3.6 Greenhouse Gas Emissions

This chapter provides an overview of the regulatory framework applicable to greenhouse gas (GHG) emissions at the statewide, regional, and local scales and evaluates the potential environmental impacts associated with implementation of the proposed Project (Project). GHG emissions refer to airborne pollutants that are generally understood to affect global climate conditions. These gaseous pollutants have the effect of trapping heat in the atmosphere, and consequently altering weather patterns and climactic conditions over long timescales. The GHG emissions impact assessment addresses both construction and operational activities associated with the Project. Supporting data and calculations are included in Appendix H of the Draft EIR.

Table 3.6-1 presents the most common anthropogenic (human-made) GHG compounds as well as their respective atmospheric lifetimes and global warming potential (GWP) values.[1] The six most prevalent GHG compounds associated with anthropogenic sources are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is the most common GHG in the atmosphere, but its emissions are not regulated. CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion. The other GHG compounds are less abundant but have higher GWP on a per-molecule basis than CO_2, meaning they are more capable of retaining infrared radiation. To account for the higher GWP, GHG emissions are typically expressed in terms of CO_2 equivalents, denoted as "CO_2e." The CO_2e metric is used as a standardized measurement technique to account for varying GWP; all GHG emissions disclosed in this chapter are expressed in terms of CO_2e.

3.6.1 Regulatory Setting

GHG emissions refer to a group of emissions that are generally believed to affect global climate conditions by trapping heat energy in the atmosphere. Consequently, regulatory efforts have been implemented at the federal, state, regional, and local levels to address the effects of GHG emissions, as discussed below.

3.6.1.1 Federal

The following discussion presents legislation, court rulings, and policies pertaining to GHG emissions.

Energy Independence and Security Act

The *Energy Independence and Security Act of 2007* (Act) includes several key provisions that will increase energy efficiency and the availability of renewable energy, which will reduce GHG emissions as a result. This act requires fuel producers to use at least 36 billion gallons of biofuel by 2022 through a Renewable Fuel Standard.[2] Also, this act increases Corporate Average Fuel Economy

[1] GWPs are one type of simplified index based upon radiative properties used to estimate the potential future impacts of emissions of different GHGs upon the climate system in a relative sense. The GWP values of various GHG emissions have been defined on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of carbon dioxide (CO_2) (CO_2 has a GWP of 1 by definition).

[2] According to the United States Energy Information Administration, 36 billion gallons of fuel represents approximately 26 percent of current gasoline consumption.

Table 3.6-1. Common Greenhouse Gases and Atmospheric Properties

Greenhouse Gas	Atmospheric Lifetime (Years)[a]	Global Warming Potential (20-Year)[b]	Global Warming Potential(100-Year)[b]
Carbon Dioxide (CO_2)	100	1	1
Nitrous Oxide (N_20)	121	264	298
Nitrogen Trifluoride	500	12,800	16,100
Sulfur Hexafluoride (SF_6)	3,200	17,500	23,500
Perfluorocarbons (PFCs)	3,000–50,000	5,000–8,000	7,000–11,000
Black Carbon	days to weeks	270–6,200	100–1,700
Methane (CH_4)	12	84	34
Hydrofluorocarbons (HFCs)	Uncertain	100–11,000	100–12,000

Source: California Air Resources Board, *First Update to the Climate Change Scoping Plan*, May 2014.

[a] Lifetime refers to the approximate amount of time it would take for the anthropogenic increment to an atmospheric pollutant concentration to return to its natural level as a result of either being converted to another chemical compound or being taken out of the atmosphere via a sink.

[b] The United States primarily uses the 100-year GWP as a measure of the relative impact of different GHGs. However, the scientific community has developed a number of other metrics that could be used for comparing one GHG to another. These metrics may differ based on timeframe, the climate endpoint measured, or the method of calculation. For example, the 20-year GWP is sometimes used as an alternative to the 100-year GWP. Just like the 100-year GWP is based on the energy absorbed by a gas over 100 years, the 20-year GWP is based on the energy absorbed over 20 years. This 20-year GWP prioritizes gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur. Because all GWPs are calculated relative to CO_2, GWPs based on a shorter timeframe would be larger for gases with lifetimes shorter than that of CO_2, and smaller for gases with lifetimes longer than CO_2.

Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Lastly, this act includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

National Fuel Efficiency Policy

On May 19, 2009, President Barack Obama announced a new National Fuel Efficiency Policy (NFEP) aimed at increasing fuel economy and reducing GHG pollution (White House Office of the Press Secretary 2009). The NFEP is expected to increase fuel economy by more than five percent by requiring a fleet-wide average of 35.5 miles per gallon by 2016 starting with model year 2012.

Fuel Economy Standards

On September 15, 2009, the U.S. Environmental Protection Agency (U.S. EPA) and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining emissions standard. Under the program, by 2012 passenger cars and light-duty trucks had to meet an average emissions standard of 295 grams of CO_2 per mile and 30.1 miles per gallon. By 2016, the vehicles had to meet an average standard of 250 grams of CO_2 per mile and 35.5 miles per gallon (U.S. EPA 2009). The final standards were adopted by U.S. EPA and DOT on April 1, 2010.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the *Clean Air Act* (CAA) (42 United States Code Section 7521):

1. Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
2. Cause or Contribute Finding: The U.S. EPA Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

While these findings do not impose additional requirements on industry or other entities, this action is a prerequisite to finalizing U.S. EPA's proposed GHG emissions standards for light-duty vehicles, which were jointly proposed by U.S. EPA and NHTSA.

***Massachusetts v. U.S. EPA*.** The U.S. Supreme Court ruled in *Massachusetts v. U.S. EPA*, 127 S. Ct. 1438 (2007), that CO_2 and other GHGs are pollutants under the CAA, which the U.S. EPA must regulate if it determines they pose an endangerment to public health or welfare. On December 7, 2009, the U.S. EPA Administrator made two distinct findings: 1) the current and projected concentrations of the six key GHGs in the atmosphere (i.e., CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations; and 2) the combined emissions of these GHGs from motor vehicle engines contribute to GHG pollution which threatens public health and welfare.

Heavy-Duty Vehicle Program

The Heavy-Duty Vehicle Program (HD National Program) was adopted on August 9, 2011 to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014. The HD National Program was developed by the U.S. EPA and the DOT's NHTSA to address the urgent and closely intertwined challenges on dependence on fossil fuel, energy security, and global climate change. The agencies estimated that the combined proposed standards have the potential to reduce GHG emissions by nearly 250 million metric tons and save approximately 500 million barrels of oil over the life of vehicles sold during 2014 to 2018. The HD National Program included CO_2 and fuel consumption standards, as well as standards applicable to N_2O, CH_4, and HFC emissions.

Federal Climate Action Plan

On June 25, 2013, President Barack Obama issued a Climate Action Plan. The three main goals are to cut carbon pollution, prepare the United States for the impacts of climate change, and lead international efforts to combat global climate change and prepare for its impacts. The objective is to cut carbon pollution by directing the U.S. EPA to complete carbon pollution standards in the power sector. This will reduce emissions from power plants and encourage renewable energy development. Other strategies to combat climate change are increasing energy efficiency, stricter vehicle and fuel standards, preserving forests to absorb carbon dioxide, reducing energy waste, combating short-lived climate pollutants, mobilizing climate finance, and leading international negotiations on climate change.

***Utility Air Regulatory Group. v. U.S. EPA*.** On June 23, 2014, the U.S. Supreme Court ruled in *Utility Air Regulatory Group. v. U.S. EPA* that the U.S. EPA exceeded its statutory authority under the *Clean Air Act* when it determined that stationary source emissions of GHGs would trigger permitting

obligations under the Prevention of Significant Deterioration (PSD) program and Title V of the CAA. The Court, however, upheld those portions of U.S. EPA's rulemaking that require a source to apply best available control technology (BACT) to GHG emissions where the source would otherwise trigger PSD permitting on account of its emissions of other pollutants. The Supreme Court's decision was limited to U.S. EPA's regulation of GHG emissions under the PSD and Title V provisions of the CAA, and it left unanswered other questions regarding U.S. EPA's permitting and BACT authority under the PSD program, and the U.S. EPA's efforts to regulate GHG emissions from stationary sources.

Executive Order 13693

On June 10, 2015, Executive Order (EO) 13693—Planning for Federal Sustainability in the Next Decade—revokes multiple prior executive orders and memoranda including EO 13514. The goal of EO 13693 is to maintain federal leadership in sustainability and GHG emission reductions. This executive order outlines forward-looking goals for federal agencies in the area of energy, climate change, water use, vehicle fleets, construction, and acquisition. Federal agencies shall, where life-cycle cost-effective, beginning in 2016:

- Reduce agency building energy intensity as measured in British Thermal Units per square foot by 2.5 percent annually through 2025;
- Improve data center energy efficiency at agency buildings;
- Ensure a minimum percentage of total building electric and thermal energy shall be from clean energy sources;
- Improve agency water use efficiency and management (including storm water management); and
- Improve agency fleet and vehicle efficiency and management by achieving minimum percentage GHG emission reductions.

Executive Order 13783

On March 28, 2017, EO 13783—Promoting Energy Independence and Economic Growth—revokes multiple prior executive orders and memoranda, including EO 13653, the Power Sector Carbon Pollution Standards, Presidential Memorandum – Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment, and Presidential Memorandum – Climate Change and National Security, as well as other federal reports and provisions. EO 13783 represents a reversal on federal climate policy relative to the work of previous administrations and its objective is to reduce the regulatory framework applicable to GHG emissions to spur fossil fuel production. The order "established a national policy to promote the clean and safe development of our energy resources while reducing unnecessary regulatory burdens."[3] The order also "directs the U.S. EPA to review existing regulations, orders, guidance documents and policies that potentially burden the development or use of domestically produced energy resources." Future changes to national policy on GHG emissions as a result of EO 13783 cannot be predicted at this time.

[3] Federal Register, *Executive Order 13783 of March 28, 2017: Promoting Energy Independence and Economic Growth*, Vol. 82, No. 61, March 21, 2017.

Executive Order 13795

On April 28, 2017, EO 13795—Implementing an America-First Offshore Energy Strategy—was "to encourage energy exploration and production, including on the Outer Continental Shelf, in order to maintain the nation's (US) position as a global energy leader and foster energy security and resilience for the benefit of the American people, while ensuring that any such activity is safe and environmental responsible."[4] The objective is to expand the opportunity for offshore energy development by removing restrictions on resource exploration and extraction. This prioritizes the development of offshore energy resources over the protection of National Marine Sanctuaries and authorizes the review and potential revision or withdrawal of the Bureau of Ocean Energy Management's Proposed Rule entitled "Air Quality Control, Reporting, and Compliance," 81 Fed. Reg. 19718 and any other related rules and guidance. The implications of implementing EO 13795 with regards to the national GHG emissions inventory cannot be reasonably determined at this time.

3.6.1.2 State

CEQA Guidelines Section 15064.4

Section 15064.4 of the CEQA Guidelines require that, in performing environmental review under CEQA, an 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 project. The lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions, and which model or methodology to use, or rely on a qualitative analysis or performance-based standards. The lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Assembly Bill 1493

Assembly Bill (AB) 1493 (referred to as Pavley I), adopted in 2002, required the California Air Resource Board (CARB) to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost-effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 and extending to 2016 and the Low Emission Vehicle (LEV) III GHG will cover 2017 to 2025. It is

[4] Federal Register, *Executive Order 13795 of April 28, 2017: Implementing an America-First Offshore Energy Strategy*, Vol. 82, No. 84, May 3, 2017.

estimated that this will reduce climate change emissions from the vehicle fleet by 30 percent in 2016 compared to the emissions in the same year without the standards (CARB 2013).

Executive Order S-3-05

On June 1, 2005, EO S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO S-3-05 calls for the Secretary of California Environmental Protection Agency (CalEPA) to be responsible for coordination of state agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency (California Energy Commission 2011).

In response to the EO S-3-05, the Secretary of the CalEPA created the Climate Action Team (CAT). California's CAT originated as a coordinating council and included the Secretaries of the Natural Resources Agency, and the Department of Food and Agriculture, and the Chairs of the CARB, Energy Commission, and Public Utilities Commission. The original council was an informal collaboration between the agencies to develop potential mechanisms for reductions in GHG emissions in California.

The original mandate for the CAT was to develop proposed measures to meet the emission reduction targets set forth in EO S-3-05. The CAT has since expanded and currently has members from 18 state agencies and departments. The CAT also has ten working groups, which coordinate policies among their members. The working groups and their major areas of focus are:

- Agriculture: Focusing on opportunities for agriculture to reduce GHG emissions through efficiency improvements and alternative energy projects, while adapting agricultural systems to climate change;
- Biodiversity: Designing policies to protect species and natural habitats from the effects of climate change;
- Energy: Reducing GHG emissions through extensive energy efficiency policies and renewable energy generation;
- Forestry: Coupling GHG mitigation efforts with climate change adaptation related to forest preservation and resilience, waste to energy programs and forest offset protocols;
- Land Use and Infrastructure: Linking land use and infrastructure planning to efforts to reduce GHG from vehicles and adaptation to changing climatic conditions;
- Oceans and Coastal: Evaluating the effects of sea level rise and changes in coastal storm patterns on human and natural systems in California;
- Public Health: Evaluating the effects of GHG mitigation policies on public health and adapting public health systems to cope with changing climatic conditions;
- Research: Coordinating research concerning impacts of and responses to climate change in California;
- State Government: Evaluating and implementing strategies to reduce GHG emissions resulting from state government operations; and
- Water: Reducing GHG impacts associated with the state's water systems and exploring strategies to protect water distribution and flood protection infrastructure.

The CAT is responsible for preparing reports that summarize the state's progress in reducing GHG emissions. The most recent CAT Report was published in December 2010. The CAT Report discusses mitigation and adaptation strategies, state research programs, policy development, and future efforts.

Assembly Bill 32

In September 2006, the *California Global Warming Solutions Act of 2006*, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California, and requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. CARB initially determined that the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 million metric tons of CO_2e. The 2020 target reduction was estimated to be 174 million metric tons of CO_2e.

To achieve the goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects. Senate Bill (SB) 1368, a companion bill to AB 32, requires the California Public Utilities Commission (CPUC) and the California Energy Commission to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the state.

AB 32 delegates CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. On June 1, 2007, CARB adopted three discrete early action measures to reduce GHG emissions. These measures involved complying with a low carbon fuel standard, reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills (CARB 2007b). On October 25, 2007, CARB tripled the set of previously approved early action measures. The approved measures include improving truck efficiency (i.e., reducing aerodynamic drag), electrifying port equipment, reducing PFCs emissions from the semiconductor industry, reducing propellants in consumer products, and promoting proper tire inflation in vehicles.

The CARB AB 32 Scoping Plan (Scoping Plan) contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by CARB with input from CAT and proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the state economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing GHG emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable electricity standard 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;
- Establishing targets for transportation-related GHG emissions for regions throughout the state, and pursuing policies and incentives to achieve those targets; and
- Adopting and implementing measures to reduce transportation sector emissions.

CARB has adopted the First Update to the AB 32 Scoping Plan (CARB 2014). This Update identifies the next steps for California's leadership on climate change. The First Update to the initial AB 32 Scoping Plan describes progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years. It also frames activities and issues facing the state as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020. Specifically, the update covers a range of topics:

- An update of the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants;
- A review of progress-to-date, including an update of Scoping Plan measures and other state, federal, and local efforts to reduce GHG emissions in California;
- Potential technologically feasible and cost-effective actions to further reduce GHG emissions by 2020;
- Recommendations for establishing a mid-term emissions limit that aligns with the state's long-term goal of an emissions limit 80 percent below 1990 levels by 2050; and
- Sector-specific discussions covering issues, technologies, needs, and ongoing state activities to significantly reduce emissions throughout California's economy through 2050.

As discussed above, in December 2007, CARB approved a total statewide GHG 1990 emissions level and 2020 emissions limit of 427 million metric tons of CO_2e. As part of the Update, CARB revised the 2020 statewide limit to 431 million metric tons of CO_2e, an approximately one percent increase from the original estimate. The revised estimate includes incorporation of the Pavley standards in the business-as-usual forecast. The 2020 business-as-usual forecast in the Update is 509 million metric tons of CO_2e. The state would need to reduce those emissions by 15 percent to meet the 431 million metric tons of CO_2e 2020 limit.

Senate Bill 375

SB 375, adopted in September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions by cars and light trucks. SB 375 requires Regional Transportation Plans (RTPs) prepared by Metropolitan Planning Organizations (MPOs) to include Sustainable Communities Strategies (SCSs). In adopting SB 375, the Legislature found that improved coordination between land use planning and transportation planning is needed in order to achieve the GHG emissions reduction target of AB 32. Further, the staff analysis for the bill prepared for the Senate Transportation and Housing Committee's August 29, 2008 hearing on SB 375 began with the following statement: "According to the author, this bill will help implement AB 32 by aligning planning for housing, land use, transportation and greenhouse gas emissions for the 17 MPOs in the state." Under the *Sustainable Communities Act*, CARB sets regional targets for GHG emissions reductions from passenger vehicle use. CARB has set the following reduction targets for SCAG: reduce per capita 8 percent of GHG emissions below 2005 levels by 2020 and 13 percent below 2005 levels by 2035.

Executive Order B-30-15

On April 29, 2015, Governor Jerry Brown issued EO B-30-15, stating a new statewide policy goal to reduce GHG emissions 40 percent below their 1990 levels by 2030. The executive order establishes GHG emissions reduction targets to reduce emissions to 80 percent below 1990 levels by 2050 and sets an interim target of emissions reductions for 2030 as being necessary to guide regulatory policy

and investments in California and put California on the most cost-effective path for long-term emissions reductions. The executive order orders "all state agencies with jurisdiction over sources of [GHG] emissions [to]…implement measures, pursuant to statutory authority, to achieve reductions of [GHG] emissions to meet the 2030 and 2050 [GHG] emissions reductions targets."

EO B-30-15 directs CARB to "update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent" ($MMTCO_2e$). It directs the Natural Resources Agency to update "Safeguarding California," the state's climate adaptation strategy, every three years, as specified; directs state agencies to "take climate change into account in their planning and investment decisions and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives;" and orders the state's "Five-Year Infrastructure Plan [to] take current and future climate change impacts into account in all infrastructure projects." Among its other directives, the executive order provides that "state agencies' planning and investment shall be guided by the…principle that priority should be given to actions that both build climate preparedness and reduce GHG emissions."

Senate Bill 32

On September 8, 2016, California signed into law SB 32, which adds Section 38566 to the Health and Safety Code and requires a commitment to reducing statewide GHG emissions by 2020 to 1990 levels and by 2030 to 40 percent less than 1990 levels. SB 32 was passed with companion legislation AB 197, which provides additional direction for developing the Scoping Plan. Recently, CARB released the 2017 Climate Change Scoping Plan Update (2017 Update), which outlines the proposed framework of action for achieving California's new SB 32 2030 GHG target: a 40 percent reduction in GHG emissions by 2030 relative to 1990 levels (CARB 2017c). The 2030 target is intended to ensure that California remains on track to achieve the goal set forth by EO B-30-15 to reduce statewide GHG emissions by 2050 to 80 percent below 1990 levels. The Proposed 2017 Update identifies key sectors of the implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water.

Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 $MMTCO_2e$, and that further commitments will need to be made to achieve an additional reduction of 50 $MMTCO_2e$ beyond current policies and programs. Key elements of the Proposed 2017 Update include a proposed 20 percent reduction in GHG emissions from refineries and an expansion of the Cap-and-Trade program to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2050 limit set forth by EO B-30-15. The Proposed 2017 Update indicates that stronger SB 375 reduction targets are needed to meet the state's 2030 and 2050 goals and that, "[m]ore needs to be done to fully exploit synergies with emerging mobility solutions like ridesourcing and more effective infrastructure planning to anticipate and guide the necessary changes in travel behavior, especially among millennials. Stronger SB 375 reduction targets will likely encourage further densification around transit infrastructure.

3.6.1.3 Regional

Southern California Association of Governments (SCAG) 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

SCAG is the MPO for the six-county region that includes Los Angeles, Orange, Riverside, Ventura, San Bernardino and Imperial counties. The 2016–2040 RTP/SCS includes commitments to reduce emissions from transportation sources to comply with SB 375. Goals and policies included in the

2016–2040 RTP/SCS to reduce GHG emissions consist of adding density in proximity to transit stations, mixed-use development and encouraging active transportation (i.e., non-motorized transportation such as bicycling). SCAG promotes the following policies and actions related to active transportation to help the region confront congestion and mobility issues and consequently reduce emissions:

- Implement Transportation Demand Management (TDM) strategies including integrating bicycling through folding bikes on buses programs, triple racks on buses, and dedicated racks on light and heavy rail vehicles;
- Encourage and support local jurisdictions to develop "Active Transportation Plans" for their jurisdiction if they do not already have one;
- Expand Compass Blueprint program to support member cities in the development of bicycle plans;
- Expand the Toolbox Tuesday's program to encourage local jurisdictions to direct enforcement agencies to focus on bicycling and walking safety to reduce multimodal conflicts;
- Support local advocacy groups and bicycle-related businesses to provide bicycle-safety curricula to the general public;
- Encourage children, including those with disabilities, to walk and bicycle to school;
- Encourage local jurisdictions to adopt and implement the proposed SCAG Regional Bikeway Network; and
- Support local jurisdictions to connect all of the cities within the SCAG region via bicycle facilities.

SB 375 requires CARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, for cars and light trucks only for 2020 and 2035 for each MPO. SB 375 also requires that each MPO prepare an SC) as part of the RT) to reduce CO_2 by better aligning transportation, land use, and housing. For SCAG, the targets are to reduce per capita emissions 8 percent below 2005 levels by 2020 and 13 percent below 2005 levels by 2035 (SCAG 2016). The 2016–2040 RTP/SCS states that the region will meet or exceed the SB 375 per capita targets, lowering regional per capita GHG emissions (below 2005 levels) by eight percent by 2020 and 18 percent by 2035. The 2016–2040 RTP/SCS also states that regional 2040 per capita emissions would be reduced by 22 percent, although CARB has not established a 2040 per capita emissions target.

3.6.1.4 Local

GreenLA Action Plan

The City of Los Angeles (City) has issued guidance promoting sustainable development to reduce GHG emissions Citywide in the form of the GreenLA action plan. The objective of GreenLA is to reduce GHG emissions 35 percent below 1990 levels by 2030 (City 2007). GreenLA identifies goals and actions designed to make the City a leader in confronting global climate change. The measures would reduce emissions directly from municipal facilities and operations and create a framework to address Citywide GHG emissions. GreenLA lists various focus areas in which to implement GHG reduction strategies. Focus areas include energy, water, transportation, land use, waste, port, airport, and ensuring that changes to the local climate are incorporated into planning and building decisions. Relevant City goals in each focus area include, but are not limited to, the following:

Energy

- Increase the generation of renewable energy;
- Encourage the use of mass transit;
- Develop sustainable construction guidelines; and
- Increase citywide energy efficiency.

Water

- Decrease per capita water use to reduce electricity demand associated with water pumping and treatment.

Transportation

- Power the City vehicle fleet with alternative fuels; and
- Promote alternative transportation (e.g., mass transit and rideshare).

Other Goals

- Create a more livable City through land use regulations; and
- Increase recycling.

In order to provide detailed information on action items discussed in GreenLA, the City published an implementation document titled ClimateLA (City 2008). ClimateLA presents the existing GHG inventory for the City, describes enforceable GHG reduction requirements, provides mechanisms to monitor and evaluate progress, and includes mechanisms that allow the plan to be revised in order to meet targets. By 2030, the plan aims to reduce GHG emissions by 35 percent from 1990 levels, which were estimated to be approximately 54.1 million metric tons. Therefore, the City will need to lower annual GHG emissions to approximately 35.1 million metric tons per 2030.

To achieve these reductions the City has developed strategies that focus on energy, water use, transportation, land use, waste, open space and greening, and economic factors. To reduce emissions from energy usage, ClimateLA proposes the following goals: increase the amount of renewable energy provided by the Los Angeles Department of Water and Power; present a comprehensive set of green building policies to guide and support private sector development; reduce energy consumed by City facilities and utilize solar heating where applicable; and help citizens to use less energy.

With regard to waste, ClimateLA sets the goal of reducing or recycling 70 percent of trash by 2015. With regard to open space and greening, ClimateLA includes the following goals: create 35 new parks; revitalize the Los Angeles River to create open space opportunities; plant 1 million trees throughout the City; identify opportunities to "daylight" streams; identify promising locations for stormwater infiltration to recharge groundwater aquifers; and collaborate with schools to create more parks in neighborhoods.

Sustainable City pLAn

In addition to GreenLA, Mayor Eric Garcetti released the Sustainable City pLAn (pLAn) on April 8, 2015 (City 2015). The pLAn is a roadmap to achieving short-term results and sets a path to strengthen and transform the City in future decades. Recognizing the risks posed by climate change, Mayor Garcetti set time-bound outcomes on climate action, most notably to reduce GHG emissions by 45 percent by 2025,

60 percent by 2035, and 80 percent by 2050, all against a 1990 baseline. Through the completion and verification of the GHG inventory update, the City concluded that:

- The City accounted for approximately 36.2 million metric tons of CO_2e in 1990;
- The City's most recent inventory shows that emissions fell to 29 million metric tons of CO2e in 2013; and
- Los Angeles' emissions are 20 percent below the 1990 baseline as of 2013, putting Los Angeles nearly halfway to the 2025 pLAn reduction target of 45 percent.

In addition, the 20 percent reduction exceeds the 15 percent statewide goal listed in the First Update to the AB 32 Scoping Plan.

Mobility Plan 2035

On September 7, 2016, the City Council adopted the Mobility Plan 2035 to provide the policy foundation for achieving a transportation system that balances the needs of all road users. The Mobility Plan 2035 outlines goals and objective targets to help measure the progress of its implementation and success. By placing a Citywide emphasis on safety, access, and health the Mobility Plan 2035 will help to equalize the playing field and first address socioeconomically disadvantaged areas with the highest need to connect people to more prospects of success through mobility. Key policy initiatives of the Mobility Plan 2035 include the following:

- Lay the foundation for a network of complete streets and establish new complete street standards that will provide safe and efficient transportation for pedestrians (especially for vulnerable users such as children, senior, and the disabled), bicyclists, transit riders, and car and truck drivers; and
- Target GHG reductions through a more sustainable transportation system.

2028 Zero-Emissions Roadmap

In 2018, the Los Angeles Cleantech Incubator (LACI) formed the Transportation Electrification Partnership (TEP), with the objective of accelerating transportation electrification in the Greater Los Angeles region and moving toward an additional 25 percent reduction in GHG emissions and air pollution by 2028 (LACI 2018). The TEP comprises members of numerous agencies and municipalities, including, but not limited to, CARB, the City, the County of Los Angeles, the Los Angeles County Metropolitan Transportation Authority (LA Metro), the Los Angeles Department of Water and Power (LADWP), and Southern California Edison (SCE). Together, these groups will coordinate to achieve advancements in reducing GHG emissions and air pollution in the people movement, goods movement, and energy-transportation nexus sectors through the following guiding principles:

- Ensuring equal access to zero-emissions transportation options that are cost competitive, safe, and convenient;
- Ensuring that the autonomous future is electric and does not increase vehicle miles traveled (VMT);
- Ensuring that first- and last-mile electric options complement the region's public transit network;

- Ensuring infrastructure planning and investments support modern zero-emissions freight corridors;
- Improving freight efficiency and transitioning goods movement through zero-emissions technologies;
- Increasing competitiveness and future economic growth within freight sector in the Greater Los Angeles region and across California;
- Expanding grid infrastructure in a way that ensures resilience and promotes electric vehicle (EV) adoption at scale;
- Ensuring that the increased demand from transportation electrification is met through renewable energy; and
- Ensuring a localized power grid that addresses the opportunities and needs for integration of EVs and related technologies.

3.6.2 Environmental Setting

GHG emissions are the result of both natural and human-influenced activities. Volcanic activity, forest fires, decomposition, industrial processes, landfills, consumption of fossil fuels for power generation, transportation, heating, and cooling are the primary sources of GHG emissions. Without human activity, the Earth would maintain an approximate, but varied, balance between the emission of GHGs into the atmosphere and the storage of GHG in oceans and terrestrial ecosystems. Increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) has contributed to a rapid increase in atmospheric GHG levels over the last 150 years.

The primary effect of rising global concentrations of atmospheric GHG levels is a rise in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide (including from economically developed and developing countries and deforestation), which would induce further changes in the global climate system during the current century (U.S. EPA 2009c). Significant impacts from global climate change worldwide and in California include:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor, due to the atmosphere's ability to hold more water vapor at higher temperatures (U.S. EPA 2009c);
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (IPCC 2013);
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (IPCC 2013);
- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years (CalEPA 2010);

- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25 percent to 85 percent (depending on the future temperature scenario) in high ozone areas located in the Southern California area and the San Joaquin Valley by the end of the 21st Century (CalEPA 2010);
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level (CalEPA 2010); and
- Exacerbating the severity of drought conditions in California such that durations and intensities are amplified, ultimately increasing the risk of wildfires and consequential damage incurred (California State Senate 2015).

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade. However, there remain significant scientific uncertainties; for example, in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, volcanic activity, and changes in oceanic circulation.

Due to the complexity of the climate system, the uncertainty surrounding the implications of climate change may never be completely eliminated. Because of these uncertainties, there continues to be significant debate as to the extent to which increased concentrations of GHGs have caused or will cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. Given the scale over which climate change occurs, as well as the uncertainties described above, it is not possible to link specific development projects to future specific climate change impacts; though estimating Project-specific emissions is possible.

3.6.2.1 Statewide Greenhouse Gas Emissions Trends

CARB has prepared a statewide emissions inventory covering 2000 to 2015, which demonstrates that GHG emissions have decreased by 7.9 percent over that period (CARB 2017a). Emissions in 2014 from the transportation sector, which represents California's largest source of GHG emissions and contributed 37 percent of total annual emissions, declined marginally relative to 2011 even while the economy and population continued to grow over that three-year time period (CARB 2017a). The long-term direction of transportation-related GHG emissions is another clear trend, with a 13 percent drop over the past 10 years. Table 3.6-2 shows GHG emissions from 2005 to 2015 in California.

3.6.2.2 Citywide Sustainability Endeavors

One component of the pLAn program is to prepare annual reports documenting progress and achievements in sustainable efforts Citywide. The most recent Second Annual Report 2016–2017 provides an overview of accomplishments by resource area, one of which is Carbon & Climate Leadership. An element of the Carbon and Climate Leadership is the preparation and updating of the City's GHG emissions inventory, which was originally compiled in 2013. As of 2013, the City had reduced its GHG emissions by 20 percent relative to 1990 levels, nearly halfway to the goal of 45 percent below by 2025. The 2013 emissions inventory determined that Citywide annual emissions were approximately 29 $MMtCO_2e$, with approximately 64 percent of emissions attributed to energy use, approximately 34 percent of emissions attributed to transportation, and the remaining 2 percent of emissions being generated by waste (City 2015a).

Table 3.6-2. California Greenhouse Gas Emissions Inventory 2005–2015

	Annual CO_2e Emissions (million metric tons)										
Sector	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Transportation	184	184	184	173	166	163	160	159	158	160	165
Industrial	95	93	90	90	87	91	91	91	93	94	92
Electric Power	108	105	114	120	101	90	88	95	90	88	84
Commercial/Residential	42	43	43	43	44	45	45	43	43	37	38
Agriculture	34	36	36	36	34	35	35	36	35	36	35
High Global Warming Potential	9	10	11	12	12	14	15	16	17	18	19
Recycling and Waste	8	8	8	8	8	8	8	8	8	9	9
Emissions Total	**482**	**479**	**486**	**483**	**453**	**446**	**442**	**445**	**445**	**442**	**440**

Source: CARB, *California Greenhouse Gas Inventory for 2000-2015 – by Category as Defined in the 2008 Scoping Plan*, June 6, 2017.

As documented in the Second Annual Report of the City pLAn, the LADWP 2015 *Integrated Resource Plan* sets a path toward 55 percent renewable energy by 2030, beating the state mandate. The mayor's office is also developing pathways to meet 80 percent GHG reduction by 2050. Another sustainability goal in the pLAn is to reduce the urban/rural temperature differential by at least 1.7 degrees Fahrenheit (°F) in 2025 and 3.0°F in 2035 (City 2015b). In 2016, the Mayor's Office and Climate Reserve hosted an Urban Heat Island and Extreme Heat Symposium, which identified key strategies including increased street tree canopy and green infrastructure in vulnerable communities, implementing and expanding the cool roof program, ramp-up cool pavement installations, and coordinating public communication efforts. The City is implementing an Alternative Materials pilot program that began in late 2017 to evaluate the effectiveness of cool pavement technologies and inform future decisions related to reducing the urban heat island effect throughout the City (City 2018).

3.6.3 Environmental Impact Analysis

This subsection analyzes the potential for GHG emissions impacts associated with construction and operation of the Project. The analysis is based on parameters for the anticipated construction and operational activities associated with the Project. Information has also been supplemented using appropriate methodologies and assumptions approved by regulatory agencies.

3.6.3.1 Approach

Implementation of the Project would generate GHG emissions as a result of the continuation of construction activities and future operational maintenance activities related to sidewalk repair. The Project would be implemented over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of up to 12,860 street trees, and the planting of about 30,405 new street trees. Replacement street trees would be planted at a 2:1 ratio for the first 10 years of the program, at a 3:1 ratio for years 11 through 21 of the program, and again at a 2:1 ratio for the remaining nine years of the 30-year Project.

For analysis purposes, an average site is assumed to be 650 linear feet long and 5 feet wide for each scenario. This assumption is based on data gathered from past work. As a conservative approach, it is also assumed that each repair site would include a street tree removal when the street tree cannot survive root pruning. Each Construction Scenario 1 repair project is anticipated to take a minimum average of 5 work days to complete, while Construction Scenario 2 is anticipated to take 30 work days to complete. Both Construction Scenario 1 and Construction Scenario 2 may be occurring simultaneously throughout the City at any given time. Of the approximately total 12 crews at peak construction activity at the last 5 years of the Project, it is assumed that up to 11 crews would be working on a Construction Scenario 1 site on a given day. Construction Scenario 2 would be more intensive than Construction Scenario 1 and would include substantial utility repair work as well as crosswalk repaving. Only a single crew is assumed to be conducting repairs for Construction Scenario 2 on any given day, during the last years of the Project because that is when the greatest amount of sidewalk repair sites will be repaired.

With respect to construction activities, the number of worker crews throughout the City at a given time is anticipated to increase every five years of the Project because of the increase in sidewalk repair (i.e., 298 repair sites annually in years 1–5, 344 annually in years six through 10, 396 annually in years 11–15, 457 annually in years 16–20, 527 annually in years 21–25, and 607 annually in years 26–30). Thus, for the purposes of this impacts assessment, the representative maximum annual GHG emissions that would be generated by construction activities during each five-year increment period of the 30-year Project are disclosed. The GHG emissions assessment included all anticipated Construction Scenario 1 and Construction Scenario 2 sites collectively.

The Citywide Construction daily trip generation (including one crew at a Construction Scenario 2 site) would be 758 trips if all total 12 crews in years 26 through 30 were working on the maximum number of phases in a single day (three phases under Construction Scenario 1 and four phases under Construction Scenario 2). Project trip generation would be reduced earlier in Project implementation, assuming there would be fewer construction activities per day, compared to later years of the Project where additional crews would be present. It should be noted that trip generation would be geographically dispersed throughout the City, and effects would not be confined to one area at a time.

Activities associated with Construction Scenarios 1 and 2 would generate GHG emissions from sources including the use of heavy-duty equipment, worker trips, and material delivery and disposal trips. Table 3.6-3 presents an overview of the individual events (phases) of construction activities under each scenario, the duration of each activity, the equipment required to complete the work, and the number of daily workers and total truck round trips anticipated for each event under Construction Scenario 1 and 2. See Table 3.6-3, for summary of activities for each construction scenario.

Estimates of annual GHG emissions that would be released by construction equipment use were quantified using methodologies described in the California Emissions Estimator Model (CalEEMod2016.3.2) *User's Guide Appendix A Calculation Details for CalEEMod* (CAPCOA 2017). The construction equipment emissions calculations relied on emission factors extracted from the CARB OFFROAD2011 model that are contained in the *CalEEMod User's Guide Appendix D Default Data Tables* document (CAPCOA 2017). The emission factors are expressed in terms of grams of pollutant emitted per hour of equipment use (g/hr). Detailed construction equipment emissions calculations can be found in Appendix H.

Table 3.6-3. Summary of Activities for Each Construction Scenario

Scenario/Activity	Duration (days)	Daily Equipment Type (count)	Daily Workers	Truck Trips
Construction Scenario 1				
Mobilization	5	Compressor (1) Small Generator (1)	4	2
Traffic Control/Demolition/Removal	1	Pneumatic Jackhammer (2) Concrete Saw (2) Skid-Steer Loader (1) Tractor (1)	4	2
Grading/Formwork	1	3 Ton Roller (1)	5	2
Concrete Pouring	1	Concrete Mixer (1) Concrete Vibrator (2)	9	2
Utility Adjustment	2	Manhole Cutter (1) Concrete Saw (1) Concrete Mixer (1)	5	2
Street Tree Removal	1	Bucket Truck (1) Chainsaw (1) Wood Chipper (1) Stump Grinder (1) Skid-Steer Loader (1)	5	0
Street Tree Planting	1	Mini Excavator (1)	3	0
Cleanup	1	N/A	3	2
Construction Scenario 2				
Mobilization	5	Same equipment as under Construction Scenario 1	4	2
Traffic Control/Demolition/Removal	1	Same equipment as under Construction Scenario 1	4	2
Grading/Formwork	1	Same equipment as under Construction Scenario 1	5	2
Concrete Pouring	1	Same equipment as under Construction Scenario 1	9	2
Utilities Relocation	20	Concrete/Industrial Saw (1) Excavator (1) Vibratory Plate Compactor (1) Asphalt Paver (1)	5	2
Crosswalk Repaving	5	Concrete/Industrial Saw (1) Skid Steer Loader (1) Asphalt Paver (1) Line Striper (1)	4	1
Street Tree Removal	1	Same equipment as under Construction Scenario 1	5	0
Street Tree Planting	1	Same equipment as under Construction Scenario 1	3	0
Cleanup	1	N/A	4	2

Source: MARRS Services Inc., 2018.

GHG emissions that would be released by vehicle trips (workers and trucks) were estimated using mobile source emission factors obtained from the CARB EMFAC2017 model. The EMFAC2017 model

is a tool compiled by the CARB to assist mobile source emissions analysis for various projects throughout the state. The model generates average pollutant emission rates for various types of vehicles based on the regional climate conditions and year of analysis, accounting for mandatory improvements in engine and fuel efficiency required by programs implemented by the CARB into the future. Emission rates are expressed in terms of grams of pollutant emitted per vehicle mile traveled (g/mi) for CO_2 and CH_4. Construction worker trips were assigned a combination of light duty vehicles and construction truck trips were conservatively assumed to be heavy-duty trucks. Vehicle trip emissions calculations can be found in Appendix H.

The continuation of operational activities under the Project would consist of crews watering the street trees for the first three years after planting. The Project proposes to plant a total of 30,405 street trees over 30 years. At repair sites requiring street tree removal and replacement, it is anticipated that newly planted street trees would receive regular watering for the first three years following planting. It is estimated that up to six water trucks would be used daily to make the watering rounds, and each truck would travel up to 70 miles per day. The operational emissions analysis estimated GHG emissions generated by 420 daily water trucks, using emission rates obtained from EMFAC2017; detailed calculations can be found in Appendix H.

Following the construction activities at each site, inspection crews would be required to visit the construction sites to verify compliance with applicable accessibility requirements and compile an inventory of sites repaired for Certificate of Warranty (see Chapter 2, *Project Description*). For analysis purposes and based on ongoing activities, it is assumed that a site inspector could visit four sites per day, totaling approximately 20 miles of travel, and that up to four inspection crew vehicles could be working at a given time. Therefore, operational site inspection activities would generate up to approximately 80 VMT daily. Mobile source GHG emissions associated with inspection activities were estimated using emission rates obtained from the EMFAC2017 model; detailed calculations can be found in the Appendix H.

Carbon sequestration is a term used to describe processes by which CO_2 is removed from the atmosphere for long-term storage. Trees sequester carbon by using photosynthesis to convert CO_2 into sugar, cellulose, and other carbon-containing carbohydrates that they use for food and growth (CARB 2015). A consequence of removing and replacing street trees is the change in carbon sequestration that occurs from removing a full-grown street tree and replacing it with a sapling. As street trees grow, they are more capable of sequestering CO_2 from the atmosphere, and the annual CO_2 sequestration increases with age. Furthermore, various tree species have different CO_2 sequestration rates. As a response to demand for urban street tree planning projects and the need to characterize their effects on climate change, the United States Forest Service (USFS) in partnership with the California Department of Forestry and Fire Protection (CAL FIRE) developed the CUFR Tree Carbon Calculator (CTCC) tool to quantify estimates of annual carbon sequestration from urban street trees (USDA 2012).

The CTCC tool contains a database that provides estimated annual carbon sequestration based on the climate zone, age, and species of street trees. Under the Project, removed street trees would be replaced at a 2:1 ratio during Years 1 through 10, a 3:1 ratio during years 11 through 21, and a 2:1 ratio for the final nine years of the program. Net annual carbon sequestration estimates associated with street tree removal (loss of carbon sequestration) and new street tree planting and growth (gain in carbon sequestration) were calculated for each year of the Project as a component of the operations analysis. Detailed carbon sequestration calculations are provided in Appendix H.

Given the scientific consensus, acknowledging that the effects of GHG emissions on climate change are cumulative in nature, the GHG emissions impact analyses considered combined GHG emissions from both construction and operational activities associated with the Project. Because the continuation of construction and operation activities resulting from the Project would occur simultaneously and be ongoing over its 30-year lifetime, the Project's potential environmental impacts related to GHG emissions are also assessed by including aggregate estimates of annual GHG emissions generated by construction activities, operational maintenance activities, and changes in carbon sequestration resulting from street tree removal and planting. Ultimately, the continuation of construction and operation activities from the Project are considered cumulatively and simultaneously.

3.6.3.2 Project Design Features

No project design features are anticipated.

3.6.3.3 Thresholds of Significance

As the 2006 *L.A. CEQA Thresholds Guide* was adopted prior to the requirement for GHG emissions to be addressed as part of CEQA, there are no local thresholds of significance related to GHG emissions that are identified in the guide. As such, the significance thresholds related to GHG emissions identified in *Appendix G of the 2019 CEQA Guidelines* are used to analyze potential impacts associated with the Project.

According to the Environmental Checklist in Appendix G of the CEQA Guidelines, a project may have a significant environmental impact related to Greenhouse Gas Emissions if it would:

- **GHG-1:** Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? *Appendix G of the CEQA Guidelines.*
- **GHG-2:** Conflict with any applicable plan, policy, regulation, or recommendation of an agency adopted for the purpose of reducing emissions of GHGs? *Appendix G of the CEQA Guidelines.*

With respect to GHG emissions, CEQA Guidelines Section 15064.4 provides guidance to lead agencies for determining the significance of impacts from GHG emissions. Section 15064.4(a) provides that a 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 project. Section 15064.4(a) further provides that a lead agency shall have the discretion to determine, in the context of a particular project, whether: (1) to use a model or methodology to quantify GHG emissions resulting from a project and which model methodology to use and/or (2) to rely on qualitative analysis or performance-based standards.

Pursuant to CEQA Guidelines Section 15064.4(a), the analysis presented herein uses a model or methodology to quantify GHG emissions resulting from the Project. The analysis contained herein provides a good-faith effort to describe, calculate, and estimate GHG emissions resulting from the Project and compares those emissions with the chosen threshold level.

CEQA Guidelines Section 15064.4(b) also provides that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which the project may increase or reduce GHG emissions compared with existing conditions, (2) whether the project's GHG emissions exceed a threshold of significance that the lead agency determines applies to the project, and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The analysis of the potential impacts from the project's GHG emissions follows this approach.

The CEQA Guidelines do not provide numeric or qualitative thresholds of significance for evaluating GHG emissions. Instead, they leave the determination of the significance of GHG emissions up to the lead agency and authorize the lead agency to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence (CEQA Guidelines Sections 15064.4(a) and 15064.7(c)).

A number of lead agencies within the state and region, including multiple air districts, have drafted, adopted, or recommended threshold approaches and guidelines for analyzing GHG emissions and climate change in CEQA documents. However, there are currently no quantitative thresholds that have been adopted by a local agency relevant to the Project. The City has not drafted nor adopted threshold approaches and guidelines for analyzing GHG emissions and climate change in CEQA documents. While the City has completed an action plan related to climate change in 2007 (GreenLA), this action plan does not qualify for tiering under CEQA (specifically, CEQA Guidelines Section 15183.5) because the CAP has not undergone CEQA review per the tiering requirements from Section 15183.5. Therefore, the Project-specific analysis herein cannot rely on a qualitative tiering analysis with the City's CAP. Thus, there is no City guidance or threshold applicable to the Project.

Although there is no direct local guidance for the analysis of impacts related to climate change, at the regional scale, the South Coast Air Quality Management District (SCAQMD) considered draft GHG CEQA guidance in 2008 and adopted a staff proposal that has been used by lead agencies to evaluate climate change impacts within the Basin. (SCAMD, 2008.) SCAQMD's draft GHG guidance recommends a tiered approach to analyzing GHG emissions in CEQA documents. This tiered approach allows for flexibility when analyzing GHG emissions based on project size, land use type, or other characteristics. The various tiers include: (1) potential CEQA exemptions for certain projects, (2) compliance with a qualified GHG reduction strategy, (3) comparison with separate screening level thresholds for industrial and commercial/residential projects, (4) consistency with compliance options, including a performance-based reduction analysis (i.e., compare with a Business-As-Usual level), compliance with AB 32, and/or comparison with efficiency-based thresholds (i.e., quantitative thresholds that are based on a per capita efficiency metric), and/or (5) implement offsite mitigation to reduce GHG emission impacts to a less-than-significant level. The draft GHG guidance is included as part of the periodic updates to SCAQMD's *Air Quality Handbook*.

Based on the available threshold concepts recommended by expert agencies, the assessment herein analyzes operational emissions against SCAQMD's draft 3,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) bright-line threshold level. Per SCAQMD, projects below the bright-line significance criteria have a minimal contribution to cumulative global emissions and are considered to have less-than significant impacts.

3.6.3.4 Construction Impacts

GHG-1. Would the proposed Project GHG emissions—either directly or indirectly—that may have a significant impact on the environment?

This impact would be less than significant during construction.

As mentioned above in Section 3.6.3.3, *Thresholds of Significance*, GHG emissions are measured exclusively as cumulative impacts; therefore, the construction emissions listed below are considered part of total GHG emissions for the project lifecycle, which also include GHG emissions during operational maintenance activities and changes in carbon sequestration. The determination of significance is based on aggregate GHG emissions associated with all activities throughout the life of

the Project. Based on the methodology discussed above, the impact conclusion is drawn from the assessment of operational emissions, combined with construction emissions and changes in carbon sequestration throughout the 30-year repair program, because construction emissions are typically amortized over a 30-year period, in accordance with SCAQMD guidance.

Annual construction activities would expand every five years under the Project. Table 3.6-4 presents the five-year incremental increases in construction activity anticipated as resources and funding are made available. Under CEQA, GHG emissions are evaluated on an annual basis. The analysis of construction GHG emissions considers all Construction Scenario 1 and Construction Scenario 2 repair sites that would be completed in a given year under the Project. On average, it was assumed that a street tree removal would be required at every sidewalk and curb ramp repair site.

Table 3.6-4. Summary of Project Construction Crew Activities

Years	Annual Sidewalk Repair (square feet)	Annual Number of Construction Scenario 1 Repair Sites	Annual Number of Construction Scenario 2 Repair Sites	Estimated Annual Street Trees Removed/ Replaced (Ratio)
1–5	968,750	284	12	292/583 (2:1)
6–10	1,116,969	332	12	336/672 (2:1)
11–15	1,287,500	384	12	388/1,164 (3:1)
16-20	1,484,375	445	12	447/1,341 (3:1)
21–25	1,712,188	515	12	515/1,133 (2:1)[a]
26–30	1,974,063	595	12	594/1,188 (2:1)

Source: MARRS Services, Inc., 2018.
[a] Street tree replacement ratio in Program Year 21 is 3:1 (2:1 thereafter).

Construction Scenario 1 and Construction Scenario 2

Both Construction Scenario 1 and Construction Scenario 2 would result in GHG emissions from fuel combustion associated with heavy-duty construction equipment, construction worker vehicle trips, material deliveries, and trips by haul, water, and concrete trucks. The activity-specific construction equipment inventories presented in Table 3.6-3 and the vehicle activities described in Section 3.6.3.1 were used to prepare the GHG emissions inventory presented in Table 3.6-5. The results of the construction emissions modeling determined that a maximum annual total of 1,129.3 $MTCO_2e$ of GHG emissions would result from Construction Scenario 1 and Construction Scenario 2 activities. The significance determination is based on aggregate GHG emissions generated by construction activities, operational maintenance activities, and changes in carbon sequestration resulting from street tree removal and replacement throughout the lifetime of the Project. Please refer to the discussion below under Section 3.6.3.5, Operational Impacts, GHG-1. Therefore, the project annual construction-related GHG emissions are below 3,000 $MTCO_2e$, and would be less than significant.

Mitigation Measures

No mitigation measures are required

Table 3.6-5. Project Annual Construction-Related GHG Emissions

Project Period	Total Equipment Emissions ($MTCO_2e$)	Total Vehicle Emissions ($MTCO_2e$)	Total Activity Emissions ($MTCO_2e$)
Years 1–5	205.3	584.1	789.3
Years 6–10	218.0	579.5	797.5
Years 11–15	250.1	633.3	797.5
Years 16–20	302.8	658.8	883.4
Years 21–25	346.5	707.4	1,053.8
Years 26–30	394.2	735.0	1,129.3
Maximum Annual Construction Activity GHG Emissions			**1,129.3**

Source: MARRS Services, 2018; TAHA, 2018.

GHG-2. Would the proposed Project conflict with any applicable plan, policy, regulation, or recommendation of an agency adopted for the purpose of reducing GHG emissions?

This impact would be less than significant.

As discussed above, GHG emissions are measured exclusively as cumulative impacts; therefore, the construction emissions listed above are considered as part of the GHG emissions for the Project lifecycle, including GHG emissions during operation. Based on the SCAQMD guidance and the methodology discussed above, the impact conclusion is drawn from the assessment of operational emissions and not construction emissions. The significance determination is based on aggregate GHG emissions generated by construction activities, operational maintenance activities, and changes in carbon sequestration resulting from street tree removal and planting throughout the lifetime of the Project. Please refer to the discussion below under Section 3.6.3.5, *Operational Impacts, GHG-2*.

Mitigation Measures

No mitigation measures are required. Please refer to the discussion below under Section 3.6.3.5, *Operational Impacts, GHG-2*.

3.6.3.5 Operational Impacts

The continuation of activities under the Project would result in sources of GHG emissions associated with continuing sidewalk repair operations during the ongoing 30-year sidewalk repair program. The continuation of operational activities from the Project would include sidewalk inspection and street tree monitoring and watering with a hose that is attached to a water tank on a pick-up truck. During construction activities, the street trees would have been planted in a 4- by 6-foot street tree well, per the proposed Revised Street Tree Retention, Removal and Replacement Policy for the Sidewalk Repair Program. As discussed Chapter 2, *Project Description*, the street trees will be manually watered 33 times annually. For the times when manual watering is not feasible, two 15-gallon water bags would be placed in the street tree well for the new street trees until the next scheduled manual watering. Other than routine watering and inspection, there are no additional operations associated with the Project. As a result of the proposed Revised Street Tree Retention, Removal and Replacement Policy for the Sidewalk Repair Program, there would be an increase in

the number of street trees from the baseline count of 711,248 to 728,793 and an approximate 0.72 percent net increase of the street tree canopy cover.

As mentioned previously, the primary sources of GHG emissions associated with the continuation of operational activities from the Project include motor vehicle emissions generated by site assessments and inspections and street tree watering activities. Additionally, the analysis considers the net change in annual GHG emissions throughout the City as a result of street tree removal and replacement activities. Implementation of the Project would not introduce a new permanent stationary source of GHG emissions in the City.

Because of the cumulative nature of the effect of GHG emissions on global climate change—as well as the longevity of the continuation of construction activities associated with the Project—the operational impact assessment examines the combined GHG emissions from both construction activities over 30 years as well as operational activities.

GHG-1. Would the proposed Project generate GHG emissions—either directly or indirectly—that may have a significant impact on the environment?

This impact would be less than significant during operation.

Implementation of the continuing activities from the Project would result in operational vehicle trips associated with site assessments, inspections, and street tree watering. Site assessments would involve approximately six crews visiting six sites each per day with a daily trip length of 20 miles, for a total site assessment daily VMT of 120. Site inspections would consist of approximately four crews per day visiting four sites each with a daily trip length of 20 miles, for a total site inspection daily VMT of 80. The LABOE anticipates that street tree watering activities would require up to six crews with a daily trip length of 70 miles, for a total watering daily VMT of 420. Therefore, total operational daily VMT would be approximately 620 miles as a result of implementation of the continuing activities from the Project.

Table 3.6-6 presents the GHG emissions estimated in the operational vehicle trips analysis. The emissions factors extracted from the EMFAC2017 model were for 2018. The annual emissions analysis does not account for improvements in engine and fuel efficiency in subsequent years after initiation of the Project in 2018 that will ultimately reduce GHG emissions per VMT as mandated CARB program requirements are phased in. Annual motor vehicle GHG emissions associated with operation of the Project would be no greater than approximately 65.6 $MTCO_2e$. The GHG emissions resulting from motor vehicle trips would not represent a substantial incremental increase relative to the 9.6 $MMTCO_2e$ annual citywide emissions from on-road motor vehicles inventoried in 2013, constituting less than 0.01 percent of the total. The operational impact related to mobile source GHG emissions would be less than significant.

Table 3.6-6. Annual GHG Emissions – Project's Operational Maintenance Vehicle Trips

Trip Type	Annual VMT	Annual GHG Emissions ($MTCO_2e$)
Site Assessments	30,840	12.7
Site Inspections	20,560	8.5
Site Watering	107,940	44.4
Total Annual Vehicle Trip GHG Emissions		65.6

Source: LABOE, 2018; TAHA, 2018.

In addition to motor vehicle trips, operation of the continuing activities from the Project would have an indirect effect on Citywide GHG emissions through changes in carbon sequestration that occur as a result of removing and replacing street trees. As mentioned previously, young street trees sequester less carbon from the atmosphere on an annual basis than full-grown street trees. To mitigate the effective loss in carbon sequestration from removing existing street trees, the Project would replace removed street trees on a 2:1 basis during years 1–10 and 22–30, and on a 3:1 basis during years 11–21. Table 3.6-7 presents the net annual change in carbon sequestration as a result of removing full-grown street trees and replacing them with saplings at the ratios described above. The numbers displayed reflect the cumulative change in annual GHG emissions resulting from Project implementation. Each year takes into account the removed sequestration of street trees in previous years, as well as growth of newly planted street trees in years following initial planting. The removed street trees would be replaced with 2 or 3 new, healthy trees within one year of removal.

Table 3.6-7. Change in Carbon Sequestration Resulting from Implementation of the Project

Project Year	Cumulative Project Street Trees Removed	Annual Sequestration Lost ($MTCO_2e$)	Cumulative Project Street Trees Planted	Annual Sequestration Added ($MTCO_2e$)	Net Change in Annual Sequestration ($MTCO_2e$)
1	292	19.6	583	1.0	-18.6
2	584	39.3	1,166	2.9	-36.4
3	879	58.9	1,749	5.7	-53.2
4	1,168	78.5	2,332	9.8	-68.8
5	1,460	98.2	2,915	15.0	-83.2
6	1,796	135.6	3,587	21.6	-114.0
7	2,132	158.1	4,259	30.5	-127.7
8	2,468	180.7	4,931	40.9	-139.8
9	2,804	203.3	5,603	52.9	-150.5
10	3,140	225.9	6,275	66.4	-159.5
11	3,528	287.0	7,439	82.3	-204.6
12	3,916	313.1	8,603	111.2	-201.9
13	4,304	339.2	9,767	142.8	-196.3
14	4,692	365.2	10,931	177.2	-188.1
15	5,080	391.3	12,095	214.2	-177.1
16	5,527	480.9	13,436	254.3	-226.6
17	5,974	510.9	14,777	303.3	-207.7
18	6,421	541.0	16,118	355.4	-185.6
19	6,868	571.1	17,459	410.5	-160.6
20	7,315	601.1	18,800	468.6	-132.5
21	7,830	727.2	19,933	529.4	-197.8
22	8,345	761.8	21,066	583.6	-178.2
23	8,860	796.4	22,199	640.2	-156.2
24	9,375	831.1	23,332	699.3	-131.8
25	9,890	865.7	24,465	760.8	-104.9
26	10,484	1,038.4	25,653	824.7	-213.7
27	11,078	1,078.4	26,841	894.0	-184.4

Project Year	Cumulative Project Street Trees Removed	Annual Sequestration Lost ($MTCO_2e$)	Cumulative Project Street Trees Planted	Annual Sequestration Added ($MTCO_2e$)	Net Change in Annual Sequestration ($MTCO_2e$)
28	11,672	1,118.3	28,029	965.7	-152.6
29	12,266	1,158.2	29,217	1,037.5	-120.8
30	12,860	1,198.2	30,405	1,109.2	-89.0

Source: LABOE, 2018; TAHA, 2018.

As shown in Table 3.6-7, reasonably foreseeable street tree removal and replacement activities associated with implementation of the Project would result in a maximum net annual sequestration loss of approximately 226.6 $MTCO_2e$ in Program Year 16. This finding indicates that the annual loss in sequestration due to street tree planting and replacement activities would never exceed 230 $MTCO_2e$. The net change in annual sequestration would gradually increase because of growth in planted street trees and the continuation of the street tree replacement activities, ultimately reducing the annual loss in sequestration. Eventually, implementation of the Project would result in a net positive gain in carbon sequestration in future years beyond the program's horizon.

The graph below presents the trend in annual carbon sequestration changes throughout the lifetime of the Project resulting from street tree removal and planting activities. The graph displays the annual sequestration lost from street tree removals, the annual sequestration gained from new street tree planting and the growth of previously planted trees, and the net change in annual carbon sequestration as a result of the street tree removal and replacement activities presented in Table 3.6-7. Detailed carbon sequestration calculations can be found in Appendix H.

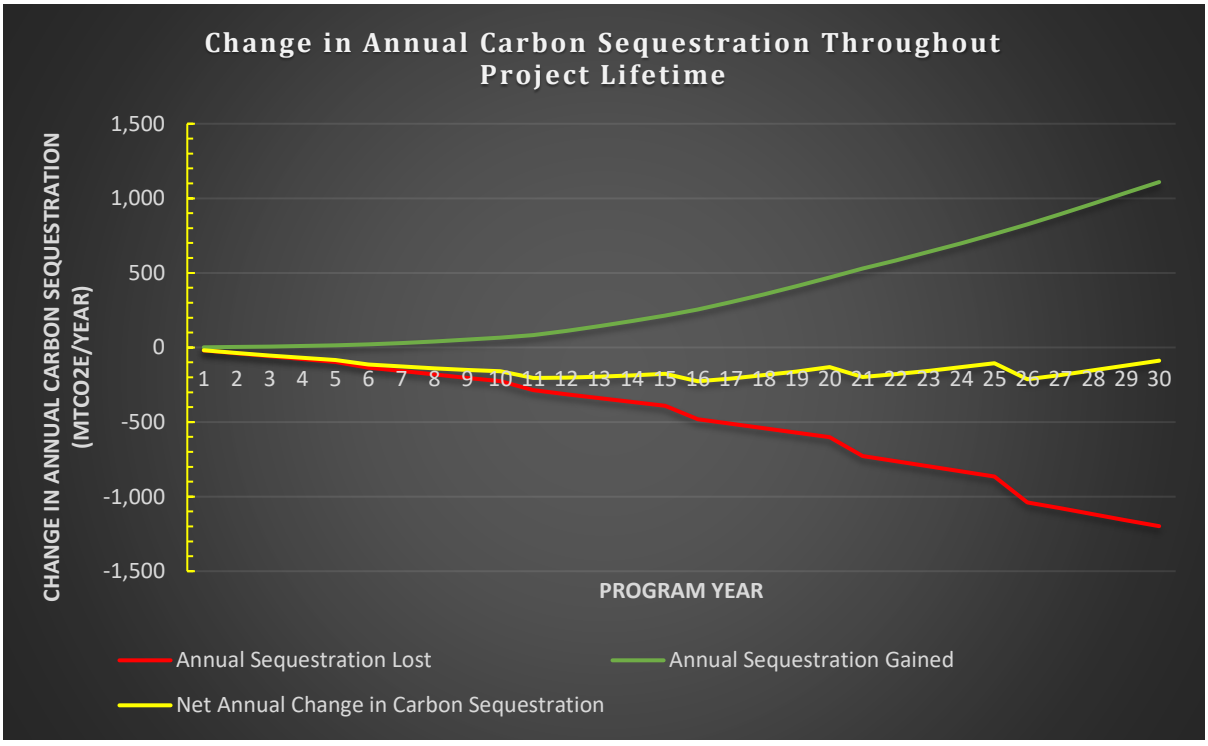

Figure 3.6-1. Annual Carbon Sequestration

Continuation of the operational activities from the Project would result in maximum annual mobile trip emissions of 65.6 $MTCO_2e$ and maximum annual carbon sequestration losses of approximately 226.6 $MTCO_2e$, which suggests that citywide operation of the Project would never exceed approximately 300 $MTCO_2e$ annually. Accounting for ongoing construction activities that would occur every year during operation of the Project, maximum annual GHG emissions associated with construction and operation activities under the Project would occur in year 26 of the program and would be approximately 1,408.6 $MTCO_2e$. Annual GHG emissions (the sum of construction and operational emissions) for the continuation of activities from the Project would never exceed the 1,500 $MTCO_2e$ annually, which is half of the interim 3,000 $MTCO_2e$ bright-line criterion for 90 percent capture of all CEQA projects within SCAQMD jurisdiction. As of 2016, the Citywide GHG emissions inventory accounted for 26.7 million $MTCO_2e$; the continuation of activities from the Project would generate approximately 0.005 percent of the City inventory. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

GHG-2. Would the proposed Project conflict with any applicable plan, policy, regulation, or recommendation of an agency adopted for the purpose of reducing GHG emissions?

The impact would be less than significant during operation.

The regional and local plans and policies most relevant to the Project include the SCAG 2016–2040 RTP/SCS, the GreenLA action plan, the ClimateLA implementation program, the pLAn, and Mobility Plan 2035. SCAG and the City have prepared these documents in response to statewide initiatives to reduce GHG emissions, including EO S-3-05, AB 32, EO B-30-15, and SB 32, which were discussed in Section 3.6.1.2, above. The SCAG and City policies considered the statewide GHG emissions reduction targets in formulating regional and local strategies to reduce GHG emissions. The SCAG RTP/SCS is designed to comply with the CARB AB 32 and SB 375 objectives, and CARB staff members evaluated the adequacy of the SCAG analyses and regional GHG emission reduction efforts. The City prepared GreenLA CAP, pLAn, and Mobility Plan 2035 as a pathway to materializing the desired GHG emissions reductions outlined in the statewide initiatives.

Enhancing infrastructure accessibility and accommodating multi-modal transportation options is a critical component to creating a safer and more sustainable transportation network. Table 3.6-8, below, shows that the Project would not conflict with applicable GHG emissions reductions plans, policies, and regulations because of direct conformance with stated objectives at the regional and local levels derived from large-scale goals. Conforming to regional and local efforts to reduce GHG emissions is representative of consistency with statewide policies and legislation, which outline required reductions into the future.

Table 3.6-8. Project Conformance with GHG Emissions Reduction Framework

Policy/Goal/Objective	Project Conformance
SCAG 2016–2040 RTP/SCS	
Promote walking biking, and other forms of active transportation through improving sidewalk quality, local bike networks, and neighborhood mobility areas.	Implementation of the Project would occur over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of up to 12,860 street trees, and

Policy/Goal/Objective	Project Conformance
	the planting of about 30,405 new street trees. Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Preserve infrastructure to encourage active transportation.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Ensuring safety, adequate maintenance, and efficiency of operations on the existing multimodal transportation system should be the highest RTP/SCS priorities.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Active transportation improvements: Livable Corridors should include increased investments in Complete Streets to make these corridors and the intersecting arterials safety for biking and walking.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Neighborhood Mobility Areas: Encouraging Active Transportation for Short Trips through the development of Complete Streets strategies such as bike lanes, roundabouts, wider sidewalks and better lighting.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
GreenLA Cap & ClimateLA	
Action LU2: Promote and implement transit-oriented development to create cohesive, vibrant, walkable communities.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Action OS/G3: Plant 1 million trees throughout Los Angeles to provide shade and reduce energy costs, clean the air, absorb greenhouse gases that cause global warming, capture polluted urban runoff, improve water quality, provide homes for wildlife, and add beauty to our neighborhoods.	Implementation of the Project would occur over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of up to 12,860 street trees, and the planting of about 30,405 new street trees.
Action T8: Promote walking and biking to work, within neighborhoods, and to large events and venues.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Expand number of green infrastructure sites and green streets (e.g., bioswales, infiltration cut-outs, permeable pavement, and street trees).	Implementation of the Project would occur over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of up to 12,860 street trees, and the planting of about 30,405 new street trees.
Reduce the impact of LA's urban heat island effect through the addition of street trees and cool roofs.	Implementation of the Project would occur over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of

Policy/Goal/Objective	Project Conformance
	up to 12,860 street trees, and the planting of about 30,405 new street trees.
Sustainable City Plan	
Long-Term Mobility & Transit Outcomes: Increase the percentage of all trips made by walking, biking, or transit to at least 35 percent by 2025 and 50 percent by 2035.	Implementation of the Project would occur over a 30-year period, resulting in approximately 42,719,225 square feet of repaired sidewalks, possible removal of up to 12,860 street trees, and the planting of about 30,405 new street trees. Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Improve pedestrian and bicycle infrastructure and other sustainable transport, emphasizing connections to mass transit.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Strengthen pedestrian and bike safety through the incorporation of safety for pedestrians into all street designs and redesigns.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Implement Vision Zero policy to reduce traffic fatalities and improve pedestrian/bike safety.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Mobility Plan 2035	
Increase pedestrian safety improvements in the design and implementation of complete streets projects within the top 25 percent SB565 disadvantaged communities located in the City.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Enhance roadway safety by maintaining the street, alley, tunnel and bridge system in good to excellent condition.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Recognize walking as a component of every trip and ensure high-quality pedestrian access in all site planning and public right-of-way modifications to preserve a safe and comfortable walking environment.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right of way.	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility requirements, providing improved walkability and safety for all pedestrians.
Promote equitable land use decisions that result in fewer vehicle trips by providing greater	Implementation of the Project would continue the activities to create sidewalks and curb ramps that would meet the applicable accessibility

Policy/Goal/Objective	Project Conformance
proximity and access to jobs, destinations, and other neighborhood services.	requirements, providing improved walkability and safety for all pedestrians.

The development and maintenance of safe and accessible infrastructure is crucial to diverse transportation opportunities throughout the City. Although the Project would continue activities that would generate GHG emissions, its implementation would also enhance accessibility and safety for pedestrians. A consistent theme throughout regional and local plans designed to reduce GHG emissions is encouraging the public to engage in active transportation, including walking and biking. Furthermore, improving sidewalks would be conducive to choosing public transit options. As discussed in Chapter 3.12, *Transportation*, in response to the passage of SB 743 (2013) into law, which directs lead agencies to revise transportation assessment guidelines to include a transportation performance metric that promotes, among other things, the reduction of GHG emissions, the latest (2018) CEQA Guidelines have added Section 15064.3, stating that VMT is the most appropriate measure of transportation impacts. According to the Governor's Office of Planning and Research (OPR) recommendations regarding criteria used to evaluate the significance of a project's VMT, "rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets ([…] pedestrian facilities) and that do not add additional motor vehicle capacity" are deemed to be projects that would most likely not lead to a substantial or measureable increase in vehicle travel and therefore should not require an induced travel analysis. Thus, because the Project would meet this criteria, it would not result in a substantial or measurable increase in vehicle travel that would compromise the state's efforts to reduce GHG emissions. On the contrary, the replacement of removed street trees on a 2:1 basis during years 1–10 and 22–30, and on a 3:1 basis during years 11–21 under the Project would eventually result in a net positive gain in carbon sequestration in future years beyond the program's horizon as the street canopy is increased. The replacement of street trees would also retain the City's beauty and continue to mitigate the urban heat island effect. Implementation of the Project would not conflict with any applicable plan, policy, or regulation aimed at reducing GHG emissions. This impact would be less than significant.

In addition, as discussed in Section 3.6.1.2, EO B-30-15 established a statewide interim GHG emissions reduction target of 40 percent below 1990 levels by 2030, and EO S-3-05 established a long-term goal of reducing statewide GHG emissions to 80 percent below 1990 levels by 2050. Achieving these long-term GHG emissions reduction policies will require systemic changes in how energy is produced and used. There are a number of studies that discuss potential mechanisms for limiting statewide GHG emissions to meet the aggressive goals identified by EO B-30-15 and EO S-3-05. For example, CARB and other state agencies commissioned Energy + Environmental Economics in 2015 to develop feasible GHG reduction scenarios for 2030. Other studies include a report by the California Center for Science and Technology, the California Department of Transportation's California Transportation Plan 2040, CARB's First Update to the AB 32 Scoping Plan, and a study published in *Science* that analyzes the changes that would be required to reduce GHG emissions to 80 percent below 1990 levels by 2050. In general, these studies reach similar conclusions—deep reductions in GHG emissions can be achieved only with significant changes in electricity production, transportation fuels, and industrial processes (e.g., decarbonizing electricity production, electrifying transportation, using alternative fuels for aviation).

In evaluating the Project's emissions for consistency with EO S-3-05 and EO B-30-15, it is important to note that many of the broad-scale shifts needed to meet the reduction goals are

outside of the control of the City and beyond the scope of the Project. The long-term climate change policy and regulatory changes that would be enacted to meet 2030 and 2050 emissions reduction targets are unknown at this time. As a consequence, the extent to which the Project emissions and resulting impacts would be mitigated through implementation of statewide (and nationwide) changes is not known. However, some of the anticipated statewide actions (e.g., decarbonization, energy efficiency, and alternative transportation) can be facilitated, at least to some extent, through implementation of specific GHG reduction measures in large-scale developments, such as the Project. In addition, implementation of the Project would not conflict with the objectives of the Zero Emissions 2028 Roadmap, which was adopted by the TEP to reduce regional GHG emissions and air pollution through accelerated electrification of the transportation sector. Construction and operation of the continuing activities from the Project would not interfere with planned infrastructure upgrades to the power grid, nor would it introduce new non-EVs to the regional transportation network. Ultimately, implementation of the continuing activities from the Project may enhance accessibility to electrified public transit options and EV charging stations, the number of which would be expanded under the Zero Emissions 2028 Roadmap. The goals of the Zero Emissions 2028 Roadmap will not be compromised by implementing the Project.

The Project includes policies related to planting drought-tolerant species resulting in reduced water consumption. The Project is consistent with anticipated long-term statewide strategies to reduce GHG emissions. Implementation of the Project would result in the planting of 30,405 street trees over 30 years of street tree retention, removal, and replacement. Street tree removal and replacement would follow a 2:1 replacement ratio to maintain street tree canopy and street tree cover. Accordingly, the Project would not conflict with the goals in EO S-3-05 and EO B-30-15. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

3.6.4 Summary of Combined Construction and Operation Impacts

As discussed previously, the effect of GHG emissions on climate change is cumulative in nature. The GHG analyses presented above account for concurrent construction and operational emissions. Ongoing construction activities, operational maintenance activities, and changes in carbon sequestration will result in a maximum annual net cumulative increase in GHG emissions of 1,408.6 $MTCO_2e$ throughout the Project's lifetime. In the 2017 Climate Change Scoping Plan, CARB acknowledges that a project can generate GHG emissions above net zero without being considered cumulatively considerable (CARB 2017c).

> Achieving net-zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with the scoping plan, the state's long-term GHG goals, and climate change science.

The maximum annual increase in GHG emissions resulting from implementation of the Project represents less than half of the interim SCAQMD screening threshold that was determined to capture 90 percent of projects within the agency's jurisdiction.

Although the City has not established a numeric threshold of its own as a lead agency, the Project's conformance with regional and local GHG emission reduction initiatives—as outlined in Table 3.6-8—demonstrates that the Project would be consistent with applicable plans and policies adopted to meet the statewide reduction targets. The CEQA Guidelines advise that, "[p]ursuant to Sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances" (Governor's Office of Planning and Research 2017). The Project's conformance with local plans and policies has been sufficiently demonstrated above. No further analysis is warranted, and the impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

3.6.5 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impact related to GHG would occur.