3.14 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Greenhouse gas (GHG) emissions have the potential to adversely affect the environment, because they contribute, on a cumulative basis, to global climate change. In turn, global climate change has the potential to affect rain and snow fall, leading to changes in alpine hydrology and water supply; to affect habitat, leading to adverse effects on biological and other resources; and to change the frequency and duration of droughts, which can affect wildfire hazards and forest health.

Federal, state, and local regulations related to GHG emissions and climate change and potential impacts of the project alternatives are analyzed in this section. Because the nature of this issue is inherently cumulative, this section serves as the cumulative impact analysis related to GHGs and climate change. Therefore, the cumulative global climate change analysis presented in this section of the Draft EIR/EIS/EIS examines the GHG emissions associated with construction and operation-related activities of the US 50 South Shore Revitalization Project and its role in implementing statewide and regional plans that aim to reduce GHGs. The potential effects of global climate change on the project are also identified based on available scientific data.

The cumulative project list applicable to global climate comprises anthropogenic (i.e., human-made) GHG emission sources across the globe, and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context and a process for developing an enforceable statewide cap on GHG emissions. Similarly, implementation of the applicable regional transportation plan and sustainable communities' strategy for the Tahoe Region established a regional context for addressing GHG emission associated with transportation and land use. Nevada follows the guidance of FHWA for climate change issues related to transportation projects. Given the nature of environmental consequences from GHGs and global climate change, Tahoe Regional Planning Agency's (TRPA) environmental review process, NEPA, and CEQA require that lead agencies consider evaluating the cumulative impacts of GHGs, even in relatively small additions. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and, therefore, significant.

3.14.1 Regulatory Setting

FEDERAL

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. The Supreme Court of the United States ruled on April 2, 2007 that carbon dioxide (CO_2) is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in EPA taking steps to regulate GHG emissions and lent support for state and local agencies' efforts to reduce GHG emissions.

However, neither the EPA nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis. FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process, from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

FHWA has outlined four strategies to lessen climate change impacts, which correlate with efforts that California and Nevada are undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity. Climate change and its associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program," as discussed below, and Executive Order 13514 - Federal Leadership in Environmental, Energy, and Economic Performance. This order is focused on reducing greenhouse gases internally in federal agency missions, programs, and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks

On August 28, 2014, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) finalized a new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the U.S. (NHTSA 2012). EPA proposed the first-ever national GHG emissions standards under the CAA, and NHTSA proposed Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act. This proposed national program allows automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both federal programs and the standards of California and other states. While this program will increase fuel economy to the equivalent of 54.5 miles per gallon for cars and light-duty trucks by Model Year 2025, additional phases are being developed by NHTSA and EPA that address GHG emission standards for new medium- and heavy-duty trucks (NHTSA 2014).

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons (MT) or more of CO_2 per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

TAHOE REGIONAL PLANNING AGENCY

TRPA has not specifically identified any goals or Environmental Threshold Carrying Capacities related to GHG emissions or climate change at this time. The single policy in the Goals and Policies document pertaining to GHG emissions (Policy AQ-1.3) encourages the reduction of GHG emissions from motor vehicles and motorized machinery in the Tahoe Region. The TRPA Code of Ordinances includes a provision requiring that a GHG reduction strategy be incorporated into area plans adopted by local jurisdictions (TRPA Code Section 13.5.3.E) to reduce emissions of GHGs from the operation or construction of buildings. As part of the Lake Tahoe Sustainability Collaborative, TRPA participated in the preparation of the regional transportation plan for the Tahoe Region that includes strategies for reducing transportation-related GHGs (see below at *Mobility 2035: Lake Tahoe Regional Transportation Plan*) and the *Tahoe Sustainability Action Plan* (see below at *Tahoe Sustainability Action Plan*).

Mobility 2035: Lake Tahoe Regional Transportation Plan

The Tahoe Metropolitan Planning Organization (TMPO) serves as the metropolitan planning organization (MPO) for El Dorado County within the Lake Tahoe Air Basin (LTAB) and would be applicable to the project. In 2012, the TMPO prepared the Mobility 2035: Lake Tahoe Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS), which seeks to improve mobility and safety for the commuting public while at the same time delivering environmental improvements throughout the transportation network in the Lake Tahoe Basin (Basin). Important directions of the plan are to reduce the overall environmental impact of transportation in the Tahoe Region, create walkable, vibrant communities, and provide real alternatives to driving. The RTP establishes a target to reduce GHG emissions by 7 percent per capita reduction of GHGs by 2020 and by 5

percent per capita by 2035. The Basin is currently meeting these targets. The plan also supported an update of the Transportation Element of the TRPA Regional Plan. The RTP update included a Sustainable Communities Strategy (SCS), in accordance with California Senate Bill 375 (Sustainable Communities and Climate Protection Act). The SCS demonstrates how integrated transportation, land use, and housing strategies will help the MPO Region meet environmental thresholds and greenhouse gas targets for cars and light trucks on the California side of the Basin by 2035. The RTP/SCS is integrated into TRPA's Regional Plan.

2017 Lake Tahoe Regional Transportation Plan Update

The 2017 Regional Transportation Plan (2017 RTP), which is an update to the 2012 RTP, and its joint CEQA/TRPA environmental document have been circulated for public review. The vision and goals of the 2017 RTP were based on the 2012 RTP. The projects listed in the 2017 RTP are substantially similar to those in the 2012 RTP, and the US 50/South Shore Community Revitalization Project is included in both documents.

Best Construction Practices Policy for Construction Emissions

TRPA coordinates implementation of its Best Construction Practices Policy 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 (TRPA 2013). TRPA developed its Best Construction Practices Policy pursuant to Mitigation Measure 3.4-2 and Mitigation Measure 3.5-1 of the 2012 RTP/SCS Environmental Impact Report/Environmental Impact Statement (EIR/EIS), and Mitigation Measure 3.4-2 of the Regional Plan Update EIS. Included in these measures are limits on idling time and the use of clean-fuel generators rather than diesel, which would be required for this project and would help reduce GHG emissions related to the construction of the build alternatives.

STATE

California

California Executive Order S-3-05

Executive Order S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those problems, the Executive Order established total GHG emission targets for the State. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

As described below, legislation was passed in 2006 (Assembly Bill [AB] 32, the California Global Warming Solutions Act of 2006) to limit GHG emissions to 1990 levels by 2020 with continued "reductions in emissions" beyond 2020, but no specific additional reductions were enumerated in the legislation. Further, Senate Bill 375 (sustainable community strategies/transportation) established goals for emissions from light duty truck and automobiles for 2020 and 2035.

California Executive Order B-30-15

On April 20, 2015 Governor Edmund G. Brown Jr. signed Executive Order B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. California is on track to meet or exceed the current target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (Assembly Bill 32, discussed below). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2°C—the warming threshold at which there will likely be major climate disruptions such as super droughts and rising sea levels according to scientific consensus.

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions "…shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020. (c) The (Air Resources Board) shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020." [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

In December 2008, ARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) of CO_2-equivalent (CO_2e) emissions, or approximately 21.7 percent from the state's projected 2020 emission level of 545 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 47 MMT CO_2e, or almost 10 percent, from 2008 emissions). ARB's original 2020 projection was 596 MMT CO_2e, but this revised 2020 projection takes into account the economic downturn that occurred in 2008 (ARB 2011). The Scoping Plan reapproved by ARB in August 2011 includes the Final Supplement to the Scoping Plan Functional Equivalent Document, which further examined various alternatives to Scoping Plan measures. The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. ARB estimates the largest reductions in GHG emissions to be achieved by 2020 will be by implementing the following measures and standards (ARB 2011):

- improved emissions standards for light-duty vehicles (estimated reductions of 26.1 MMT CO_2e),
- the Low-Carbon Fuel Standard (15.0 MMT CO_2e),
- energy efficiency measures in buildings and appliances (11.9 MMT CO_2e),
- a renewable portfolio and electricity standards for electricity production (23.4 MMT CO_2e), and
- the Cap-and-Trade Regulation for certain types of stationary emission sources (e.g., power plants).

In May 2014, ARB released and has since adopted the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching AB 32 goals and evaluate the progress that has been made between 2000 and 2012 (ARB 2014b:4 and 5). According to the update, California is on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020 (ARB 2014b:ES-2). The update also reports the trends in GHG emissions from various emission sectors.

In 2016, SB 32 (discussed below) was passed, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. Subsequently, in January 2017, ARB released the draft 2017 Climate Change Scoping Plan Update, which details California's strategy for achieving 2030 greenhouse gas targets established under SB 32.

Senate Bill 32

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize ARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

California Senate Bill 375

Senate Bill [SB] 375, signed by the Governor in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires MPOs to develop an SCS or Alternative Planning Strategy, showing prescribed land use allocation in each MPO's regional transportation plan. ARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

As discussed above, the TMPO 2012 RTP/SCS is the applicable regional plan for the project. With the assistance of the Regional Targets Advisory Committee (RTAC) and in consultation with the MPOs, ARB provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. The ARB-issued targets for the California portion of the Tahoe MPO are a 7 percent reduction in GHG emissions per capita by 2020 relative to 2005 per capita GHG emissions and a 5 percent reduction by 2035 (ARB 2011).

California Advanced Clean Cars Program

In January 2012, ARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (ARB [no date]).

California Renewable Energy Resources Act of 2011 (Senate Bill X1-2)

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.

California Building Efficiency Standards of 2013 and 2016 (Title 24, Part 6)

Buildings in California are required to comply with California's Energy Efficiency Standards for Residential and Nonresidential Buildings established by the CEC regarding energy conservation standards and found in Title 24, Part 6 of the California Code of Regulations. California's Energy Efficiency Standards for Residential and Nonresidential Buildings was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated on an approximately three-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after July 1, 2014 must follow the 2013 standards (CEC 2012). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The CEC Impact Analysis for California's 2013 Building Energy Efficiency Standards estimates that the 2013 Standards are 23.3 percent more efficient than the previous 2008 standards for multi-family residential construction and 21.8 percent more efficient for non-residential construction (CEC 2013:3).

In addition, all buildings for which an application for a building permit is submitted on or after January 1, 2017 must comply with the 2016 standards (CEC 2016). The CEC 2016 Building Energy Efficiency Standards Adoption Hearing presentation estimates that the 2016 Standards are 28 percent more efficient than the previous 2013 standards for single-family residential construction and 5 percent more efficient for non-residential construction (CEC 2015). Thus, all proposed residential and commercial land uses will be required to comply with the most current building codes applicable at the time the permit applications are sought.

Caltrans Guidance on Addressing Climate Change Adaptation in Regional Transportation Plans

In February 2013, Caltrans published a report called *Addressing Climate Change Adaptation in Regional Transportation Plans: A Guide for California MPOs and RTPAs* (Caltrans 2013). This guide was written to help MPOs and regional transportation planning agencies (RTPAs) better incorporate climate assessment and adaptation into the long-range planning process. It discusses potential climate change-related impacts to

transportation infrastructure in California and related adaptation strategies. Although there is no requirement to date to incorporate climate adaptation into regional transportation planning, this guide provides information and tools to help MPOs/RTPAs anticipate the incorporation of climate assessment and adaptation into future planning efforts.

NEVADA

The State of Nevada and its jurisdictions follow the air quality policies and regulations set forth by the FHWA and the EPA when evaluating the greenhouse gas emissions generated by the construction of road projects.

Since 1982, the TRPA, the California and Nevada bi-state regional environmental planning agency for the Lake Tahoe Region, has strived to meet two air quality threshold indicators: Vehicle Miles Traveled (VMT) and traffic counts. Both of these criteria should be reduced to 1981 levels. VMT have been decreasing in the Lake Tahoe Region over the last five years, and traffic counts, which, for the purposes of the threshold indicator, are measured at a location in South Lake Tahoe, are also trending downward.

At the statewide level, on April 10, 2007, Nevada Governor Jim Gibbons signed an executive order that created the Nevada Climate Change Advisory Committee (NCCAC). The executive order directed the Committee to develop recommendations for reducing Nevada's GHG emissions.

The NCCAC released its final report on May 31, 2008 in which it identified recommendations to reduce GHG emissions in sectors such as agriculture, energy, waste management, commercial and residential building, and transportation.

To assist in the reduction of GHG emissions within the transportation sector, the committee's recommendations are intended to further efforts to supplement and diversify Nevada's fuel supplies, and to reduce air pollutants and greenhouse gases. A few of the committee's recommendations include the creation of a clean fuels and clean vehicle incentive program, as well as incentive programs for ethanol fuels and biodiesel fuels. The committee also recommends the State of Nevada monitor the status of California motor vehicle emissions standards for GHG emissions from motor vehicles.

With regard to current road transportation projects, the Nevada Department of Transportation adheres to the policies and regulations of the PA and the FHWA for greenhouse gases.

LOCAL

El Dorado County Air Quality Management District

EDCAQMD currently recommends that lead agencies use thresholds of significance for evaluating construction- and operation-related GHG emissions developed by *Sacramento Metropolitan Air Quality Management District* (SMAQMD) and available in the SMAQMD CEQA Guide, last updated in November 2014 (Baughman, pers. comm., 2015). These thresholds were developed for the Sacramento metropolitan region and are intended to evaluate a project for consistency with GHG targets established in AB 32. Thresholds are included below in the Significance Criteria description.

Tahoe Sustainability Action Plan

The *Tahoe Sustainability Action Plan* was completed by the Lake Tahoe Sustainability Collaborative in December 2013 (Lake Tahoe Sustainability Collaborative 2013). The California Strategic Growth Council (SGC) funded the regional collaboration to develop sustainability tools for regional and local agencies, non-profits, the business community, and local residents to use in promoting greenhouse gas reduction, among other sustainability goals. The grant and planning effort was administered by the TMPO and was carried out by the Lake Tahoe Sustainability Collaborative, which is a public and private partnership that includes TRPA and was established to lead the development of sustainability tools and drive coordinated sustainability

efforts. The sustainability tools in the Tahoe Sustainability Plan are intended to support development of economic incentives, GHG reduction strategies, and climate change adaptation strategies.

South Lake Tahoe General Plan

The Natural and Cultural Resources Element of the *South Lake Tahoe General Plan* provides city-wide goals and polices aimed at reducing GHG emissions and promoting sustainable development (City of South Lake Tahoe 2011). Relevant goals and policies include incorporating bicycle and pedestrian facilities in city transportation planning and new development projects (Policy NCR-5.1), consideration of traffic-calming measures where needed (Policy NCR-5.5), encouraging interconnected bicycle, pedestrian, and bus transit circulation in development projects (NCR-5.8), supporting appropriately located mixed-use development sites within walking distance of each other (NCR-5.9), and mitigating carbon emissions during project-level CEQA review for individual projects (NCR-5.15). The General Plan also encourages conservation in new and existing development to reduce GHG emissions (Goal NCR-6); this goal is supported by policies that encourage use of "EPA Energy Star" certified appliances for new private development and public facilities (NCR-6.14), and a requirement to prepare a waste diversion plan to address the construction phase for certain projects (NCR-6.16). The full text of this goal and these policies, along with a discussion of the project's consistency with this goal and policy, is included in Appendix E, "Goals and Policies Consistency Analysis."

3.14.2 Affected Environment

EXISTING CLIMATE

Climate is the accumulation of daily and seasonal weather events over a long period of time, whereas weather is defined as the condition of the atmosphere at any particular time and place (Ahrens 2003). 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 Lake Tahoe are approximately 8,000 to 9,000 feet in height on average, with some reaching 10,000 feet.

ATTRIBUTING CLIMATE CHANGE—THE PHYSICAL SCIENTIFIC BASIS

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors together (IPCC 2014:3, 5).

Climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric

lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say, the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or microclimates.

GREENHOUSE GAS EMISSION SOURCES

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (ARB 2014a). In the United States, the main source of GHG emissions is electricity generation, followed by transportation. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (ARB 2014a). According to the NCCAC, the transportation sector in Nevada contributes 32 percent of the greenhouse gas emissions in the state.

Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. Nitrous oxide is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing CO_2 from the atmosphere.

EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to provide the world with a scientific view on climate change and its potential effects. According to the IPCC global average temperature is expected to increase relative to the 1986–2005 period by 0.3 to 4.8 degrees Celsius (°C) (0.5 to 8.6 degrees Fahrenheit [°F]) by the end of the 21st century (2081–2100), depending on future GHG emission scenarios (IPCC 2014:SPM-8). According to the California Natural Resources Agency, temperatures in California are projected to increase 2.7°F above 2000 averages by 2050 and, depending on emission levels, 4.1 to 8.6°F by 2100 (CNRA 2012:2).

Physical conditions beyond average temperatures could be indirectly affected by the accumulation of GHG emissions. For example, changes in weather patterns resulting from increases in global average temperature are expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based upon historical data and modeling, the California Department of Water Resources projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050 (DWR 2008:4). An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events (CNRA 2012:5). This scenario would place more pressure on California's levee/flood control system.

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century and, assuming that sea-level changes along the California coast continue to track global trends, sea level along the state's coastline in 2050 could be 10-18 inches higher than in 2000, and 31 to 55 inches higher by the end of this century (CNRA 2012:9).

Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of large wildfires (CNRA 2012:11).

3.14.3 Environmental Consequences

METHODS AND ASSUMPTIONS

Short-term, construction-related GHG emissions were calculated using the SMAQMD Roadway Construction Emissions Model (Version 8.1.0) for the transportation improvements and the California Emissions Estimator Model (CalEEMod) Version 2016.3.1 computer program (California Emissions Estimator Model [CAPCOA] 2016) for the mixed-use development sites, as recommended by EDCAQMD and other air districts in California. Modeling was based on project-specific information (e.g., length of road, area to be graded, area to be paved), where available; reasonable assumptions based on typical construction activities; and default values that are based on the project's location and land use type. The modeling conservatively assumed that project construction/grading phases could begin as early as 2017 for both the transportation improvements and mixed-use development sites. Transportation improvements are anticipated to take up to three years and each mixed-use site was assumed to take up to one year to construct. Construction emissions were evaluated for the transportation improvements alone and in combination with the mixed-use development sites. Actual construction phasing and timing for each mixed-use site is unknown and thus all construction activities were summed and amortized over 25 years to represent annual emissions over the life of the project, consistent with SMAQMD guidance. Note that SMAQMD guidance allows non-residential projects to amortize construction emissions over 40 years. However, for a conservative estimate (i.e., to avoid the risk of understating an impact), a 25-year life span for residential projects was applied to all emissions modeling. For a detailed description of model input and output parameters and assumptions, refer to Appendix J.

The potential for the project to result in an increase in operational GHG emissions is assessed qualitatively based on the VMT analysis provided in the traffic analysis prepared for the US 50/South Shore Revitalization Project (Wood Rodgers 2016) and the project is evaluated for its consistency with the RTP/SCS.

In addition, this EIR/EIS/EIS evaluates whether the US 50/South Shore Revitalization Project would be substantially affected by environmental impacts exacerbated by climate change. This analysis is largely informed by Caltrans guidance on *Addressing Climate Change Adaptation in Regional Transportation Plans* (Cambridge Systematics 2013) discussed earlier in this section.

SIGNIFICANCE CRITERIA

FHWA, TRPA, and EDCAQMD have not formally identified a significance threshold standard for analyzing GHG emissions generated by a project, or a methodology for analyzing impacts related to GHG emissions or global climate change.

NEPA Criteria

FHWA and EPA do not provide significance criteria for GHG emissions analysis in NEPA documents. The Council on Environmental Quality (CEQ) is the division of the Executive Office of the President that coordinates federal environmental efforts in the United States. CEQ finalized guidance for addressing GHG emissions in NEPA documents in 2016. The guidance does not include significance criteria, but directs federal agencies to disclose and carefully analyze emissions (CEQ 2016).

TRPA Criteria

TRPA's Initial Environmental Checklist does not contain any criteria that directly pertain to GHGs, climate change, or the adaptability of a project to climate change.

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, the GHG emissions generated by a proposed project would result in a cumulatively considerable contribution to climate change if the project would:

- generate greenhouse gas emissions, either directly or indirectly, that may have a significant adverse effect on the environment; or
- conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Thresholds of Significance

Based on the available guidance and criteria described above, GHG emissions generated by a proposed project would result in a cumulatively considerable contribution to climate change if the project would:

- result in construction-related GHG emissions that exceed SMAQMD recommended threshold of 1,100 $MTCO_2e$/year. To assess consistency with California's 2030 GHG target of 40 percent below 1990 levels, this threshold, established for the purpose of reducing 2020 statewide emission to 1990 levels, has been adjusted down by 40 percent to 660 $MTCO_2e$/year; and
- conflict with implementation of the adopted 2012 TRPA/TMPO RTP/SCS (i.e., Mobility 2035) or 2017 RTP, Senate Bill 375.

ENVIRONMENTAL EFFECTS OF THE PROJECT ALTERNATIVES

Impact 3.14-1: GHG emissions and consistency with the Regional Transportation Plan

Implementation of Alternatives B, C, and D would result in realignment of US 50 and community revitalization that would be consistent with implementation of the RTP/SCS, which aims to achieve regional VMT (and associated GHG emissions) reduction targets. Therefore, Alternatives B, C, and D would help implement the RTP's impact on regional VMT and related GHG emissions. There would be nominal construction-related GHG emissions of less than 1,100 $MTCO_2e$/year and 660 $MTCO_2e$/year (2030 adjusted threshold) for all the build alternatives. Implementation of Alternative A would not support the revitalization of the Tourist Core; it would retain the existing roadway system as is and existing traffic conditions, including existing levels of congestion and traffic flow but would not result in an increase in GHG emissions relative to existing conditions. For Alternative E, the existing roadway alignment would remain the same with separation of pedestrians on an elevated structure. It would not support revitalization in the Tourist Core as effectively as the realignment alternatives and the through-traffic trip length on US 50 would be unchanged as would VMT and related GHG emissions.

NEPA Environmental Consequences:	The design features of Alternatives A, B, C, D, and E would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement
CEQA/TRPA Impact Determinations:	Less Than Significant for Alternatives A, B, C, D, and E

Alternative A: No Build (No Project)

This alternative would retain existing traffic conditions, including existing levels of congestion and traffic flow, and therefore could potentially prevent full, effective implementation of the RTP/SCS, which was adopted to improve connectivity, reliability, travel times, and operations of public transportation, and increase mobility and safety of bicycles and pedestrians to achieve reduction targets for VMT (and associated mobile-source GHGs). While Alternative A could potentially conflict with implementation of the RTP/SCS, it also would not result in an increase in VMT or GHG emissions relative to existing conditions. Therefore, this would be a **less-than-significant** impact for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, Alternative A would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Alternative B: Triangle (Locally Preferred Action)

Transportation Improvements

GHG emissions for transportation projects can be divided into those generated during construction and those generated during operations. Construction activities that would generate GHG emissions include the use of off-road construction equipment, trucks hauling materials to and from the construction site, and commute trips by workers.

GHG emissions generated by construction would be primarily in the form of CO_2. Emissions of other GHGs, such as methane and nitrous oxide, are also important with respect to global climate change; however, the emission levels of these other GHGs from on- and off-road vehicles used during construction are relatively small compared with the level of CO_2 emissions, even when factoring in the relatively larger global warming potential of methane and nitrous oxide.

Construction emissions were estimated using the Road Construction Emissions Model, Version 8.1.0, which is widely accepted by air districts in California, including EDCAQMD, for estimating emissions from linear construction projects, such as roadway widening and new roadway construction. Detailed modeling parameters are provided in Appendix J and modeling results are shown below in Table 3.14-1.

Table 3.14-1 Estimated Greenhouse Gas Emissions Associated with Construction of Alternatives B, C, and D

Construction Activities	GHG Emissions ($MTCO_2e$)
Total Demolition Phase Emission	53
Total Construction Phase Emissions	2,604
Total Construction Emissions over 3-year period	2,657
Annual Construction Emissions (amortized over 25 years)	106
EDCAQMD/SMAQMD Thresholds of Significance ($MTCO_2e$/year)	1,100
Exceed Applicable Thresholds of Significance?	NO

Notes:
$MTCO_2e$ = metric tons of carbon dioxide equivalents
EDCAQMD = El Dorado County Air Quality Management District
SMAQMD = Sacramento Metropolitan Air Quality Management District
Source: Compiled by Ascent Environmental, Inc. in 2016

Based on the modeling conducted, the total CO_2 emissions for construction of Alternative B would be approximately 2,657 metric tons. Assuming a project life of 25 years, this would result in an average of 106 $MTCO_2e$/year. These emission estimates do not account for any emission reductions that would result from implementation of TRPA's Best Construction Practices Policy for Construction Emissions (e.g., minimizing idling time of diesel-powered equipment, utilizing electricity or clean-fuel generators rather than diesel, where feasible) and therefore actual emissions may be less than reported here. Nonetheless, estimated construction-related GHG emissions would not exceed applicable thresholds of significance (i.e., 1,100 $MTCO_2e$/year for 2020 targets and 660 $MTCO_2e$/year for 2030).

Regarding project operations, implementation of Alternative B would result in realignment of US 50 and community revitalization that would be consistent with implementation of the RTP/SCS, which aims to achieve regional VMT (and associated GHG emissions) reduction targets. Moreover, VMT (and resultant GHG emissions) associated with the US 50/South Shore Community Revitalization Project were evaluated in the analysis of the 2012 RTP/SCS EIR/EIS that determined an overall reduction in region-wide VMT (TMPO and TRPA 2012). This is noteworthy given that the RTP/SCS demonstrates how integrated transportation, land use, and housing strategies will help Lake Tahoe meet GHG targets for cars and light trucks on the California

side of the Basin, as required by SB 375. In turn, because SB 375 is a component of the AB 32 Scoping Plan, Alternative B would also be consistent with the state's plan to achieve AB 32-mandated emission reductions. Implementation of Alternative B would not prevent the TRPA region from reaching its goal of reducing VMT below 1981 levels.

In summary, because construction-related GHG emissions would be below SMAQMD thresholds, Alternative B would not result in a long-term increase in VMT or GHG emissions, and Alternative B is identified as part of the 2016 RTP/SCS, which aims to achieve reduction targets for mobile-source GHGs, and the transportation improvements alone do not introduce any new trip-generating land uses, implementation of Alternative B would not result in a considerable contribution to the cumulative adverse effect of climate change. Conversely, Alternative B would help implement the RTP/SCS's beneficial impacts on regional VMT. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative B transportation improvements would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Mixed-use Development including Replacement Housing

In addition to the proposed realignment of US 50 and associated improvements discussed above, three individual mixed-use development sites could be developed. Each site would include a mix of commercial and residential land uses as well as a combination of on-site parking structures and parking lots to support the mixed-use development sites.

The maximum allowable development that could occur on the three sites collectively includes up to 227 housing units, 46,250 square feet of commercial space, and 534 parking spaces. For purposes of evaluating GHG impacts, this maximum potential was assumed for emissions modeling. Emissions were estimated for construction of each site individually and combined with the transportation improvements to represent complete build out of the alternatives. Detailed modeling parameters are provided in Appendix J and modeling results are shown below in Table 3.14-2.

Table 3.14-2 Estimated Greenhouse Gas Emissions Associated with Construction of Mixed-Use Sites 1, 2, and 3

Construction Activities	GHG Emissions ($MTCO_2e$)
Total Site 1 Construction Activities (assumed 1 year construction duration)	480
Total Site 2 Construction Activities (assumed 1 year construction duration)	424
Total Site 3 Construction Activities (assumed 1 year construction duration)	380
Total Mixed-Use Sites	1,284
Annual Construction Emissions Mixed-Use Sites Alone (amortized over 25 years)	**51**
Total Alternative B Transportation Improvements (From Table 3.14-1)	2,657
Annual Construction Emissions Mixed-Use + Roadway Alignments (amortized over 25 years)	**157**
EDCAQMD/SMAQMD Thresholds of Significance ($MTCO_2e$/year)	1,100
Exceed Applicable Thresholds of Significance?	NO

Notes:
$MTCO_2e$ = metric tons of carbon dioxide equivalents
EDCAQMD = El Dorado County Air Quality Management District
SMAQMD = Sacramento Metropolitan Air Quality Management District
CEQ = Council on Environmental Quality
Source: Compiled by Ascent Environmental, Inc. in 2016

Based on the modeling conducted, the total CO_2 emissions for each site individually would not exceed applicable thresholds of 1,100 $MTCO_2e$/year (2020 target) or 660 $MTCO_2e$/year (2030 target). When combined with emissions associated with transportation improvements and amortized over the life of the

project, total CO_2 emissions would still not exceed applicable thresholds for target years 2020 or 2030. These emission estimates do not account for any emission reductions that would result from implementation of TRPA's Best Construction Practices Policy for Construction Emissions (e.g., minimizing idling time of diesel-powered equipment, utilizing electricity or clean-fuel generators rather than diesel, where feasible) and therefore actual emissions may be less than reported here. Nonetheless, construction-related GHG emissions would not exceed applicable threshold of significance.

Operational-related GHG emissions associated with the proposed mixed-use development sites would result from energy use (i.e., electricity and natural gas), area sources (i.e., fireplaces and landscape maintenance equipment), and vehicle use (i.e., trip generation and VMT).

The mixed-use development sites would replace all existing residences and develop additional residential and retail/commercial space, resulting in a net increase in development over existing conditions. However, new construction would be required to comply with current California Title 24 Building Codes, which have been requiring substantial increases in building energy efficiency over time. Considering current standards, residential building codes result in up to a 65 percent reduction in electricity consumption and 39 percent in natural gas use when compared to standards in place at the time existing structures were built. For non-residential land uses, efficiency may be improved by 29 percent for electricity and 33 percent for natural gas (See Appendix J for calculations). Thus, although a net increase in development would occur, energy consumption in new structures would be substantially more efficient compared to existing structures. In addition, new buildings would be required to comply with current TRPA Code of Ordinances 65.1.4 Combustion Appliances, that require EPA-certified clean-burning wood heaters be installed in all new construction.

Regarding mobile-source GHG emissions, the proposed mixed-use development sites would generate slightly more trips (locally) than the land uses they would replace (approximately 1,400 – 1,700 additional daily trips) (Wood Rodgers 2016). However, the type of compact mixed-use development that would occur at Sites 1, 2, and 3 are precisely the types of transit-oriented, urban infill development contemplated for this area in the Regional Plan and evaluated in the RPU EIS and 2012 RTP/SCS EIR/EIS, required to reduce region-wide VMT, by locating various land uses and amenities in close proximity to residences and existing development. Further, the mixed-use development sites are consistent with the compact development standards (e.g., density, height, and land coverage) in the TCAP and TRPA Code.

Although additional local VMT, and associated GHG emissions, may increase as a result of the mixed-use development sites, based on the VMT analysis for the entire region included in the RTP EIR/EIS, regional VMT targets would still be met. Further, new construction would be substantially more energy efficient than buildings that would be replaced. As the proposed mixed-use development sites would replace existing development and would be consistent with densities contemplated in the aforementioned planning documents and associated environmental analyses, the mixed-use development sites would not result in a net increase in operational GHG emissions that were not previously evaluated. Therefore, because similar land uses and development densities were accounted for in TRPA's regional emissions analysis, the addition of these mixed-use development sites would help implement the RTP/SCS's beneficial impact on regional VMT. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative B mixed-use development sites would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar GHG emissions from construction and operation as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of potential GHG emissions would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative B transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to GHG emissions.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative B would avoid creating substantial GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Alternative C: Triangle One-Way

Transportation Improvements

Impacts would be the same as described for Alternative B because the duration and type of construction activities with the Alternative C transportation improvements would generally be the same as with Alternative B (see Table 3.14-1 for emissions estimate). Long-term operational impacts of Alternative C would be the same as described for Alternative B because the design concept and scope of Alternative C would also be consistent with the description of the US 50/South Shore Community Revitalization Project in the 2017 RTP/SCS, and the assumptions in TMPO's regional emissions analysis. Implementation of this alternative would not conflict with applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. Conversely, Alternative C would help implement the RTP/SCS's beneficial impact on regional VMT. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative C transportation improvements would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Mixed-use Development including Replacement Housing

Impacts would be the same as described for Alternative B because the duration and type of construction activities that would occur with Alternative C would generally be the same as with Alternative B (See Table 3.14-2 for emissions estimate). Operation of the mixed-use development would also be the same as Alternative B and therefore this alternative would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. Conversely, as with Alternative B, the mixed-use development sites associated with Alternative C would help implement the RTP/SCS's beneficial impact on regional VMT. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative C mixed-use development sites would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar GHG emissions from construction and operation as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of potential GHG emissions would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative C transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to GHG emissions.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative C would avoid creating substantial GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Alternative D: Project Study Report Alternative 2

Transportation Improvements

Alternative D is similar to Alternative B in that it would construct a new alignment for US 50 to the southeast of existing US 50 from the Pioneer Trail intersection in California to Lake Parkway in Nevada. The relocated US 50/Pioneer Trail intersection would be further east than the Alternative B alignment, and would cut through the business triangle preserved by Alternative B. Proposed construction activities and construction duration would be similar with this alternative as compared to Alternative B (See Table 3.14-1 for emissions estimate). Long-term operational impacts of Alternative D would be the same as described for Alternative B because the design concept and scope of Alternative D would also be generally consistent with the description of the US 50/South Shore Community Revitalization Project in the 2017 RTP/SCS, and the assumptions in TMPO's regional emissions analysis. Implementation of this alternative would not conflict with applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative D transportation improvements would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Mixed-use Development including Replacement Housing

Alternative D includes the redevelopment of three sites within the project site similar to Alternative B. Because the highway realignment differs from Alternative B, the configuration of Sites 1 and 2 are different for Alternative D. The maximum amount of development that could occur on these three sites with Alternative D would be the same as that described above for Alternative B. Therefore, maximum construction-related emissions and associated impacts would be the same (see Table 3.14-2 for emissions estimate). Operation of the mixed-use development would also be the same as Alternative B and therefore this alternative would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. Conversely, as with Alternative B, the mixed-use development sites associated with Alternative D would help implement the RTP/SCS's beneficial impact on regional VMT. Considering both construction and operation emissions, this impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the Alternative D mixed-use development sites would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar GHG emissions from construction and operation as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of potential GHG emissions would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative D transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to GHG emissions.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative D would avoid creating substantial GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Alternative E: Skywalk

Alternative E would feature a concrete deck over the entire width and length of existing US 50 within the Tourist Core between a location about 100 feet south of Stateline Avenue and a location near the northern end of the Montbleu Resort (about 450 feet south of Lake Parkway). The deck would serve as a pedestrian "skywalk" facility or raised pedestrian walkway along the casino core. The width would be approximately 75 feet. The skywalk would be constructed on 4-feet wide columns spaced approximately 20 feet on center running along both sides of the highway for the entire length of the bridge. Construction-related emissions associated with this alternative are shown below in Table 3.14-3.

Based on the modeling, the total CO_2 emissions for construction of Alternative E would be approximately 574 metric tons. Assuming a project life of 25 years, this would result in an average of 23 $MTCO_2e$/year. These emission estimates do not account for any emission reductions that would result from implementation of TRPA's Best Construction Practices Policy for Construction Emissions (e.g., minimizing idling time of diesel-powered equipment, utilizing electricity or clean-fuel generators rather than diesel, where feasible) and therefore actual emissions may be less than reported here. Nonetheless, estimated construction-related GHG emissions would not exceed applicable thresholds of significance. Further, operation of Alternative E would not result in any increases in local or regional VMT. No mixed-use development is proposed with this alternative. Implementation of this alternative would not result in substantial GHG emissions or conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Table 3.14-3 Estimated Greenhouse Gas Emissions Associated with Construction of Alternative E

Construction Activities	GHG Emissions ($MTCO_2e$)
Total Construction Emissions 3-year period	574
Emissions $MTCO_2e$/year	23
EDCAQMD/SMAQMD Thresholds of Significance ($MTCO_2e$/year)	1,100
Exceed Applicable Thresholds of Significance?	NO

Notes:

$MTCO_2e$ = metric tons of carbon dioxide equivalents

EDCAQMD = El Dorado County Air Quality Management District

SMAQMD = Sacramento Metropolitan Air Quality Management District

Source: Compiled by Ascent Environmental, Inc. in 2016

Because of the reasons stated above, for the purposes of NEPA, Alternative E would avoid or minimize GHG emissions such that no additional mitigation measures are needed or feasible to implement.

Impact 3.14-2: Vulnerability to climate change risks

Climate change is expected to result in a variety of effects in the study area including increased frequency and intensity of wildfires, changes to timing and intensity of precipitation resulting in increased risk from landslides associated with ground saturation, increased stormwater runoff, and increased intensity of storm events that result in increased snow loading and high winds. However, there are numerous programs and policies in place, as well as design measures that would protect against these climate change risks.

NEPA Environmental Consequences:	The design features of Alternatives B, C, D, and E would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement
CEQA/TRPA Impact Determinations:	Less than Significant for Alternatives B, C, D, and E; No Impact for Alternative A.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels.

The project is located in an urbanized area where chances of wildland fire are typically reduced relative to a forested area and emergency response personnel are more readily available. Further, TRPA, El Dorado County, and Douglas County have adopted plans and policies to manage and plan for wildland fire. These include TRPA's Community Wildfire Protection Plan and TRPA's Fuel Reduction and Forest Restoration Plan; the California Department of Forestry and Fire Protection's (CALFIRE) Plans for El Dorado County; and the Nevada Hazard Mitigation Plan in Douglas County (see Section 3.12, "Hazards, Hazardous Materials, and Risk of Upset," for additional information on plans and policies related to wildland fire). Implementation of these plans would reduce the likelihood of wildland fire through management of fuels and implementation of best practices and would ensure that resources to respond to the occurrence of a wildland fire would be available. Therefore, it is not anticipated that the study area would be substantially affected by exposure to wildfire as a result of climate change impacts.

Potential impacts associated with changing storm and precipitation patterns are addressed below, for each alternative.

Alternative A: No Build (No Project)

With Alternative A there would be no improvements to existing US 50, Lake Parkway, or other roadways within the project site, and no new land use development. As no project would be implemented, there would be no new development or land uses that could be affected by climate change. There would be **no impact** for the purposes of NEPA, CEQA, and TRPA.

Alternative B: Triangle (Locally Preferred Action)

Transportation Improvements

Implementation of this alternative would result in slightly more roadway length (i.e., 0.4 mile) on US 50. However, travel lanes would be reduced on existing US 50 so overall surface area of impervious surfaces would remain relatively similar to existing conditions. The proposed pedestrian bridge would be elevated and would not be prone to flooding. In addition, landscaping improvements, such as the addition of street trees, decorative vegetation, and landscaped medians, would be included throughout the project site with this alternative. Further, the project would include various improvements that would help with storm water retention, such as sediment traps, infiltration basins, and sand traps (Wood Rogers 2016b). All of these improvements would help capture and reduce stormwater runoff.

As discussed in Section 3.11, "Geology, Soils, Land Capability, and Coverage," the project site is not located on sloping ground that is potentially subject to landslides, rock falls, and debris/earth flows, which could become more frequent or severe as storm patterns change. Also, the project would not place facilities in locations with increased avalanche risk relative to existing conditions. For these reasons, changes in local weather patterns as a result of climate change would not be expected to have a substantial impact on the project. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative B transportation improvements would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Mixed-use Development including Replacement Housing

The addition of the mixed-use development would result in the replacement of existing residential land uses with a mix of residential and commercial/retail uses. Because these redevelopment sites would replace existing housing and would be designed to meet existing building standards, they would not result in substantial population growth in the area and therefore would not be exposing additional people to potential risks from climate change. The same design components described above would also be implemented. Therefore, impacts would be the same. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative B mixed-use development sites would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar climate change risks as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of climate change risks would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative B transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to vulnerability to climate change risks.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative B would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Alternative C: Triangle One-Way

Transportation Improvements

The alignment of Alternative C would be the same as Alternative B for the route along existing Montreal Road and Lake Parkway. However, Alternative C would involve one-way travel within the Tourist Core and on the realigned highway to the southeast. All improvements associated with landscaping and stormwater retention would also be included. Therefore, impacts would be the same as Alternative B. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative C transportation improvements would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement

Mixed-use Development including Replacement Housing

Alternative C includes the redevelopment of the same three sites within the project site as Alternative B. Therefore, impacts would be the same. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative C mixed-use development sites would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar climate change risks as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of climate change risks would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative C transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to vulnerability to climate change risks.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative C would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Alternative D: Project Study Report Alternative 2

Transportation Improvements

Alternative D is similar to Alternative B in that it would construct a new alignment for US 50 to the southeast of existing US 50 from the Pioneer Trail intersection in California to Lake Parkway in Nevada. The relocated US 50/Pioneer Trail intersection would be further east than the Alternative B alignment, and would cut through the business triangle preserved by Alternative B. Nonetheless, similar improvements associated with landscaping and stormwater retention as alternative B would be included. Therefore, impacts would be the same as Alternative B. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative D transportation improvements would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Mixed-use Development including Replacement Housing

Alternative D would also include development of the same three sites, however different site configuration would be required because the highway alignment also differs with this alternative. Nonetheless, similar improvements associated with landscaping and stormwater retention as Alternative B would be included. Therefore, impacts would be the same as Alternative B. This impact would be **less than significant** for the purposes of CEQA and TRPA.

Because of the reasons stated above, for the purposes of NEPA, the design features of the Alternative D mixed-use development sites would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar climate change risks as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of climate change risks would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative D transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact as it relates to vulnerability to climate change risks.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative D would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

Alternative E: Skywalk

This alternative would not include any new roadway alignments or associated improvements. The new pedestrian bridge would be elevated and would not be susceptible to increased flooding. Impacts to this alternative from climate change would not be likely. This impact would be **less than significant** for the purposes of CEQA and TRPA.

For the purposes of NEPA, the design features of Alternative E would avoid or minimize vulnerability to climate change risks such that no additional mitigation measures are needed or feasible to implement.

3.14.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required to reduce greenhouse gas and climate change effects such that there would not be an adverse effect for the purposes of NEPA or to a less-than-significant level for the purposes of CEQA and TRPA.