3.4 AIR QUALITY

3.4.1 INTRODUCTION

This section describes the existing air quality conditions and applicable air quality regulations in the Tahoe Region and analyzes potential short-term and long-term air quality impacts that could result from implementation of Regional Plan Update alternatives. Mitigation measures are recommended to reduce potentially significant adverse impacts on air quality. Greenhouse gas emissions and climate change are evaluated separately in Section 3.5.

3.4.2 REGULATORY BACKGROUND

Air quality within the Lake Tahoe Air Basin (LTAB) is regulated by the Tahoe Regional Planning Agency (TRPA), U.S. Environmental Protection Agency (EPA), California Air Resources Board (ARB), Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC) and Bureau of Air Quality Planning (BAQP), Placer County Air Pollution Control District (PCAPCD), and El Dorado County Air Quality Management District (EDCAQMD). Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, state and local regulations may be more stringent.

TAHOE REGIONAL PLANNING AGENCY

The TRPA Regional Plan includes the following elements related to air quality: Environmental Threshold Carrying Capacities adopted in 1982 and evaluated every 5 years since 1991 (TRPA 2002 and 2012a); Goals and Policies (Air Quality Subelement); the TRPA Code of Ordinances (Code); and the Regional Transportation Plan (RTP) (TMPO 2012).

ENVIRONMENTAL THRESHOLD CARRYING CAPACITIES

In August 1982, TRPA adopted Resolution No. 82-11, which included Environmental Threshold Carrying Capacities (threshold standards) related to air quality and other resource topics for the Lake Tahoe Region. TRPA conducts a comprehensive evaluation every 5 years to determine whether each threshold standard is being achieved and/or maintained, makes specific recommendations to address problem areas, and directs general planning efforts for the next 5-year period. The most recent evaluation was completed in 2012 (TRPA 2012a).

TRPA threshold standards address carbon monoxide (CO), ozone, regional and sub-regional visibility, and nitrate deposition. Numerical standards have been established for each of these parameters, and management standards have been developed that are intended to assist in attaining the threshold standards. The management standards include reducing particulate matter, maintaining levels of oxides of nitrogen (NO_X), reducing traffic volumes on U.S. Highway 50 (US 50), and reducing vehicle miles traveled (VMT). These threshold standards and associated management standards are described in more detail below. In addition, the Compact states that the Regional Plan shall provide for attaining and maintaining federal, state, or local air quality standards, whichever are strictest, in the respective portions of the Region for which the standards are applicable.

Thresholds and standards for air quality are listed below and in Table 3.4-4 (TRPA 2012a). Threshold standards related to VMT and traffic volume are addressed further in Section 3.3, Transportation.

Carbon Monoxide

- **Numerical Standard:** Maintain CO concentrations at or below 9 ppm averaged over 8 hours.
- **Management Standard:** Reduce average daily traffic volume between 4:00 p.m. and midnight in the US 50 corridor by 7 percent from the 1981 base year during the months of November through February.

Ozone

- **Numerical Standard**: Maintain ozone concentration below 0.08 ppm averaged over 1 hour.
- **Numerical Standard**: Maintain NO_X emissions at or below the 1981 level.

Regional Visibility

- **Numerical Standards:**
  - Achieve 156 kilometers (97 miles) at least 50 percent of the year as measured by aerosol concentrations measured at the Bliss State Park monitoring site.
  - Achieve 115 kilometers (71 miles) at least 90 percent of the year as measured by aerosol concentrations measured at the Bliss State Park monitoring site.
- **Management Standard:** Reduce wood smoke emissions by 15 percent of the 1981 base values through technology, management practices, and educational programs.

Subregional Visibility

- **Numerical Standards:**
  - Achieve 78 kilometers (48 miles) at least 50 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
  - Achieve 31 kilometers (19 miles) at least 90 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
- **Management Standards:**
  - Reduce suspended soil particles by 30 percent of the 1981 base values through technology, management practices, and educational programs.
  - Reduce wood smoke emissions by 15 percent of the 1981 base values through technology, management practices, and educational programs.
  - Reduce vehicle miles of travel by 10 percent of the 1981 base values.

Atmospheric Deposition

- **Water Quality Numerical Standard:** Reduce dissolved inorganic nitrogen loading to Lake Tahoe from atmospheric sources by approximately 20 percent of the 1973–1981 annual average.
- **Management Standards:**
  - Reduce dissolved inorganic nitrogen loads from surface runoff by approximately 50 percent, from groundwater approximately 30 percent, and from atmospheric sources approximately 20 percent of the 1973–1981 annual average. This threshold standard relies on predicted reductions in pollutant loadings from out-of-basin sources as part of the total pollutant loading reduction.
  - Reduce the transport of nitrates into the LTAB and reduce oxides of nitrogen produced in the LTAB consistent with water quality threshold standards.
  - Reduce vehicles miles of travel in the Lake Tahoe Basin by 10 percent of the 1981 base year values.

Attainment status and trends of each air quality indicator are summarized in Table 3.4-1.

Table 3.4-1. Air Quality Indicator Attainment Status and Trends						
Threshold Indicator Reporting Category	1991 Attainment Status	1996 Attainment Status	2001 Attainment Status	2006 Attainment Status	2011 Attainment Status[1]	Trend
Carbon monoxide	Non-attainment	Attainment	Attainment	Non-attainment	Considerably better than target	Rapid improvement
Ozone	Non-attainment	Non-attainment	Non-attainment	Non-attainment	At or somewhat better than target	Little or no change
Particulate matter	Non-attainment	Non-attainment	Attainment	Non-attainment	At or somewhat better than target	Little or no change
Visibility	Attainment	Non-attainment	Non-attainment	Attainment	Considerably better than target	Moderate improvement
Nitrate deposition	Unknown	Unknown	Unknown	Unknown	Implemented[2]	Unknown
Odor	No Designation	No Designation	No Designation	No Designation	Implemented[2]	Unknown

Notes: [1] Change in terminology occurred in 2011 Threshold Evaluation.
[2] "Implemented" refers to implementation of a management standard rather than monitoring the achievement of a numerical standard.
Source: TRPA 2007:2-8; TRPA 2012a.

EPA, ARB, and TRPA use monitoring data (presented in Section 3.4.3, Affected Environment) to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." "Unclassified" is used in areas that cannot be classified on the basis of available information as meeting or not meeting the standards. The most current national, state, and TRPA attainment designations for the LTAB are shown in Table 3.4-2 for each criteria air pollutant. National and state ambient air quality standards are discussed below.

Table 3.4-2. Attainment Status Designations for the Lake Tahoe Air Basin				
Pollutant	National Designation[1]	State Designation	Threshold Indicator Reporting Category	TRPA Designation
Ozone	Attainment/ Unclassified	Nonattainment-Transitional	Highest 1-hour Average Concentration	At or somewhat better than target
			Highest 8-hour Average Concentration	Somewhat worse than target
			3-year Average of 4th Highest Concentration	At or somewhat better than target
			Oxides of Nitrogen Emissions	At or somewhat better than target
Respirable Particulate Matter (PM_{10})	Unclassified	Nonattainment	Highest 24-hour Average PM_{10} Concentration	Somewhat worse than target
			Annual Average PM_{10} Concentration	Unknown
Fine Particulate Matter ($PM_{2.5}$)	Unclassified/ Attainment	Attainment	3-year Average of 98th Percentile 24-hour $PM_{2.5}$ Concentration	Considerably better than target
			Annual Average $PM_{2.5}$ Concentration	Considerably better than target

Table 3.4-2. Attainment Status Designations for the Lake Tahoe Air Basin				
Pollutant	**National Designation[1]**	**State Designation**	**Threshold Indicator Reporting Category**	**TRPA Designation**
Visibility Reducing Particles	No Designation	Unclassified	Regional Visibility 50th Percentile	Considerably better than target
			Regional Visibility 90th Percentile	At or somewhat better than target
			Sub-regional Visibility 50th Percentile	Unknown
			Sub-regional Visibility 90th Percentile	Unknown
			Vehicle Miles Traveled	At or somewhat better than target
Carbon Monoxide	Unclassified/ Attainment	Attainment	1-hour Carbon Monoxide Standard	Considerably better than target
			8-hour Carbon Monoxide Standard	Considerably better than target
			Winter Traffic Volumes	Considerably better than target
Nitrogen Dioxide	Unclassified/ Attainment	Attainment	Nitrate Deposition	Implemented[2]
Sulfur Dioxide	No Designation	Attainment	No Standard	No Designation
Odor	No Designation	No Designation	Non-numerical Standard	Implemented[2]
Lead	No Designation	Attainment	No Designation	
Hydrogen Sulfide	No Designation	Unclassified	No Designation	
Sulfates	No Designation	Attainment	No Designation	

Notes: CO = carbon monoxide; NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = respirable particulate matter; SO_2 = sulfur dioxide; TRPA = Tahoe Regional Planning Agency

[1] According to the Nevada Division of Environmental Protection, Bureau of Air Quality Planning, Nevada has adopted its own air quality standards that shall not be exceeded, but does not issue its own attainment designations for these standards in the same sense that EPA issues designations for NAAQS. Nevada relies on national area designations, as described in its air quality trend report (NDEP 2011).

[2] "Implemented" refers to implementation of a management standard rather than monitoring the achievement of a numerical standard.

Sources: ARB 2011a, TRPA 2012a, EPA 2011.

Goals and Policies

The Goals and Policies are designed to achieve and maintain adopted environmental threshold standards and are implemented through the Code. The Land Use Element of the Goals and Policies document consists of seven subelements, one of which is the Air Quality Subelement.

TRPA has jurisdiction within the LTAB portion of Placer and El Dorado Counties in regard to air quality. Therefore, the Air Quality Subelement of the Goals and Policies document has focused on achieving the national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), as well as special TRPA-adopted regional and sub-regional visibility standards, and on reducing the deposition of nitrate from NO_X emitted by vehicles. The Code and the RTP contain specific measures designed to monitor and achieve the air quality objectives of the Regional Plan. EDCAQMD and PCAPCD rules and regulations (discussed below) also have certain application in the Lake Tahoe area.

Code of Ordinances

Applicable provisions of Chapter 65 (Air Quality and Transportation) of the Code (TRPA 2012b) are described below.

Chapter 65.1—Air Quality Control

The provisions of Chapter 65.1 apply to direct sources of air pollution in the Lake Tahoe region, including certain motor vehicles registered in the region, combustion heaters installed in the region, open burning and stationary sources of air pollution, and idling combustion engines:

- Section 65.1.3, "Vehicle Inspection and Maintenance Program," states that to avoid duplication of effort in implementation of an inspection/maintenance program for certain vehicles registered in the CO nonattainment area, TRPA shall work with the affected state agencies to plan for applying state inspection/maintenance programs to the Lake Tahoe region.
- Section 65.1.4, "Combustion Appliances," establishes emissions standards for wood heaters, as well as natural gas– or propane-fired water heaters and central furnaces.
- Section 65.1.6, "Environmental Assessment," states that any new stationary source of air pollution that produces emissions for the peak 24-hour period beyond any of the limits in Table II, reproduced as Table 3.4-3 below, shall be considered to have a significant adverse environmental impact. New stationary sources that have a significant adverse environmental impact shall be prohibited.

Table 3.4-3. TRPA Peak 24-Hour Period Limits for Stationary Sources

Pollutant	Kilograms	Pounds
Nitrogen dioxide	11.0	24.2
PM_{10}	10.0	22.0
Volatile organic compounds (Reactive Organic Gases)	57.0	125.7
Sulfur dioxide	6.0	13.2
Carbon monoxide	100.0	220.5

Notes: PM_{10} = respirable particulate matter; TRPA = Tahoe Regional Planning Agency
Source: TRPA 2012b (Table II in Code Section 65.1.6)

Chapter 65.2—Traffic and Air Quality Mitigation Program

The purpose of Code Chapter 65.2 is to establish fees and other procedures to offset impacts from indirect sources of air pollution. As part of a project application for any additional development that would result in an increase of more than 200 daily vehicle trips, a technically adequate analysis of potential traffic and air quality impacts must be prepared (Section 65.2.4). To offset regional and cumulative impacts, project proponents must contribute to the air quality mitigation fund, or they may provide mitigation measures that cost at least as much as the required contribution to the air quality mitigation fund (Section 65.2.6). Such regional and cumulative mitigation measures may include transportation systems management measures such as bicycle facilities and pedestrian facilities. For all other types of development (not qualifying as residential, tourism, campground, or commercial), the required contribution would be assessed in accordance with the mitigation fee schedule in the Rules of Procedure (Section 65.2.4).

Regional Transportation Plan (Goals and Policies, Action Element)

The purpose of the RTP (TMPO 2012) is to attain and maintain the environmental threshold standards and all applicable federal, state, and local standards established for transportation and air quality. The RTP contains specific measures designed to monitor and achieve the air quality objectives of its Regional Plan and to attain and maintain the TRPA threshold standards. The Regional Plan Update is in a process parallel with the update of

the RTP. Each RTP alternative proposes to accommodate the growth allowed under each Regional Plan Update alternative through corresponding sets of transportation policies and infrastructure projects.

FEDERAL

EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

CRITERIA AIR POLLUTANTS

The CAA required EPA to establish NAAQS. As shown in Table 3.4-4, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan, referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with areas that are not in attainment of all NAAQSs to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and permitting of stationary air pollution sources in the nonattainment air basin.

In addition, general conformity requirements were adopted by Congress as part of the CAAA and were implemented by EPA regulations in 1993. General conformity requires that all federal actions conform to the SIP as approved or promulgated by EPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain NAAQS. Before a federal action is taken, it must be evaluated for conformity with the SIP. All reasonably foreseeable emissions, both direct and indirect, that are predicted to result from the action are taken into consideration. The location and quantity of emissions must be identified. If it is found that the action would create emissions above *de minimis* threshold levels specified in EPA regulations, or if the activity is considered regionally significant because its emissions exceed 10 percent of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

HAZARDOUS AIR POLLUTANTS

Air quality regulations also focus on toxic air contaminants (TACs) or, in federal parlance, hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. (By contrast, for the criteria air pollutants, acceptable levels of exposure can be determined and ambient standards have been established [Table 3.4-4].) Instead, EPA and, in California, ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum available control technology or best available control technology for TACs to limit emissions. (See the discussion of TACs under "State" above for a description of ARB's efforts.) These, in conjunction with additional rules set forth by PCAPCD and EDCAQMD, described under "Placer County Air Pollution Control District and El Dorado County Air Quality Management District," establish the regulatory framework for TACs.

Table 3.4-4. Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California[a,b]	Nevada	National[c]	
					Primary[b,d]	Secondary[b,e]
Ozone	1-hour	0.08 ppm	0.09 ppm (180 µg/m^3)	0.10 ppm (195 µg/m^3)[f]	–[e]	Same as primary standard
	8-hour	–	0.070 ppm (137 µg/m^3)	–	0.075 ppm (147 µg/m^3)	
Carbon monoxide (CO)	1-hour	–	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	35 ppm (40 mg/m^3)	Same as primary standard
	8-hour	9 ppm	6 ppm[f] (7 mg/m^3)	6 ppm[f] (7 mg/m^3)	6 ppm (10 mg/m^3)	
Nitrogen dioxide (NO_2)[g]	Annual arithmetic mean	–	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	53 ppb (100 µg/m^3)	Same as primary standard
	1-hour	–	0.18 ppm (339 µg/m^3)	–	100 ppb (188 µg/m^3)	–
Sulfur dioxide (SO_2)	Annual arithmetic mean	–	–	0.030 ppm (80 µg/m^3)	–	–
	24-hour	–	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)		
	3-hour	–	–	0.5 ppm (1,300 µg/m^3)	–	0.5 ppm (1300 µg/m^3)
	1-hour	–	0.25 ppm (655 µg/m^3)	–	75 ppb (196 µg/m^3)	–
Respirable particulate matter (PM_{10})	Annual arithmetic mean	–	20 µg/m^3	50 µg/m^3	–	Same as primary standard
	24-hour	–	50 µg/m^3	150 µg/m^3	150 µg/m^3	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	–	12 µg/m^3	–	15.0 µg/m^3	Same as primary standard
	24-hour	–	–	–	35 µg/m^3	

Table 3.4-4. Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California[a,b]	Nevada	National[c]	
					Primary[b,d]	Secondary[b,e]
Lead[g]	Calendar quarter	–	–	1.5 µg/m^3	1.5 µg/m^3	Same as primary standard
	30-Day average	–	1.5 µg/m^3	–	–	–
	Rolling 3-Month Average	–	–	–	0.15 µg/m^3	Same as primary standard
Hydrogen sulfide	1-hour	–	0.03 ppm (42 µg/m^3)	0.08 ppm (112 µg/m^3)	No national standards	
Sulfates	24-hour	–	25 µg/m^3	–		
Vinyl chloride[g]	24-hour	–	0.01 ppm (26 µg/m^3)	–		
Visibility-reducing particulate matter	8-hour	*Regional:* Extinction coefficient of 25 Mm-1 (157 km, 97 miles) 50 percent of the year, 34 Mm-1 (115 km, 71 miles) 90 percent of the year. *Subregional:* 50 Mm-1 (48 miles) 50 percent of the year, 125 Mm-1 (19 miles) 90 percent of the year.				

Notes: µg/m^3 = micrograms per cubic meter; km = kilometers; ppb = parts per billion; ppm = parts per million; TRPA = Tahoe Regional Planning Agency

[a] California standards for ozone, SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] Concentration expressed first in units in which it was issued. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[c] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current federal policies.

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] Applicable in the Lake Tahoe Air Basin.

[g] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Sources: TRPA 2007, ARB 2010, NDEP 2010.

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The national emissions standards for HAPs may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology for toxics (MACT). For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards, where deemed necessary, to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions of, at a minimum, benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

STATE

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish CAAQS (Table 3.4-4).

CALIFORNIA

Criteria Air Pollutants

ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest date practical. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with federal and state laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are required before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to ARB's list of TACs.

Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold standard exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold standard. If no safe threshold standard exists, the measure must incorporate best available control technology for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus fleet rule and emissions standards for new urban buses. These rules and standards included more stringent emission standards for some new urban bus engines, beginning with the 2002 model year; zero-emission-bus demonstration and purchase requirements for transit agencies; and reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule. Recent milestones included the low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks (effective in 2007 and subsequent model years) and off-road diesel equipment (2011) nationwide. Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) in California have been reduced substantially over the last decade; such emissions will be reduced further through a progression of regulatory measures (e.g., low emission vehicle/clean fuels and Phase II reformulated-gasoline regulations) and control technologies.

With implementation of ARB's risk reduction plan, it is expected that concentrations of diesel PM will be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated 2000 level (ARB 2009: pp. 5-45). Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, risks associated with exposure to the emissions are also expected to be reduced.

NEVADA

At the state level, the Nevada BAPC and BAQP are the agencies responsible for coordination and oversight of state air pollution control programs, including the Chemical Accident Prevention Program, and air quality surveillance in Nevada. The authority for the BAPC and BAQP to implement air pollution control programs is drawn from the Nevada Revised Statutes 445B.100 through 445B.825 and 486A.010 through 486A.180. The agencies achieve and maintain air quality conditions in Douglas and Washoe Counties and Carson City Rural District through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air-quality issues. The clean air strategy of the BAPC and BAQP include the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAPC and BAQP also oversee compliance with Nevada and federal laws; prepare SIPs; conduct inspections; observe and review source test data, excess emission reports, and compliance certification reports; investigate air quality complaints; operate an ambient air quality monitoring network; develop and implement strategies to control air pollution from motor vehicles, convert motor vehicle fleets to use cleaner-burning alternative fuels; and coordinate and facilitate prescribed outdoor burning.

LOCAL

PLACER COUNTY AIR POLLUTION CONTROL DISTRICT AND EL DORADO COUNTY AIR QUALITY MANAGEMENT DISTRICT

Criteria Air Pollutants

PCAPCD and EDCAQMD attain and maintain air quality conditions in Placer and El Dorado Counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of PCAPCD and EDCAQMD includes preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. PCAPCD and EDCAQMD also inspect stationary sources of air pollution and responds to citizen complaints, monitor ambient air quality and meteorological conditions, and implement programs and regulations required by the CAA, CAAA, and CCAA.

All projects in the respective counties are subject to adopted PCACPD and EDCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include but are not limited to the following:

- **PCAPCD and EDCAQMD Rule 202—Visible Emissions.** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.
- **PCAPCD Rule 217 and EDCAQMD Rule 224—Cutback and Emulsified Asphalt Paving Materials.** A person shall not manufacture for sale nor use for paving, road construction, or road maintenance any: rapid cure cutback asphalt; slow cure cutback asphalt containing organic compounds which evaporate at 500°F or lower as determined by current American Society for Testing and Materials (ASTM) Method D402; medium cure cutback asphalt except as provided in PCAPCD Section 1.2 (EDCAQMD Rule 224.1.B).; or emulsified asphalt containing organic compounds which evaporate at 500°F or lower as determined by current ASTM Method D244, in excess of 3 percent by volume.
- **PCAPCD Rule 218 and EDCAQMD Rule 215—Application of Architectural Coatings.** No person shall: (i) manufacture, blend, or repackage for sale within PCAPCD (EDCAQMD); (ii) supply, sell, or offer for sale within PCAPCD (EDCAQMD); or (iii) solicit for application or apply within PCAPCD (EDCAQMD), any architectural coating with a volatile organic carbon (VOC) content in excess of the corresponding specified manufacturer's maximum recommendation. "Manufacturer's maximum recommendation" means the maximum recommendation for thinning that is indicated on the label or lid of the coating container.
- **PCAPCD Rule 228 and EDCAQMD Rule 223—Fugitive Dust.**
  - *Visible Emissions Not Allowed Beyond the Boundary Line*: A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area (including disturbance as a result of the raising and/or keeping of animals or by vehicle use), such that the presence of such dust remains visible in the atmosphere beyond the boundary line of the emission source.
  - *Visible Emissions from Active Operations*: In addition to the requirements of Rule 202, Visible Emissions, a person shall not cause or allow fugitive dust generated by active operations, an open storage pile, or a disturbed surface area, such that the fugitive dust is of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke as dark or darker in shade as that designated as number 2 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.
  - *Concentration Limit*: A person shall not cause or allow PM10 levels to exceed 50 micrograms per cubic meter (µg/m3) (24-hour average) when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM_{10} monitoring.

- *Track-Out onto Paved Public Roadways*: Visible roadway dust as a result of active operations, spillage from transport trucks, and the track-out of bulk material onto public paved roadways shall be minimized and removed.

  The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventative measures, and removed within 1 hour from adjacent streets any time track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations.

  All visible roadway dust tracked-out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a High Efficiency Particulate Air (HEPA) filter equipped vacuum device shall be used for roadway dust removal.

  Any material tracked-out, or carried by erosion, and clean-up water, shall be prevented from entering waterways or storm water inlets as required to comply with water quality control requirements.

- *Minimum Dust Control Requirements*: The following dust mitigation measures are to be initiated at the start and maintained throughout the duration of the construction or grading activity, including any construction or grading for road construction or maintenance.
  - Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered.
  - The speed of any vehicles and equipment traveling across unpaved areas must be no more than 15 miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust exceeding Ringelmann 2 or visible emissions from crossing the project boundary line.
  - Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.
  - Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water must be applied to the area to be disturbed to prevent emitting dust exceeding Ringelmann 2 and to minimize visible emissions from crossing the boundary line.
  - Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt, from being released or tracked off-site.
  - When wind speeds are high enough to result in dust emissions crossing the boundary line, despite the application of dust mitigation measures, grading and earthmoving operations shall be suspended.
  - No trucks are allowed to transport excavated material off-site unless the trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments, and loads are either covered with tarps; or wetted and loaded such that the material does not touch the front, back, or sides of the cargo compartment at any point less than 6 inches from the top and that no point of the load extends above the top of the cargo compartment.
- *Wind-Driven Fugitive Dust Control*: A person shall take action(s), such as surface stabilization, establishment of a vegetative cover, or paving, to minimize wind-driven dust from inactive disturbed surface areas.

- **PCAPCD and EDCAQMD Rule 501—General Permit Requirements.** Any person operating an article, machine, equipment, or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain a written permit from the Air Pollution Control Officer (APCO). Stationary sources subject to the requirements of PCAPCD Rule 507 (EDCAQMD Rule 522), Federal Operating Permit Program, must also obtain a Title V permit pursuant to the requirements and procedures of that rule.

Toxic Air Contaminants

At the local level, air pollution control or management districts may adopt and enforce ARB's control measures. Under PCAPCD and EDCAQMD Rule 501 ("General Permit Requirements"), PCAPCD Rule 502 and EDCAQMD Rule 523 ("New Source Review"), and PCAPCD Rule 507 and EDCAQMD Rule 522 ("Federal Operating Permit"), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. PCAPCD and EDCAQMD limit emissions and public exposure to TACs through a number of programs. PCAPCD and EDCAQMD prioritize TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by PCAPCD and EDCAQMD (e.g., health risk assessment) based on their potential to emit TACs. If it is determined that the project will emit toxics in excess of PCAPCD or EDCAQMD's threshold standard of significance for TACs (identified below), sources have to implement the BACT for TACs to reduce emissions. If a source cannot reduce the risk below the threshold standard of significance even after the BACT has been implemented, the air district will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs.

Odors

PCAPCD and EDCAQMD have determined some common types of facilities that have been known to produce odors: wastewater treatment facilities, chemical manufacturing plants, painting/coating operations, feed lots/dairies, composting facilities, landfills, and transfer stations. Because offensive odors rarely cause any physical harm, and federal and state air quality regulations do not contain any requirements for their control are included in federal or state air quality regulations, PCAPCD and EDCAQMD have no rules or standards related to odor emissions other than their nuisance rules:

- **PCAPCD and EDCAQMD Rule 205—Nuisance.** A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons, or to the public, or which endanger the comfort, repose, health or safety of any such persons, or the public, or which cause to have a natural tendency to cause injury or damage to business or property. The provisions of Rule 205 do not apply to odors emanating from agriculture operations necessary for the growing of crops or raising of fowl or animals.

Any actions related to odors are based on citizen complaints to local governments and PCAPCD and EDCAQMD.

Washoe County District Board of Health Regulations Governing Air Quality Management

Criteria Air Pollutants

Specific rules applicable to the construction of projects in Washoe County may include, but are not limited, to the following:

- **Regulation 040.005 — Visible Emissions:** Except as otherwise provided, it is unlawful for any person to discharge, or cause to be discharged, into the atmosphere from any stationary source of emission whatsoever, any air contaminant for a period or periods aggregating more than three (3) minutes in any one hour, which is: (1) As dark or darker in shade as that designated as No.1 on the Ringelmann Chart; or (2) Of any opacity equal to or greater than that shade designated as No. 1 on the Ringelmann Chart.

- **Regulation 040.030 — Dust Control:**
  - *Visible Emissions Prohibition*: The owner and/or operator of a source engaging in dust-generating activities shall not allow visible fugitive dust emissions for a period or periods accumulating more than 5 minutes in any hour.
  - *Stabilization Requirements for Fugitive Dust Sources*:
    a. Unpaved Parking Lot/Staging Areas: The owner and/or operator of any unpaved parking lot or staging area shall not allow visible fugitive dust emissions for a period or periods accumulating more than 5 minutes in any hour.
    b. Unpaved Haul/Access Road: The owner and/or operator of any unpaved haul/access road (whether at a work site that is under construction or at a work site that is temporarily or permanently inactive) shall not allow visible fugitive dust emissions for a period or periods accumulating more than 5 minutes in any hour.
    c. Open Area and Vacant Lot or Disturbed Surface Area: The owner and/or operator of an open area and vacant lot or any disturbed surface area on which no activity is occurring shall meet standards for stabilization as specified in this regulation.
    d. Open Storage Piles: All open storage piles shall be stabilized as specified in this regulation.
  - *Dust Control Permit Requirements*: The owner and/or operator of a dust-generating activity shall apply for and obtain a Dust Control Permit prior to commencement of the dust-generating activity. In the Dust Control Permit application, the owner and/or operator shall designate a person responsible for compliance with the "District Board of Health Regulations Governing Air Quality Management." Failure to comply with the provisions of an approved Dust Control Permit shall be deemed a violation of this Rule.
  - *Work Practices*: When engaged in the specific activities listed in Subsections a and b, the owner/operator of a source shall comply with the following work practices, in addition to any approved control measures in the applicable Dust Control Permit or Permit to Operate, to minimize fugitive dust emissions associated with haul trucks.
    a. Bulk Material Hauling Off-Site Onto Paved Public Roadways: (1) Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment floor, sides, and/or tailgate. (2) At least one of the following control measures.
       i. Cover all haul trucks with a tarp or other suitable closure; or
       ii. Bulk materials must contain enough moisture and/or dust suppressant to prevent fugitive dust emissions during transport; or
       iii. Load all haul trucks such that the freeboard is not less than six (6) inches.
    b. Spillage, Carry-Out, Erosion, and/or Trackout: (1) Install and maintain a suitable trackout control device that controls and prevents trackout and removes particulate matter from tires and the exterior surfaces of haul trucks and/or motor vehicles that traverse such work site at all exits onto a paved public roadway. (2) Clean-up spillage, carry-out, erosion, and/or trackout on the following time schedule: i. At the end of the day, when spillage, carry-out, erosion, and/or trackout extend beyond the project boundaries; or ii. Immediately at any time during the day if trackout is creating visible fugitive dust emissions for a period or periods accumulating more than 5 minutes in any hour.
- **Regulation 040.090 — Cutback Asphalts:** A person shall not cause, allow, or permit the sale, offering for sale, use or application of cutback asphalt or solvents (diluents) for any highway paving or maintenance operation within the Health District unless certain conditions specified in the regulation occur.
- **Regulation 040.200 — Diesel Engine Idling:** Except as otherwise provided in this subsection, a person shall not idle the engine of a diesel truck or a bus for more than 15 consecutive minutes.

Odors

- **Regulation 040.055 — Odorous or Gaseous Contaminants:** It is unlawful for any person to discharge, or cause to be discharged, from any source whatsoever, any quantity of odorous or gaseous emissions, materials, or air contaminants of any kind or description, which is, or tends to be, offensive to the senses, or injurious or detrimental to repose, health, and safety, or which in any way unduly interferes with or prevents the comfortable enjoyment of life or property by any property owners, residents or the general public.

3.4.3 AFFECTED ENVIRONMENT

The Tahoe Basin is located in the LTAB. The LTAB comprises portions of El Dorado and Placer counties on the California side, and Washoe County, Douglas County, and the Carson City Rural District on the Nevada side.

The ambient concentrations of air pollutant emissions are determined by the amount of pollutants emitted and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as climate, meteorology, and topography, in addition to the level of emissions by existing air pollutant sources. These factors are discussed separately below.

CLIMATE, METEOROLOGY, AND TOPOGRAPHY

Lake Tahoe lies in a depression between the crests of the Sierra Nevada and Carson ranges on the California-Nevada border at a surface elevation of approximately 6,260 feet above sea level. The LTAB is defined by the 7,000-foot contour, which is continuous around the Lake, except near Tahoe City. The mountains surrounding the Lake are approximately 8,000–9,000 feet in height on average, with some reaching 10,000 feet.

The constant water temperature of Lake Tahoe at 600 feet below the surface is approximately 39 degrees Fahrenheit (ºF). This characteristic and the Lake's topographic location combine to define one of the LTAB's most important atmospheric regimes: in the absence of strong synoptic weather systems (large-scale system, 620 miles or more), the LTAB develops shallow subsidence and radiation inversions throughout the year (air temperature variations unique to the Basin relative to surrounding areas). In addition, rapid radiation cooling at night regularly generates gentle downslope nocturnal winds that blow from the mountain ridges down to the shore, then fan across the Lake (Cahill and Cliff 2000:1).

Pollutants from local sources are trapped by frequent inversions in the LTAB, greatly limiting the volume of air into which the pollutants are mixed (e.g., diluted), which results in accumulation and elevated concentrations of pollutants. Further, each night the downslope winds transport local pollutants from nearby developed areas out over the Lake, increasing the opportunity for pollutants to deposit. This meteorological regime, characterized by weak or calm winds and a strong inversion, is the most common pattern at all times of the year (Cahill and Cliff 2000:1).

A second important meteorological regime is the transport of pollutants from the Sacramento Valley and San Francisco Bay Area because winds from these areas move upslope in the Sierra Nevada and the Lake is located directly east of the Sierra Nevada crest. This pattern develops when the western slopes of the Sierra Nevada are heated, which causes the air to rise in a chimney effect and move upslope to the Sierra crest and over into the LTAB. The strength of this pattern depends on the amount of heating; thus, it is strongest in summer, beginning in April and essentially ceasing in late October (Cahill and Cliff 2000:1).

Other regimes in the LTAB are defined by strong synoptic weather patterns that overcome the dominant terrain-defined meteorology regimes discussed above. The most important is the winter storm regime, which is responsible for precipitation primarily in the form of snow (Cahill and Cliff 2000:1).

Each of these meteorological regimes could influence pollution concentrations in the LTAB. Concentrations of pollutants typically increase when local inversions are present, trapping emissions, and when conditions allow pollution to be transported from the western slopes of the Sierra Nevada, the Sacramento Valley, and San Francisco Bay. Recent studies have even shown spring and fall contributions to local pollution levels from Asia. Periods of low pollution concentrations are associated with winter storms and high winds. Winter storms dilute the local and upwind pollution with strong vertical mixing and the incorporation of clean North Pacific air (Cahill and Cliff 2000:1).

Local meteorological conditions representative of the study area are recorded at the South Lake Tahoe Airport Station. The annual normal precipitation is approximately 15 inches and occurs primarily from November through March in the form of snowfall. January temperatures average approximately 26ºF and August temperatures average approximately 63ºF (WRCC 2011a). The annual predominant wind direction and mean speed is from the south at 6 miles per hour (mph) (WRCC 2011b).

CRITERIA AIR POLLUTANTS

Concentrations of ozone, CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

A brief description of each criteria air pollutant—source types, health effects, and future trends—is provided below and summarized in Table 3.4-5 along with a description of the most current emissions inventory, attainment area designations, and monitoring data for the study area.

OZONE

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels. Emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels (ARB 2009).

NITROGEN DIOXIDE

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions (EPA 2011).

PARTICULATE MATTER

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate

matter formed in the atmosphere by reaction of gaseous precursors (ARB 2009). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM_{10} emissions are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly over the last 20 years, and are projected to continue. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020 (ARB 2009).

Table 3.4-5. Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from reaction of ROG and NO_X in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	headache, dizziness, fatigue, nausea, vomiting, death	permanent heart and brain damage
Nitrogen dioxide (NO_2)	combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO_2 and ROG	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	alterations to the immune system, carcinogenesis
Lead	metal processing	reproductive/developmental effects (fetuses and children)	numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.
[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.
[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.
Sources: EPA 2011.

MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

Concentrations of criteria air pollutants are measured two monitoring stations in the LTAB. The South Lake Tahoe–Sandy Way station and South Lake Tahoe–1901 Airport Road station. In general, the measurements of ambient air quality from these monitoring stations are representative of the air quality in the vicinity of the study area. Table 3.4-6 summarizes the air quality data from these stations for 2008–2010.

Table 3.4-6. Summary of Annual Air Quality Data (2008–2010) [1]			
Ozone [2]	**2008**	**2009**	**2010**
Maximum concentration (1-hour/8-hour, ppm)	0.091/0.077	0.077/0.071	—
Number of days state standard exceeded (1-hour/8-hour)	0/5	0/1	—
Number of days national standard exceeded (1-hour/8-hour)	0/1	0/0	—
Respirable Particulate Matter (PM_{10}) [3]	**2008**	**2009**	**2010**
Maximum Concentration ($\mu g/m^3$) (California)	96.7	52.8	71.4
Number of days state standard exceeded (measured [4])	10	1	2
Number of days national standard exceeded (measured [4])	*	*	*

Notes: $\mu g/m^3$ = micrograms per cubic meter;— = data not available; ppm = parts per million; * = Insufficient data to determine the value.

1 Data provided from the South Lake Tahoe–Sandy Way and South Lake Tahoe–1901 Airport Road monitoring stations, as noted below. Data on carbon monoxide, nitrogen dioxide, sulfur dioxide, and fine particulate matter not available for the Lake Tahoe Air Basin.

2 Data from the South Lake Tahoe–1901 Airport Road Station; data not available after 2009.

3 Data from the South Lake Tahoe–Sandy Way Station.

4 Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2011b

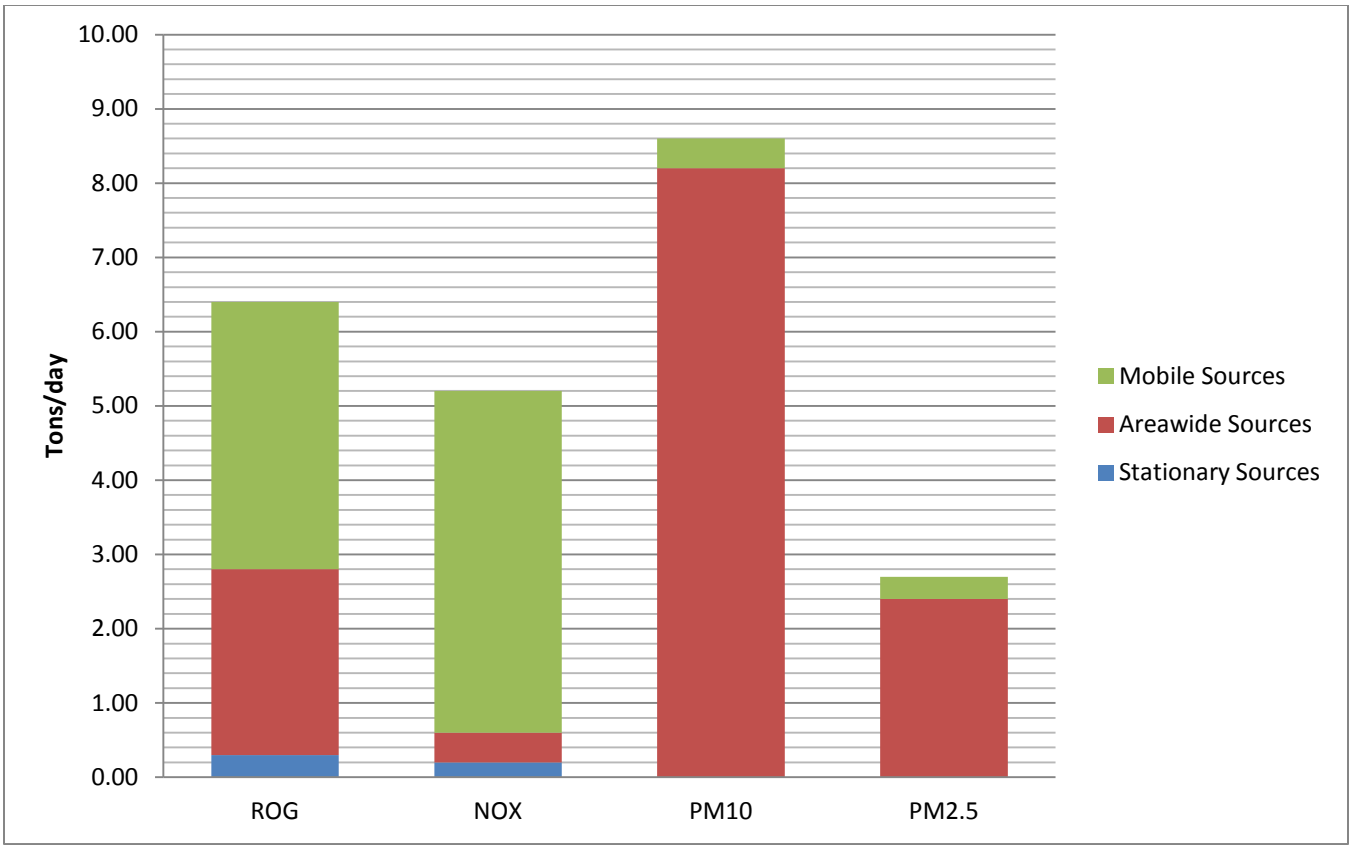
EMISSIONS INVENTORY

Exhibit 3.4-1 summarizes emissions of criteria air pollutants and precursors within the for various source categories. According to the LTAB emissions inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_X accounting for approximately 37 percent and 88 percent respectively, of the total emissions. Areawide sources account for approximately 95 percent and 89 percent of the Basin's PM_{10} and $PM_{2.5}$ emissions, respectively (ARB 2008).

TOXIC AIR CONTAMINANTS

Concentrations of TACs are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2009), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel PM. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.



Source: ARB 2008.

Exhibit 3.4-1. Lake Tahoe Air Basin 2008 Emissions Inventory

Major sources of TACs in the LTAB include Sierra Pacific Power Company located in Kings Beach (ARB 2011c). This facility's TAC emissions are within acceptable limits, according to ARB (i.e., emissions of TACs do not result in health risks greater than 10 in one million or Hazard Index greater than 1) (ARB 2011c). Major highways and roadways are also considered sources of TAC emissions, associated with the presence of diesel PM emissions from vehicle exhaust. US 50; California State Routes (SR) 267, 28, and 89; and Nevada State Routes (SR) 28 and 431 are located within the plan area.

Naturally Occurring Asbestos

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Naturally occurring asbestos, which was identified as a TAC by ARB in 1986, is located in many parts of California and is commonly associated with serpentine.

According to two reports by the California Department of Conservation Division of Mines and Geology *Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California* and *A General Location Guide to Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Higgins and Clinkenbeard 2006:54, Churchill and Hill 2000), the Tahoe Basin is not likely to contain naturally occurring asbestos.

ATMOSPHERIC DEPOSITION

Lake Tahoe's clarity has been generally decreasing by an average of approximately 1 foot per year for over 30 years (see Section 3.8, Hydrology and Water Quality, for more information). Clarity loss has historically been

attributed to increased inputs of the nutrients nitrogen and phosphorus. These nutrients cause an increase in the growth of algae, which results in reduced clarity. Recent data indicate that particles in the water also have a significant impact to lake clarity, and possibly even more than algal growth. Data from the late 1970s and early 1980s found that nitrogen deposition from the atmosphere was contributing to the nutrient load in the Lake. At that time, it was believed that excess nitrogen was having the largest impact on the loss of lake clarity. Therefore, TRPA adopted a threshold indicator for nitrogen deposition to the Lake. However, data collected in the 1980s and 1990s indicated that phosphorus also plays a significant role in lake clarity, and in some years its role was equal to or more significant than nitrogen. Research published in 1994 found that phosphorus is also depositing from the air into the Lake (Jassby et al. 1994). This has prompted further study into the role of atmospheric deposition, with data indicating that phosphorus loading to the Lake must also be reduced if the loss of clarity is to be slowed and, hopefully, reversed. Although TRPA has not yet adopted indicators for deposition of phosphorus, it is expected that as the indicator update process gets underway, an indicator will be included for this nutrient. As discussed above, particle deposition to the Lake is also important to clarity.

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as "flowery" or "sweet," then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that detection or recognition of the odor is difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

The Region does not contain major sources of potential odor-generating uses, such as landfills, large wastewater treatment facilities, dairies, or chemical manufacturing plants. The South Tahoe Refuse Transfer Station and Materials Recovery Facility, is located in South Lake Tahoe, and the Region also includes three small wastewater treatment facilities and numerous enclosed pump stations that pump wastewater out of the Region. Pump stations are enclosed and potential odorous emissions are therefore contained. Diesel exhaust from vehicles could be generated throughout the Region, but these sources are intermittent and temporary, and dissipate rapidly from the source with an increase in distance.

SENSITIVE RECEPTORS

Sensitive receptors are people, or facilities that generally house people (e.g., schools, hospitals, residences), that may experience adverse effects from unhealthful concentrations of air pollutants. Sensitive land uses are land uses that accommodate sensitive receptors, and exposure to pollutants could result in health-related risks to

individuals. Existing sensitive land uses that accommodate sensitive receptors throughout the Tahoe Region include residences, schools, hospitals, daycare centers, parks and playgrounds.

3.4.4 ENVIRONMENTAL CONSEQUENCES AND RECOMMENDED MITIGATION MEASURES

This section analyzes the air quality impacts associated with each of the Regional Plan Update alternatives. Analysis for each significance criteria will include a policy-level discussion of anticipated impacts. Significant impacts are identified and mitigation measures are provided where appropriate.

METHODS AND ASSUMPTIONS

The operational emissions (i.e., regional area- and mobile-source emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$) of build-out of each of the Regional Plan Update alternatives were estimated using ARB's Mobile-Source Emission Factor Model (EMFAC) 2011 (ARB 2011a), based on inputs from the transportation analysis. (See Section 3.3, Transportation, and Appendix E for the transportation analysis; EMFAC modeling output is provided in Appendix F). EMFAC 2011 and 2007 were both used for the purposes of transportation conformity analysis for CO. Both models were used because EMFAC 2011 is the most recent model from ARB and contains the best available emission factors reflective of the current vehicle fleet; however, EPA has not yet adopted EMFAC 2011 as the acceptable model to determine transportation conformity. Thus, EMFAC 2007 is the model currently accepted by EPA for conformity purposes.

It is not possible to speculate on the specific type, number, location, timing, or construction details of future projects that would be proposed over the planning horizon of the Regional Plan, so short-term construction-generated emissions of criteria air pollutants and ozone precursors (which would be assessed at the project level during environmental review of specific development proposals) were assessed qualitatively.

Local mobile-source impacts were evaluated in accordance with the Transportation Project-Level Carbon Monoxide Protocol (Garza et al. 1997).

Construction-generated emissions of TACs were evaluated qualitatively. Operational emissions of TACs were evaluated qualitatively based on the level of diesel PM and $PM_{2.5}$ emissions associated with plan implementation, and the proximity to off-site sensitive receptors.

Odor-related impacts were assessed qualitatively.

Atmospheric nitrogen deposition was assessed quantitatively using mobile-source operational NO_X emissions data estimated using EMFAC 2011.

SIGNIFICANCE CRITERIA

For purposes of this analysis, the following significance criteria have been used to determine whether implementation of the proposed project would result in significant air quality impacts. Implementation of the Regional Plan Update would result in a significant adverse effect on air quality if it would:

- cause a substantial increase in pollutant emissions or a deterioration of ambient air quality;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation[1];

[1] With the proposed amendments to the TRPA Code of Ordinances in place; in the case of CO, ozone, and particulate matter, the TRPA threshold standards would be identical to the most stringent applicable ambient air quality standards. If the plan alternative under consideration would not violate an air quality standard, then the plan alternative would not interfere with maintenance or achievement of TRPA threshold standards.

- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions that exceed quantitative threshold standards for ozone precursors);
- conflict with applicable local, state or regional air quality plans;
- expose sensitive receptors to substantial pollutant concentrations (including TACs/HAPs); or,
- create objectionable odors affecting a substantial number of people.

IMPACT ANALYSIS AND MITIGATION MEASURES

Impact 3.4-1 **Consistency with Air Quality Plan and Transportation Conformity.** All of the Regional Plan Update alternatives would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. If the transportation emissions budget is met, then the Basin is considered to be on track for maintaining attainment of the CO AAQS. Therefore, none of the Regional Plan Update alternatives would result in emission levels that would conflict with or obstruct implementation of any applicable air quality-related plans. This impact would be **less than significant** for all alternatives.

For the California portion of the LTAB, the applicable federal air quality maintenance plan for Lake Tahoe is the Carbon Monoxide Maintenance Plan (CO Maintenance Plan) originally adopted in 1996 and revised in 2004 (ARB 2004). Part of the maintenance strategy involves allocation of transportation emissions budgets to the maintenance areas. The motor vehicle emissions budgets for the Lake Tahoe Maintenance Areas are summarized in Table 3.4-7.

Table 3.4-7. Carbon Monoxide Maintenance Area Emissions Budgets (TPD)

CO Maintenance Area	2010	2018
Lake Tahoe North Shore (Eastern Placer County)	11	11
Lake Tahoe South Shore (Eastern El Dorado County)	19	10

Notes: CO = carbon monoxide; TPD = tons per day.
Source: TMPO 2011:2.

The Regional Plan Update is a process parallel with the update of the RTP. Each RTP alternative is being designed to accommodate the growth anticipated under each Regional Plan Update alternative through sets of transportation strategies and projects. The RTP must conform to the transportation emissions budget, or the Region would face penalties for impairing the Region's ability to maintain the federal CO standards. The emissions budgets only apply to VMT in the applicable California jurisdiction. If the RTP conforms to the emissions budget allocated to the Region, then the RTP would be consistent with the CO maintenance strategy for the CO NAAQS.

Unlike the California portion of the Basin, the Nevada portion has no emissions budget and operates under a Limited Maintenance Plan that was adopted by EPA in 2004 (TRPA 2008:70). Thus, there is no emissions budget with which to conform. The Limited Maintenance Plan includes provisions for interagency consultation procedures should CO concentrations exceed pre-determined trigger levels, which include exceedances of the 8-hour CO standard (TRPA 2008:70). Interagency consultation on the RTP/SCS is underway (TMPO 2011).

The LTAB is in attainment or designated unclassified for all NAAQS and is designated a nonattainment area for the ozone and PM_{10} CAAQS.

The Transportation Element of the Regional Plan Update seeks to accommodate the expected growth in the Region in a way that improves traffic flow and mobility of residents and visitors to the Region, and reduces regional and localized traffic congestion.

An analysis of conformity of the RTP with the regional air quality plan for CO was conducted for the RTP/SCS EIS/EIR (TMPO 2011) and is reproduced here for reference. Absolute VMT in the respective California portions of the Basin (Placer and El Dorado Counties) was obtained from the TRPA travel demand model (Section 3.3, Transportation, and Appendix E) for each alternative. VMT was calculated by multiplying the length of roadway segments in Placer and El Dorado Counties times the average daily traffic (ADT) volume for 2010, 2020, and 2035. VMT was interpolated to derive activity data for attainment milestone years 2018 and 2026. Daily CO emissions associated with VMT were modeled using EMFAC 2007 and EMFAC 2011 and compared with the applicable emissions budget for the respective portions of the Basin (i.e., Placer and El Dorado Counties). Both models were used because EMFAC 2007 is the current model accepted by EPA for purposes of conformity analysis, but it is anticipated that EPA will soon begin accepting EMFAC 2011 results. EPA review of EMFAC 2011 is currently in process. Both EMFAC models produce similar results, but results of EMFAC 2011 are slightly higher than those from EMFAC 2007. CO emissions estimated using both EMFAC models for Alternatives 1 through 5 would conform to the emissions budgets.

ALTERNATIVE 1: NO PROJECT

Under Alternative 1, no changes would be made to the 1987 Regional Plan. The transportation strategy of Alternative 1 would consist of basic maintenance of the existing transportation infrastructure in the Region and construction of projects that are already substantially in progress. Alternative 1 would authorize no additional development allocations beyond those remaining from the 1987 Regional Plan (i.e., 874 bonus residential units, 383,600 square feet CFA, and 342 TAUs). Estimated mobile-source CO emissions associated with Alternative 1 and transportation conformity analysis results are summarized below in Table 3.4-8.

Table 3.4-8. Alternative 1 Mobile-Source Carbon Monoxide Emissions Transportation Conformity Analysis

Attainment Milestone Year	CO Maintenance Area							
	Eastern El Dorado County (South Shore)				Eastern Placer County (North Shore)			
	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?
	EMFAC 2011	EMFAC 2007			EMFAC 2011	EMFAC 2007		
2010	7.95	6.84	19	Yes	4.35	3.25	11	Yes
2018	3.32	3.15	10	Yes	1.86	1.48	11	Yes
2026	1.76	1.62	-	n/a	1.05	0.82	-	n/a

Notes: CO = carbon monoxide; EMFAC = Mobile-Source Emission Factor Model; TPD = tons per day.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Alternative 1 would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. The transportation emissions budget is the basis for air quality planning efforts in the Lake Tahoe CO Maintenance Plan. If the transportation emissions budget is met, then the Basin is considered to be on track for maintaining attainment of the CO AAQS. Alternative 1 would not conflict with or obstruct regional CO maintenance efforts. This impact would be **less than significant.**

ALTERNATIVE 2: LOW DEVELOPMENT, INCREASED REGULATION

Alternative 2 would include a limited number of new residential allocations (i.e., a maximum of 2,600 total, or 130 per year) and 200,000 square feet of new commercial floor area (CFA), in addition to the remaining

allocations in the 1987 Regional Plan. Estimated mobile-source CO emissions associated with Alternative 2 and transportation conformity analysis results are summarized below in Table 3.4-9.

Table 3.4-9. Alternative 2 Mobile-Source Carbon Monoxide Emissions Transportation Conformity Analysis

Attainment Milestone Year	CO Maintenance Area							
	Eastern El Dorado County (South Shore)				Eastern Placer County (North Shore)			
	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?
	EMFAC 2011	EMFAC 2007			EMFAC 2011	EMFAC 2007		
2010	7.95	6.84	19	Yes	4.35	3.25	11	Yes
2018	3.23	3.11	10	Yes	1.82	1.46	11	Yes
2026	1.75	1.62	-	n/a	1.04	0.82	-	n/a

Notes: CO = carbon monoxide; EMFAC = Mobile-Source Emission Factor Model; TPD = tons per day.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Alternative 2 would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. The transportation emissions budget is the basis for air quality planning efforts in the Lake Tahoe CO Maintenance Plan. If the transportation emissions budget is met, then the Basin is considered to be on track for maintaining attainment of the CO AAQS. Alternative 2 would not conflict with or obstruct regional CO maintenance efforts. This impact would be **less than significant**.

Alternative 3: Low Development, Incentivized Redevelopment

Alternative 3 would include remaining allocations from the 1987 Regional Plan, 2,600 new residential allocations, 600 new residential bonus units, and 200,000 square feet of new CFA. Estimated mobile-source CO emissions associated with Alternative 3 and transportation conformity analysis results are summarized below in Table 3.4-10.

Table 3.4-10. Alternative 3 Mobile-Source Carbon Monoxide Emissions Transportation Conformity Analysis

Attainment Milestone Year	CO Maintenance Area							
	Eastern El Dorado County (South Shore)				Eastern Placer County (North Shore)			
	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?
	EMFAC 2011	EMFAC 2007			EMFAC 2011	EMFAC 2007		
2010	7.95	6.84	19	Yes	4.35	3.25	11	Yes
2018	3.27	3.15	10	Yes	1.84	1.46	11	Yes
2026	1.76	1.63	-	n/a	1.04	0.82	-	n/a

Notes: CO = carbon monoxide; EMFAC = Mobile-Source Emission Factor Model; TPD = tons per day.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Alternative 3 would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. The transportation emissions budget is the basis for air quality planning efforts in the Lake Tahoe CO Maintenance Plan. If the transportation emissions budget is met, then the Basin is considered to be on track for maintaining attainment of the CO AAQS. Alternative 3 would not conflict with or obstruct regional CO maintenance efforts. This impact would be **less than significant**.

Alternative 4: Reduced Development, Incentivized Redevelopment

Alternative 4 would increase the amount of development compared to Alternatives 1, 2, and 3. Alternative 4 would allow the remaining allocations from the 1987 Regional Plan, but would also include 4,000 new residential

units, 400,000 square feet of CFA, and 200 new TAUs. Estimated mobile-source CO emissions associated with Alternative 4 and transportation conformity analysis results are summarized below in Table 3.4-11.

Table 3.4-11. Alternative 4 Mobile-Source Carbon Monoxide Emissions Transportation Conformity Analysis

Attainment Milestone Year	CO Maintenance Area							
	Eastern El Dorado County (South Shore)				Eastern Placer County (North Shore)			
	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?
	EMFAC 2011	EMFAC 2007			EMFAC 2011	EMFAC 2007		
2010	7.95	6.84	19	Yes	4.35	3.25	11	Yes
2018	3.32	3.18	10	Yes	1.86	1.48	11	Yes
2026	1.81	1.67	-	n/a	1.08	0.84	-	n/a

Notes: CO = carbon monoxide; EMFAC = Mobile-Source Emission Factor Model; TPD = tons per day.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Alternative 4 would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. The transportation emissions budget is the basis for air quality planning efforts in the Lake Tahoe CO Maintenance Plan. If the transportation emissions budget is met, then the Basin is considered to be on track for maintaining attainment of the CO AAQS. Alternative 4 would not conflict with or obstruct regional CO maintenance efforts. This impact would be **less than significant**.

Alternative 5: Similar Rate of Development and Regulatory Structure to the 1987 Regional Plan

Alternative 5 would include the group of projects listed under Transportation Strategy Package A, which includes status quo of projects in the Basin and includes operation and maintenance of the existing transportation system and the construction of projects on the constrained project list already significantly in progress. Alternative 5 would represent a continuation of the level of development experienced under the 1987 Regional Plan. Alternative 5 would authorize 4,091 new residential allocations, 600,000 square feet CFA, and 400 new TAUs, in addition to the remaining allocations allowed under the 1987 Regional Plan. Estimated mobile-source CO emissions associated with Alternative 5 and transportation conformity analysis results are summarized below in Table 3.4-12.

Table 3.4-12. Alternative 5 Mobile-Source Carbon Monoxide Emissions Transportation Conformity Analysis

Attainment Milestone Year	CO Maintenance Area							
	Eastern El Dorado County (South Shore)				Eastern Placer County (North Shore)			
	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?	Estimated Emissions (TPD)		Emissions Budget (TPD)	Budget Met?
	EMFAC 2011	EMFAC 2007			EMFAC 2011	EMFAC 2007		
2010	7.95	6.84	19	Yes	4.35	3.25	11	Yes
2018	3.35	3.21	10	Yes	1.87	1.49	11	Yes
2026	1.83	1.69	-	n/a	1.09	0.85	-	n/a

Notes: CO = carbon monoxide; EMFAC = Mobile-Source Emission Factor Model; TPD = tons per day.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Alternative 5 would result in mobile-source CO emissions well within the emissions budgets allocated for transportation conformity. The transportation emissions budget is the basis for air quality planning efforts in the Lake Tahoe CO Maintenance Plan. If the transportation emissions budget is met, then the Basin is considered to

be on track for maintaining attainment of the CO AAQS. Alternative 5 would not conflict with or obstruct regional CO maintenance efforts. This impact would be **less than significant**.

MITIGATION MEASURES

No mitigation is required for any of the alternatives.

Impact 3.4-2	**Short-Term Construction Emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.** Construction emissions are described as "short-term" or temporary in duration and have the potential to represent a significant impact with respect to air quality. ROG and NO_X emissions are primarily associated with gas and diesel equipment exhaust and the application of architectural coatings. Fugitive dust emissions (PM_{10} and $PM_{2.5}$) are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT by construction vehicles on- and off-site. Implementation of projects would involve construction that would result in the temporary generation of ROG and NO_X (ozone precursors), PM_{10} and $PM_{2.5}$ emissions from site preparation (e.g., excavation, grading, and clearing); off-road equipment, material import/export, worker commute exhaust emissions, paving, and other miscellaneous activities. Typical construction equipment associated with development and redevelopment projects includes dozers, graders, excavators, loaders, and trucks. Construction emissions of these pollutants associated with Alternatives 1, 2, 3, 4, and 5 have the potential to be substantial, and would result in **potentially significant** impact to air quality.

Although it is not possible to speculate on the exact type, number, location, or timing of future projects that would be proposed over the planning horizon of the Regional Plan, nor on the precise nature or degree of environmental impacts associated with such projects, Regional Plan policies and threshold standard attainment will be accelerated and/or realized through future projects that will require construction activity. Proposed projects may include development, redevelopment, commercial and tourist uses, transit and transportation, recreation, public/quasi-public facilities, and natural resources restoration. Because specific projects would involve construction and construction emissions, the impact analysis below pertains to the potential for the different levels of development authorized under each of the Regional Plan Update alternatives to result in significant adverse impacts to air quality from project construction.

The Regional Plan includes goals, policies, and Code provisions to improve air quality in the Region, as contained in the Air Quality Subelement of the TRPA Goals and Policies document (TRPA 2012b), and Chapter 33, Grading and Construction and Chapter 65, Air Quality and Transportation, of the Code.

Because several local jurisdictions have their own regulations pertaining to construction emissions, project construction activities in those locations would be required to comply with those rules under all proposed alternatives. For projects in Placer, El Dorado, and Washoe Counties, construction equipment exhaust emissions may not exceed PCAPCD and EDCAQMD Rule 202 or Washoe County Health District Regulation 040.005 limitations regarding visible emissions, respectively. Operators of vehicles and equipment that exceed opacity limits must be immediately notified and the equipment must be repaired within 72 hours. Construction of projects located in California are also required to comply with all other applicable PCAPCD or EDCAQMD rules, as appropriate, including Rule 228 (PCAPCD) and 223 (EDCAQMD) regarding fugitive dust, Rule 218 (PCAPCD) and 215 (EDCAQMD) regarding the application of architectural coatings, and Rule 217(PCAPCD) and 224 (EDCAQMD) regarding cutback and emulsified asphalt paving materials; and projects located in Washoe County would be required to comply with Regulations 040.030 Dust Control, 040.090 Cutback Asphalts, and 040.200 Diesel Engine Idling.

ALTERNATIVE 1: NO PROJECT

Alternative 1 would authorize no additional development allocations beyond those remaining from the 1987 Regional Plan, which would result in very low levels of development and redevelopment over the planning horizon of the Regional Plan. Construction of projects under Alternative 1, however, would be expected to generate equipment exhaust and fugitive dust emissions that could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB portion of Placer and El Dorado Counties with respect to the California standards. Therefore, construction accommodated under Alternative 1, although very low, would result in a **potentially significant** impact to air quality.

ALTERNATIVE 2: LOW DEVELOPMENT, INCREASED REGULATION

Alternative 2 would authorize an additional 200,000 square feet of CFA and 2,600 new residential allocations in addition to allocations remaining from the 1987 Regional Plan.

Although project-specific details cannot be known, the types of construction activities that would be associated with land use development and redevelopment projects typically generate equipment exhaust and fugitive dust emissions that could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB portion of Placer and El Dorado Counties with respect to the California standards. Therefore, construction accommodated under Alternative 2 would result in a **potentially significant** impact to air quality.

ALTERNATIVE 3: LOW DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

Alternative 3 would authorize an additional 200,000 square feet of CFA, 2,600 new residential allocations, and 600 new residential bonus units in addition to allocations remaining from the 1987 Regional Plan. For the same reasons described under Alternative 2, Alternative 3 could contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB portion of Placer and El Dorado Counties with respect to the California and TRPA standards. Therefore, construction of Alternative 3 would result in a **potentially significant** impact to air quality.

ALTERNATIVE 4: REDUCED DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

Alternative 4 would authorize an additional 400,000 square feet of CFA, 4,000 new residential allocations, and 200 new TAUs in addition to allocations remaining from the 1987 Regional Plan. For the same reasons described under Alternative 2, Alternative 4 could contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB portion of Placer and El Dorado Counties with respect to the California and TRPA standards. Therefore, construction of Alternative 4 would result in a **potentially significant** impact to air quality.

ALTERNATIVE 5: SIMILAR RATE OF DEVELOPMENT AND REGULATORY STRUCTURE TO THE 1987 REGIONAL PLAN

Alternative 5 would represent a continuation of the level of development experienced under the 1987 Regional Plan. Alternative 5 would also result in the addition of 600,000 square feet CFA, 5,200 new residential allocations (new residential units would be limited to the 4,091 available development rights), and 400 new TAUs in addition to the remaining allocations allowed under the 1987 Regional Plan. For the same reasons

described under Alternative 2, Alternative 5 could contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB portion of Placer and El Dorado Counties with respect to the California and TRPA standards. Therefore, construction of Alternative 5 would result in a **potentially significant** impact to air quality.

MITIGATION MEASURES

The following mitigation is required for Alternatives 1, 2, 3, 4, and 5.

Mitigation Measure 3.4-2: Develop and Implement a Best Construction Practices Policy for Construction Emissions

Within 12 months of adoption of an updated Regional Plan, TRPA will coordinate implementation of Best Construction Practices for Construction Emissions through TRPA approved plans, project-permitting, or projects/programs developed in coordination with local or other governments that require, as a condition of project approval, implementation of feasible measures and Best Management Practices to reduce construction-generated emissions to the extent feasible. Until that time, TRPA will continue existing practice to require measures developed on a project-specific basis. Where local ordinances, rules, or regulations already require Best Construction Practices for construction emissions, no further action is necessary. Where local government ordinances, rules, or regulations do not adequately address Best Construction Practices, those practices will be implemented through local government and/or TRPA permitting activities. Such measures may include, but are not limited to, the following:

- *Construction contractors shall prepare and submit an inventory of heavy-duty equipment over 50 horsepower and used an aggregate of 40 or more hours during construction. The equipment inventory shall demonstrate that the project-wide fleet average will achieve a minimum 20 percent NO_X and 45 percent particulate matter emissions reduction compared to the most recent statewide average. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.*

- *Fugitive dust shall not exceed 40 percent opacity and not go beyond the property boundary at any time during project construction.*

- *No open burning of removed vegetation shall occur during infrastructure improvements.*

- *Minimize idling time to five minutes for all diesel-power equipment.*

- *Apply water to control dust as needed to prevent dust impacts offsite. Operational water truck(s) shall be onsite, as required, to control fugitive dust. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt from being released or tracked off-site.*

- *Apply approved chemical soil stabilizers, vegetative mats, or other appropriate Best Management Practices to manufacturer's specifications, to all inactive construction areas (previously graded areas which remain inactive for 96 hours). Spread soil binders on unpaved roads and employee/equipment parking areas and wet broom or wash streets if silt is carried over to adjacent public thoroughfares.*

- *Utilize existing power sources (e.g., power poles) or clean-fuel generators rather than temporary diesel power generators, wherever feasible.*

Significance After Mitigation

Mitigation Measure 3.4-2 includes basic best practices for dust control during construction. Implementation of Mitigation Measure 3.4-2 would reduce fugitive PM_{10} and $PM_{2.5}$ dust emissions a minimum of approximately 50

percent for each project and prevent dispersion, thereof, beyond a given property boundary (SMAQMD 2009a). Implementation of Mitigation Measure 3.4-2 would also reduce diesel equipment exhaust emissions of NO_X and PM_{10} by a minimum of 20 percent and 45 percent, respectively, as prescribed by the mitigation measure. It is anticipated that these best practices would be effective in substantially reducing construction-generated emissions. Importantly, projects located in PCAPCD's or EDCAQMD's jurisdiction must demonstrate that emissions would be mitigated to below district-applicable threshold standards for construction emissions as a condition of approval. This would ensure that impacts from project-specific construction activities would be mitigated to **less-than-significant** levels.

Impact 3.4-3	**Long-Term Operational Emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.** Project-related operational emissions of the ozone precursors ROG and NO_X would be reduced over the plan implementation period under Alternatives 1 through 5, as compared with existing conditions. Each Regional Plan Update alternative may result in a slight long-term increase in emissions of PM over the plan period. This would be largely attributable to the increased number of natural gas fireplaces and EPA-certified wood stoves that would be associated with new development allocations under Alternatives 2 through 5. However, the total increase in PM emissions associated with each Plan alternative would be less than the amount considered significant by PCAPCD (82 pounds per day). In addition, TRPA will continue to implement its wood stove retrofit program, which is expected to contribute to a continuing trend of improvement in baseline PM emissions levels in the Basin. The increase in operational ozone precursors and PM emissions associated with Alternatives 1 through 5 would not be expected to result in a substantial contribution to a violation of air quality standards. This impact would be **less than significant**.

Proposed projects that may occur under the Regional Plan may include development, redevelopment, commercial and tourist uses, transit and transportation, recreation, public/quasi-public facilities, and natural resources restoration. The impact analysis below pertains to the potential for the different levels of development authorized under each of the Regional Plan Update alternatives to result in significant adverse impacts to air quality from project operation.

As described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background, mobile-source operational emissions would decrease for all pollutants associated with Alternatives 1 through 5 because of more stringent vehicle emission standards over the planning period. The emissions model used in this analysis (EMFAC 2011) accounts for already enacted (present) and approved (future) vehicle emissions control measures contained in SIPs submitted to EPA, smog check programs, truck and bus emissions rules, and fuel economy standards, which would result in foreseeable mobile-source emission reductions in the Basin (ARB 2012b). Area-source emissions would include emissions from consumer products, landscaping and maintenance, wood-burning appliances, and snow removal equipment. Natural gas-related emissions would be associated with space and water heating.

Basin-wide VMT was obtained from the TRPA travel demand model (see Appendix E) and was estimated using the origin-destination method recommended by the SB 375 Regional Targets Advisory Committee (RTAC) (discussed in Section 3.5, Greenhouse Gas Emissions and Climate Change). Total Basin-wide mobile-source emissions associated with VMT from each alternative were modeled using EMFAC 2011, a model widely used in air quality analysis (ARB 2012a). It was assumed that the vehicle fleet information contained in the EMFAC model for eastern Placer and El Dorado Counties would be representative of vehicles throughout the Region because the factors that determine vehicle choice (e.g., lifestyle, mobility, environmental, and local economic factors) do not differ dramatically throughout the Basin.

Area-source emissions (e.g., natural gas consumption for space and water heating, wood stoves and fireplaces, landscaping and snow removal equipment) were calculated using Basin-specific inputs and default model assumptions in CalEEMod. To be conservative, it was assumed that 100 percent of new residential units would

include a fireplace. Based on information from the Washoe County Residential Wood Use Survey, it was assumed that 13 percent of new residential units would be equipped with EPA-certified wood stoves and 87 percent would be equipped with natural gas fireplaces (Washoe County 2010). New open wood-burning fireplaces are not allowed under current TRPA code. Wood stove and natural gas fireplace-related emissions are reported under "Area-Source Emissions" in the tables below. It was assumed that landscaping equipment would be used 180 days per year by model default for the Tahoe Basin, and that snow removal equipment would be used 72 days per year based on the number of precipitation days per year for the climate zone of the Tahoe Basin. Natural gas-related emissions were also calculated using default assumptions within CalEEMod.

Emissions associated with waterborne transit vehicles were estimated using the ARB California Commercial Harbor Craft Emissions Inventory database tool (ARB 2012c). It was assumed that three additional ferries would operate simultaneously under Alternatives 1, 3, 4, and 5. Though waterborne transit is a specific transportation program identified in the RTP, associated emissions are reported within this analysis of the Regional Plan Update alternatives for completeness.

TRPA's existing wood stove retrofit program, applicable county and state regulations, and other programs to improve air quality have resulted in a baseline condition with a positive trend toward attainment of PM and visibility threshold indicators and AAQS (TRPA 2012a). The net increase in emissions associated with operation of each alternative was estimated for build-out (2035) and compared with existing conditions (2010), and significance conclusions are based on this data. For informational purposes, the net increases in emissions associated with operation of each alternative in year 2035 were also compared with operation of Alternative 1, the No Project Alternative. This exercise is intended to provide additional information about the level of emissions associated with individual alternatives above-and-beyond what would happen without the project.

TRPA's significance criteria for ozone and PM are based on achieving concentration-based standards for these pollutants. In order to evaluate how a project or plan would affect regional attainment of concentration-based ambient air quality standards, local air pollution control districts and air quality management districts frequently rely on mass-emission-based significance criteria. TRPA, however, does not have mass-emission–based standards for projects or plans. For example, PCAPCD considers a project that would result in less than 82 pounds per day (lb/day) of ROG, NO_X, or PM to have a less-than-significant contribution to a violation of an ambient air quality standard for ozone and PM. EDCAQMD also considers a project that would result in less than 82 lb/day of ROG or NO_X to have a less-than-significant impact on ozone. These mass-emission threshold standards are tied to PCAPCD and EDCAQMD air quality attainment planning efforts of the CAAQS, which are as stringent as TRPA threshold standards for ozone and PM. Thus, it is appropriate to use PCAPCD and EDCAQMD significance criteria of 82 lb/day to evaluate how emissions from the Regional Plan Update alternatives might affect attainment planning efforts and TRPA threshold standards.

ALTERNATIVE 1: NO PROJECT

According to the transportation analysis prepared for the project, regional VMT in the Basin would increase by approximately 111,000 VMT/day by 2035 compared to 2010 conditions under Alternative 1. VMT per capita would increase by approximately 5 percent by 2035 compared to 2010 conditions.

Operational emissions modeling results are summarized in Table 3.4-13. Table 3.4-13 presents the net increase in emissions in 2035 compared with existing conditions (2010) associated with implementation of Alternative 1.

Based on the results of the emissions modeling presented in Table 3.4-13, emissions of ozone precursors, CO, and PM in the Basin would be expected to decrease by 2035 under Alternative 1. This can be explained by the fact that (as described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background) vehicle emissions standards would be improved substantially over the next 20 years (ARB 2012c), and no new development would be allocated beyond what was authorized in the 1987 Regional Plan under Alternative 1. Any additional population growth and associated increase in operational emissions in the Basin would be more than offset by more stringent vehicle

emissions standards. In other words, a net reduction in mobile-source emissions would occur, and would offset an increase in area-source emissions. Because Alternative 1 would result in a substantial long-term reduction in emissions of ozone precursors and slight reduction in PM, this impact would be **less than significant.**

Table 3.4-13. Alternative 1 Net Change in Operational Emissions (TPY)					
2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	14.55	0.28	19.89	1.83	1.83
Mobile-Source Emissions	-399.13	-636.52	-4,578.56	-6.21	-7.30
Natural Gas Emissions	0.23	2.00	1.23	0.16	0.16
Waterborne Transit Emissions	3.57	26.89	26.79	0.711	0.711
Total Emissions[2]	**-380.78**	**-607.35**	**-4,530.65**	**-3.51**	**-4.60**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Waterborne transit-related emissions were reported as PM, and were assumed to be comprised of 100% $PM_{2.5}$ as a worst-case assumption.
[2] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

ALTERNATIVE 2: LOW DEVELOPMENT, INCREASED REGULATION

According to the transportation analysis prepared for the project, regional VMT in the Basin would increase by approximately 93,000 VMT/day by 2035 compared to 2010 conditions under Alternative 2. VMT per capita would increase by approximately 0.25 percent by 2035 compared to 2010 conditions.

Operational emissions modeling results are summarized in Table 3.4-14. Table 3.4-14 presents the net change in emissions in 2035 compared with existing conditions (2010) associated with implementation of Alternative 2.

Table 3.4-14. Alternative 2 Net Change in Operational Emissions (TPY)					
2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	45.59	1.11	78.95	7.25	7.25
Mobile-Source Emissions	-400.44	-638.68	-4,588.93	-6.61	-7.41
Natural Gas Emissions	0.62	5.41	2.76	0.43	0.43
Total Emissions[1]	**-354.23**	**-632.16**	**-4,507.22**	**1.07**	**0.27**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

The net change in operational emissions that would occur under Alternative 2 compared with Alternative 1 (No Project) is summarized below in Table 3.4-15.

Based on the results of the emissions modeling presented in Table 3.4-14, emissions of ozone precursors and CO in the Basin would be expected to decrease substantially by 2035 under Alternative 2 compared to existing conditions. This can be explained by the fact that (as described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background) vehicle emissions standards would be improved substantially over the next 20 years (ARB 2012b), and limited development would be allocated beyond what was authorized in the 1987 Regional Plan under Alternative 2. Any additional population growth and associated increase in operational ozone precursor emissions in the Basin would be more than offset by more stringent vehicle emissions standards. The emissions model used in this analysis (EMFAC 2011) accounts for vehicle emissions control measures contained in State Implementation Plans submitted to EPA, smog check programs, truck and bus emissions rules, and fuel

economy standards (ARB 2012b). These regulatory programs are already in place or approved and will result in foreseeable emissions reductions in mobile-source emissions in the plan area.

Table 3.4-15. Alternative 2 Net Change in Operational Emissions Compared with Alternative 1 (TPY)

2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	31.04	0.83	59.06	5.42	5.42
Mobile-Source Emissions	-1.31	-2.15	-10.37	-0.40	-0.11
Natural Gas Emissions	0.39	3.41	1.53	0.27	0.27
Waterborne Transit Emissions[1]	-3.57	-26.89	-26.79	-0.71[2]	-0.71[2]
Total Emissions[3]	**26.54**	**-24.80**	**23.43**	**4.58**	**4.87**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Waterborne transit-related emissions are treated as negative because Alternative 2 does not include waterborne transit. Alternative 1 would result in higher emissions associated with this source compared with Alternative 2.
[2] Waterborne transit-related emissions were reported as PM, and were assumed to be comprised of 100% $PM_{2.5}$ as a worst-case assumption.
[3] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Emissions of PM_{10} and $PM_{2.5}$ would increase by a nominal amount (approximately 1 TPY or 6 lb/day and 0.3 TPY or 1.5 lb/day, respectively) by 2035. However, Alternative 2 would ensure that only wood stoves that meet EPA emissions standards would be installed and would allow air quality mitigation fees to be used for regional projects, which could include incentives to remove non-conforming stoves. Alternative 2 would also require all new projects, programs, and policies to demonstrate a decrease in air pollutants that are out of attainment of thresholds standards. These proposed changes would be expected to continue the trend of decreasing PM emissions in the Region over the planning period.

Alternative 2 would result in a substantial long-term reduction in emissions of ozone precursors and a nominal increase in PM Alternative 2 that would not be anticipated to contribute substantially to nonattainment conditions for the California standards. In addition, the increase in emissions of PM associated with build-out of the entire Plan alternative would be below the project-level increment considered significant by PCAPCD of 82 lb/day. This impact is considered **less than significant**.

ALTERNATIVE 3: LOW DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

According to the transportation analysis prepared for the project, regional VMT in the Basin would increase by approximately 126,000 VMT/day by 2035 compared to 2010 conditions under Alternative 3. VMT per capita would decrease by approximately 2 percent by 2035 compared to 2010 conditions.

Operational emissions modeling results are summarized in Table 3.4-16. Table 3.4-16 presents the net change in emissions in 2035 compared with existing conditions (2010) associated with implementation of Alternative 3.

Table 3.4-16. Alternative 3 Net Change in Operational Emissions (TPY)

2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	52.52	1.31	92.64	8.51	8.51
Mobile-Source Emissions	-398.07	-634.88	-4,570.13	-5.91	-7.08
Natural Gas Emissions	0.71	6.15	3.08	0.71	0.71
Waterborne Transit Emissions	3.57	26.89	26.79	0.71[1]	0.71[1]
Total Emissions[2]	**-341.27**	**-600.53**	**-4,447.62**	**3.80**	**2.63**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Waterborne transit-related emissions were reported as PM, and were assumed to be comprised of 100 percent $PM_{2.5}$ as a worst-case assumption.
[2] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

The net change in operational emissions that would occur under Alternative 3 compared with Alternative 1 (No Project) is summarized below in Table 3.4-17.

Table 3.4-17. Alternative 3 Net Change in Operational Emissions Compared with Alternative 1 (TPY)

2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	37.97	1.03	72.75	6.68	6.68
Mobile-Source Emissions	1.06	1.64	8.43	0.29	0.22
Natural Gas Emissions	0.48	4.15	1.85	0.33	0.33
Waterborne Transit Emissions	0	0	0	0	0
Total Emissions[1]	**39.51**	**6.82**	**83.03**	**7.30**	**7.23**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Based on the results of the emissions modeling presented in Table 3.4-16, emissions of ozone precursors and CO in the Basin would be expected to decrease substantially by 2035 under Alternative 3 compared to existing conditions. This can be explained by the fact that (as described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background) vehicle emissions standards would be improved substantially over the next 20 years (ARB 2012b), and limited development would be allocated beyond what was authorized in the 1987 Regional Plan under Alternative 3. Any additional population growth and associated increase in operational ozone precursor emissions in the Basin would be more than offset by more stringent vehicle emissions standards. As discussed under Alternative 2, the emissions model used in this analysis (EMFAC 2011) accounts for vehicle emissions control measures contained in State Implementation Plans submitted to EPA, smog check programs, truck and bus emissions rules, and fuel economy standards (ARB 2012b). These regulatory programs are already in place or approved and will result in foreseeable emissions reductions in mobile-source emissions in the plan area.

Emissions of PM_{10} and $PM_{2.5}$ would increase slightly by 2035 (approximately 4 TPY or 21 lb/day and 3 TPY or 14 lb/day, respectively). However, Alternative 3 would require that only wood stoves that meet EPA emissions standards would be installed and would allow air quality mitigation fees to be used for regional projects, which could include incentives to remove non-conforming stoves. These proposed changes would be expected to continue the trend of decreasing PM emissions in the Region over the planning period.

Because Alternative 3 would result in a substantial long-term reduction in emissions of ozone precursors, this impact is considered **less than significant** for ozone. Because the increase in emissions of PM associated with build-out of the entire Plan alternative would be below the project-level increment considered significant by PCAPCD (82 lb/day), Alternative 3 would not be anticipated to contribute substantially to nonattainment conditions for the California standards. This impact would also be **less than significant** for PM.

ALTERNATIVE 4: REDUCED DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

According to the transportation analysis prepared for the project, regional VMT in the Basin would increase by approximately 191,000 VMT/day by 2035 compared to 2010 conditions under Alternative 4. VMT per capita would increase by approximately 3 percent by 2035 compared to 2010 conditions.

Operational emissions modeling results are summarized in Table 3.4-18. Table 3.4-18 presents the net change in emissions in 2035 compared with existing conditions (2010) associated with implementation of Alternative 4.

Table 3.4-18 Alternative 4 Net Change in Operational Emissions (TPY)					
2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	64.24	1.56	110.83	10.18	10.18
Mobile-Source Emissions	-393.36	-627.36	-4,532.10	-4.38	-6.31
Natural Gas Emissions	0.88	7.64	3.93	0.61	0.61
Waterborne Transit Emissions	3.57	26.89	26.79	0.71[1]	0.71[1]
Total Emissions[2]	**-324.67**	**-591.27**	**-4,390.55**	**7.12**	**5.16**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Waterborne transit-related emissions were reported as PM, and were assumed to be comprised of 100% $PM_{2.5}$ as a worst-case assumption.
[2] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

The net change in operational emissions that would occur under Alternative 4 compared with Alternative 1 (No Project) is summarized below in Table 3.4-19.

Table 3.4-19. Alternative 4 Net Change in Operational Emissions Compared with Alternative 1 (TPY)					
2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	49.69	1.28	90.94	8.35	8.35
Mobile-Source Emissions	5.77	9.16	46.46	1.83	0.99
Natural Gas Emissions	0.65	5.64	2.70	0.45	0.45
Waterborne Transit Emissions	0	0	0	0	0
Total Emissions[1]	**56.11**	**16.08**	**140.10**	**10.63**	**9.79**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Based on the results of the emissions modeling presented in Table 3.4-18, emissions of ozone precursors and CO in the Basin would be expected to decrease substantially by 2035 under Alternative 4 compared to existing conditions. This can be explained by the fact that (as described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background) vehicle emissions standards would be improved substantially over the next 20 years, despite the additional development that would be allocated beyond what was authorized in the 1987 Regional Plan under Alternative 4. Any additional population growth and associated increase in operational ozone precursor emissions in the Basin would be offset by more stringent vehicle emissions standards. As discussed under Alternative 2, the emissions model accounts for vehicle emissions control measures contained in State Implementation Plans submitted to EPA, smog check programs, truck and bus emissions rules, and fuel economy standards (ARB 2012b). These regulatory programs are already in place or approved and will result in foreseeable emissions reductions in mobile-source emissions in the plan area.

Emissions of PM_{10} and $PM_{2.5}$ would increase slightly by 2035 (approximately 7 TPY or 39 lb/day and 5 TPY or 28 lb/day, respectively). However, Alternative 4 would require that only wood stoves that meet EPA emissions standards would be installed and would allow air quality mitigation fees to be used for regional projects, which could include incentives to remove non-conforming stoves. These proposed changes would be expected to continue the trend of decreasing PM emissions in the Region over the planning period.

Because Alternative 4 would result in a substantial long-term reduction in emissions of ozone precursors, this impact is considered **less than significant** for ozone. Because the increase in emissions of PM associated with

build-out of the entire Plan alternative would be below the project-level increment considered significant by PCAPCD 82 lb/day, Alternative 4 would not be anticipated to contribute substantially to nonattainment conditions for the California standards. This impact would also be **less than significant** for PM.

ALTERNATIVE 5: SIMILAR RATE OF DEVELOPMENT AND REGULATORY STRUCTURE TO THE 1987 REGIONAL PLAN

According to the transportation analysis prepared for the project, regional VMT in the Basin would increase by approximately 241,000 VMT/day by 2035 compared to 2010 conditions under Alternative 5. VMT per capita would increase by approximately 6 percent by 2035 compared to 2010 conditions.

Operational emissions modeling results are summarized in Table 3.4-20. Table 3.4-20 presents the net change in emissions in 2035 compared with existing conditions (2010) associated with implementation of Alternative 5.

Table 3.4-20. Alternative 5 Net Change in Operational Emissions (TPY)

2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	67.78	1.59	112.89	10.37	10.37
Mobile-Source Emissions	-390.08	-621.67	-4,503.11	-3.25	-5.84
Natural Gas Emissions	0.95	8.27	4.41	0.66	0.66
Waterborne Transit Emissions	3.57	26.89	26.79	0.71[1]	0.71[1]
Total Emissions[2]	**-317.78**	**-584.92**	**-4,359.02**	**8.49**	**5.90**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Waterborne transit-related emissions were reported as PM, and were assumed to be comprised of 100% $PM_{2.5}$ as a worst-case assumption.
[2] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

The net change in operational emissions that would occur under Alternative 5 compared with Alternative 1 (No Project) is summarized below in Table 3.4-21.

Table 3.4-21. Alternative 5 Net Change in Operational Emissions Compared with Alternative 1 (TPY)

2035	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area-Source Emissions	53.23	1.31	93.00	8.54	8.54
Mobile-Source Emissions	9.05	14.86	75.45	2.96	1.46
Natural Gas Emissions	0.72	6.27	3.18	0.50	0.50
Waterborne Transit Emissions	0	0	0	0	0
Total Emissions[1]	**63.00**	**22.44**	**171.63**	**12.00**	**10.50**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; TPY = tons per year.
[1] Totals may not sum exactly because of rounding.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

Based on the results of the emissions modeling presented in Table 3.4-20, emissions of NO_X and CO in the Basin would be expected to decrease substantially by 2035 under Alternative 5 compared to existing conditions. This can be explained by the fact that (as described in "Toxic Air Contaminants" in Section 3.4.2, Regulatory Background) vehicle emissions standards would be improved substantially over the next 20 years, despite the additional development that would be allocated beyond what was authorized in the 1987 Regional Plan under Alternative 5. Any additional population growth and associated increase in operational ozone precursor

emissions in the Basin would be offset by more stringent vehicle emissions standards. As discussed under Alternative 2, the emissions model used in this analysis accounts for vehicle emissions control measures contained in State Implementation Plans submitted to EPA, smog check programs, truck and bus emissions rules, and fuel economy standards (ARB 2012b). These regulatory programs are already in place or approved and will result in foreseeable emissions reductions in mobile-source emissions in the plan area.

Emissions of PM_{10} and $PM_{2.5}$ would increase slightly by 2035 (approximately 8.5 TPY or 46.5 lb/day and 6 TPY or 32 lb/day, respectively). However, TRPA's existing he wood stove retrofit program, applicable county and state regulations, and other programs to improve air quality have resulted in a positive trend toward attainment of PM and visibility threshold indicators and AAQS (TRPA 2012a). Since no changes are proposed to these existing programs and regulations, it is reasonable to expect that these existing program and regulations would continue to promote the existing decreasing trend in PM emissions in the Region over the planning period.

Because Alternative 5 would result in a substantial long-term reduction in emissions of ozone precursors, this impact is considered **less than significant** for ozone. Because the increase in emissions of PM associated with build-out of the entire Plan alternative would be below the project-level increment considered significant by PCAPCD 82 lb/day, Alternative 5 would not be anticipated to contribute substantially to nonattainment conditions for the California standards. This impact would also be **less than significant** for PM.

MITIGATION MEASURES

No mitigation is required for any of the alternatives.

Impact 3.4-4	**Long-Term Operational Localized Exposure to Mobile-Source Carbon Monoxide Emissions.** Under all of the Regional Plan Update alternatives, all affected intersections would be anticipated to operate at acceptable LOS (i.e., LOS D or better). Therefore, traffic volumes would not be heavy enough to result in a CO "hot spot." For this reason, and based on the fact that CO emission factors would be reduced substantially over the planning period, long-term operation of Regional Plan Update Alternatives 1 through 5 would not result in congestion at intersections that would result in a violation of an air quality standard (i.e., 1-hour CAAQS of 20 ppm, 8-hour TRPA standard of 6 ppm for CO), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This would be a **less-than-significant** impact.

As described above under Impact 3.4-1 regarding transportation conformity for regional CO, mobile-source CO emissions would be reduced substantially over the plan implementation period. All plan alternatives would be well within the CO emissions budgets allocated to the applicable jurisdictions. None of the Regional Plan Update alternatives would conflict with CO maintenance planning efforts.

The Regional Plan Update also proposes to align the TRPA standard for CO with the more stringent California and Nevada 8-hour CO standards of 6 ppm currently applied in the Lake Tahoe Air Basin. Because the more stringent standards are already in effect at the state level and the Basin currently attains the state ambient air quality standards for CO, the impact associated with changing the TRPA standard to match the state standards would be **less than significant** regardless of which action alternative is selected.

With respect to localized CO impacts, the Transportation Project-Level Carbon Monoxide Protocol (Garza et al. 1997) states that signalized intersections that operate at an unacceptable level of service (LOS) represent a potential for a CO violation, also known as a "hot spot." Thus, an analysis of CO concentrations is typically recommended for receptors located near signalized intersections that are projected to operate at LOS E or F.

According to the traffic analysis prepared for the Regional Plan Update, signalized intersections in the Basin under existing conditions plus Alternatives 1 through 3 measured in 2035 (i.e., the plan build-out year) would operate at LOS D or better (refer to Table 3.3-14 in Section 3.3, Transportation). Under Alternatives 4 and 5, the intersection of SR 28 and SR 267 would operate at LOS E.

In addition, as described in detail in Section 3.3, Transportation, as part of the Regional Plan Update, TRPA is considering a modification to its LOS goals. The proposed modification would allow vehicle LOS standards to be exceeded when provisions for multi-modal amenities (e.g., such as transit, bicycling, and walking facilities) are adequate to provide mobility for users. This policy change would encourage development of a more balanced transportation system. However, it could also potentially result in added delays and longer vehicle queues at intersections where this standard is applied. The analysis that follows evaluates the potential for localized CO violations at congested intersections that would operate at LOS E or F.

Alternative 1: No Project

As reported in Section 3.3, Transportation, under Alternative 1, all affected intersections would be anticipated to operate at acceptable LOS (i.e., LOS D or better). Therefore, it is not anticipated that traffic volumes would be heavy enough to result in a CO "hot spot" (Garza et al. 1997). For this reason, and based on the fact that CO emission factors would be reduced substantially over the planning period, as described above under Impact 3.4-1, long-term operational (local) mobile-source CO emissions under Alternative 1 would not violate an air quality standard (i.e., 1-hour CAAQS of 20 ppm, 8-hour CAAQS and newly proposed TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would be **less than significant**.

Alternative 2: Low Development, Increased Regulation

As reported in Section 3.3, Transportation, under Alternative 2, all affected intersections would be anticipated to operate at acceptable LOS. This impact is the same as described above for Alternative 1. This impact would be **less than significant**.

Alternative 3: Low Development, Incentivized Redevelopment

As reported in Section 3.3, Transportation, under Alternative 3, all affected intersections would be anticipated to operate at acceptable LOS. This impact is the same as described above for Alternative 1. This impact would be **less than significant**.

Alternative 4: Reduced Development, Incentivized Redevelopment

As reported in Section 3.3, Transportation, under Alternative 4, the intersection of SR 28 and SR 267 would be degraded from LOS C under existing conditions to LOS E.

The Sacramento Metropolitan Air Quality Management District (SMAQMD) developed screening criteria for determining whether local CO modeling is necessary to evaluate impacts of traffic congestion on local CO concentrations. The SMAQMD screening method was developed using emission factors from ARB's EMFAC model, the same modeling tool applied to estimate operational mobile-source emissions associated with the Regional Plan Update. Therefore, because SMAQMD's screening tool was developed using methods that also apply in the LTAB, it is appropriate to use the SMAQMD screening method for screening of CO impacts for intersections in the LTAB. The applicable screening criteria are as follows (SMAQMD 2009b:4-15, 4-16):

- The project would not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- The project would not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway, or other locations where horizontal or vertical mixing of air would be substantially limited; and
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the county average (as identified by the EMFAC or URBEMIS models).

Implementation of Alternative 4 would not trigger any of these screening criteria. Specifically, no affected intersections would experience more than 31,600 vehicles per hour (for instance, the intersection of SR 28 and SR 267 would experience 2,980 vehicles per peak hour under 2035 cumulative plus project conditions [see Section 3.3, Transportation]). Alternative 4 would not affect intersections where mixing would be substantially limited, and the vehicle fleet would not differ substantially from the local average. The SMAQMD screening criteria are associated with the 1-hour CAAQS for CO of 20 and 9 ppm, respectively. The Nevada AAQS for 1-hour CO (35 ppm) is less stringent than that applied in California. Additionally, the LTAB AAQS for 8-hour CO of 6 ppm is more stringent than the CAAQS of 9 ppm. However, because the affected intersection would accommodate traffic levels an order of magnitude below the SMAQMD screening level of 31,600 vehicles, in combination with the more stringent emission standards that would continue to reduce CO emissions from vehicles over the planning period, and the fact that the LTAB is a maintenance area for CO (rather than in nonattainment), it is not anticipated that an air quality violation would occur. Thus, implementation of Alternative 4 would not result in or contribute to local CO concentrations that exceed the TRPA 8-hour AAQS of 6 ppm, or Nevada 1-hour and 8-hour CO standards of 35 ppm or 6 ppm, respectively. This impact would be **less than significant**.

Alternative 5: Similar Rate of Development and Regulatory Structure to the 1987 Regional Plan

As reported in Section 3.3, Transportation, under Alternative 5, the intersection of SR 28 and SR 267 would be degraded from LOS C under existing conditions to LOS E. For the same reasons, this impact would be the same as described for Alternative 4. Specifically, no affected intersections would experience more than 31,600 vehicles per hour (for instance, the intersection of SR 28 and SR 267 would experience 3,000 vehicles per peak hour under 2035 cumulative plus project conditions [see Section 3.3, Transportation]). This impact would be **less than significant.**

Mitigation Measures

No mitigation is required for any of the alternatives.

Impact 3.4-5	**Exposure to Toxic Air Contaminant Emissions.** The Regional Plan Update alternatives would not involve the siting of sensitive receptors near any major roadways or near any major stationary sources of TAC emissions, nor would they result in the siting of any new stationary sources of TAC emissions. Implementation of any of the Regional Plan Update alternatives would not result in exposure of sensitive receptors to substantial TAC concentrations. In addition, mobile-source diesel PM would be expected to decline over the plan implementation period compared to existing conditions. However, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in exposure of receptors to substantial TAC concentrations in Alternatives 1 through 5. This impact would be **potentially significant** for construction.

The exposure of sensitive receptors to emissions of TACs can occur during both the construction and operational phases of a project, as discussed separately below.

Construction of the proposed project would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Diesel PM was identified as a TAC by ARB in 1998. Construction of individual projects under the Regional Plan Update alternatives would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. According to ARB, the potential cancer risk from the inhalation of diesel PM is a more serious risk than the potential non-cancer health impacts (ARB 2003). Consequently, for the purposes of this analysis, the discussion below focuses on cancer rather than non-cancer risks. It is important to note that construction-equipment emissions will be reduced over the period of plan implementation. In January 2001, EPA promulgated a Final Rule to reduce emission standards for heavy-duty diesel engines from 2007 and subsequent model years. These emission standards represent a 90 percent reduction in NO_X, 72 percent reduction of non-methane hydrocarbon (NMHC) emissions, and 90 percent reduction of PM emissions compared to the 2004 model year emission standards. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment–based exhaust standards for NO_X and PM starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines. ARB's Advanced Clean Cars Regulation, adopted on January 26, 2012, will also result in reductions in TAC emissions.

More specifically, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2001:9-10). Thus, because the use of off-road construction equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), as well as future reductions in exhaust emissions and the relatively small scale of construction-related activities anticipated under the Regional Plan Update alternatives, short-term construction activities would not expose sensitive receptors to substantial TAC emissions.

In addition, according to *Special Report 190: Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California* (Higgins and Clinkenbeard 2006) and the *General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000), the Basin is not likely to contain naturally occurring asbestos.

The proposed Regional Plan Update would not include the construction or operation of any major stationary sources of TAC emissions or result in an increase in mobile-source TAC emissions (e.g., diesel truck traffic). In fact, mobile-source emissions of PM would decline over the plan implementation period. One major stationary source of TAC emissions is located in the LTAB: Sierra Pacific Power Company, located in Kings Beach, California. This facility is subject to state and local permitting requirements. According to ARB, this facility does not emit quantities of TACs that would expose sensitive receptors to excessive concentrations (i.e., concentrations that would present risk levels greater than 10 in 1 million or Hazard Index greater than 1) (ARB 2011c). Receptors in the Kings Beach area would not be exposed to unacceptable levels of TACs and associated risk.

The land use strategy of Regional Plan Update Alternatives 2 through 5 would include incentivizing development in more urban areas, which are located along the Basin's main transportation corridors. ARB recommends a minimum setback distance of 500 feet from urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day to minimize the health risk of sensitive receptors to mobile-source TACs (ARB 2005:4).

According to Table 3.3-13 in Section 3.3, Transportation, none of the major roadways in the Basin would accommodate more than 50,000 vehicles per day.

Thus, long-term operation of Alternatives 1 through 5 would not result in exposure of sensitive receptors to excessive levels of TACs. However, proximity of heavy-duty diesel-fueled construction equipment to sensitive receptors during construction activities resulting from implementation of Alternatives 2 through 5 may result in exposure of sensitive receptors to TACs, as discussed below.

Alternative 1: No Project

Alternative 1 would include the remaining development allocations authorized in the 1987 Regional Plan. Alternative 1 includes implementation of transportation projects consistent with the Regional Transportation Plan (RTP). Project-specific details such as construction schedule, equipment list, and disturbance area, are not available at the plan level. Construction activities associated with development or transportation infrastructure projects may expose sensitive receptors to substantial pollutant concentrations associated with diesel exhaust from heavy-duty construction equipment and heavy trucks.

As presented in Impact 3.4-3, mobile-source operational emissions of particulate matter (which includes diesel PM) are anticipated to decrease slightly over the plan implementation period, associated with more stringent vehicle emissions controls. Thus, Alternative 1 would not result in exposure of sensitive receptors to substantial TAC emissions from operation however, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in short-term exposure of receptors to substantial TAC concentrations. This would result in a **potentially significant** impact to air quality.

Alternative 2: Low Development, Increased Regulation

As described above, although precise details of projects that may be implemented in accordance with the Regional Plan Update cannot be known, construction activities associated with such projects, along with transportation projects consistent with the RTP, may expose sensitive receptors to substantial pollutant concentrations associated with diesel exhaust from heavy-duty construction equipment and heavy trucks.

As presented in Impact 3.4-3, mobile-source operational emissions of particulate matter (which includes diesel PM) would be anticipated to decrease slightly over the plan implementation period, associated with more stringent vehicle emissions controls. Alternative 2 does not propose the siting of new sensitive receptors or new stationary sources of TACs. Existing receptors would not be exposed to transportation facilities accommodating more than 50,000 vehicles per day, consistent with ARB's recommendation for sensitive land uses (ARB 2005:4). Operational emissions of TACs associated with Alternative 2 would be less than significant; however, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in exposure of receptors to substantial TAC concentrations. This would result in a **potentially significant** impact to air quality.

Alternative 3: Low Development, Incentivized Redevelopment

For the same reasons identified for Alternative 2, operational emissions of TACs associated with Alternative 3 would be less than significant; however, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in exposure of receptors to substantial TAC concentrations. This would result in a **potentially significant** impact to air quality.

ALTERNATIVE 4: REDUCE DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

Alternative 4 would include the group of projects listed under Transportation Strategy Package C, which includes the constrained project list. For the same reasons identified for Alternative 2, operational emissions of TACs associated with Alternative 4 would be less than significant; however, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in exposure of receptors to substantial TAC concentrations. This would result in a **potentially significant** impact to air quality.

ALTERNATIVE 5: SIMILAR RATE OF DEVELOPMENT AND REGULATORY STRUCTURE TO THE 1987 REGIONAL PLAN

For the same reasons identified for Alternative 2, operational emissions of TACs associated with Alternative 5 would be less than significant, however, as with implementation of any site-specific project, construction emissions may occur in proximity to sensitive receptors and may result in exposure of receptors to substantial TAC concentrations. This would result in a potentially significant impact to air quality.

MITIGATION MEASURES

The following mitigation is required for Alternatives 1, 2, 3, 4, and 5.

Mitigation Measure 3.4-5: Develop and Implement a Best Construction Practices Policy for TAC Emissions during Construction

Within 12 months of adoption of an updated Regional Plan, TRPA will coordinate implementation of Best Construction Practices for Construction Emissions through TRPA approved plans, project-permitting, or projects/programs developed in coordination with local or other governments that requires, as a condition of project approval, implementation of feasible measures to reduce exposure of sensitive receptors to construction-related TAC emissions. Until that time, TRPA will continue the existing practice to require measures developed on a project-specific basis. Where local ordinances, rules, or regulations already require Best Construction Practices for construction emissions, no further action is necessary. Where local government ordinances, rules, or regulations do not adequately address Best Construction Practices, those practices will be implemented through local government and/or TRPA permitting activities. Such measures may include, but are not limited to, the following:

- *Limit idling time to five minutes maximum.*
- *Equip heavy-duty construction equipment with diesel particulate traps.*
- *Locate construction staging areas as far away as possible on the project site from off-site receptors.*
- *As a condition of approval, individual project environmental review shall demonstrate that current district-recommended BMPs are implemented to ensure sensitive receptors are not exposed to substantial TAC concentrations.*

Significance After Mitigation

Implementation of Mitigation Measure 3.4-5 would reduce diesel equipment exhaust emissions. These best practices will substantially reduce construction-generated emissions of TACs. Importantly, projects located within PCAPCD or EDCAQMD jurisdiction must demonstrate that emissions would be mitigated to below district-applicable threshold standards for construction emissions as a condition of approval. This would ensure that this impact would be mitigated to a **less-than-significant** level with mitigation incorporated.

Impact 3.4-6	**Exposure to Excessive Odorous Emissions.** None of the Regional Plan Update alternatives include goals, policies, or implementation measures that would change the nature, location, size, or operation of any odor-producing use or facility in the Tahoe Region. No changes in land use designation or zoning are proposed that would result in placement of sensitive receptors nearer any such facilities. Finally, neither construction nor operation of projects that may be developed as a result of authorization of additional allocations for residential, commercial, or tourist uses would be expected to create objectionable odors affecting a substantial number of people. This impact would be **less than significant**.

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Alternative 1: No Project

None of the Regional Plan Update alternatives would result in major sources of odor as the plan does not include or contemplate construction of any of the common types of facilities that are known to produce odors (e.g., landfills, wastewater treatment facilities). In addition, no known substantial sources of objectionable odors are located in the Region. Diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and would dissipate rapidly from the source with an increase in distance. Finally, the Regional Plan Update does not propose the siting of new sensitive receptors (e.g., schools, hospitals). Thus, neither project construction nor operation of Alternative 1 would create objectionable odors affecting a substantial number of people, nor would Alternative 1 result in the siting of sensitive receptors in proximity to an odor source. As a result, this impact would be considered **less than significant.**

Alternative 2: Low Development, Increased Regulation

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 2 would be **less than significant.**

Alternative 3: Low Development, Incentivized Redevelopment

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 3 would be **less than significant.**

Alternative 4: Reduced Development, Incentivized Redevelopment

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 4 would be **less than significant.**

Alternative 5: Similar Rate of Development and Regulatory Structure to the 1987 Regional Plan

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 5 would be **less than significant.**

Mitigation Measures

No mitigation is required for any of the alternatives.

Impact 3.4-7	**Atmospheric Deposition.** Substantial reductions (76-78 percent) in mobile-source NO_X emissions are anticipated over the Regional Plan build-out period under Alternatives 1 through 5. The foreseeable reductions in mobile-source NO_X are associated with increased vehicle emissions control requirements. Mobile-source emissions of NO_X are a major component of atmospheric nitrogen deposited to Lake Tahoe. Because substantial reductions in mobile-source NO_X are anticipated under Regional Plan Update Alternatives 1 through 5, the Regional Plan Update would be consistent with performance standards for atmospheric nitrogen deposition and would promote attainment of threshold standards for atmospheric deposition. This impact would be **less than significant.**

Deposition of nitrogen and phosphorus from the atmosphere into Lake Tahoe is believed to impair lake clarity. TRPA adopted a threshold indicator for nitrogen deposition to the Lake related to total maximum daily load (TMDL) requirements from EPA for nitrogen (LRWQCB 2011). A phosphorus threshold standard has not been developed by TRPA at this time. The TMDL also relies on TMPO and TRPA air quality and transportation plans to manage the load of nitrogen to the atmosphere from mobile sources. This management is expected to reduce the Basin-wide nitrogen load by at least 1 percent within 15 years. In addition, TRPA's management standard for atmospheric nitrogen is to reduce dissolved inorganic nitrogen loading to Lake Tahoe from atmospheric sources by approximately 20 percent of the 1973–1981 annual average (TRPA 2012a).

TMPO and TRPA analyzed the RTP program of projects and strategies to determine whether they will meet the 1-percent reduction in atmospheric nitrogen. Because detailed models are not available to accurately predict atmospheric nitrogen deposition throughout the Region, it was assumed that NO_X can serve as a proxy for atmospheric nitrogen.

This assumption is based on the following information that relates nitrogen deposition to in-Basin mobile sources. It has been estimated that more than half of the annual nitrogen loading to the Lake comes from atmospheric deposition (Reuter and Miller 2000). Studies show that the local generation of ozone and other pollutants in the Basin is more important than long-range transport when it comes to exceedances of the state and national ozone standards and elevated levels of other pollutants within the Basin (Bytnerowicz et al. 2004, Dolislager et al. 2012a, Gertler et al. 2006). Mobile sources comprise 88 percent of NO_X emissions in the California portion of the Tahoe Basin (ARB 2008). NO_X is a precursor to ammonia (NH_3) and nitric acid (HNO_3). Residential wood combustion and prescribed burning are also major sources of NH_3 (SWRCB 2008). NH_3 and HNO_3 were found to be the key components of the direct nitrogen deposition to Lake Tahoe (Dolislager et al. 2012b, Tarnay et al. 2001). As part of a series of summer measurements, Tarnay et al. (2001, 2005) quantified HNO_3, NH_3, and particulate ammonium (NH_4+) and nitrate (NO_3-) levels at a number of locations in the Basin and obtained NO_X data collected by ARB at Echo Summit. They found HNO_3 was responsible for most of the nitrogen deposition, except in areas influenced by local NH_3 and NO_2 concentrations. Using these results, coupled with geospatial modeling, they concluded that most of the HNO_3 and NH_3 were from in-Basin sources.

It is assumed that the vehicle fleet mix is uniform between the California and Nevada portions of the Tahoe Region. For this reason, and reasons described by the literature cited in the previous paragraph, it is assumed that mobile-source NO_X emissions from VMT generated in the Basin (see Section 3.3, Transportation) and modeled using EMFAC 2011 is a reasonable proxy for atmospheric nitrogen deposition. As discussed previously in Impact 3.4-3, mobile-source emissions of NO_X are foreseeably expected to decline through plan build-out as a result of increases in emissions control technology and ARB regulatory programs (ARB 2012c). Results of NO_X emissions modeling are summarized below. In the case of all alternatives, mobile-source NO_X emissions would decline substantially between 2010 and 2035.

ALTERNATIVE 1: NO PROJECT

Mobile-source NO_X emissions were estimated to decline by approximately 78 percent between 2010 and 2035 under Alternative 1, as summarized in Table 3.4-22. Because mobile-source NO_X is a major source of atmospheric nitrogen deposited into Lake Tahoe and would decline by 78 percent over the planning period under Alternative 1, it is reasonable to conclude that Alternative 1 would support achievement of the TRPA threshold standard for atmospheric nitrogen deposition (i.e., reduce atmospheric sources of nitrogen by approximately 20 percent of the 1973-1981 annual average) and the TMDL (i.e., reduce the Basin's nitrogen load by at least 1 percent over 15 years).

Introduction of waterborne transit would result in emissions of approximately 27 TPY of NO_X associated with operation of additional ferries. Emissions from waterborne transit are evaluated in Impact 3.4-3. Some amount of NO_X emissions associated with waterborne transit would also contribute to atmospheric nitrogen deposition. However, the contribution from waterborne transit would be more than offset by the substantial overall reduction in regional mobile-source NO_X emissions.

The impact of Alternative 1 on this threshold standard would be **less than significant**, and Alternative 1 would be expected to contribute to achievement and maintenance of the threshold standard for atmospheric nitrogen deposition.

ALTERNATIVE 2: LOW DEVELOPMENT, INCREASED REGULATION

Mobile-source NO_X emissions were estimated to decline by approximately 78 percent between 2010 and 2035 under Alternative 2, as summarized in Table 3.4-22. For the same reasons described above for Alternative 1, Alternative 2 would support achievement of the TRPA threshold standard for atmospheric nitrogen deposition (i.e., reduce atmospheric sources of nitrogen by approximately 20 percent of the 1973-1981 annual average) and the TMDL (i.e., reduce the Basin's nitrogen load by at least 1 percent over 15 years).

The impact of Alternative 2 on this threshold standard would be **less than significant**, and Alternative 2 would be expected to contribute to achievement and maintenance of the threshold standard for atmospheric nitrogen deposition.

ALTERNATIVE 3: LOW DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

Mobile-source NO_X emissions were estimated to decline by approximately 78 percent between 2010 and 2035 under Alternative 3, as summarized in Table 3.4-22. For the same reasons described above for Alternative 1, Alternative 3 would support achievement of the TRPA threshold standard for atmospheric nitrogen deposition

Table 3.4-22. Operational Mobile-Source NO_X Emissions (Entire Tahoe Basin)[1]

Alternative	2010	2035	Percent Change from 2010 to 2035
1	816	179	-78.0
2	816	177	-78.3
3	816	181	-77.8
4	816	188	-76.9
5	816	194	-76.2

Notes: NO_X = oxides of nitrogen; TPY = tons per year.
[1] VMT and vehicle trips were attributed to TMPO using the RTAC method.
Source: Traffic data provided by Fehr & Peers (Appendix E); results of modeling by Ascent Environmental are provided in Appendix F.

(i.e., reduce atmospheric sources of nitrogen by approximately 20 percent of the 1973-1981 annual average) and the TMDL (i.e., reduce the Basin's nitrogen load by at least 1 percent over 15 years).

Introduction of waterborne transit would result in emissions of approximately 27 TPY of NO_X associated with operation of additional ferries. Emissions from waterborne transit are evaluated in Impact 3.4-3. Some amount of NO_X emissions associated with waterborne transit would also contribute to atmospheric nitrogen deposition. However, the contribution from waterborne transit would be more than offset by the substantial overall reduction in regional mobile-source NO_X emissions.

The impact of Alternative 3 on this threshold standard would be **less than significant**, and Alternative 3 would be expected to contribute to achievement and maintenance of the threshold standard for atmospheric nitrogen deposition.

ALTERNATIVE 4: REDUCED DEVELOPMENT, INCENTIVIZED REDEVELOPMENT

Mobile-source NO_X emissions were estimated to decline by approximately 77 percent between 2010 and 2035 under Alternative 4, as summarized in Table 3.4-22. For the same reasons described above for Alternative 1, Alternative 4 would support achievement of the TRPA threshold standard for atmospheric nitrogen deposition (i.e., reduce atmospheric sources of nitrogen by approximately 20 percent of the 1973-1981 annual average) and the TMDL (i.e., reduce the Basin's nitrogen load by at least 1 percent over 15 years).

Introduction of waterborne transit would result in emissions of approximately 27 TPY of NO_X associated with operation of additional ferries. Emissions from waterborne transit are evaluated in Impact 3.4-3. Some amount of NO_X emissions associated with waterborne transit would also contribute to atmospheric nitrogen deposition. However, the contribution from waterborne transit would be more than offset by the substantial overall reduction in regional mobile-source NO_X emissions.

The impact of Alternative 4 on this threshold standard would be **less than significant**, and Alternative 4 would be expected to contribute to achievement and maintenance of the threshold standard for atmospheric nitrogen deposition.

ALTERNATIVE 5: SIMILAR RATE OF DEVELOPMENT AND REGULATORY STRUCTURE TO THE 1987 REGIONAL PLAN

Mobile-source NO_X emissions were estimated to decline by approximately 76 percent between 2010 and 2035 under Alternative 5, as summarized in Table 3.4-22. For the same reasons described above for Alternative 1, Alternative 5 would support achievement of the TRPA threshold standard for atmospheric nitrogen deposition (i.e., reduce atmospheric sources of nitrogen by approximately 20 percent of the 1973-1981 annual average) and the TMDL (i.e., reduce the Basin's nitrogen load by at least 1 percent over 15 years).

Introduction of waterborne transit would result in emissions of approximately 27 TPY of NO_X associated with operation of additional ferries. Emissions from waterborne transit are evaluated in Impact 3.4-3. Some amount of NO_X emissions associated with waterborne transit would also contribute to atmospheric nitrogen deposition. However, the contribution from waterborne transit would be more than offset by the substantial overall reduction in regional mobile-source NO_X emissions.

The impact of Alternative 5 on this threshold standard would be **less than significant**, and Alternative 5 would be expected to contribute to achievement and maintenance of the threshold standard for atmospheric nitrogen deposition.

MITIGATION MEASURES

No mitigation is required for any of the alternatives.

Impact 3.4-8	**Implementation of Proposed Air Quality Environmental Threshold Carrying Capacity Amendments.** Implementation of the proposed amendments to the threshold standards for CO, PM_{10}, and $PM_{2.5}$ would not result in degradation of air quality conditions or relaxation of air quality standards. These amendments would occur under Alternatives 2 through 5 and would result in closer alignment of TRPA numerical threshold standards with ambient air quality standards already applied to projects in TRPA's jurisdiction. This impact would be **less than significant.**

TRPA proposes to amend the numerical standards for CO and for PM_{10} and $PM_{2.5}$. Threshold standards for each pollutant are discussed separately below.

Carbon Monoxide – Numerical Standard

TRPA proposes to amend its numerical Threshold Standard for CO from 9.0 ppm to 6.0 ppm, to be consistent with the CAAQS for Lake Tahoe. The Compact requires TRPA to achieve state and federal standards for air quality when they are stricter than the threshold standards. The CAAQS for Lake Tahoe of 6.0 ppm is the most stringent standard.

Respirable and Fine Particulate Matter (PM_{10} and $PM_{2.5}$) – Numerical Standards

TRPA proposes to replace its current threshold standards for suspended soil (i.e., visibility standards) and wood smoke with quantitative, concentration-based thresholds for PM_{10} and $PM_{2.5}$. The proposed threshold standards would be consistent with the California and Nevada AAQS for the respective portions of the Basin to which they apply. In California, the proposed threshold standard would limit PM_{10} concentration to 50 $\mu g/m^3$ when averaged over any 24-hour period and to 20 $\mu g/m^3$ when averaged over 1 year. In Nevada, the proposed threshold standard would limit PM_{10} concentration to 150 $\mu g/m^3$ when averaged over any 24-hour period and to 50 $\mu g/m^3$ when averaged over 1 year. Concentrations of $PM_{2.5}$ would be limited to 35 $\mu g/m^3$ when averaged over any 24 hour period, which is consistent with both state's air quality standards. When averaged over 1 year, $PM_{2.5}$ concentration would be limited to 12 $\mu g/m^3$ in California and 15 $\mu g/m^3$ in Nevada.

Replacement of TRPA visibility and wood smoke standards with numerical, concentration-based PM_{10} and $PM_{2.5}$ standards would provide TRPA a consistent, widely-accepted method for monitoring attainment of these threshold standards. This will improve TRPA's level of confidence in its attainment designations for these pollutants.

The most stringent air quality standards were applied throughout this air quality analysis of the Regional Plan Update alternatives. Because the TRPA threshold standards would become more closely aligned with existing threshold standards that are currently applied by the CAA and CCAA, attainment of air quality standards would continue to be enforced under these existing laws. The Compact requires TRPA to achieve the most stringent air quality standard when state or federal standards are stricter than the threshold standard. Thus, air quality standards would remain as stringent as or become more stringent than under current conditions. This would be a **less-than-significant** impact on air quality.

ALTERNATIVE 1: NO PROJECT

The proposed threshold standard amendments would not occur under Alternative 1 and, thus, there would be **no impact**. Nonetheless, the current AAQS that are in place are as stringent as the proposed threshold standard amendments. The AAQS would still apply to the Basin, whether or not TRPA aligns its threshold standards with the AAQS.

ALTERNATIVES 2 THROUGH 5

The proposed threshold standard amendments would result in air quality standards remaining as stringent or becoming more stringent than under current conditions. There would be **no impact** on air quality.

MITIGATION MEASURES

No mitigation is required for any of the alternatives.

Impact 3.4-9	**Extension of Time for Air Quality Mitigation Fee Basis.** Alternative 4 proposes to extend the time for which an applicant could use a prior existing use as the basis for a new trip calculation from 90 days within the last 2 years to 90 days within the last 5 years. Because the change could result in the reduction of air quality mitigation fees used to implement air quality enhancement projects, this proposal could result in **potentially significant** effects.

To aid the reopening of closed business locations, Alternative 4 proposes to amend Code Section 65.2.4.F to permit new businesses to include trips generated from a prior business for purposes of calculating air quality mitigation fees if that prior use had been active for at least 90 days within the last 5 years. As noted above, the existing Code section allows an applicant to include trips generated by a prior use that was active for 90 days in only the last 2 years. Air quality mitigation fees are used by local jurisdictions to fund air quality improvement projects. The potential result of this policy change would be an unknown reduction in the amount of air quality mitigation fees collected from project applicants as the change would increase the number of situations where a change in operations would not result in an increase in trips compared to the baseline (previous use) condition. The potential extent of the decrease in funds in somewhat speculative as it is unknown how many projects that would otherwise pay fees would not be required to do so under the proposed Code amendment. Moreover, it may be that the closed business had already paid an air quality mitigation fee prior to closing so that the trips had already been mitigated. However, since the rationale for the proposal is to encourage business development and a substantial number of businesses have closed over the last 5 years because of the recession, it is reasonable to assume that a substantial number of projects that would otherwise be required to pay fees would avoid those fees. As a result, it is reasonable to assume that fewer resources would be available to fund air quality mitigation projects and that potentially fewer projects would be implemented and potential air quality improvements that could have occurred would not be funded under the proposal. The proposal thus could result in **potentially significant** effects.

MITIGATION MEASURES

No mitigation is required for Alternatives 1, 2, 3, or 5. The following mitigation is required for Alternative 4.

Mitigation Measure 3.4-9: Maintain Level of Air Quality Mitigation Improvements. For Alternative 4, TRPA will evaluate and adjust the Air Quality Mitigation Fee program to ensure that no decrease in the level of air quality improvements would result from the change in the eligible time period for a previous use from 2 to 5 years. Adjustments to the mitigation fee program may include, but are not limited to the following:

- *Increase Air Quality Mitigation Fees on new developments to offset the reduction in fees from the proposed change.*
- *Implement regulatory changes that would ensure the same level of air quality improvements could occur with reduced fees.*
- *Develop an additional Air Quality Mitigation Fee for additional uses that would offset the reduction in mitigation fees from the proposed change.*

Significance After Mitigation

Implementation of Mitigation Measure 3.4-9 would eliminate any reduction in the amount of air quality mitigation improvements. This would ensure that this impact would be mitigated to a **less-than-significant** level with mitigation incorporated.