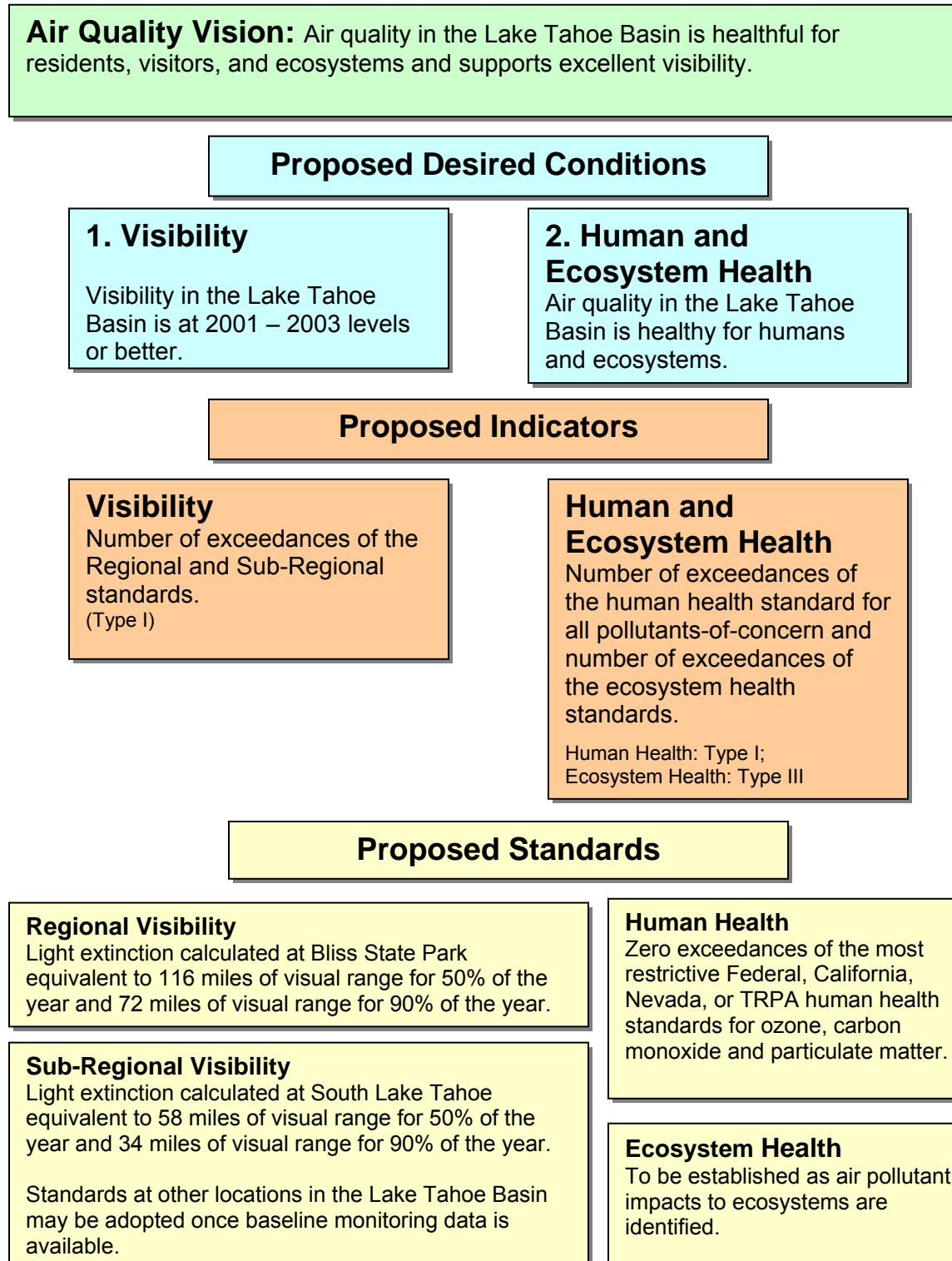


Chapter 6 - AIR QUALITY

Figure 6-1. Air Quality Diagram



6.0 AIR QUALITY OVERVIEW

Air quality conditions in the Lake Tahoe Basin affect human health, visibility, forest health, and water quality for the Basin's various lakes including the famed clarity of Lake Tahoe. The primary factors known to influence the basin's air quality are motor vehicle emissions, wood smoke, road and other sources of dust, topography and climate, and pollutants transported from sources outside the Lake Tahoe Basin. In general, the Lake Tahoe Basin's air quality has improved over the past 20 years. However, the Lake Tahoe Basin remains out-of-attainment with some of the state and local air quality standards.

Over the last two years the Pathway 2007 agencies, have been involved with the public and the air quality Technical Working Group (TWG) to develop and propose improvements to the air quality program in order to better protect human and ecosystem health in the Basin.

To this end, the opinions derived through the multiple Pathway efforts reflect strong support for the following:

- Uniform standards applied basin-wide;
- Improvements in transportation to reduce the effects of emissions on air quality;
- Protection of long-range visibility;
- Reductions in wood smoke; and
- Improvements in dust management for improvements in particulate matter and visibility.

This chapter provides a summary of the background information and current proposals for the improvement of the air quality program in the Lake Tahoe Basin. More comprehensive information on air quality will be available in the Pathway Air Quality Technical Supplement and in TRPA's *2006 Threshold Report*.

6.1 AIR QUALITY VISION

A major conclusion of the Pathway effort is that the air quality program requires a more streamlined approach and needs to incorporate a more progressive basin-wide program to improve air quality. These changes include replacing the current value statements with a more encompassing vision for air quality, and more specific desired conditions for visibility thresholds and human and environmental health. This vision statement is presented below:

Air Quality Vision

Air quality in the Lake Tahoe Basin is healthful for residents, visitors, and ecosystems and supports excellent visibility.

6.2 NEED FOR CHANGE

There are several reasons supporting the need for change for the air quality program. The primary reasons were to fulfill the request by the Pathway Forum members to simplify the current structure, adopt a uniform program, and improve the threshold by utilizing the scientific advances and research that have occurred since the development of the existing programs

6.2.1 Need for Change - Overview

The primary areas of focus for Air Quality, as identified through the Pathway efforts, are presented below. They are explained in greater detail throughout the following text.

- a. The existing eight indicators should be simplified into two main headings: visibility; and human and ecosystem health. Although there are only two proposed indicators, the strength of the programs remains intact and incorporates and improves upon the intent of the original indicators.
- b. The air quality indicators need to be updated. New information supports the modification of indicators and standards in order to provide better protection of both human and ecosystem health.
- c. Another important need for change was to standardize the air quality program wherever possible. Currently, it is possible to have a different pollution standard or measurement protocol for each state, local and federal agency. This leads to confusion and the expenditure of large amounts of resources to keep track of each of the standards. For this reason, it is proposed that the most stringent air quality standards be adopted basin-wide. This will simplify the air quality program by reducing the resources necessary to monitor the Lake Tahoe Basin's air quality and bring additional health benefits to those areas that currently have less stringent requirements.
- d. At the time of the original threshold development, several standards were promulgated without the necessary tools to measure or evaluate the progress or reduction needed. Because these tools have not been developed, it is necessary to delete those indicators until the appropriate tools and methods can be developed.

6.2.2 Need for Change - Visibility

Some of the regional and sub-regional visibility targets established 20 years ago have been met and exceeded. As a result, visibility has improved in the Lake Tahoe Basin. Because visibility was identified as a significant asset to the Lake Tahoe Basin, new standards are proposed that will protect the visibility improvements achieved to date and prevent backsliding to less desirable conditions.

6.2.3 Need for Change - Human Health

Existing air quality indicators and standards for human health were developed by the U.S.EPA, California, Nevada and TRPA based on the best available information at the time. Over the last ten years, researchers and scientists have developed a much better understanding of the effects of air pollution on human health. This understanding led to the conclusion that some of the current standards are insufficient to protect human health and more progressive air quality standards are necessary.

Another important need for change was to simplify and standardize the air quality program. Currently, it is possible to have a different pollution standard or measurement protocol for each state, local and federal agency. This leads to confusion and the

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expenditure of large amounts of resources to keep track of each of the standards. For this reason, it is proposed that the most stringent air quality standards be adopted basin-wide. This will simplify the air quality program by reducing the resources necessary to monitor the Lake Tahoe Basin's air quality and bring additional health benefits to those areas that currently have less stringent requirements.

6.2.4 Need for Change – Ecosystem Health

Lake Clarity

Air pollutants affect lake clarity by either directly contributing to particles in the water through the re-suspension of road dust, or by contributing nutrients to algae formation (e.g., nitrogen and phosphorus). More is known today about the significance of air pollutant contributors to lake clarity than 20 years ago. When the original air quality plan was developed, nitrogen was deemed the important pollutant to control for lake clarity. Today, it is understood that particulates, nitrogen and phosphorous are all consider primary pollutants causing visibility degradation in the lake. Additionally, research and measurement technologies have advanced to allow for more accurate measurements of these pollutants. For these reasons, changes to the existing indicators are warranted.

Water Quality: Acid Neutralizing Capacity (ANC) in High Elevation Lakes

Increased acidification to the lakes in the Lake Tahoe Basin causes impacts to fish and other zooplankton. Sampling data indicate that most of these lakes are highly sensitive to acid deposition, due to their limited acid neutralizing capacity (ANC). Because existing standards and indicators intended to protect water quality do not address this issue, it will be necessary to valuate the need and potential standards and indicators as information and resources become available.

Forest Health

Ozone is known to damage the leaves and needles of trees. Especially in high altitude areas where the short growing season corresponds to peak ozone concentrations. Previous information indicated ozone damage to pine trees occurred at concentrations that were considered healthy to humans. For this reason, TRPA promulgated a more stringent ozone standard specifically for the protection of the basin's trees and vegetation. Since this time, additional information suggests an even more stringent standard may be necessary to prevent ozone damage to the basin's vegetation. As a first step to correct this concern, the TRPA is proposing to adopt California's new 8-hour ozone standard basin-wide. As resources become available, the Lake Tahoe Basin agencies will continue their work in developing air quality standards to ensure forest health is protected.

6.2.5 Need for Change - Emissions-Based Indicators

Some of the emissions-based indicators and standards such as wood smoke, atmospheric nutrient loading, and vehicle-miles-traveled (VMT) do not have the appropriate scientific basis to be continued. For this reason, it is proposed that they be eliminated until an acceptable scientific basis can be established and alternative indicators are developed.

As an example, the indicator for wood smoke and atmospheric nutrient loading was to reduce a set percentage of their loadings from their 1981 baseline levels. However, not only were the 1981 levels not measured, no scientifically sound measurement procedures have been developed to measure the current levels. This makes it impossible to evaluate these indicators.

The purpose of the VMT threshold is to reduce the amount of nutrients deposited to the lake through vehicular activity. This included the nitrogen emission from the tailpipe as well as the nutrients associated with re-entrained road dust. However, because emissions associated with VMT very greatly depending on the type or mode of transportation, lowering VMT can actually increase nutrients and other pollution to the basin. The correlation between vehicle use and environmental impacts is a complex relationship between miles traveled, road maintenance practices, proximity of road segments to the lake, weather, type of vehicle used, and other factors. For this reason, new indicators will need to be developed that incorporates VMT with other factors to more accurately represent environmental impact.

6.3 DESIRED CONDITION 1: VISIBILITY

Air quality in the Lake Tahoe Basin affects the ability to view significant distances. The ability to see substantial distances and enjoy the scenic beauty of the area has been identified by the general public as one of most important attributes of the Lake Tahoe Basin. For this reason, visibility was identified as a key indicator for the Lake Tahoe Basin's air quality. There are two types of visibility indicators: regional and sub-regional visibility. Regional visibility is defined as the overall visibility across the Lake Tahoe Basin and is measured at Bliss State Park. Sub-regional visibility is defined as the overall visibility over the urbanized areas and is measured in South Lake Tahoe. Visibility is influenced both by natural factors such as clouds, snow cover, sun angle, and by human-introduced air pollutants such as dust and combustion emissions.

6.3.1 Proposed Indicator for Air Quality and Visibility

The purpose of an indicator is to provide information that is quantifiable and measurable and will enable assessment of the progress toward attaining and maintaining the established standards. The previous indicator for visibility was the methodology used to take a visibility measurement and did not provide quantifiable information on the attainment status. Thus, a new indicator is being proposed for visibility, as presented below.

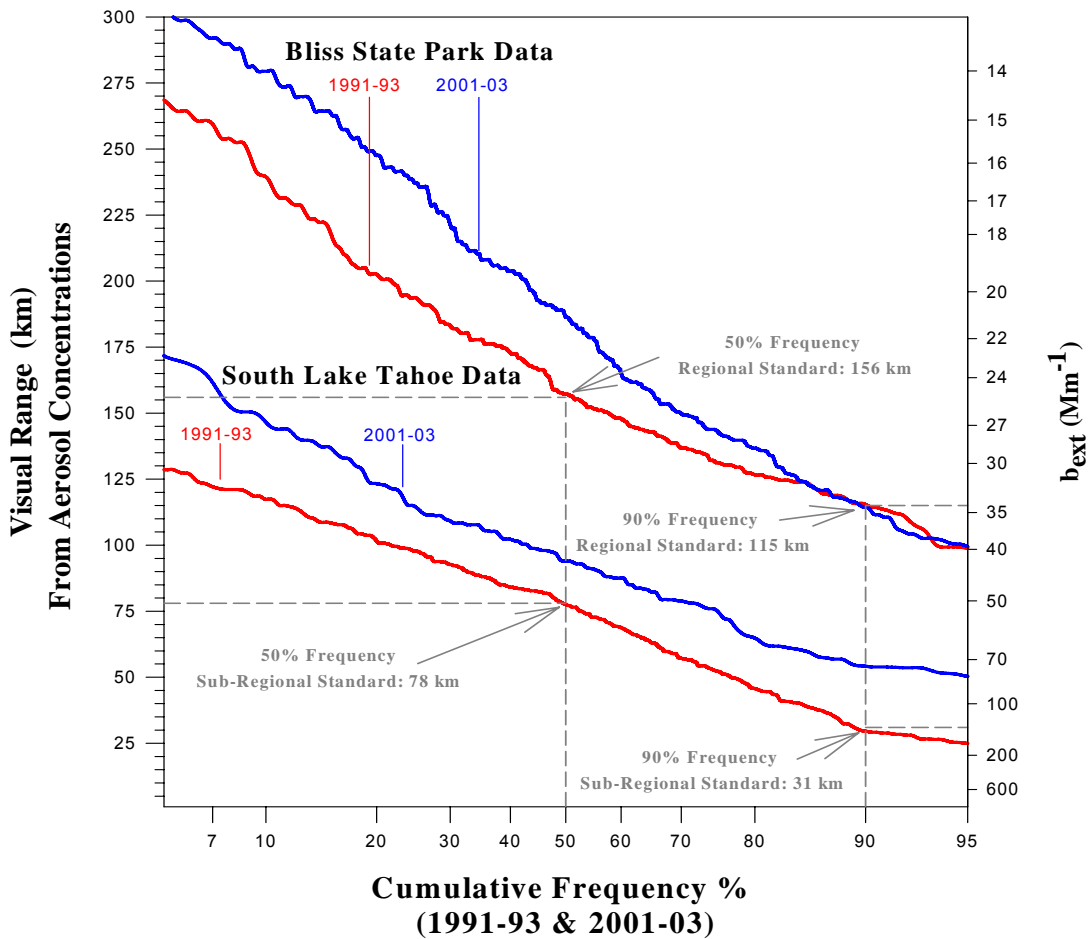
Proposed Indicator for Visibility: Number of exceedances of the Regional and Sub-Regional standards.

Measuring the number of exceedances of the visibility standards corrects the previous error, and provides a quantifiable and measurable way to assess the progress of attaining and maintaining the visibility standards.

6.3.2 Current Conditions and Trend for Visibility

TRPA’s current visibility standards are based on the visibility conditions that were present in the Lake Tahoe Basin during the years 1991 through 1993. Figure 6-2 depicts those conditions and compares them to the 2001 through 2003 visibility conditions for both regional and sub-regional visibility. The higher the lines are up the graph, the better the visibility.

Figure 6-2. Visibility Comparisons between 1991 to 1993 and 2000 to 2003



A

As demonstrated by Figure 6-2, sample results from the period 2001 through 2003 show that regional visibility at Bliss State Park site has improved and is roughly equivalent to a visual range of 187 kilometers or 116 miles (21Mm^{-1} light extinction) for 50% of the sampled days in the year and 116 kilometers or 72 miles (34Mm^{-1} light extinction) for 90% of the sampled days in the year and exceeds our current standards by a significant margin.

Similarly, sub-regional visibility at the South Lake Tahoe site for the same period has also improved and is roughly equivalent to a visual range of 93 kilometers or 58 miles (42Mm^{-1} light extinction) for 50% of the sampled days in the year and 55 kilometers or 34 miles (72Mm^{-1} light extinction) for 90% of the sampled days in the year.

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The current visibility improvements are believed to be attributed to the following emission-reduction efforts:

- Phase-out of open-burning wood fireplaces and less-efficient wood heaters;
- Popularity of natural gas stoves;
- Reduced vehicle emissions;
- Increased placements of Best Management Practices (BMPs); and
- Improved street sweepers and sweeping practices.

For historical reference, Table 6-1 shows attainment status of the visibility indicators from previous periods.

Table 6-1 Visibility Attainment Status					
#	NAME	1991 Attainment Status	1996 Attainment Status	2001 Attainment Status	2006 Attainment Status
AQ-3	Regional Visibility 50%	Attainment	Non- Attainment	Attainment	Attainment
AQ-3	Regional Visibility 90%	Attainment	Attainment	Non- Attainment	Attainment
AQ-3	Sub-Regional Visibility 50%	Attainment	Non- Attainment	Attainment	Attainment
AQ-3	Sub-Regional Visibility 90%	Attainment	Attainment	Attainment	Attainment

6.3.3 Technical Range of Feasibility of Improving Air Quality for Visibility

Emissions from transportation and forest fuels management practices are the most significant contributors to visibility degradation. Trends in transportation emissions technology improvements and practices are expected to continue, and if managed properly, will allow us to maintain the proposed standards. For example, exhaust emissions from the transportation sector will continue to improve with advances in new technologies such as particulate traps for diesels and hydrogen and electric vehicle technologies for automobiles. Similarly, improved best management practices and street sweeping practices along with new forest fuels treatment practices have the ability to dramatically reduce the amount of particulates in the air. However, due to the high forest fuel loading currently in the Lake Tahoe Basin, we must ensure that non-burning practices are utilized wherever possible and only burn on days that allow the wood smoke and particulates to rapidly move out of the basin.

6.3.4 Proposed Desired Condition and Standard for Air Quality for Visibility

The development of the proposed desired condition for visibility was straightforward. All parties engaged in the Pathway process agreed that the goal for the Lake Tahoe Basin was to retain the current level of visibility with no backsliding. To this end, the proposed desired condition for visibility is as follows:

Proposed Desired Condition for Visibility

Visibility in the Lake Tahoe Basin is at 2001 – 2003 levels or better.

Table 6-2 presents the proposed visibility standards. These standards reflect the intent of the proposed desired condition and represent the current level of visibility in the Lake Tahoe Basin. Due to budgetary constraints, no visibility monitoring is being conducted at this time. This will resume once resources are obligated and the sites become operational.

Table 6-2 Proposed Visibility Standards		
#	NAME	STANDARDS
AQ-1	Regional Visibility	Light extinction calculated at Bliss State Park is 21 Mm ⁻¹ - equivalent to 116 miles of visual range - for 50% of the year and 34 Mm ⁻¹ - equivalent to 72 miles of visual range - for 90% of the year.
AQ-1	Sub-Regional Visibility	Light extinction calculated at South Lake Tahoe is 42 Mm ⁻¹ - equivalent to 58 miles of visual range - for 50% of the year and 72 Mm ⁻¹ - equivalent to 34 miles of visual range - for 90% of the year. Standards at other locations in the Lake Tahoe Basin may be adopted once baseline monitoring data is available.

6.4 DESIRED CONDITION 2: AIR QUALITY AND HUMAN AND ECOSYSTEM HEALTH

Air quality standards are numeric limits on concentrations of specific pollutants. The air pollutants of greatest concern in the Lake Tahoe Basin are carbon monoxide (CO), ozone (O₃) and particulate matter (PM) and have been defined as “pollutants-of-concern” for purposes of the Pathway process. These pollutants are currently being managed by the TRPA separately under their own air quality indicator. They are also managed by both states and the federal government and may be administered differently depending on the area of the Lake Tahoe Basin.

The levels of these “pollutants-of-concern” must be within limits considered healthy for humans by the U. S. Environmental Protection Agency, the state of California, the state of Nevada and

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the TRPA. However, not all of these standards are consistent. Many use differing numerical values for each standard, and in some cases, the agencies utilize different monitoring techniques and attainment status determination criteria. For example, not only does the federal government have different numerical standards for ozone than the State of California, the equipment and techniques used to monitor them are different as well as what triggers a violation of the standards. California uses a not-to-exceed the numerical limit per year, while the federal government uses the forth highest value, averaged over a three-year period that is equal to or less than the numerical standard. Table 6-3 provides a summary of the emission standards of the various agencies for the pollutants-of-concern that are applicable to the Lake Tahoe Basin.

Table 6–3 Current Air Quality Standards					
Pollutant	Indicator	Federal Standards	California Standards	Nevada Standards	TRPA Standards
Carbon Monoxide	8-Hour Average ¹	9.0 ppm	6.0 ppm	6.0 ppm	6.0 ppm
	1-Hour Average ²	35 ppm	20 ppm	35 ppm	-
Ozone	1-Hour Average ³	Rescinded June 2005	0.09 ppm	0.10 ppm	.08 ppm
	8-Hour Average ⁴	0.08 ppm	0.07 ppm	-	-
Particulate Matter (10 microns and less)	24-Hour Average ⁵	150 µg/m ³	50 µg/m ³	150 µg/m ³	-
	Annual Arithmetic Mean ⁶	50 µg/m ³	20 µg/m ³	50 µg/m ³	-
Particulate Matter (2.5 microns and less)	24-Hour Average ⁷	65 µg/m ³	25 µg/m ³ (proposed)	-	-
	Annual Arithmetic Mean ⁸	15 µg/m ³	12 µg/m ³	-	-

Table 6–3 Current Air Quality Standards					
Pollutant	Indicator	Federal Standards	California Standards	Nevada Standards	TRPA Standards
Footnotes to Indicators:					
¹ -CA/TRPA: <i>Not to be equaled or exceeded</i> Fed/NV: Not to exceeded more than once per year ² -CA: <i>Not to be exceeded</i> Fed/NV: Not to be exceeded more than once per year ³ -CA/TRPA: <i>Not to be exceeded</i> NV: The expected number of days above the standard is equal to or less than one ⁴ -CA: <i>Not to be exceeded</i> Fed: Fourth highest value averaged over three years is equal to or less than the standard ⁵ -CA: <i>Not to be exceeded</i> Fed/NV: Expected number of days above the standard is equal to or less than one ⁶ -CA: <i>Not to be exceeded</i> Fed/NV: Average over three years is equal to or less than the standard ⁷ -CA: <i>Not to be exceeded</i> Fed: 98 th percentile of daily concentrations, averaged over three years, is equal to or less than the standard ⁸ -CA: <i>Not to be exceeded</i> Fed: Average over three years is equal to or less than the standard					
ppm = parts per million					
µg/m ³ = micrograms per cubic meter					

6.4.1 Proposed Air Quality Indicators for Human and Ecosystem Health

The primary modifications that are being proposed for the Human and Ecosystem Health indicators include the incorporation of multiple indicators under one heading and that the number of exceedances is used as the actual indicators for the pollutants of concern. Similar to the Visibility indicator, some of previous indicators for the pollutants-of-concern were actually the methodology used to make a pollutant measurement and did not provide quantifiable information on the attainment status. For this reason, new indicators are proposed as presented below.

Proposed Indicator for Human and Ecosystem Health

Number of exceedances of the human health standard for all pollutants-of-concern and number of exceedances of the ecosystem health standards.

Human Health: Type I;
 Ecosystem Health: Type III

The proposed indicators will measure the number of exceedances of the each of the standards for the pollutants-of-concern and for the ecosystem standards when developed. By measuring these values, we will provide a quantifiable and measurable way to assess air quality human health and ecosystem health and be able to make corrections if any area proves to be an issue.

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The proposed indicator for human health aggregates all of the ambient air quality standards and evaluates the number of samples showing exceedances of the pollutants-of-concern standards. The advantages to “bundling” the key pollutants into one indicator are as follows:

- The indicator for each pollutants-of-concern and for the ecosystem health is identical (e.g., no exceedances);
- The number of overall indicators and standards is kept to a more manageable level;
- Data for each key pollutant will still be reported to the public in as much detail as if the pollutants were not bundled; and
- Most importantly, federal and state standards are periodically revised. By keeping the pollutants bundled, every time the U.S. EPA or California or Nevada revised or established a new standard, formal action would not be needed by any Pathway agency. The most stringent standard would automatically apply without additional formal action. Under the current individual pollutant approach, since the TRPA Regional Plan was last adopted, numerous changes have been made to both state and federal standards, which are not included as TRPA indicators and standards, rendering some TRPA indicators obsolete with respect to current federal or state requirements.

6.4.2 Current Conditions for Air Quality related to Human and Ecosystem Health.

Table 6-4 presents a brief overview of the attainment status and trend for each of the existing air quality indicators. More detailed information for each indicator is discussed below. For a more thorough evaluation of this threshold, please see the *2006 TRPA Threshold Evaluation*.

AQ-1 Carbon Monoxide: Non-Attainment

The CO status indicator was previously measured at what was called the Park Avenue monitoring station. This monitor was removed and replaced by one operating at the Harvey’s Casino garage at Stateline, Nevada. This site is currently managed by the Nevada Division of Environmental Protection (NDEP) and is now used as one of the official measuring sites for this indicator. Based on measurements at this site, the Lake Tahoe Basin is currently out of attainment for the 8-hr standards set by Nevada and California. At the time of this writing, data is still being collected and analyzed and therefore it is difficult to establish a reliable trend. That said, although the Lake Tahoe Basin was in violation at the beginning of the five-year analysis period, no recorded violations have been recorded since 2003 from the stations that have been analyzed. In addition, data indicates the Lake Tahoe Basin is currently in attainment for the remaining state and federal CO standards at all other monitored sites in the Lake Tahoe Basin. For these reasons, TRPA is stating that we have a positive trend.

Table 6-4						
2006 TRPA Air Quality Indicator Attainment Status						
#	Threshold Name	1991 Attainment Status	1996 Attainment Status	2001 Attainment Status	2006 Attainment Status	5-Year Trend
1	Carbon Monoxide	Non-Attainment	Attainment	Attainment	Non-Attainment	Positive
2	Ozone	Non-Attainment	Non-Attainment	Non-Attainment	Non-Attainment	Negative ¹
3	Particulate Matter	Non-Attainment	Non-Attainment	Attainment	Non-Attainment	Negative
4	Visibility	Attainment	Non-Attainment	Non-Attainment	Attainment	Positive
5	Traffic Volume	Non-Attainment	Attainment	Unknown	Attainment	Positive
6	Wood Smoke	Non-Attainment	Non-Attainment	Unknown	Unknown	Unknown
7	Vehicle Miles Traveled	Non-Attainment	Non-Attainment	Non-Attainment	Non-Attainment	Positive
8	Atmospheric Deposition	Unknown	Unknown	Unknown	Unknown	Unknown

*Information for 1991 to 2001 was from the 2001 Threshold Report
 1. More stringent ozone standards became effective in May 2006. This may result in additional ozone violations in the future.
 Table 2-3: 2006 A/Q Indicator Attainment Status, 2006 Threshold Evaluation

AQ-2 Ozone: Non-Attainment

Over the last 10 years, the TRPA has monitored ozone levels in the Lake Tahoe Basin at no less than 6 separate sites. During the last 5 years, over 50% of the ozone monitors have been removed and/or relocated in the basin making threshold and trend analysis extremely difficult. As of 2006, only two sites (CSLT airport and Incline Village) remain operational. Between 2001 and 2004 there were no violations of any federal or state ozone standards. However, during this same period, over 54 separate violations of TRPA’s 1-hour ozone standard were recorded and therefore the Lake Tahoe Basin was listed as non-attainment. In addition, because more stringent standards became effective in May 2006, and the Lake Tahoe Basin has violated this standard multiple times in the past, the trend was listed as negative for this indicator. The Lake Tahoe Basin has exceeded TRPA’s ozone standard for every threshold report to date.

AQ-3 PM₁₀: Non-Attainment

Previously, PM₁₀ was monitored at four separate sites around the Lake Tahoe Basin: two in Nevada and two in California. Only two sites were in operation in 2005. At the time of publication, data was only available from the Sandy Way site located in South Lake Tahoe between 2001 and 2005. During this period, no exceedances of the federal

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24-hr standard were recorded and only six exceedances were estimated for the California's standard. Because this indicator was previously in attainment between 1996 and 2001 and we have experienced non-attainment events in recent years, this indicator is listed as non-attainment and experiencing a negative trend.

AQ – 4 Visibility: Attainment

Regional Visibility - Data was collected at the Bliss State Park monitoring station from 2000 to 2004. During this period, 503 days were sampled and 96 percent of the days were found to be above the 71 miles and 65 percent of the days above the 97-mile standard. Based on this sample time, we were able to calculate the three-year rolling average for the years 2002, 2003, and 2004. All of these years were shown to be in attainment based on information provided by Air Resource Specialists (ARS).

Sub-regional Visibility - Data was collected at the South Lake Tahoe monitoring station from 2000 to 2004. During this period, 186 days were sampled and 100 percent of the days were found to be above the 19 miles and 73 percent of the days above the 48-mile standard. Based on this data, we were able to calculate the three-year rolling average for the years 2002, 2003, and 2004 and all years were shown to be in attainment based on information provided by ARS.

Due to budget constraints, data collection and the analysis of the visibility data for both sites has been temporarily suspended. Staff will be addressing this shortfall and the possibility of adding an addition sub-regional monitoring station on the North shore in the near future.

AQ – 5 Traffic Volume: Attainment

Attainment is reached if we attain and maintain a 7 percent reduction in traffic on U.S. 50 from the 1981 baseline levels (25,173). The Lake Tahoe Basin has been in attainment since 2003 and has shown a general improvement in almost every year since that time. The latest average traffic volume of 17,936 was recorded in 2006 on the Saturday of the Presidents' Day holiday. This represents a 28.7 percent reduction from the 1981 levels and is well above the 7 percent reductions required by the current standards.

AQ – 6 Wood Smoke & Suspended Soil Particulates: Unknown

The wood smoke indicator is based on reducing wood smoke from the 1981 levels. Because wood smoke levels were never established for the 1981 or subsequent timeframes and no reliable method of establishing them have been developed, it is impossible to evaluate this indicator and it is therefore listed as unknown. In addition, this indicator also contains a requirement to reduce suspended solid particles by 30% from the 1981 base levels. Similar issues hamper the suspended soil particles in that soil particle levels were never established for the 1981 or subsequent timeframes and no reliable method of establishing suspended soil particle levels have been developed.

AQ – 7 Vehicle Miles Traveled (VMT): Non-Attainment

Current data indicates that significant shifts in housing, gaming economies, employment and redevelopment strategies have assisted in reductions in traffic volumes and VMT. The TRPA utilized 27 actual count stations around the Lake Tahoe Basin in order to analyze the attainment status for VMT. The combined published traffic volumes for the traffic count locations in the basin decreased approximately 2.7 percent from the 1981

modeled traffic counts. Using this process, VMT was shown to exhibit a positive trend towards attainment with a decrease of 4.5 percent from the 1981 values.

AQ – 8 Atmospheric Nutrient Loading: Unknown

The threshold standards require a reduction in dissolved inorganic nitrogen loading to Lake Tahoe from all sources by 20 percent from the 1973-81 annual average. However, the exact 1973-1981 annual average is unknown and the methods necessary to assess nitrogen dioxide loadings have not been developed. Therefore, attainment of the threshold relative to nitrogen dioxide cannot be determined.

6.4.3 Technical Range of Feasibility of Improving Air Quality for Human Health

It is technically feasible to meet the proposed standards within the next 20 years. However, because the majority of health based pollution comes from the transportation sector, a significant change in the way transportation practices are handled in the Lake Tahoe Basin must occur. This can be done by promoting and implementing the cleanest modes of transportation and redeveloping more pedestrian friendly communities. In addition, programmatic improvement to the basin's wood heater, fuels reduction, street sweeping, and BMP programs would also provide positive air quality results.

6.4.4 Proposed Air Quality Desired Condition for Human and Ecosystem Health

The development of the proposed desired condition for Human and Ecosystem Health was straightforward. All parties involved in the Pathway process agreed that the goal for the Lake Tahoe Basin was to attain and maintain air quality at levels that are healthful for humans and the ecosystem. Additionally, the standards should be set at the most protective and progressive levels and that they be applied basin-wide. To this end, the proposed desired condition for Human and Ecosystem Health is as follows:

Proposed Desired Condition for Human and Ecosystem Health

Air quality in the Lake Tahoe Basin is healthy for humans and ecosystems.

6.4.5 Proposed Air Quality Standards for Human Health

The primary modification being proposed for the Air Quality Human Health standards include the adoption of the most stringent standards basin-wide, for pollutants-of-concern. Currently, the air quality standards differ depending on which side of the Lake Tahoe Basin you are on. This provides inequity for the basin occupants in terms of the healthfulness of the air quality. In addition, because control strategies are designed around the air quality standards, it is extremely difficult to develop equitable programs

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between the two states when the standards are different and the air we breathe does not recognize the state boundaries.

Table 6-5, shows the proposed numerical standards for Air Quality for Human Health. These standards will be applied Basin-wide and are designed to allow for the most effective management of air quality within the Basin. These standards reflect the intent of the proposed desired condition, which is to have zero exceedances of the most restrictive federal, California, Nevada, or TRPA human health standards for the pollutants-of-concern. This will reduce resources needed to monitor the air quality and provide equitable health based benefits for all areas of the Lake Tahoe Basin.

Table 6-5		
Proposed Numerical Air Quality Standards for Human Health		
Zero exceedances of the most-restrictive Federal, California, Nevada, or TRPA standard for ozone, carbon monoxide and particulate matter.		
Pollutant	Indicator	Numerical Standard
Carbon Monoxide	Highest 8-hour average – Not to equal or exceed:	6 ppm
	Highest 1-hour average – Not to exceed:	20 ppm
Ozone	Highest 1-hour average – Not to exceed:	0.09 ppm
	Highest 8-hour average – No to exceed:	0.07 ppm
PM ₁₀	Annual arithmetic mean – Not to exceed:	20 µg/m ³
	Highest 24-hour average – Not to exceed:	50 µg/m ³
PM _{2.5}	Annual arithmetic mean – Not to exceed:	12 µg/m ³
	Highest 24-hour average – Not to exceed ^a :	35 µg/m ^{3b}
<p>Note:</p> <p>^a 98% of the daily concentrations, averaged over three years, are equal to or less than the std.</p> <p>^b A 24-hour PM_{2.5} standard of 25 µg/m³ is currently being considered by California. Should California adopt this standard, it will automatically apply to the entire Basin.</p> <p>There are additional air pollutants regulated by federal and state agencies in the Lake Tahoe Basin. Because these pollutants are at low concentrations in the Basin they are not considered to be of concern for Pathway discussion. Federal and state standards remain in effect for these pollutants.</p> <p>ppm = parts per million µg/m³ = micrograms per cubic meter</p>		

6.4.5 Proposed Air Quality Standards for Ecosystem Health

There are currently no proposed standards for Air Quality for Ecosystem Health. However, the same air quality pollutants that effect human health also affect ecosystem health. Therefore, many of the proposed human health standards provide protection for the ecosystem of the Lake Tahoe Basin. Separate standards will be developed to specifically address air quality effects related to ecosystem health as resources become available. Some of this work is ongoing through the development of the adaptive management process. For example, the development of the Total Maximum Daily Load (TMDL) program will provide the basis and recommendation for air quality standards and programs to protect the water quality of Lake Tahoe. Similarly, the U.S. Forest Service is developing programs for the protection of the Lake Tahoe Basin's vegetation from ozone damage.

6.5 FURTHER CONSIDERATIONS REGARDING AIR QUALITY

- a. The ability to routinely monitor air quality levels in the Lake Tahoe Basin has been drastically reduced over the last 20 years. Multiple air quality stations have been removed or downsized due to budget constraints and/or the availability of monitoring sites. For this reason, significant efforts and resources need to be allocated in order to restore the routine monitoring capability in the Lake Tahoe Basin.
- b. While commonly available in other air basins, critical tools necessary to relate pollutant emissions to ambient air quality are lacking for the Lake Tahoe Air Basin. Specifically, these include a comprehensive emissions inventory, activity levels, and an airshed model. Without these tools, the ability to assess the effectiveness of past or future emission reduction strategies is significantly limited.
- c. There is significant need and support for aggressively reducing forest fuels in the next 20 years. One of the primary mechanisms available for reducing forest fuels is prescribed burning. Unfortunately, prescribed burns directly impact air quality. Important decisions will need to be made to provide maximum benefit to both forest health and air quality objectives.
- d. Federal visibility requirements are being developed for Class I Wilderness Areas, including Desolation Wilderness. These requirements may be incorporated into the visibility standards once rules are promulgated. These rules are not expected until after 2007. In addition, new PM standards are currently being considered by California. If adopted they will be incorporated into the proposed standards.
- e. A determination about how to address the impact of air pollutants on water quality will be new to the planning discussion. New tools and information related to the Lake Tahoe Fine Sediment and Nutrients Total Maximum Daily Load (TMDL) will help inform discussion on the subject of ecosystem health. Additional air quality standards for PM, N and P may need to be adopted to match load reduction requirements that will result from this project.