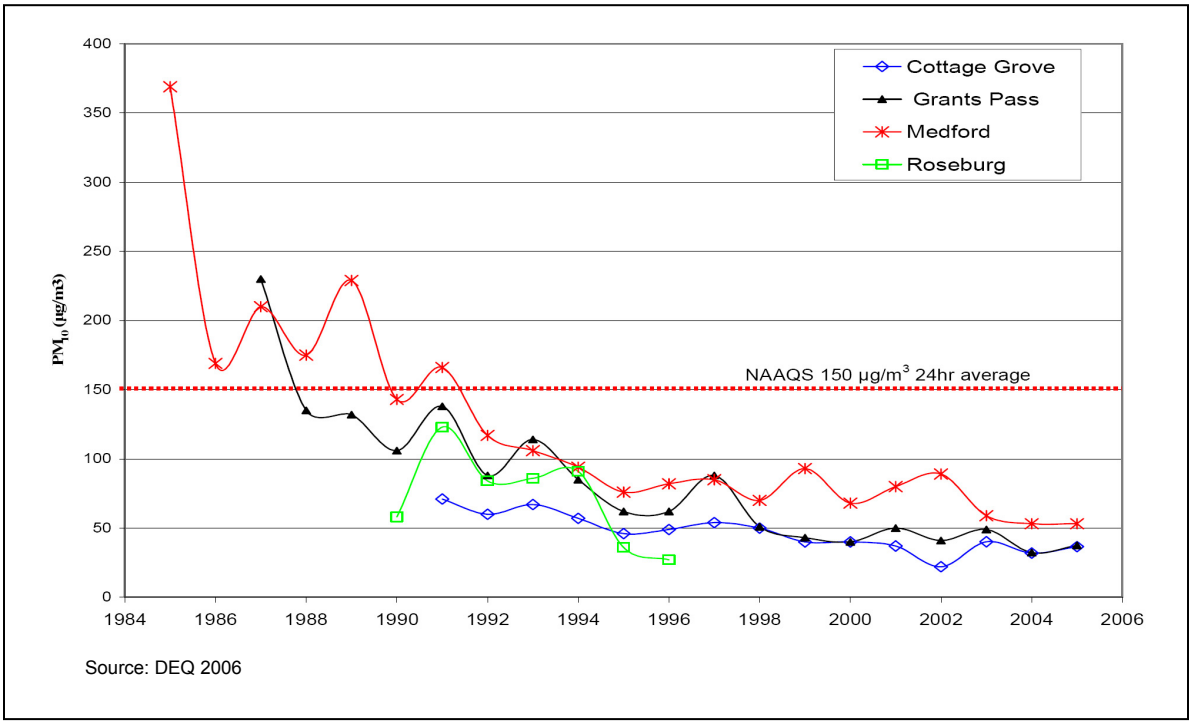
Monitored PM_{10} Levels

Grants Pass has never violated the annual PM-10 standard. Figure 3 shows the PM_{10} trends for Western Oregon cities using second highest 24-hour average monitored data. As shown, the 24-hour standard has not been exceeded at the Grants Pass monitor since 1988. In addition, no exceedances of the PM_{10} 24-hour or annual standard have been recorded in Western Oregon since 1995.

The maximum 24-hour PM_{10} level recorded in the City of Grants Pass in 2005 (the last full year of monitored data) is 48 micrograms per cubic meter, which is 32 percent of the NAAQS. Similarly, the maximum annual average PM_{10} value monitored at this location

is 16.4, which is 33 percent of the NAAQS. This monitor, located at the Grants Pass Parkside School, is approximately 1 mile northwest of the project location.

Figure 3. PM10 Trends in Western Oregon



Built and Natural Environment

The Highway 199 Expressway Upgrade project is located within the planning jurisdiction of the City of Grants Pass and Josephine County. The City of Grants Pass has planning jurisdiction within the city limits and within the Grants Pass Urban Growth Boundary (UGB). Land outside of the UGB is within Josephine County's jurisdiction. In the API, existing land uses generally reflect zoning designations. Land uses in the API range from urban at the east end to rural at the west end. Land uses in the eastern end of the API are a mix of predominately general commercial, light industrial, and low to moderate density residential. Land use in the western end, which is outside the UGB, is primarily rural residential and open space.

According to the City of Grants Pass and Josephine County development codes, transportation facilities (public roads) are a permitted use within all city and county zoning districts. In addition to the development codes, there are several state and local plans and regulations applicable to land uses in the API. Applicable local plans include the City of Grants Pass Comprehensive Plan, Josephine County Comprehensive Plan, and the local transportation system plans (TSPs). The Highway 199 Expressway Upgrade project complies with state plans, goals, and regulations and is identified for funding in the Oregon Statewide Transportation Improvement Program (STIP).

Future Scenario

As previously discussed, PM_{10} emissions are expected to substantially decrease in future years for the entire maintenance area. This predicted decrease in emissions is due in large part to EPA's "Heavy-duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements – Final Rule," signed in December 2000. According to this rule, particulate matter emission levels are expected to be 90 percent lower on a per vehicle basis in 2030 than they were in 2000.

The traffic and transportation analysis that was conducted for the Environmental Assessment for this project estimated a set of future (2025) performance measures to get a better understanding of the differences in traffic conditions under future No Build and the two future Build alternatives. Table 4 summarizes the modeled peak vehicles miles of travel (VMT) under each future alternative that are the results of this analysis. As can be seen from this table, the proposed project alternatives only minimally affects regional miles of travel – with VMT increasing be approximately thirteen percent under Alternative C and eight percent under Alternative A.

Table 4. Modeled PM Peak vehicles miles of travel (2025)

Alternative	VMT
No Build	17,348
Alternative A	18,827
Alternative C	19,691

Source: Transportation Section of the Environmental Assessment

Results

Based on the year of expected peak emissions it was determined that the project opening year, 2010, represents the year for the potential worst case impacts of the project. In addition, an analysis of truck volumes and overall 2010 Build AADTs, determined that the intersection of Highway 199 and Allen Creek Road represents the worst case analysis area of the proposed project.

Although, due to a lack of applicable traffic data near the state's PM_{10} monitoring locations, there is no monitor that can be determined to representative of the project area, there are several factors that strongly indicate that the proposed project would not cause or exacerbate a violation of the NAAQS. These are as follows:

- No exceedances of the PM_{10} NAAQS have been recorded at any monitor in Western Oregon in over 10 years;
- No exceedances of the PM_{10} NAAQS have been recorded in the City of Grants Pass since 1988;
- The AADT (94,800) and truck percentage (1.3%) at the worst case analysis site in the critical analysis year (2010) are below the conformity Guidance threshold of 125,000 AADT and 8% that are used to determine whether a proposed project should be considered a project of air quality concern;

- The proposed project will not affect the overall character of the API, and therefore not change the current vehicle mix within the area or increase the relatively low truck percentages on the affected roadways;
- PM_{10} impacts from diesel truck emissions on a per vehicle basis should decrease in future years due to the implementation of national diesel engine and diesel sulfur fuel regulations that are expected to cut heavy-duty diesel emissions; and
- The proposed project would minimally affect PM_{10} emissions -- Alternative C would increase AADT in the future by only thirteen percent and Alternative A would result in an increase by only eight in AADT.

PM-10 Hot spot analysis Conclusion

Based on the analysis provided, it is determined that the proposed Highway 199 Expressway project will not cause or contribute to a new violation of the PM_{10} NAAQS, or increase the frequency or severity of a violation for the following reasons:

- All monitors in Western Oregon are currently monitoring PM_{10} concentrations that are well below the annual and 24-hour standards, and no exceedances of the NAAQS have been recorded in over 10 years;
- The proposed project would not substantially affect the AADTs and truck volumes on the affected roadways; PM-10 emissions contributed from transportation vehicles are primarily from reentrained road dust. Reentrained road dust factors for paved roads are much lower than for unpaved roads. PM-10 emissions from exhaust, brake and tire wear for vehicles traveling on paved roads do not vary significantly based on vehicular speeds. Increases in PM-10 emissions on paved roads will only occur due to increases in the number of vehicles or vehicular delay. and,
- Vehicular emissions are expected to be reduced in the project area, as demonstrated by national projections by the EPA reflecting the impacts of national emissions control programs, such as the 2007 Heavy-Duty Diesel Rule.

Project Conformity with the State Implementation Plan

Based on the results of the PM-10 hot spot analysis provided, it is determined that the proposed Highway 199 Expressway project will not cause or contribute to a new localized violation. The project will not increase the frequency or severity of an existing violation of the PM_{10} NAAQS as no violations currently exist. These results are applicable to all alternatives under study.

The Highway 199 Expressway Upgrade project has been determined to be regionally significant. An air quality regional emissions analysis must be completed for the preferred alternative prior to the completion of the FHWA NEPA decision (prior to issuance of the FONSI). The regional conformity has not yet been established; it is the responsibility of the Rogue Valley Council of Governments (RVCOG) to complete the regional conformity determination.

Therefore, project conformity with the SIP can not be established until regional conformity has been established.

Mobile Source Air Toxics

On February 3, 2006, the FHWA released an *Interim Guidance on Mobile Source Air Toxics (MSAT)* for use in National Environmental Policy Act (NEPA) documents. This guidance is interim because MSAT science is still evolving and the EPA is in the process of assessing the risks of various kinds of exposures to these pollutants.

A basic analysis of the likely MSAT emission impacts of this project was conducted. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the project. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22 (b)) regarding incomplete or unavailable information.

Information that is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Emissions

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not

sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

Dispersion

The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program (NCHRP) is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects

Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Currently, EPA has not established regulatory concentration targets for relevant MSAT pollutants appropriate for use in the project development process. The proposed project would replace an existing facility without adding substantial new capacity and it is unlikely to substantially increase MSAT emissions. Therefore, a qualitative assessment of MSAT emissions projection was conducted.

Priority MSATs

The Clean Air Act identified 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list of toxics and identified a group of 21 as MSATs, which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (66 FR 17235). The EPA also extracted a subset of this list of 21 that it now labels as the six priority MSATs. These are as follows:

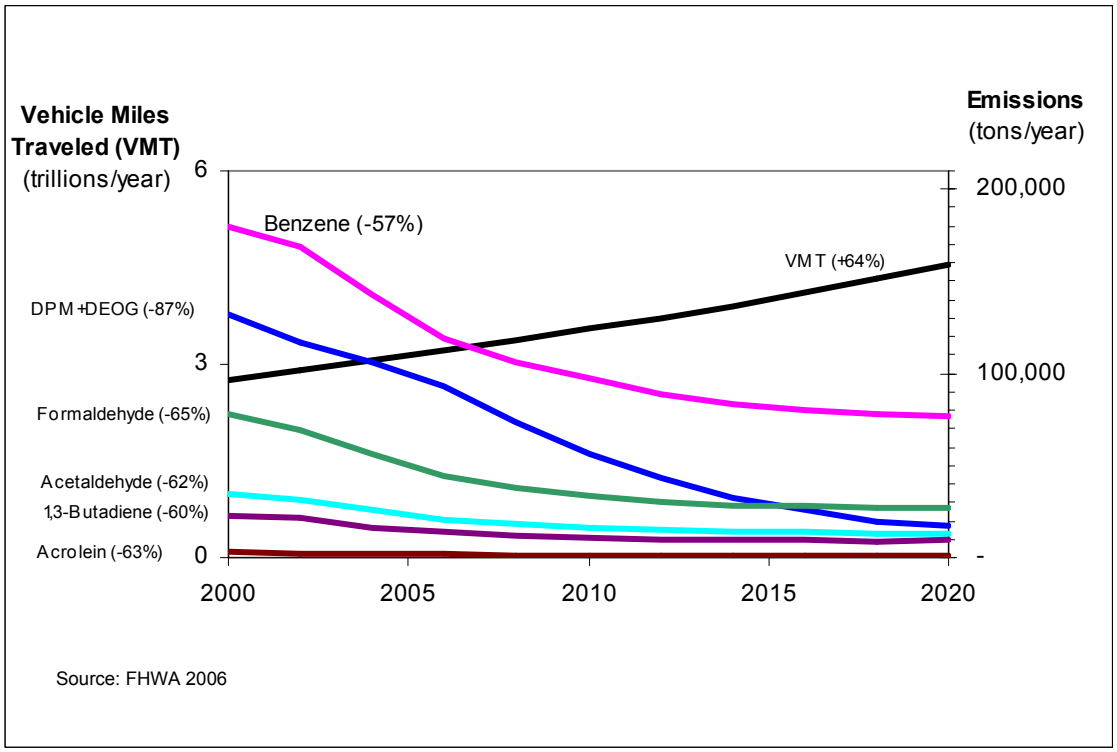
- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

Mobile Source Air Toxic Trends

The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (EPA 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. 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, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements.

The EPA has also issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in Figure 4.

Figure 4. Mobile Source Air Toxic Emission Trends



Project Impacts

FHWA's *Interim Guidance on Mobile Source Air Toxics* groups projects into the following categories:

- Exempt Projects or Projects with no Meaningful Potential MSAT Effects;
- Projects with Low Potential MSAT Effects; and
- Projects with High MSAT Effects.

Examples of projects with low potential MSAT effects include minor roadway widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic projections are less than 140,000 to 150,00 AADT.

As the proposed project alternatives fit the definition of a project with low potential MSAT impacts and as the highest future year AADT that would occur at any of the affected intersections (i.e., the intersection of Highway 199 and Allen Creek Road) is 94,800 in 2010 and 122,100 in 2030 (see Table 1), which are below the FHWA criterion, the proposed alternatives are considered to be "Projects with Low Potential MSAT Effects."

MSAT emissions are proportional to the number of vehicle miles traveled. Because the estimated AADT under each of the Alternatives is nearly the same, increasing by

approximately three percent under Alternative C and decreasing by approximately three percent under Alternative A, it is expected there would be no appreciable difference in overall MSAT emissions generated in the API between the Build Alternatives. Also, 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 57 to 87 percent between 2000 and 2020.

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.