4.5 CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

4.5.1 INTRODUCTION

This section describes the potential effects of climate change from the Proposed Project's contribution to greenhouse gas (GHG) emissions, and the potential effects of climate change on the Proposed Project. The *City of Roseville General Plan 2025* (last updated in June 2015) provides goals and policies adopted by the City Council to help guide the direction of City development. The following documents contain GHG-related policies or other guidance that has been relied upon for the Project Analysis:

- *City of Roseville General Plan 2025*, as amended June 2015 (City of Roseville, 2015a)
- *City of Roseville Zoning Ordinance* as amended, August 2014
- *Draft Amoruso Ranch Specific Plan*, February 2016 (City of Roseville, 2016)
- *Creekview Specific Plan Final EIR*, April 2011 (City of Roseville, 2011a)
- *California Environmental Quality Act Air Quality Handbook* (PCAPCD, 2012)
- *Traffic Study for the Amoruso Ranch Specific Plan*, Fehr & Peers August 2016 (included as **Appendix M**)

These documents listed above are available for review during normal business hours (Monday through Friday 8 a.m. to 5 p.m.) at:

City of Roseville Permit Center
311 Vernon Street
Roseville, CA 95678

One comment letter related to GHG emissions was received in response to the Notice of Preparation (NOP). The letter was submitted by the Placer County Air Pollution Control District (PCAPCD) and provided general recommendations on the methodology for analysis of the Proposed Project's impacts regarding climate change. See **Appendix C** for a copy of the NOP and comments received in response to the NOP.

4.5.2 ENVIRONMENTAL SETTING

The Greenhouse Effect

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. As defined in California Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, discussed in detail below, GHGs include all of the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6)[1] (Health & Safety Code §38505[g]). The greenhouse effect is the process of solar radiation entering 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. The absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower-frequency infrared radiation. Most solar radiation passes through GHGs; however, infrared radiation is selectively absorbed by GHGs. As a result, infrared

[1] These are also known as the six "Kyoto Protocol" greenhouse gasses.

radiation released from the earth 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.

Global warming potential (GWP) is a measure of how much a given mass of GHG is estimated to contribute to global warming. It is a relative scale, which compares the gas in question to that of the same mass of CO_2 (which has a GWP of 1). Thus, for example, CH_4 has a GWP of 12 and N_2O has a GWP of 114 (CARB, 2014b). Consequently, using each pollutant's GWP, emissions of CO_2, CH_4, N_2O, chlorofluorocarbons and ozone depleting chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFCs), can be converted into CO_2 equivalents, expressed as CO_2e.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme. IPCC's mission is to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, including the potential impacts and options for adaptation and mitigation. It is anticipated that the average global temperature could rise 0.6 degrees Celsius (ºC) (1.08 degrees Fahrenheit [º F]) to 4.0º C (7.2º F) between the years 2000 and 2100 (IPCC, 2007). The first installment of the Fifth Assessment Report, *Working Group I, Climate Change 2013: The Physical Science Basis* was released in September 2013; this installment was accepted and the underlying science was approved (IPCC, 2014).

Fossil fuel combustion removes carbon stored underground (as, for example, coal, oil, or natural gas) and releases it into the active carbon cycle, thus increasing concentration of GHGs in the atmosphere. The IPCC Fifth Assessment Report concludes emissions of GHGs in excess of natural ambient concentrations are extremely likely (defined as 95%–100% confidence) to be responsible for the enhancement of the greenhouse effect and contribute to what is termed "global warming," a trend of unnatural warming of the Earth's climate. Increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants (such as ozone, carbon monoxide, and particulate matter) and toxic air contaminants, which are pollutants of regional and local concern.

In 2011, transportation generated 38 percent of California's GHG emissions, followed by the industrial sector (21 percent), electricity generation (19 percent), commercial and residential (10 percent), agriculture and forestry (7 percent), and other sources (5 percent) (CARB, 2014a). Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. Methane results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the world's ocean.

Climate change could impact California's natural environment in the following ways (CEC, 2012):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento-San Joaquin River Delta due to ocean expansion;
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;

- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality;
- Reduced snow pack and stream flow in the Sierra Nevada mountains, affecting winter recreation and water supplies;
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield; and
- Changes in distribution of plant and wildlife species due to changes in temperature, competition of colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems could occur at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (CEC, 2005a). Consequently, for a "business as usual" (BAU) scenario if actions are not taken to reduce GHG emissions, the anticipated increase in population would also lead to increases in the amount of anthropogenic GHG emissions and the number of people potentially affected by climate change in California.

Topography, Climate, and Meteorology

A detailed discussion of the region's topography, climate, and meteorology is provided in **Section 4.4.2**.

4.5.3 Regulatory Setting

Federal

There are currently no federal laws that regulate global warming through the establishment of emissions limitations or regulatory thresholds. Existing laws that address climate change at the federal level include the following:

The Energy Policy Act of 2005

On August 8, 2005, President Bush signed the Energy Policy Act of 2005 (P.L. 109-58), with provisions directly and indirectly related to GHG emissions. Title XVI establishes a voluntary national program designed to encourage voluntary reductions in GHGs. The effort is led by an Interagency Committee, with the United States Department of Energy (USDOE) playing a key supporting role. Title XVI attempts to support actions focused on reducing U.S. carbon intensity, but does not establish a requirement to reduce emissions. The title also establishes a program to encourage exports of carbon intensity-reducing technologies to developing countries. This program is led by the Secretary of State. In addition to Title XVI, Section 1253 repeals the mandatory purchase requirement under Section 210 of the Public Utility Regulatory Policy Act for new contracts if the Federal Energy Regulatory Commission finds that a competitive electricity market exists and if other conditions are met. The debate over the bill included proposals to increase corporate average fuel economy (CAFE) standards and to establish a renewable portfolio standard, although these changes were not included in the final law.[2]

[2] CAFE is the sales weighted average fuel economy, expressed in miles per gallon (mpg), of a manufacturer's fleet of passenger cars or light trucks with a gross vehicle weight rating (GVWR) of 8,500 lbs. or less, manufactured for sale in the United States, for any given model year. Fuel economy is defined as the average mileage traveled by an

The Energy Independence and Security Act

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140). EISA contains many energy provisions that could lead to reductions in GHG emissions. In addition to these indirect reductions, EISA also directly addresses climate change issues in several ways.

First, EISA expands the renewable fuel standard (RFS) established in P.L. 109-58. The RFS requires that a minimum amount of renewable fuels be blended into transportation fuels each year. The EISA amendments to the RFS significantly expand the mandated level. Further, they require that an increasing share of the RFS be met with "advanced biofuels" defined as having 50 percent lower lifecycle GHG emissions than petroleum fuels. This is the first time that Congress has enacted national policy addressing the carbon content of motor fuels.

Second, Title VII of the new law focuses on research, development, and demonstration of technologies to capture and store carbon dioxide. USDOE research and development is expanded and will include large-scale demonstration projects. The Department of the Interior must develop a methodology to assess the national potential for geologic and ecosystem storage of carbon dioxide, and must recommended a regulatory framework for managing geologic carbon sequestration on public lands.

In addition to the above programs, EISA also requires the establishment of an Office of Climate Change and Environment in the Department of Transportation (DOT). This office will plan, coordinate, and implement research at DOT on reducing transportation-related energy use, mitigating the causes of climate change, and addressing the impacts of climate change on transportation.

Energy provisions not directly addressing climate change, but that could lead to lower GHG emissions, including:

- more stringent fuel economy (CAFE) standards for passenger cars and light trucks;
- higher-efficiency standards for appliances and lighting;
- higher-efficiency requirements for government buildings; and research and development on renewable energy.

Environmental Protection Agency

The U.S. Supreme Court has held that CO_2 falls under the Clean Air Act's (CAA's) definition of an "air pollutant", such that the United States Environmental Protection Agency (EPA) has statutory authority to regulate the emissions of this gas.

The following are the most recent regulatory actions taken by the EPA:

- On September 15, 2009, EPA and the DOT's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel

automobile per gallon of gasoline consumed as measured in accordance with the testing and evaluation protocol set forth by the EPA.

economy for all new cars and trucks sold in the United States. EPA proposed the first national GHG emissions standards under the CAA, and NHTSA proposed an increase in the CAFE standards under the Energy Policy and Conservation Act.

- In response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. Signed by the Administrator on September 22, 2009, the rule requires that suppliers of fossil fuels and industrial GHGs, manufacturers of vehicles and engines outside of the light duty sector, and facilities that emit 25,000 metric tons or more of GHGs per year to submit annual reports to EPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.
- In June 2014, the EPA took steps to provided guidelines to reduce GHG emissions in existing power plants by 2030, the steps EPA is taking are as follows:

    - Cut carbon emission from the power sector by 30 percent nationwide below 2005 levels, which is equal to the emissions from powering more than half the homes in the United States for one year;
    - Cut particle pollution, nitrogen oxides, and sulfur dioxide by more than 25 percent as a co-benefit;
    - Avoid up to 6,600 premature deaths, up to 150,000 asthma attacks in children, and up to 490,000 missed work or school days—providing up to $93 billion in climate and public health benefits; and
    - Shrink electricity bills roughly 8 percent by increasing energy efficiency and reducing demand in the electricity system.

State

California has been a leader among the states in outlining and aggressively implementing a comprehensive climate change strategy that is designed to result in a substantial reduction in total statewide GHG emissions in the future. California's climate change strategy is multifaceted and involves a number of state agencies implementing a variety of state laws and policies. These laws and policies are provided below.

Executive Order (EO) S-3-05

Executive Order (EO) S-3-05 was signed by the Governor on June 1, 2005. EO S-3-05 established the following statewide emission reduction targets:

- Reduce GHG emissions to 2000 levels by 2010,
- Reduce GHG emissions to 1990 levels by 2020, and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

EO S-3-05 created a Climate Action Team (CAT) headed by the California Environmental Protection Agency (Cal EPA) and including several other state agencies. The CAT is tasked by EO S-3-05 with implementing the global warming emission reduction programs identified in the Climate Action Plan and to report on the progress made toward meeting the emission reduction targets established in the EO.

The first report to the Governor and the Legislature was released in March 2006 and will be issued bi-annually thereafter. The 2006 CAT report to the Governor contains recommendations and strategies to help ensure the targets in EO S-3-05 are met (Cal EPA, 2006). Subsequent CAT reports discussed the progress and supplemental recommendations to ensure the targets of EO S-3-05. The 2010 CAT Report to the Governor and the Legislature was issued in December 2010 (Cal EPA, 2010).

Executive Order B-30-15 (EO B-30-15)

EO B-30-15 was signed by the Governor on April 29, 2015. EO B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. This intermediate GHG emissions reduction target will make it possible to meet the ultimate GHG emissions reduction target of 80 percent below 1990 levels by 2050, as established in EO S-3-05.

California Global Warming Solutions Act of 2006 (AB 32)

In adopting the California Global Warming Solutions Act of 2006 (AB 32), the California state legislature established a cap on statewide GHG emissions and set forth a regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, GHGs are defined as: carbon dioxide (CO_2), methane (CH_4), N_2O, HFC, PFC, and sulfur hexafluoride(SF_6).

AB 32 requires that CARB:

- Adopt early action measures to reduce GHGs;
- Establish a statewide GHG emissions cap for 2020 based on 1990 emissions;
- Adopt mandatory report rules for significant GHG sources;
- Adopt a scoping plan indicating how emission reductions will be achieved via regulations, market mechanisms, and other actions; and
- Adopt regulations needed to achieve the maximum technologically feasible and cost- effective reductions in GHGs.

Early Action Measures

CARB has adopted several early action measures to reduce GHG emissions. They include actions such as improvements to landfill methane capture, a vehicle tire pressure program, improvements to heavy duty truck efficiency, and a low carbon fuels standard (LCFS). On April 23, 2009, CARB adopted a LCFS. This standard requires that all fuels sold in California must have a reduced carbon content that will lower emissions by 10 percent by 2020.

Guidance and protocols for businesses and governments to facilitate GHG emission reductions were approved as early action items by CARB at its June 2007 hearing. A Local Government Toolkit was designed to provide guidance and resources to help cities and counties reduce GHG emissions and save money. No regulations have been adopted by CARB that apply specifically to cities and counties.
A variety of tools are available to assist with climate action planning, including information on:

- How to calculate and inventory current GHG emissions;
- A recommended target to reduce GHG emissions;

- Cost-saving strategies to take action now;
- Financial resources to get started;
- Case studies to learn what other cities have been able to accomplish.

Phase II of the Toolkit will include a decision support tool to help local governments develop customized climate action plans, a peer-networking online discussion forum, and a climate leadership recognition program to recognize achievements for measured GHG emission reductions.

California's Scoping Plan and Cap and Trade Program

In the adopted Climate Change Scoping Plan, CARB lays out the GHG reductions that need to be achieved and the types of measures that will be used to reach them. The Plan predicts that under a BAU scenario, 2020 GHG emissions would equal 596 million metric tons (MMT) CO_2e. Consequently, compared to the 1990 GHG emissions inventory, emissions would need to be reduced by 169 MMT CO_2e in 2020. This represents a 30 percent GHG reduction from the 1990 levels to be achieved by 2020. In 2011, CARB updated the projected GHG emissions to reflect the effects of the economic downturn, finding that a reduction of 21 percent from the projected BAU scenario would be necessary to achieve the statewide emission targets. This 21 percent reduction assumes that the BAU scenario does not account for the effect of additional GHG regulations that have been adopted. CARB found that if using a BAU scenario that accounts for those additional regulations, specifically the increased renewable energy standard (the Renewable Portfolio Standard, RPS) and vehicle emissions reductions (under a regulation referred to as Pavley I), a reduction from that BAU scenario of 16 percent would be needed to achieve the established targets (CARB, 2011).

The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs, and building and appliance standards.
- Achieving a statewide renewables energy mix of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

The first update to the 2007 Climate Action Scoping Plan was released in May 2014 (CARB, 2014b). The purpose of the update is to identify the next steps for California's leadership on climate change. The updated Plan outlines the progress California has made to date regarding near-term 2020 GHG limits, such as cleaner and more efficient energy, cleaner transportation, and CARB's Cap-and-Trade Program. The updated Plan identifies six key areas where further control strategies are needed, which are: energy, transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), agriculture, water, waste management, and natural and working lands.

Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375)

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, Senate Bill (SB) 375, Chapter 728, Statutes of 2008) encourages housing and transportation planning on a regional scale, in a manner designed to reduce vehicle use and associated GHG emissions. As required under this law, CARB has assigned regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. The targets apply to the regions in the State covered by the 18 Metropolitan Planning Organizations (MPOs), including the Sacramento Area Council of Governments (SACOG) in the Sacramento region. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012. CARB adopted regional reduction targets in 2010. For the SACOG area, the adopted reduction targets call for a 7 percent reduction by 2020 and a 16% reduction by 2025.

SB 375 also requires each MPO to include a Sustainable Communities Strategy (SCS) in its Regional Transportation Plan (or an Alternative Planning Strategy, if it was not feasible to adopt an SCS that met regional GHG reduction targets). The SCS must set forth a vision for growth for the region while taking into account transportation, housing, environmental, and economic needs. The SCS will be the blueprint by which the region will meet its GHG emissions reductions target if there is a feasible way to do so. Discussion of the recently adopted SACOG SCS is provided below in the Local Regulations section.

Senate Bill 97 (SB 97)

Signed by the governor on August 24, 2007, SB 97 required the state Office of Planning and Research to prepare California Environmental Quality Act (CEQA) guidelines for evaluating the effects of GHG emissions and for mitigating such effects. In accordance with SB 97, on December 30, 2009, the National Resources Agency adopted CEQA Guidelines amendments for the quantification and mitigation of GHG emissions. The adopted guidelines provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the Lead Agency.
- The Lead Agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a Proposed Project.
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project.
- Significance may rely on qualitative analysis or performance based standards.

- The Lead Agency may adopt thresholds of significance previously adopted or recommended by other public agencies or recommended by experts.
- The CEQA document shall discuss regional and/or local GHG reduction plans.
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable.
- A description of the effects of climate change on the environment shall be included in CEQA documents.
- A CEQA document shall contain mitigation measures which feasibly reduce GHG emissions.
- GHG analysis in a CEQA document may be Tiered or Streamlined.

The methodology and basis of calculation for estimating and analyzing GHG emissions resulting from the Proposed Project is based on scientific and factual data and is consistent with the methodology and guidance identified in the CEQA Guidelines Amendments.

Senate Bill X1 2

SB X1 2 expands the RPS by establishing as a goal that 20 percent of the total electricity sold to retail customers in California per year must be from renewable sources by December 31, 2013, and 33 percent by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers covered by SB 107, SB X1 2 adds local publicly-owned electric utilities to the RPS. The California Public Utilities Commission (CPUC) has established the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers in order to achieve targets of 20 percent by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. The statute also requires that the governing boards for local publicly-owned electric utilities establish the same targets, and the governing boards are responsible for ensuring compliance with these targets. The CPUC is responsible for enforcement of the RPS for retail sellers, while the California Energy Commission (CEC) and CARB will enforce the requirements for local publicly-owned electric utilities.

Green Building Standards

All new construction must adhere to the 2013 California Green Building Standards Code (California Code of Regulations, Title 24, Part 11). The California Green Building Standards, referred to as CALGreen:

- Sets a threshold of a 20 percent reduction in indoor water use and includes voluntary goals for reductions of 30 percent, 35 percent and 40 percent.
- Requires separate meters for indoor and outdoor water use at nonresidential buildings; and at those sites, irrigation systems for larger landscaped areas must be moisture-sensing.
- Calls for 50 percent of construction waste to be diverted from the landfills and lists higher, voluntary diversion amounts of 65 percent to 75 percent for new homes, and 80 percent for commercial construction.

- Mandates inspections of energy systems -- such as the heat furnace, air condition and mechanical equipment -- for nonresidential buildings that are larger than 10,000 square feet to "ensure that all are working at their maximum capacity according to design efficiencies."
- Requires that paint, carpet, vinyl flooring, particle board and other interior finish materials be low-emitting in terms of pollutants.

California Air Pollution Control Officers Association (CAPCOA) Guidance

The California Air Pollution Control Officers Association (CAPCOA) released a report in August 2010 that describes methods to estimate and quantify mitigation for GHG emissions from projects subject to CEQA. The CAPCOA report evaluates several GHG thresholds that could be used to evaluate the significance of a project's GHG emissions. The CAPCOA report, however, does not recommend any one threshold. Instead, the report is designed as a resource for public agencies as they establish agency procedures for reviewing GHG emissions from projects subject to CEQA (CAPCOA, 2010).

Local

Sacramento Region Blueprint

In 2004, SACOG adopted the Preferred Blueprint Scenario for 2050 (Blueprint). Although not a binding regulatory document, the Blueprint depicts a way for local agencies within the region to grow through 2050 in a manner consistent with the seven smart growth principles: (1) transportation choices, (2) mixed-use developments, (3) compact development, (4) housing choice and diversity, (5) use of existing assets, (6) quality design, and (7) natural resources conservation. The seven smart growth principles provide guidance for land use planners which, when implemented, would ultimately result in an overall reduction in vehicle miles traveled (VMT), emissions of criteria pollutants, and GHG emissions.

By providing a more compact development pattern adjacent to existing city services and infrastructure, with a balance of employment, housing, retail and recreation opportunities, the Blueprint Plan shows that development consistent with the plan could reduce the need for an additional 400,000 acres of land for development, and reduce traffic congestion and associated air quality impacts. The eastern half of project site is identified as an appropriate area to accommodate urban growth within the Preferred Blueprint Scenario.

SACOG Metropolitan Transportation Plan (MTP)/Sustainable Communities Strategy

Placer County and the City of Roseville are members of SACOG, an MPO which covers a six-county area. In April 2012, SACOG adopted the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for 2035 to provide a regional vision for all modes of surface transportation. Building on prior plans, including the Sacramento Region Blueprint and the 2008 MTP, the SCS accommodates future growth through a more compact land use pattern, emphasizes operational improvements over new roadway capacity projects, and reflects other factors that have tended to reduce motor vehicle use. The SCS demonstrates that, if implemented, the region will achieve a 9 percent per capita GHG reduction in passenger vehicle emissions in 2020 and a 16 percent reduction in 2035. These reductions meet the targets for SACOG of 7 percent and 16 percent per capita GHG reduction from 2005 for the years 2020 and 2035, respectively, established by CARB (refer to discussion of SB 375 above). In June 2012, CARB

issued an Acceptance of GHG Quantification Determination for the SACOG SCS, indicating that CARB concurs with SACOG's quantification of GHG emission reductions from the final MTP/SCS and its determination that the SCS would achieve the 2020 and 2035 targets established by CARB.

City of Roseville Implementation Strategies to Achieve Blueprint Project Objectives

In support of the regional effort and to help foster development patterns that incorporate Blueprint objectives, in May 2005, the City adopted the *Implementation Strategies to Achieve Blueprint Project Objectives* to guide development projects within the City of Roseville which include: (1) transportation choices; (2) mixed-use developments; (3) compact development; (4) housing choices; (5) existing assets (infill); (6) natural resources (7) quality design, (8) education and outreach, and (9) monitoring. These implementation strategies give the City a means to implement the "smart growth" principles derived from the Blueprint effort in newly-developing areas. In addition to density, other objectives include connectivity of neighborhoods, adjacency of uses and opportunities for alternative modes of travel.

City of Roseville General Plan

The *City of Roseville General Plan 2025* (last updated in August 2014) provides goals and policies adopted by the City Council to help guide the direction of City development. The City has been advocating steps to reduce GHG emissions. The following are applicable goals from the Air Quality and Climate Change Element of the *City of Roseville General Plan 2025* that are relevant to the Proposed Project.

GHG-related policies that are actively being implemented by the City include the following:

<u>Land Use Element – Community Form Policies – General</u>

Policy 5 Promote land use patterns that result in the efficient use of urban lands and preservation of open space as specified in the Open Space and Conservation Element.

Policy 6 Through development approvals and City programs (e.g. redevelopment, capital improvement program, parks and recreation programs, etc.) assure that all portions of the community are linked and integrated.

<u>Land Use Element – Community Form Policies – Relationship to Transit, Pedestrian, Air Quality</u>

Policy 1 Promote land use patterns that support a variety of transportation modes and accommodate pedestrian mobility.

Policy 2 Allow for land use patterns and mixed use development that integrate residential and non-residential land uses, such that residents may easily walk or bike to shopping, services, employment, and leisure activities.

Policy 3 Concentrate higher intensity uses and appropriate support uses within close proximity of transit and bikeway corridors as identified in the Bicycle Master Plan. In addition, some component of public use such as parks, plazas, public buildings, community centers and/or libraries should be located within the corridors.

Policy 4 Promote and encourage the location of employee services such as childcare, restaurants, banking facilities, convenience markets, etc., within major employment centers for the purpose of reducing midday service-related vehicle trips.

Policy 5 Where feasible, improve existing development areas to create better pedestrian and transit accessibility.

Policy 6 Through City land use planning and development approvals, require that neighborhood serving uses (e.g., neighborhood commercial uses, day care, parks, schools, and other community facilities) be physically linked with adjacent residential neighborhoods.

Land Use Element – Community Form Policies – Relationship of New Development

Policy 1 Require that new development areas and associated community-wide facilities (open space resources, parks, libraries, etc.) be linked and oriented to existing developed areas of the community through road networks, public transit systems, open space systems, bike way and pedestrian systems, and other physical connections.

Land Use Element – Community Form Policies – Jobs/Housing and Economic Development

Policy 1 Strive for a land use mix and pattern of development that provides linkages between jobs and employment uses, will provide a reasonable jobs/housing balance, and will maintain the fiscal viability of the City.

Land Use Element – Community Form Policies – Community Design

Policy 2 Continue to develop and apply design standards that result in efficient site and building designs, pedestrian friendly projects that stimulate the use of alternative modes of transportation, and the establishment of a functional relationship between adjacent developments.

Policy 3 Encourage project designs that place a high priority and value on open space, and the preservation, enhancement and incorporation of natural resources and other features including consideration of topography, vegetation, wetlands, and water courses.

Policy 9 The location and preservation of native oak trees and oak woodlands shall be a primary factor in determining site design, building location, grading, construction and landscaping, and in establishing the character of projects through their use as a unifying element in both new and existing development.

Growth Management Element Policies

Policy 8 Manage growth in such a way to ensure that significant open space areas will be preserved.

Circulation Element – Level of Service Policies

Policy 2 Strive to meet the level of service standards through a balanced transportation system that reduces the auto emissions that contribute to climate change by providing alternatives to the automobile and avoiding excessive vehicle congestion through roadway improvements, Intelligent Transportation Systems, and transit improvements.

Policy 5 Enable the City to designate a Pedestrian District over a geographic area for the purpose of implementing measures that promote pedestrian walkability and reduce total vehicle miles traveled and resultant air pollution emissions that contribute to climate change. In these districts, the City recognizes that pedestrian travel takes a higher priority than automobile travel, which could reduce the vehicular level of service.

Circulation Element – Transit Policies

Policy 1 Pursue and support transit services within the community and region and pursue land use, design and other mechanisms that promote the use of such services.

Circulation Element – Transportation Systems Management Policies

Policy 1 Continue to enforce the City's TSM ordinance and monitor its effectiveness.

Policy 2 Work with appropriate agencies to develop measures to reduce vehicular travel demand and total vehicle miles traveled and meet air quality goals.

Circulation Element – Bikeway/Trails Policies

Policy 1 Develop a comprehensive and safe system of recreational and commuter bicycle routes and trails that provides connections between the City's major employment and housing areas and between its existing and planned bikeways.

Policy 2 **C**oordinate Roseville's bikeway and trail system with those of neighboring jurisdictions to provide both local and regional connections.

Air Quality and Climate Change Element Goals

Goal 1 Improve Roseville's Air Quality b: a) achieving and maintaining ambient air quality standards established by the U.S. Environmental Policy Agency and the California Air Resources Board; and b) minimizing public exposure to toxic or hazardous air pollutants and air pollutants that create a public nuisance through irritation to the senses (such as unpleasant odors).

Goal 2 Integrate air quality planning with the land use and transportation planning process.

Goal 3 Encourage the coordination and integration of all forms of public transport while reducing motor vehicle emissions through a decrease in the average daily trips and vehicle miles

traveled and by increasing the commute vehicle occupancy rate by 50% to 1.5 or more persons per vehicle.

Goal 5 Provide adequate pedestrian and bikeway facilities for present and future transportation needs.

Goal 7 While recognizing that the automobile is the primary form of transportation, the City of Roseville should make a commitment to shift from the automobile to other modes of transportation.

Air Quality and Climate Change Element – General Policies

Policy 1 Cooperate with other agencies to develop a consistent and effective approach to air pollution planning.

Policy 2 Work with the Placer County Air Pollution District to monitor air pollutants of concern on a continuous basis.

Policy 3 Develop consistent and accurate procedures for evaluating the air quality impacts of new projects.

Policy 4 As part of the development review process, develop mitigation measures to minimize stationary and area source emissions.

Air Quality and Climate Change Element – Transportation and Circulation-Related Policies

Policy 5 Develop transportation systems that minimize vehicle delay and air pollution.

Policy 6 Develop consistent and accurate procedures for mitigating transportation emissions from new and existing projects.

Policy 7 Encourage alternative modes of transportation including pedestrian, bicycle, and transit usage.

Air Quality and Climate Change Element – Land Use-Related Policies

Policy 9 Encourage land use policies that maintain and improve air quality.

Air Quality and Climate Change Element – Energy Conservation-Related Policies

Policy 10 Conserve energy and reduce air emissions by encouraging energy efficient building designs and transportation systems.

Open Space and Conservation Element – Open Space System Policies

Policy 1 Provide an interconnecting system of open space corridors that, where feasible, incorporate bikeways and pedestrian paths.

Policy 2 Provide interconnected open space corridors between open space and habitat resources, recreation areas, schools, employment, commercial service and residential areas.

Policy 3 Work with adjacent jurisdictions to connect the City with regional open space and trail systems, providing a network of open space and habitat resources, pathways and, where reasonable, equestrian trails through the City to link nearby communities.

Policy 4 Require all new development to provide linkages to existing and planned open space systems. Where such access cannot be provided through the creation of open space connections, identify alternative linkages.

Policy 6 Take into account consideration of natural habitat areas in developing linkages and in preserving open space areas. Identify alternate sites for linkages where sensitive habitat areas have the potential to be adversely impacted.

Policy 7 Maximize opportunities for preservation and maintenance of open space resources, including establishment of private open space areas. Consider coordination with non-profit organizations and investigate the potential for conservancy ownership and/or management of open space areas.

Open Space and Conservation Element – Vegetation and Wildlife Policies

Policy 1 Incorporate existing trees into development projects, and where preservation is not feasible, continue to require mitigation for the loss of removed trees. Particular emphasis shall be placed on avoiding the removal of groupings or groves of trees.

Policy 2 Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.

Policy 3 Require dedication of the 100-year flood plain or comparable mechanism to protect habitat and wildlife values in perpetuity.

Policy 4 Require preservation of contiguous areas in excess of the 100-year flood plain as merited by special resources or circumstances. Special circumstances may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.

Open Space and Conservation Element – Groundwater Recharge and Water Quality Policies

Policy 3 Ensure a buffer area between waterways and urban development to protect water quality and riparian areas.

Policy 4 Continue to monitor and participate in, as appropriate, regional activities affecting water resources, groundwater, and water quality.

Policy 5 Continue to monitor groundwater resources and investigate strategies for enhanced sustainable use. Areas where recharge potential is determined to be high shall be considered for designation as open space.

Policy 6 Where feasible, locate storm water retention ponds in areas where subsoil is suitable for groundwater recharge.

Parks and Recreation Element Policies

Policy 1 The City shall ensure the provision of 9 acres of park land per 1,000 residents, except in certain instances in the Riverside and Downtown Specific Plan areas.

Policy 6 Take into consideration energy efficiency and water conservation, including the use of treated wastewater, in park development, and design.

Public Facilities Element – Electric Utility Policies

Policy 5 Explore the feasibility of the development of and participation in renewable energy resources.

Policy 6 Adopt a load/resource management plan, incorporating energy efficiency, conservation, load management, and reliability strategies, identifying program objectives and implementation and monitoring mechanisms.

Policy 8 Pursue reasonable and cost effective energy efficiency, conservation, and load management programs pertinent to the electric utility system.

Policy 10 Require new development to pay a fair share of the cost of new sub-transmission and distribution needed to serve the development and to dedicate sites and easements needed for substations, transmission, sub-transmission, and distribution.

Public Facilities Element– Water System Policies

Policy 10 Develop and implement water conservation standards and measures as necessary elements of the water system.

Policy 11 Develop and implement an aquifer storage and recovery program.

Public Facilities Element – Wastewater and Recycled Water System Policies

Policy 5 Explore potential alternatives to treatment and discharge.

Policy 6 Develop, plan, and provide incentives for use of recycled water by the public and private sectors.

Public Facilities Element – Solid Waste, Source Reduction and Recycling Policies

Policy 1 Ensure existing and future recycling sites and operations remain viable through application of land use compatibility standards.

Policy 2 Comply with the source reduction and recycling standards mandated by the State by reducing the projected quantity of solid waste disposed at the regional landfill by 50%, as well as any mandated future reductions.

Policy 5 Develop public education and recycling programs

Public Facilities Element – Water and Energy Conservation Policies

Policy 1 Develop and implement water conservation standards.

Policy 2 Implement various water conservation plans developed by the Environmental Utilities Department.

Policy 3 Explore potential uses of treated wastewater.

Policy 4 Protect the quality and quantity of the City's groundwater and consider designating areas as open space where recharge potential is high.

Policy 5 Develop and adopt a landscape ordinance that provides standards for the use of drought tolerant, xeriscape, and water-conserving landscape practices for both public and private projects.

Policy 6 Develop and implement public education programs designed to increase public participation in energy, water conservation and recycled water use.

Policy 7 Require large electricity users to submit a use and conservation plan concurrent with development review specifying measures to be taken to minimize demand.

Policy 8 Enforce energy requirements and encourage development and construction standards that promote energy efficiency and conservation.

Policy 9 Preserve scarce resources by undertaking major projects in energy conservation and load management, including increasing efficiency in the City's electrical system.

Policy 10 Continue and expand energy efficiency and conservation programs to serve all utility users.

Safety Element – Flood Protection Policies

Policy 1 Continue to regulate, through land use, zoning, and other restrictions, all uses and development in areas subject to potential flooding and require new development to comply with the State Plan of Flood Control.

Policy 2 Monitor and regularly update City flood studies, modeling and associated land use, zoning, and other development regulations.

Policy 3 Continue to pursue a regional approach to flood issues.

Policy 4 Provide flood warning and forecasting information to community residents to reduce impacts to personal property.

Policy 5 Minimize the potential for flood damage to public and emergency facilities, utilities, roadways, and other infrastructure.

Policy 6 Require new developments to provide mitigation to insure that the cumulative rate of peak run-off is maintained at predevelopment levels.

Policy 8 Establish flood control assessment districts or consider other funding mechanisms to mitigate flooding impacts.

Policy 9 Where feasible, maintain natural stream courses and adjacent habitat and combine flood control, recreation, water quality, and open space functions.

City of Roseville Communitywide Sustainability Action Plan (SAP)

The City of Roseville Communitywide Sustainability Action Plan (SAP) sets forth a comprehensive strategy to reduce GHG emissions and air pollutant emissions within the community, and addresses both municipal and community-wide emissions (City of Roseville, 2010a). The SAP seeks to achieve the following primary objectives:

- Improve overall quality of life in the community by promoting smart growth and mobility principles that better connect the community, reduce air pollution, and increase energy independence.
- Outline various strategies and measures to meet the City's goal of reducing GHG emissions.
- Demonstrate Roseville's ability to respond to and comply with AB 32.

The City's approach to sustainability and GHG emissions reduction is similar to the climate change planning process being used throughout California. This GHG emissions reduction process includes the following:

- Completing a baseline emissions inventory and projecting future emissions,
- Identifying a communitywide reduction target,
- Preparing a plan to identify strategies and measures to meet the reduction target,

- Identifying targets and reduction strategies in the plan and evaluating its environmental impacts pursuant to CEQA,
- Monitoring the effectiveness of reduction measures and adapting the plan to changing conditions, and
- Adopting the plan in a public process following environmental review.

The SAP provides the following measures, which are applicable to the Proposed Project and would reduce GHG emissions:

T 4.1 Increase public transit mode share.

T 5.1 Increase pedestrian and bicycle mode share.

LU 3.1 Expand urban forestry and green infrastructure to increase carbon sequestration, reduce building energy consumption, and mitigate heat island effect.

E 1.3 and 1.4 Develop new residential units and commercial buildings within the City to meet, at a minimum, Department of Energy "Energy Star" rating.

WR 2.1 Maximize reuse, recycling, and composting programs.

City of Roseville Greenhouse Gas Emissions

The City of Roseville in its SAP provides a baseline GHG inventory and business-as-usual projections. The City of Roseville baseline (2006) GHG emissions were 28,858 metric tons of CO_2e. GHG emissions in the City of Roseville are estimated to increase by approximately 15 percent per year between 2008 and 2020 under business-as-usual conditions to 1,385,942 metric tons of CO_2e. The City of Roseville estimates the majority of GHG emissions would come from on-road mobile sources (44 percent), while commercial/industrial energy use is 24 percent (City of Roseville, 2010a). Residential energy and natural gas use is 13 percent and 9 percent, respectively. Wastewater treatment, solid waste, and water use make up five percent of the City of Roseville's GHG emissions (City of Roseville, 2010a).

Amoruso Ranch Specific Plan

The Proposed Project incorporates guidelines, strategies, and project design features that reduce the human environmental footprint with respect to transportation fuels consumption and electricity production. Implementation of these strategies and measures would help reduce potential GHG emissions resulting from the development in the project site, compared to what otherwise may occur. The transportation sector is the largest component of fossil energy consumption, and therefore the sector responsible for the largest share of GHG emissions statewide. To address transportation emissions, the proposed ARSP land use plan and Design Guidelines include policies and implementation measures with the following elements that would reduce project-related vehicles miles traveled, thereby reducing transportation GHG emissions:

- Mix of land uses to provide opportunities for residential uses and other services, which reduces vehicle miles travelled and GHG emissions by providing commercial uses, a school, and park and recreation facilities within proximity to residences.
- Implement bicycle facilities consistent with the City's Bicycle Master Plan including Class I bicycle facilities and an integrated paseo system that provide connectivity of neighborhoods, designed to provide opportunities to reduce automobile demand.
- Promote the use of transit in new developments by requiring the installation of transit facilities such as bus stops and a park and ride.

4.5.4 IMPACTS

Method of Analysis

Construction GHG emissions from on- and off-road vehicle operation and stationary sources emissions from operation of air compressors and generators were estimated for each construction year between 2017–2034 using the California Emissions Estimator Model Version 2013.2 (CalEEMod) air quality model, which is recommended by the PCAPCD. The model estimates emissions for a variety of sources, including transportation, electricity use, natural gas use, and solid waste disposal. The model estimates GHG emissions of carbon dioxide, methane, and nitrous oxide and then converts them to carbon dioxide equivalents (CO_2e) using GWP of 21 for methane and 310 for N_2O. It should be noted that the current May 2014 Scoping Plan indicates a GWP of 12 for methane and 114 for N_2O. The higher GWP values assumed in the CalEEMod model result in more conservative emission estimates. Project-specific construction CalEEMod inputs are provided in the CalEEMod Inputs Table included as **Appendix N**.

Operational emissions from build-out of the Proposed Project were estimated using CalEEMod and included direct mobile sources, including residential and commercial vehicle trips, as well as indirect GHG emissions sources from electricity use, solid waste disposal, water and wastewater processing, usage, and conveyance. Project-specific operational CalEEMod inputs are provided in the CalEEMod Inputs Table included as **Appendix N**.

As described in **Section 2.11.6**, **Project Schedule and Construction Phasing**, the Proposed Project would be developed in phases. The highest levels of GHG emissions would occur in years where construction and operation is occurring simultaneously. In order to provide a conservative analysis of the level of GHG emissions that would occur as a result of the Proposed Project, this analysis combines the highest yearly construction emissions with the operation emissions from full buildout of the project site.

The analysis included the calculation of three emissions scenarios in the year 2020, which is the nearest year by which AB 32 targets must be met:

1) 2020 Business As Usual Project Emissions (Unmitigated)

   The unmitigated 2020 BAU Project emissions reflect the basic characteristics of the Proposed Project without mitigation and do not account for all GHG emission reductions that would result from plans, programs and policies implemented as a result of CARB's AB 32 Scoping Plan. The unmitigated BAU emission estimates do, however, take into account the effect of certain GHG

regulations that were adopted as of 2010 (the year from which reduction targets were established in the Scoping Plan), specifically, the increased renewable energy standard (the RPS) and vehicle emissions reductions (under a regulation referred to as Pavley I). The 2020 BAU scenario was modeled because the significance criteria (see the below **Thresholds of Significance** section) is based on how much lower the emissions of the Proposed Project are when compared to an unmitigated BAU scenario; the emissions must be at least 21 percent lower based on the Scoping Plan targets.

2) 2020 Adjusted Business As Usual (ABAU) Project Emissions (Unmitigated)

   Similar to the BAU scenario, the 2020 ABAU Project emissions reflect the basic characteristics of the Proposed Project without mitigation but also account for GHG emission reductions that would result from plans, programs and policies implemented as a result of CARB's AB 32 Scoping Plan, including California Building Efficiency Standards (2013 Title 24) and Low Carbon Fuel Standards.

3) 2020 ABAU Project Emissions with Mitigation

   The 2020 ABAU Project Emissions with Mitigation incorporate the GHG reductions that would result from the implementation of mitigation measures, selected as appropriate from a list of measures identified within CalEEMod. Project-specific mitigation incorporated into this scenario is listed in the CalEEMod Inputs Table included as **Appendix N** and included within **Mitigation Measure 4.5-1**. As identified in the CalEEMod Inputs Table, the majority of the measures identified within CalEEMod correspond to mitigation measures identified within CAPCOA's Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010).

Thresholds of Significance

Criteria for determining the significance of impacts due to GHG emissions have been developed based on Appendix G of the CEQA Guidelines and relevant agency thresholds. Impacts due to GHG emissions would be considered significant if the Proposed Project would:

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

To date, although the PCAPCD has not identified significance thresholds for GHG emissions, the agency has recommended that lead agencies consider use of an adopted or approved threshold when analyzing a project's related GHG impacts and potential to interfere with the Global Warming Solutions Act's (AB 32) GHG reduction goals, including but not limited to the Sacramento Metropolitan Air Quality Management District's (SMAQMD) GHG thresholds adopted October 24, 2014. While the California Supreme Court recently rejected an analytical approach that relied strictly on reduction from BAU levels in CARB's Scoping Plan without substantial evidence regarding how a particular project fits within the statewide context, including emissions from existing, less efficient development, the Court suggested

several alternative analytical approaches that would comply with CEQA. (*Center for Biological Diversity v. Cal. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204.) Consequently, the City uses a significance threshold based on the CARB's Scoping Plan, described above in Section 4.5.3, which identifies that a statewide GHG emission reduction of 21 percent from projected BAU levels would be necessary to achieve the statewide GHG emission target for 2020. A comparison of the 2020 BAU and 2020 ABAU Project emissions outputs was made to determine if mitigation measures were required to meet the 21 percent reduction threshold. In recognition of the other methodologies recommended by the Supreme Court, however, the City has also considered the project's emissions against the SMAQMD's numerical threshold for GHG emissions of 1,100 MT of CO2e per year for land development and construction projects (SMAQMD, 2015).

Impacts

IMPACT 4.5-1	GENERATE A SUBSTANTIAL CONTRIBUTION TO GHG EMISSIONS THAT CONFLICTS WITH AN APPLICABLE PLAN OR POLICY
Applicable Policies and Regulations	AB 32 City of Roseville General Plan Greenhouse Gas Policies
Significance with Policies and Regulations	Significant
Mitigation Measures	MM 4.5-1 Measures to Reduce GHG Emissions
Significance After Mitigation	Significant and Unavoidable

The Placer County General Plan currently designates the project site as agriculture/timberland. The majority of the project site is undeveloped and has historically been used for agricultural or grazing activities. Because the project site is largely undeveloped, and there currently are no significant GHG-producing agricultural operations other than seasonal cattle grazing, the existing GHG emissions on the project site are conservatively considered zero. The Proposed Project would result in the urbanization of the project site and development of residential, commercial and recreational uses that would generate short-term construction and long-term operational emissions of GHGs. Construction emissions would be associated with vehicle engine exhaust from construction equipment, vendor trips, and employee compute trips. Operational emissions would be associated with area, mobile, and stationary sources. Area-source emissions would be associated with activities such as natural gas use for space and water heating, maintenance of landscaping and grounds, waste disposal, and other sources. Mobile-source emissions of GHGs would include project-generated vehicle trips for residents and employees of, and visitors to the project site. In addition, increases in stationary-source emissions could occur by off-site utility providers in order to generate electricity to supply power to the proposed uses within the Plan Area (power produced and/or secured by Roseville Electric). This would result in a contribution to the cumulative impact of global climate change and may result in a potentially **significant** impact.

As described above, in 2004 SACOG adopted the Preferred Blueprint Scenario for 2050 (Blueprint), which examined how transportation and land use planning could be better linked to accommodate future growth while reducing transportation congestion. In support of this regional effort and to help foster development patterns that incorporate Blueprint smart growth principles, in May 2005, the City adopted implementation strategies to achieve Blueprint project objectives to guide development projects in Roseville. These implementation strategies to give the City a means to implement the "smart growth" principles derived from the Blueprint effort in newly developing areas. To this end, the Proposed Project incorporates smart growth elements, consistent with the Blueprint smart growth principles and the City's Blueprint implementation strategies. In addition to density, other objectives include connectivity of neighborhoods, adjacencies of uses, and opportunities for alternative modes of travel. The Proposed Project meets these objectives with the following features:

- ***Transportation.*** A variety of transportation modes are planned in the Proposed Project that will reduce reliance on automobiles. The Proposed Project would utilize bus service systems for Roseville Transit and Placer County Transit. These transit providers would use the Proposed Project's circulation systems to provide local and regional transit connections for community residents. Multiple transit stops are located within the project site. A number of parking spaces within the commercial uses of Parcel AR-53 will be designated for park and ride users. Roseville Transit provides fixed route and Dial-A-Ride services within the City, as well as fixed route commuter services between Roseville and downtown Sacramento. The Proposed Project would provide an extensive network of multiple-use trails and paseos, which could be used by pedestrians and bicyclists to utilize the existing Plan Area, open space and recreational facilities, and connectivity to the City pedestrian and bike lane network.
- ***Compact Development***. The Proposed Project land use plan provides a mix of residential land uses that emphasize creating neighborhoods with small-lot or attached single family homes. Approximately 61 percent of the units within the Proposed Project are either high density residential (13 and more units per acre) or medium density residential (7-12.9 units per acre) units. In addition to the proposed densities, the proposed commercial development will support a development pattern that is more efficient by creating neighborhoods that are more compactly built, thereby reducing reliance on the automobile and encouraging walking, biking, and use of public transit.
- ***Quality Design***. The Proposed Project incorporates design features that make it pedestrian friendly and facilitate the ease of walking and biking to neighborhood services. These features include but are not limited to a modified grid street network that creates shorter, more traditional feeling block lengths, a linked network of linear parks, paseos and sidewalks, narrow tree lined streets, architectural diversity, alley loaded garage placement, and where front loaded garages are allowed, requiring the placement of the garage to be behind the living space.
- ***Housing Choices.*** The medium and high-density residential areas will support a variety of housing types: single family detached or attached dwelling units, duets, townhomes, condominiums, or apartments on varying lot sizes, which addresses multiple demographic, pricing, and market segments. The development standards incorporated into the Proposed Project, in addition to the City's Zoning Ordinance, would allow these types of housing to be developed and, collectively, this range of housing would provide residents with a mix of housing choices.

- ***Mixed Use Development***. The Proposed Project includes a balanced mix of residential and commercial uses in close proximity to each other that promotes walking or bike riding to neighborhoods functions and services. Additionally, the Village Commercial District would have a zoning designation of mixed use commercial that is intended to provide a mix and density of commercial, office, and residential uses common to an urban setting or traditional downtown.
- ***Water Conservation***. Consistent with the City's implementation strategies for water supply sources, the Proposed Project includes the use of recycled water for irrigation purposes which would offset potable water demand. Recycled water use within the project site would be limited to irrigation demands of non-single family residential units, with the exception of residential units that have common area landscaping (limited to HDR parcels). This would include use of recycled water for irrigation within the Community Commercial and Village Center parcels, Parks & Recreation areas, street side paseos, public/quasi-public areas, including the proposed school and fire station, and landscaped areas with road right-of-ways. Additionally, the Proposed Project distribution system would include one on-site groundwater well designed for both injection and extraction that would be included as part of the City's Aquifer Storage and Recovery (ASR) Program to augment water supplies during "drier" years and as a mechanism to provide operational flexibility.

The seven smart growth principles included in the Blueprint are intended to result in an overall reduction in VMT thereby reducing GHG emissions. Although the Proposed Project includes features to reduce reliance on automobiles, including those listed above, the Proposed Project will result in an overall net increase in trips and VMTs in the region.

Table 4.5-1 shows the estimated unmitigated 2020 BAU Project emissions for the construction and operation phases of the Proposed Project and the GHG emission reductions for each of the recommended mitigation measures. As described in the **Methodology** section above, the highest levels of GHG emissions would occur in years where construction and operation is occurring simultaneously. Therefore, in order to provide a conservative analysis of the level of GHG emissions that would occur as a result of the Proposed Project, this analysis combines the highest yearly construction emissions with the operation emissions from buildout of the full Plan Area.

As shown in **Table 4.5-1**, the total annual 2020 BAU Project emissions would be approximately 70,434 MT of CO_2e per year. As described above, the 2020 BAU Project emissions reflect the basic characteristics of the Proposed Project and do not account for GHG emission reductions that would result from plans, programs and policies implemented as a result of CARB's AB 32 Scoping Plan. The 2020 ABAU Project Emissions, which do account for GHG emission reductions that would result from plans, programs and policies implemented as a result of CARB's AB 32 Scoping Plan, are estimated to be 57,132 MT of CO2 per year, which is 18.9 percent lower than 2020 BAU Project emissions. ABAU emission reductions from the BAU scenario would be accomplished through a combination of energy efficiency measures that have been implemented by the CEC and CARB (California Building Efficiency Standards [2013 Title 24], and Low Carbon Fuel Standards). Since the ABAU Project emissions would not meet the 21 percent less than BAU threshold, this is considered a **significant** impact. With the incorporation of **Mitigation Measure 4.5-1**, which includes various project design measures consistent with the City's Blueprint implementation strategies, the total annual 2020 ABAU Project Mitigated emissions would be reduced by approximately 5,659 MT of CO_2e per year, or an additional 8.1 percent.

With the implementation of **Mitigation Measure 4.5-1** and energy efficiency measures, annual 2020 ABAU Project Mitigated GHG emissions from the Proposed Project would be would be 51,473 MT of CO2, which represents a 27 percent reduction over BAU; thus, showing consistency with the Scoping Plan.

As shown in **Table 4.5-1**, through the implementation of **Mitigation Measure 4.5-1**, the Proposed Project's reduction in GHG emissions would exceed the 21 percent reduction over BAU for the year 2020 established within the CARB 2011 reapproved Scoping Plan.

TABLE 4.5-1
CONSTRUCTION AND OPERATIONAL GHG EMISSIONS

Proposed Project Emissions	2020 BAU Project (MT of CO2e/year)	2020 ABAU Project (MT of CO2e/year)	Percent Reduction
Highest Year Construction	3,852	3,852	
Unmitigated Operation	66,582	53,280	
Sub-total Emissions	*70,434*	*57,132*[1]	*18.9%*
Mitigation Measure 4.5-1: Design GHG Reductions	-	- 5,659	-
Total Emissions	**70,434**	**51,473**	**27.0%**
Source: CalEEMod, 2010 (**Appendix N**).			

In addition to the GHG reduction goals for 2020 established by AB 32, EO S-3-05 establishes a GHG reduction target of 80 percent below 1990 levels by 2050, and EO B-30-15 establishes a California GHG reduction target of 40 percent below 1990 levels by 2030 as an intermediate target to meet the ultimate 2050 goals. The CalEEMod model does not account for future programs that may be developed by the state in an effort to meet these targets, so it is not possible to accurately calculate emission estimates for these years. As described above, there are several local land use plans that have been adopted in part to reduce GHG emissions within the region; in particular, the Sacramento Region Blueprint, SACOG MTS/SCS, and the City of Roseville Communitywide Action Plan. While the Proposed Project includes many features that meet the objectives of these plans, including, but not limited to, those listed above, it was not included in the growth assumptions of these plans, and thus has not been factored in to regional GHG emission estimates and reduction strategies. A detailed discussion of the Proposed Project's consistency with these plans is included in **Section 4.1**.

In its "Guide to Air Quality Assessment in Sacramento County", the SMAQMD has adopted a numerical threshold for GHG emissions of 1,100 MT per year for land development and construction projects (SMAQMD, 2015). According to the SMAQMD, these thresholds were developed utilizing guidance from CAPCOA and demonstrate consistency with AB 32 and Scoping Plan goals by reducing project emissions by 21.7 percent (SMAQMD, 2014). Although the City has not adopted this threshold, it can be used as additional relevant regional reference point for determining whether or not the Proposed Project would impede the ability of the state to meet its GHG reduction targets. As shown in **Table 4.5-1**, Proposed Project GHG emissions would be well above the numerical threshold established by SMAQMD.

Because the Proposed Project has not been factored into regional plans established to the meet the goals of AB 32, including the MTP/SCS, and due to the current disparity between the amount of existing

global GHG emissions and the goals of AB 32 and EO S-3-05, even with mitigation measures incorporated, the Proposed Project would contribute a cumulatively considerable, incremental contribution to global GHG emissions and, therefore, would result in a **significant and unavoidable** impact.

IMPACT 4.5-2	IMPACTS ON THE PROPOSED PROJECT RELATED TO GLOBAL CLIMATE CHANGE
Applicable Policies and Regulations	AB 32
Significance with Policies and Regulations	Less than Significant
Mitigation Measures	None Required
Significance After Mitigation	Less than Significant

As recommended in the PCAPCD CEQA Air Quality Handbook, Steps to Ensure Full Disclosure, a CEQA climate change analysis should describe the cumulative, global climate change impact to which the project could contribute and the potential impacts of global climate change on the project. Global climate change is a complex phenomenon that is influenced by many environmental factors. There are also many different climate or hydrologic modeling tools available, each with strengths and weaknesses. While changes to the existing climate landscape can be demonstrated by looking at the historic record, it becomes challenging to predict future trends. Therefore, scientists involved in these modeling efforts do not try to be absolutely predictive, but instead use different model types with different sets of assumptions to capture a range of possible scenarios. The range of scenarios possible for the project site is described below.

Temperature

GHG emissions from the Proposed Project in combination with global GHG emissions have the potential to increase the average annual temperatures. Increased temperatures by itself would have little effect on the Proposed Project, other than increasing the demand for irrigation from increased evapotranspiration rates, and potentially greater overall energy demand to meet air conditioning needs.

Precipitation Climate

Although global climate change models generally predict an increase in overall precipitation on a worldwide scale, global circulation models indicate no clear trend for precipitation volume (Ficke, 2007). Therefore, the data have been inconclusive in formulating agreed-on predictions of future conditions. GHG emissions from the Proposed Project in combination with global GHG emissions can affect rainfall by changing the amount, timing, and intensity of precipitation events.

Snow Pack/Water Supply

GHG emissions from the Proposed Project in combination with global GHG emissions have the potential to affect California's annual snow and annual water supply due the less snow pack and the snow pack melting earlier in the year (Null and Viers, 2012). The reduction in the water supply has the potential to reduce potable water available to the Proposed Project. However, the City of Roseville is taking a proactive approach in the face of future water uncertainties, and has requested the project applicants to prepare a water conservation strategy, which has been incorporated into the Proposed Project, which would reduce water demands. At a state or regional level, it is expected that a combination of adaptation strategies, including new technologies for water supply, treatment and water use efficiency, implementation of water transfers and conjunctive use, coordinated operation of reservoirs, improved flow forecasting, and the cooperation of local, regional, state, and federal agencies, will be needed to help California respond to the effects of global climate change on water supply (DWR, 2008).

Although the project region could experience an increased number of single-dry and multiple dry years as a result of global climate change (Huber and Gulledge, 2011), based on current information it is reasonably expected that such increase would not significantly affect the ability of the City of Roseville to reliably meet the build-out water demands for the Proposed Project. As described in the *Water Conservation Plan* included as **Appendix G**, adequate water supply to reliably meet all of the projected existing City demands and Proposed Project demands, even under single-year and multiple-year drought conditions is available.

Storms and Extreme Events

GHG emissions from the Proposed Project in combination with global GHG emissions have the potential to cause weather variations over time, including droughts or severe storms; climate change impacts are expected to manifest in increased frequency and severity of extreme events, such as heat waves, wildfires, flooding, and conditions conducive to air pollution formation (Cayan et al., 2006). Increased intense local storms and changes in runoff patterns and periods of drought would have an effect on the Proposed Project's water supply, result in ground erosion, and property damage; however, it is not possible to predict with any accuracy these types of events. The Proposed Project is designed to provide adequate stormwater facilities in the event of storms, and includes provisions for water supply in dry and driest years.

Rise in Sea Level

Over the last 100 years, sea level has risen almost eight inches along the California coast, and climate models predict substantial increases in sea level over the next century (Heberger et al., 2009). GHG emissions from the Proposed Project have the potential to exacerbate sea level rise by contributing to rising temperatures. However, given the location and altitude of the project site, the Proposed Project would not be affected by a rise in sea level, even if the Sacramento Delta were to be impacted.

Ground Water Supply

GHG emissions from the Proposed Project in combination with global GHG emissions have the potential to change ground water supply in the region of the project site. Not many studies have been performed

on the effects of climate change on specific groundwater basins or groundwater recharge characteristics; however, changes in rainfall or snow pack in the Sierra Nevada Mountains has the potential to change the timing of the groundwater recharge season and other features of the hydrological cycle, which have the potential to alter groundwater recharge to aquifers (Treidel et al, 2012). As noted in **Section 4.13**, **Hydrology and Water Quality** of this EIR, the project site is underlain with clay and low permeable soils. Except for the University Creek stream channels, there is little area within the project site that would be expected to provide opportunities for natural groundwater recharge. The City of Roseville is separately pursuing an Aquifer Storage and Recovery program, which would enable the city to inject surplus water into the groundwater table.

Summary

The above description of potential cumulative, global climate change impacts shows compliance with the PCAPCD CEQA Air Quality Handbook, Steps to Ensure Full Disclosure requirement to outline the potential impacts that cumulative global climate change may have on the project site and region. As shown above there would be a **less-than-significant** impact on the project due to global climate change.

4.5.5 Mitigation Measures

MM 4.5-1 Measures to Reduce GHG Emissions (Impact 4.5-1)

Implementation of the Air Quality **Mitigation Measures 4.4-1** and **4.4-2** would reduce operational and construction-related emissions of criteria air pollutants and precursors, and would also act to reduce GHG emissions associated with project construction and operation. The requirements of **Mitigation Measure 4.4-2** are listed below and would achieve a 21 percent reduction in GHG emissions over BAU:

MM 4.4-2 Project Measures to Reduce Operational Emissions

Following receipt of an application for a Tentative Map (excluding the Large Lot Subdivision Map), Design Review Permit, conditional use permits and/or all discretionary permits, the City will forward an early consultation notice to the PCAPCD. Where the PCAPCD provides comments on a specific development proposal, the City shall consult with PCAPCD and the developer to incorporate measures recommended by the PCAPCD and agreed to by the City into the project. Where the PCAPCD does not provide comment on a specific development proposal, the City shall incorporate measures that reduce vehicle emissions and operation emissions from the proposed development. This measure will be implemented through project design, conditions of approval, noticing and disclosure statements, or through the City's plan check and inspection processes. This process is intended to ensure that best available and practical approaches are used to reduce operational emissions in specific tentative map and design review permit applications. The following is a listing of measures that shall be implemented for the purpose of reducing vehicle and operational emissions, applicant provides an analysis that demonstrates to the City's satisfaction that the measure is infeasible or other measures is comparably effective. If the applicant demonstrates that any particular measure in the list below is infeasible for a proposed project to which it

would otherwise be applicable, the applicant must provide an analysis supported by substantial evidence demonstrating that a replacement measure is comparably effective.

- Provide tree plantings that meet or exceed the requirements of the City's Community Design Guidelines to provide shading of buildings and parking lots.
- Landscape with native drought-resistant plants (ground covers, shrubs and trees) with particular consideration of plantings that are not reliant on gas-powered landscape maintenance equipment.
- Require all flat roofs on non-residential structures to have a white or silver cap sheet to reduce energy demand.
- Provide conductive/inductive electric vehicle charging station and signage prohibiting parking for non-electric vehicles within designated spaces within non-residential developments.
- Provide vanpool parking only spaces and preferential parking for carpools to accommodate carpools and vanpools in employment areas (e.g. community commercial, business-professional uses)
- All truck loading and unloading docks shall be equipped with one 110/208 volt power outlet for every two-dock doors. Signs shall be posted stating "Diesel trucks are prohibited from idling more than five minutes and trucks requiring auxiliary power shall connect to the 110/208-volt outlets to run auxiliary equipment".
- Design streets to maximize pedestrian and bicycle access to transit stops.
- Require site design to maximize access to transit lines, to accommodate bus travel, and to provide lighted shelters at transit access points.
- Develop the plan consistent with the higher residential densities (within approved residential density ranges of zone) provided around the village nodes and transit corridors.
- Participate in Roseville Electric incentive programs for energy-efficient development where feasible if available at the time of construction.
- Ten percent of the residential units shall be designated as low to very-low income residential units.
- A pedestrian and bicycle access network shall link areas of the project site with other land uses.
- Electric landscape maintenance equipment shall be utilized to the extent feasible on parks and public/quasi-public lands.
- Design buildings to meet the 2013 Title 24 Energy Efficiency Standards (which is a 25 percent reduction below 2010 Title 24 Energy Efficiency Standards).
- Ensure that all area lighting installed on the site shall be considered high efficiency lighting. All public street lighting shall meet the lighting standards of Roseville Electric at the time of construction.
- Utilize reclaimed water where available for irrigation of all non-single family areas within the project site, including the school, parks, paseos, roadway landscaping and commercial landscaping.
- Reduce the area of turf allowed consistent with the City's Water Efficient Landscape Ordinance and the Water Conservation Strategy (see **Appendix G**).

- Install water efficient landscape irrigation systems at all public land uses

Measures for Residential Units:

- Require electrical outlets be installed on the exterior walls of both the front and back of residences to promote the use of electric landscape maintenance equipment.
- Require every garage of each single family home to be considered "Electric Vehicle Ready". This by definition is not limited to, but includes a conduit raceway to a spare electric box in the garage that is sized for a future minimum 50-amp 220v outlet. A 220v breaker space must be available in the electrical panel.
- Require installation of a gas outlet in the rear of residential buildings for use of outdoor cooking appliances, such as gas burning barbeques.
- Require installation of low NO_x hot water heaters (beyond District Rule 246 requirements)
- Prior to approval of Tentative Maps: provide notice to homebuyers through CC&Rs or other mechanisms to inform them that only gas fireplaces would be permitted.
- The applicant shall ensure that builders offer only energy efficient appliances for installation in residential units, including Energy Star refrigerators, clothes washers, dishwashers, and ceiling fans.
- Prior to building permit approval, the applicant shall show, on the plans submitted to the Building Department, provisions for construction of new residences, and where natural gas is available, the installation of a gas outlet for use with outdoor cooking appliances, such as a gas barbecue or outdoor recreational fire pits.