

4.8 GREENHOUSE GAS EMISSIONS

This section evaluates potential impacts of the proposed Plan related to greenhouse gas (GHG) emissions.

4.8.1 EXISTING CONDITIONS

GLOBAL CLIMATE CHANGE

The phenomenon known as the greenhouse effect keeps the atmosphere near the Earth's surface warm enough for the successful habitation of humans and other life. Present in the Earth's lower atmosphere, GHGs play a critical role in maintaining the Earth's temperature. Sunlight—including infrared, visible, and ultraviolet radiation—passes through the atmosphere. Some of the sunlight striking the Earth is absorbed and converted to heat, which warms the surface. The surface emits infrared radiation to the atmosphere, where some of it is absorbed by GHGs and re-emitted toward the surface; some of the heat is not trapped by GHGs and escapes into space. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the Earth (IPCC 2013).

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution. According to the Intergovernmental Panel on Climate Change (IPCC), human influence has warmed the climate at a rate that is unprecedented in at least the last 2,000 years (IPCC 2021). In addition, the IPCC reported with high confidence that in 2019 carbon dioxide concentrations were higher than at any time in at least 2 million years, and reported with very high confidence that 2019 concentrations of methane and nitrous oxide were higher than at any time in at least 800,000 years (IPCC 2021). Rising atmospheric concentrations of GHGs in excess of natural levels enhance the greenhouse effect, which contributes to global warming of the Earth's lower atmosphere. This warming induces large-scale changes in ocean circulation patterns, precipitation patterns, global ice cover, biological distributions, and other changes to the Earth's system that are collectively referred to as *climate change*. The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years (IPCC 2021). The IPCC also reports that many changes in the climate system become larger in direct relation to increasing global warming, including increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover, and permafrost (IPCC 2021). In addition, low-likelihood outcomes, such as ice sheet collapse, abrupt ocean circulation changes, some compound extreme events, and warming substantially larger than the assessed *very likely* range of future warming cannot be ruled out (IPCC 2021). Climate change impacts in this analysis are evaluated in the relevant resource sections (e.g., climate change effects to water supply are discussed in Section 4.18, *Water Supply*, and climate change's influence on wildfire are discussed in Section 4.19, *Wildfire*, and similarly for other sections) and covered in detail in the *Climate Change Projections, Impacts and Adaptation* report in Appendix C.

GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants. Criteria air pollutants and toxic air contaminants occur locally or regionally, and local concentrations respond to locally implemented control measures. However, the long atmospheric lifetimes of GHGs allow them to be transported great distances from the original emissions source. GHGs and global climate change therefore represent cumulative impacts; that is, GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change.

PRINCIPAL GREENHOUSE GASES

As defined in Section 15364.5 of the CEQA Guidelines, GHGs include the following gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorinated carbons (PFCs), and sulfur hexafluoride (SF₆). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources. The primary GHGs associated with implementation of the proposed Plan are CO₂, CH₄, and N₂O. Minor amounts of HFCs, which are considered high global warming potential (GWP) GHGs, may also be generated by leaking air conditioners and refrigerators. The principal characteristics of these pollutants are discussed in this section.

Methods have been set forth to describe emissions of GHGs in terms of a single gas equivalent to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the GWP methodology defined in the Intergovernmental Panel on Climate Change (IPCC) reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO₂e), which compares the gas in question to that of the same mass of CO₂ (which has a GWP of 1 by definition).

This EIR calculates CO₂e using the same GWP values that the California Air Resources Board (CARB) uses to prepare the State's annual statewide GHG emissions inventory, including the most recent statewide inventory completed in 2020 (CARB 2020a). CARB uses GWP values from the IPCC Fourth Assessment Report (AR4) as shown in Table 4.8-1 (CARB 2020b). The GWP values are considered over a 100-year timeframe.

Different GWP values are used in the IPCC's more recent Fifth Assessment Report (AR5). To understand how using the AR5 values could affect total regional GHG emissions levels, SANDAG has re-calculated the 2016 baseline GHG emissions level using the AR5 values. The analysis shows that 2016 baseline annual GHG emissions levels are 0.3 percent higher when calculated using AR5 values (25.9 million metric tons [MMT] of CO₂e) instead of AR4 (25.8 MMTCO₂e). Future projections of annual GHG emissions levels would be similarly affected, with very slight increases, by use of the AR5 values. These calculations and the AR5 GWP values used are included in Appendix G.

Carbon Dioxide

CO₂ is the most abundant anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its long atmospheric lifetime ensures that atmospheric concentrations of CO₂ will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (U.S. Environmental Protection Agency [EPA] 2016a). The primary sources of anthropogenic CO₂ in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO₂ is also removed from the atmosphere by photosynthetic organisms. Atmospheric CO₂ has increased from a pre-industrial concentration of 280 parts per million (ppm) to a global monthly mean of 413 ppm as of November 2020 (IPCC 2013, NOAA 2021a).

Methane

CH₄, the main component of natural gas, is the second most abundant GHG and has a GWP of 25 according to IPCC's AR4 (CARB 2020b). Sources of anthropogenic emissions of CH₄ include natural gas and petroleum systems, livestock cultivation, and waste decomposition in landfills (EPA 2019a). Certain land uses also function as both a source and sink for CH₄. For example, wetlands are a terrestrial source of CH₄, whereas undisturbed, aerobic soils act as a CH₄ sink (i.e., they remove CH₄ from the atmosphere). Atmospheric CH₄ has

increased from a pre-industrial concentration of 721 parts per billion (ppb) to a global monthly mean of 1,891 ppb as of October 2020 (IPCC 2013, NOAA 2021b).

Nitrous Oxide

N₂O is a powerful GHG with a GWP of 298 based on the AR4 (CARB 2020b). Anthropogenic sources of N₂O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N₂O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N₂O, which can be released to the atmosphere by diffusion. In the United States more than 70 percent of N₂O emissions are related to agricultural soil management practices, particularly fertilizer application. N₂O concentrations in the atmosphere have increased 18 percent from pre-industrial levels of 270 ppb to a global monthly mean of 333 ppb as of October 2020 (IPCC 2013, NOAA 2021c).

Hydrofluorocarbons

HFCs are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs ranging from 124 (HFC-152a) to 14,800 (HFC-23) (CARB 2020b). HFCs are generally used as substitutes for ozone-depleting substances in automobile air conditioners and refrigerants. They were introduced as alternatives to ozone depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. More than three-quarters of HFC emissions in California come from the use of refrigerants in the commercial, industrial, residential, and transportation sectors (CARB 2019a). Within the transportation sector, HFCs from refrigeration and air conditioning units represented about 3 percent of total on-road emissions in California in 2017 (CARB 2019a).

Perfluorocarbons

PFCs are a group of human-made chemicals composed of carbon and fluorine. PFCs do not harm the stratospheric ozone layer, but they are powerful GHGs (CARB 2020c), with GWPs ranging from 7,390 (PFC-14) to 12,200 (PFC-116). These chemicals (predominantly carbon tetrafluoride and hexafluoroethane) were introduced as alternatives, along with hydrofluorocarbons, to ozone depleting substances. PFCs are emitted as byproducts of industrial processes and are also used in manufacturing.

Sulfur Hexafluoride

SF₆ is a human-made chemical used as an electrical insulating fluid in power distribution equipment, the magnesium industry, semiconductor manufacturing, and as a tracer chemical for the study of oceanic and atmospheric processes. SF₆ is a powerful GHG with a GWP of 22,800 (CARB 2020b). Because SF₆ is a human-made chemical, it did not exist in the atmosphere before the twentieth century.

GREENHOUSE GAS GLOBAL WARMING POTENTIALS

Table 4.8-1 lists AR4 GWP values and atmospheric lifetimes of CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆.

**Table 4.8-1
Greenhouse Gas Global Warming Potentials (AR4)**

Greenhouse Gas		Lifetime (years)	Global Warming Potential (AR4)
Name	Formula		
Carbon Dioxide	CO ₂	Varies ²	1
Methane	CH ₄	12	25
Nitrous Oxide	N ₂ O	121	298
Hydrofluorocarbons	HFCs	1 to 270	124 to 14,800
Perfluorocarbons	PFCs	2,600 to 50,000	7,390 to 12,200
Sulfur Hexafluoride	SF ₆	3,200	22,800

Sources: Blasing 2016, CARB 2020a.

¹ Defined as the half-life of the gas.

² CO₂ cannot be represented with a single lifetime value because the gas is not destroyed over time, but instead moves among different parts of the ocean-atmosphere-land system. Some amounts of CO₂ are absorbed from the atmosphere relatively quickly (for example, by the ocean), but some will remain in the atmosphere for thousands of years, due in part to the slow process by which carbon is transferred to ocean sediments. However, most lifetime estimates fall in the 100- to 300-year range.

GREENHOUSE GAS INVENTORIES

A GHG inventory is a quantification of all GHG emissions and sinks¹ within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a particular building or person). Although some processes are difficult to evaluate, agencies and practitioners have developed tools to quantify emissions from many common sources.

Table 4.8-2 provides the results of the most recent global, national, statewide, and regional GHG inventories to contextualize regional emissions. Globally, the two highest emitting economic sectors of anthropogenic GHG emissions are electricity and heat production (25 percent) and agriculture, forestry, and other land use (24 percent) (IPCC 2014). At the federal level, transportation is the largest emission source (28 percent), followed by electric power 25 percent (EPA 2021a).

**Table 4.8-2
Global, National, State, and San Diego Region Greenhouse Gas Emissions Inventories**

GHG Emissions Inventory	Annual Emissions (MMTCO ₂ e)
2010 IPCC Global GHG Emissions Inventory ¹	49,000
2019 EPA National GHG Emissions Inventory ^{2, 3}	5,769
2018 CARB State GHG Emissions Inventory ²	425.3
2016 San Diego Region GHG Emissions Inventory ²	25.8

Sources: IPCC 2014, EPA 2021a, CARB 2020a, Appendix G.

¹ These values are estimated using the IPCC's AR5 GWPs.

² These values are estimated using the IPCC's AR4 GWPs.

³ This total accounts for sequestration of carbon from the land sector.

¹A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

Within California, transportation is the largest emission source (41 percent), followed by industrial (24 percent) and electric power sources (in-State generation and imported) (15 percent) (CARB 2019a). Within the transportation sector, the majority of the emissions are from passenger vehicles (71 percent) and heavy duty vehicles (21 percent), with smaller amounts from aviation (3 percent), off-road vehicles (2 percent), ships and commercial boats (2 percent), rail (1 percent), and unspecified sources (1 percent) (CARB 2020a). Table 4.8-3 summarizes the statewide GHG inventory for California emissions by sector and percentage in 2018.

**Table 4.8-3
2018 Statewide Greenhouse Gas Emissions by Economic Sector, 2018**

Sector	Annual Emissions (MMTCO₂e)	Percentage of Annual Emissions
Transportation	174	41%
Industrial	102	24%
Electricity Generation (in state)	38	9%
Agriculture	34	8%
Residential	30	7%
Electricity Generation (imports)	26	6%
Commercial	21	5%
Total	425	100%

Source: CARB 2020a.

Within the San Diego region, on-road transportation – passenger cars and light-duty vehicles is the largest emission source (40 percent), followed by electricity consumption (20 percent), natural gas consumption (12 percent), industrial uses (8 percent), on-road transportation – heavy-duty trucks and vehicles (7 percent), other fuels (4 percent), off-road vehicles (2 percent), solid waste (2 percent), and other sectors representing 1 percent of total emissions or less (Appendix H). Table 4.8-4 summarizes the 2016 GHG inventory for the San Diego region.

**Table 4.8-4
Total Greenhouse Gas Emissions in the San Diego Region, 2016**

Source	Annual Emissions (MMTCO₂e)	Percentage of Annual Emissions
Passenger Cars and Light Duty Vehicles	10.45	40%
Electricity	5.3	20%
Natural Gas	3.1	12%
Industrial	2.1	8%
Heavy-Duty Trucks and Vehicles	1.8	7%
Other Fuels	1.1	4%
Off-Road Transportation	0.62	2%
Solid Waste	0.59	2%
Water	0.24	1%
Aviation	0.21	1%
Rail	0.11	<1%
Wastewater	0.07	<1%

Source	Annual Emissions (MMTCO ₂ e)	Percentage of Annual Emissions
Agriculture	0.05	<1%
Marine Vessels	0.05	<1%
Soil Management	0.05	<1%
Total	26	100%

Source: Appendix H.

Anticipated Effects from Climate Change

Climate change is driving changes in the environment that may in turn influence levels of GHG emissions and the relative effectiveness of mitigation measures. Absent mitigation, climate change may affect GHG emissions due to sea-level rise submerging coastal lands, more frequent and severe flooding, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

GHG emissions are responsible for climate change, but some impacts of climate change can also release more GHGs into the atmosphere, resulting in a positive feedback cycle. A biological example of this would be soil carbon sequestration; the combination of increased temperatures and decreased rainfall will likely result in decreased plant productivity and reproduction. As fewer or less robust plants pull less CO₂ out of the atmosphere, soil erosion and loss will increase and there will be less carbon from dead plants available to become incorporated into the soil reducing soil carbon sequestration (Ren et al, 2020). An increase in wildfire frequency and intensity brought about by climate change can also increase GHG emissions in the region by reducing carbon sequestration. Fires that burn through forests remove trees that serve as carbon reservoirs, and high temperature fires can also result in reduced soil carbon sequestration (Reidmiller et al. 2018, Verma and Jayakumar, 2012).

Hotter temperatures in the San Diego region may incentivize more people to use air conditioning more often; in the next decade, summer energy demand in California could increase by 1 gigawatt. This increase in energy use could release more GHG depending on the electricity-generating portfolio. One potential climate adaptation measure to address reduced water supply is to diversify the region's portfolio of water sources, and the San Diego County Water Authority plans to increase its reliance on seawater desalination 2 percent by the year 2035 (SDCWA 2016). This water treatment process is highly energy-intensive, however; this could increase GHG emissions depending on the electricity-generating portfolio. Higher temperatures from climate change can harm some measures used to reduce GHG emissions. For example, attempts to use more solar energy to help reduce GHG emissions may be challenged by high temperatures, which can render solar panels less efficient (Omubo-Pepple et al. 2009).

4.8.2 REGULATORY SETTING

Refer to Section 4.3, *Air Quality*, and Section 4.6, *Energy*, for air quality- and energy-related laws, regulations, plans, and policies that are relevant to GHG emissions.

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

As of June 2021, there is no overarching federal law specifically related to climate change or the reduction of GHG emissions.

Greenhouse Gas Regulations Under the Clean Air Act

Massachusetts v. Environmental Protection Agency

The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency*, 127 S. Ct. 1438 (2007), that CO₂ and other GHGs are pollutants under the federal Clean Air Act (CCA), which the U.S. Environmental Protection Agency (EPA) must regulate if it determines those GHGs pose an endangerment to public health or welfare.

Endangerment Finding and Cause or Contribute Finding

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under CAA Section 202(a) (42 United States Code Section 7521).

- **Endangerment Finding:** The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator found 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.

Mandatory Reporting Rule

The EPA adopted a mandatory GHG reporting rule in September 2009. The rule requires suppliers of fossil fuels or entities that emit industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of GHG emissions to submit annual reports to the EPA beginning in 2011. Vehicle and engine manufacturers were required to begin reporting GHG emissions starting with model year 2011.

Clean Power Plan

In 2015, the EPA published the Clean Power Plan. The Clean Power Plan sets achievable standards to reduce CO₂ emissions by 32 percent from 2005 levels by 2030. This Plan established final emissions guidelines for states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired electric generating units. Specifically, the EPA established: (1) CO₂ emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: fossil-fuel-fired electric utility steam generating units and stationary combustion turbines; (2) state-specific CO₂ goals reflecting the CO₂ emission performance rates; and (3) guidelines for the development, submittal, and implementation of state plans that establish emission standards or other measures to implement the CO₂ emission performance rates, which may be accomplished by meeting the state goals. This final rule continued

progress already under way in the U.S. to reduce CO₂ emissions from the utility power sector. On February 9, 2016, the Supreme Court (Order No. 15A773) stayed implementation of the Clean Power Plan pending judicial review. As directed by Executive Order on Energy Independence (Executive Order 13783, March 28, 2017), the EPA officially repealed the Clean Power Plan in June 2019 and issued the final Affordable Clean Energy rule in its place (EPA 2019c).

Affordable Clean Energy Rule

The EPA issued the Affordable Clean Energy (ACE) rule on June 19, 2019, in order to replace the Clean Power Plan. The ACE Rule established emissions guidelines for states to use when developing plans to limit CO₂ at coal-fired power plants. Specifically, the ACE rule aims at improving the heat rate as the best system of emissions reductions for CO₂ at coal-fired power plants, with improvements that can be made at individual facilities. States will have 3 years to submit plans. The EPA estimates that the ACE rules will result in a reduction of CO₂ emissions from the electricity sector by as much as 35 percent below 2005 levels by 2030 (EPA 2019c).

Fuel Economy Standards

The National Highway Traffic Safety Administration (NHTSA) and EPA set the Corporate Average Fuel Economy Standards (CAFE) standards to improve the average fuel economy and reduce GHG emissions generated by cars and light duty trucks. NHTSA and EPA adopted a rule in 2019 for the current fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). NHTSA and EPA also issued a regulation revoking California's Clean Air Act waiver, which allows California to set its own emissions standards, asserting that the waiver was preempted by federal law (SAFE Rule Part One, 84 *Federal Register* 51310, September 27, 2019). California, 22 other states, the District of Columbia, and two cities have filed suit against the SAFE Rule Part One (*California et al. v. United States Department of Transportation et al.*, 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal proceedings. Part One of the SAFE Vehicles Rule went into effect on November 26, 2019. However, on April 26, 2021, EPA announced plans to reconsider Part One of the SAFE Rule as directed in Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" (discussed below). At the time of preparing this Draft EIR, EPA is seeking public input on its reconsideration of the action. Public comments to the Notice of Reconsideration ended on June 6, 2021 and EPA held a public hearing on June 22, 2021 (EPA 2021b). Nevertheless, at the time this Draft EIR was prepared, the SAFE Rule Part One is in place and it is unclear whether, to what degree, and when the SAFE Rule Part One may be revoked by EPA. As such, the GHG inventory for the San Diego region summarized in Table 4.8-4 and used as the basis for the analysis contained herein reflects compliance with the SAFE Rule Part One using as it exists in June 2021 using CARB-developed adjusted emissions factors.

SAFE Rule Part Two was finalized on March 31, 2020, and went into effect on June 29, 2020. Part Two of the SAFE Rule sets the CAFE standards to increase in stringency by 1.5 percent per year above Model Year (MYs) 2020 levels for MYs 2021–2026. These standards are lower than the previous CAFE standards which required that MYs 2021–2026 increase in stringency by 5 percent per year. The current federal administration has also stated its intent to revisit the current CAFE standards as well. For further information on CAFE standards refer to Section 4.3.

Executive Order 13990

On January 20, 2021, Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis” was signed into effect. With respect to climate change, this executive order includes the following agency directives:

- Required the Secretary of the Interior to place a temporary moratorium on the federal oil and gas leasing program in the Arctic National Wildlife Refuge.
- Established an Interagency Working Group on the Social Cost of Greenhouse Gases tasked with developing and promulgating social costs of carbon, nitrous oxide, and methane for agencies to apply during cost-benefit analysis.
- Revoked the presidential permit for construction and operation of the Keystone XL pipeline.

Heavy-Duty Vehicle Program

EPA and NHTSA also set fuel efficiency and GHG standards for medium- and heavy-duty trucks. In 2011, EPA and NHTSA finalized a joint rule that established a national program to reduce GHG emissions and improve fuel economy for new medium- and heavy-duty engines and vehicles. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in model years 2014 through 2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which requires fuel efficiency standards for engines in model years 2018 through 2027 (EPA 2016b).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

The State of California has adopted various laws addressing various aspects of climate change, GHG mitigation, energy efficiency, and renewable energy. Much of this establishes a broad framework for the State’s long-term GHG and energy reduction goals and climate change adaptation program. Governors have also issued several Executive Orders (EOs) related to the State’s evolving climate change policy. A summary of key laws, regulations, plans, and policies, relevant to the proposed Plan is provided below, organized by general categories.

Executive Orders

There are four primary EOs related to the State’s GHG reduction efforts. In general, EOs provide direction to State government agencies but do not place mandates on regional or local governments or the private sector.

- **EO S-03-05:** Established GHG-reduction targets for 2010 (2000 emission levels), 2020 (1990 emission levels) and 2050 (80 percent below 1990 levels).
- **EO S-30-15:** Established a GHG reduction target for 2030 (40 percent below 1990 levels).
- **EO B-55-18:** Established a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” This EO directs CARB to ensure future Climate Change Scoping Plans (discussed below) identify and recommend measures to achieve the carbon neutrality goal.
- **EO N-19-19:** Among other things, this EO required the Department of Finance to create a Climate Investment Framework; and required the State Transportation Agency to align transportation spending with achieving objectives of the Climate Change Scoping Plan, and to reduce vehicle miles traveled (VMT) through strategic discretionary investments. In July 2021, the California State Transportation Agency adopted the Climate Action Plan for Transportation Infrastructure (CAPTI). The CAPTI was prepared in the wake of EO N-19-19 and serves an integrated climate change infrastructure plan (CalSTA 2021).

Legislative GHG Reduction Targets

State law sets forth the following requirements for reducing Statewide levels of GHG emissions by 2020 and 2030.

- **Assembly Bill (AB) 32, Health & Safety Code Section 38500 et seq.** Codified the 2020 reduction target of EO S-03-05 (i.e., reduce Statewide GHG emissions to 1990 levels by 2020). AB 32 required CARB to develop a Scoping Plan that describes California’s strategy for achieving the 2020 target and to update it every five years.
- **Senate Bill (SB) 32, Health & Safety Code Section 38566.** Codified the 2030 reduction target of EO B-30-15 (i.e., reduce Statewide GHG emissions to 40 percent below 1990 levels by 2030). Adopted in tandem with SB 32, AB 197 of 2016 (Chapter 250, Statutes of 2016) required CARB, in implementing SB 32’s 2030 GHG reduction target, to (1) prioritize emissions reductions to consider the “social costs” of GHG emissions and (2) prioritize “direct emission reductions” at large stationary sources and at mobile sources. In 2017, CARB adopted a Scoping Plan that describes California’s strategy for achieving the 2030 reduction target.

State Agency GHG Reduction Plans and Strategies

CARB and other State agencies have adopted several plans and strategies to reduce Statewide GHG emissions as described below.

- **AB 32 Scoping Plan.** Laid out the State’s strategy for achieving the 2020 reduction target set forth in AB 32. Adopted in 2008 and updated in 2014, the initial Scoping Plan and First Update recommended measures to reduce emissions from a variety of activities and sources, including on-road transportation, electricity generation, building energy use, and uses of high GWP gases. It also recommended that local governments set goals to reduce their municipal and communitywide emissions to 15 percent below existing (at the time of scoping plan adoption) levels by 2020 to match the State’s 2020 reduction target (CARB 2008). The initial Scoping Plan and its First Update were replaced by the 2017 Scoping Plan, which was approved by CARB in 2017.
- **California’s 2017 Climate Change Scoping Plan.** Identifies measures for how California can achieve the 2030 target set forth in SB 32, and substantially advance toward the 2050 reduction goal identified in EO-S-3-05. The 2017 Scoping Plan integrates several existing CARB regulations and State strategies, including the Cap-and-Trade Program, Low Carbon Fuel Standard (LCFS), SB 350 goals for renewable electricity procurement and doubling of Statewide energy efficiency savings in electricity and natural gas end uses, Mobile Source Strategy, Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant (SLCP) Strategy. The 2017 Scoping Plan accelerates the State’s focus on moving freight with zero and near-zero technologies, investing in renewables, using low-carbon fuels including electricity and hydrogen, reducing emissions of short-lived climate pollutants (e.g., CH₄, black carbon, and fluorinated gases), creating walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and managing natural lands to become carbon sinks. It also recommends that local governments aim to reduce community-wide GHG emissions levels of 6 metric tons of CO_{2e} (MTCO_{2e}) per capita by 2030 and 2 MTCO_{2e} per capita by 2050 (CARB 2017a). Measures included in the approved 2017 Scoping Plan are recommendations unless otherwise adopted by legislation, rulemaking, or other processes. Table 4.8-13 in Section 4.8.4, *Environmental Impacts and Mitigation Measures*, below summarizes the various statewide programs and regulations that will assist the State in achieving the goals of the 2017 Scoping Plan.
- **Mobile Source Strategy.** Developed by CARB to provide an integrated planning perspective and common vision for transforming the mobile sector to achieve air quality and climate change goals. It utilizes

conceptual scenarios to illustrate the emissions reduction potential of different vehicle technology mixes and VMT reductions to inform State policy development (CARB 2016a). The Mobile Source Strategy addresses on-road vehicles including passenger cars and light duty trucks, medium and heavy duty trucks, buses, as well as off-road vehicles and equipment, including locomotives, cargo handling equipment, and construction equipment. It supports multiple planning efforts, including the State Implementation Plans for criteria air pollutants, the Scoping Plan, the Short-Lived Climate Pollutant Reduction Strategy (discussed below), and the Sustainable Freight Action Plan (discussed below). CARB was required to update the Mobile Source Strategy by January 1, 2021, and every five years thereafter. The Draft 2020 Mobile Source Strategy was first published for public review in December 2020 (CARB 2020d). Following public input, a Revised Draft 2020 Mobile Source Strategy was released on April 23, 2021 (CARB 2021). As of July 2021, CARB has not adopted the 2020 Mobile Source Strategy.

- **Sustainable Freight Action Plan.** Establishes clear targets to improve freight efficiency, transition to zero-emission technologies, and increase the competitiveness of California’s freight system. The Sustainable Freight Action Plan (SFAP) was developed by several State agencies and is a recommendation document that integrates investments, policies, and programs across several State agencies to help realize a singular vision for California’s freight transport system. This SFAP recommends a high-level vision and broad direction to the Governor to consider for State agencies to utilize when developing specific investments, policies, and programs related to the freight transport system that serves California’s transportation, environmental, and economic interest. The Scoping Plan incorporates potential actions from the SFAP that provide GHG emissions reduction benefits (CARB 2016b).
- **Short-Lived Climate Pollutant Strategy.** SB 1383 (Chapter 395, Statutes of 2016) requires CARB to develop and implement a Short-Lived Climate Pollutant (SLCP) Strategy with the following reductions in emissions by 2030 compared to 2013 levels: methane by 40 percent, HFCs by 40 percent, and black carbon (non-forest) by 50 percent. The bill also specifies targets for reducing organic waste in landfills. SB 1383 also requires CARB to adopt regulations to be implemented on or after January 1, 2024, specific to the dairy and livestock industry, requiring a 40 percent reduction in methane emissions below 2013 levels by 2030, if certain conditions are met. Lastly, the bill requires CalRecycle to adopt regulations to take effect on or after January 1, 2022, to achieve specified targets for reducing organic waste in landfills.

Per its directive, CARB adopted the SLCP Strategy in 2017, establishing a path to decrease SLCPs from various sectors of the economy. Strategies span from wastewater and landfill practices and methane recovery to reducing natural gas leaks and consumption. The SLCP strategy also identifies measures that can reduce HFC emissions through incentive programs and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (CARB 2017b).

- **Draft 2030 Natural and Working Lands Implementation Plan.** In a joint, interagency effort, the California Environmental Protection Agency (CalEPA), California Department of Food and Agriculture, California Natural Resources Agency, CARB, and California Strategic Growth Council released the *Draft California 2030 Natural and Working Lands Climate Change Implementation Plan* (Draft Plan) in January 2019 (and updated in April 2019 to include errata). The Draft Plan is specific to the natural and working lands sector, which includes farmland, rangeland, forests, grasslands, wetlands, riparian areas, seagrass, and urban green space. The Draft Plan addresses the carbon flux from this sector, including the ever-dynamic changes in both GHG emissions and carbon sequestration associated with the management of these lands, and includes reduction of GHGs and black carbon from forest fires and fire management. The Draft Plan serves as a multidisciplinary approach to conserve and maintain a resilient natural and working lands sector that will gradually shift the natural and working lands sector from being a net carbon emitter to being a net carbon sink, while also improving air quality, water quality, wildlife habitat, recreation, and providing other benefits.

The Draft Plan sets goals for, at a minimum, increasing the rate of State-funded soil conservation practices fivefold, doubling the rate of State-funded forest management and restoration efforts, tripling the rate of State-funded oak woodland and riparian reforestation, and doubling the rate of State-funded wetland and seagrass restoration. The measures included in the Draft Plan are projected to result in cumulative emissions reductions of -36.6 to -11.7 million metric tons of CO_{2e} by 2045 (CalEPA et al. 2019).

While local efforts in the San Diego region to improve the carbon sequestration of natural and working lands would result in a net carbon dioxide decrease, the GHG emissions inventory summarized in Table 4.8-4 and used in this analysis does not include the GHG flux associated with carbon stocks in California's natural and working lands consistent with CARB's approach in developing statewide GHG emissions inventories (refer to Appendix H for additional discussion of the methodologies used to prepare the GHG emissions inventory).

Transportation Planning

- **SB 375, Chapter 728, Statutes of 2008.** Provides for a new planning process that integrates regional transportation, land use, GHG reduction, and housing planning. SB 375 requires regional transportation plans (RTPs) to incorporate a sustainable communities strategy (SCS) that demonstrates how the region would achieve regional GHG emission reduction targets for passenger vehicles set by CARB. CARB revised SANDAG's GHG targets in 2018 to 15 percent reduction in emissions per capita by 2020 and 19 percent by 2035 based on a 2005 baseline.

In November 2018, CARB released the 2018 Progress Report on California's Sustainable Communities and Climate Protection Act to evaluate the performance of the SCSs prepared pursuant to the first set of reduction targets established by SB 375. The 2018 Progress Report, issued pursuant to SB 150 (Chapter 646, Statutes of 2017), found that Metropolitan Planning Organizations (MPOs) are not on track to meet the GHG reductions expected under SB 375 for 2020 due to an overall increase in statewide VMT per capita. The 2018 Progress Report concluded that reductions in the rate of VMT growth will be needed to meet longer-term State GHG reductions targets for 2030 and 2050 (CARB 2018).

Under SB 375, CARB must agree that SCSs are able to meet GHG reduction targets. For this purpose, in September 2019, CARB published updated SCS Program and Evaluation Guidelines, clarifying the scope of the updated strategy-based SCS evaluation process, which consists of four key components:

- **Tracking implementation under SB 150.** Report on the progress regions have made towards meeting their SB 375 GHG reduction targets.
- **Policy Commitments.** Determine whether the planned strategies and commitments, when fully and effectively implemented, would achieve the GHG reduction targets, and whether there are any risks to not achieving those commitments.
- **Incremental Progress.** Report on whether an MPO's proposed SCS has more or enhanced strategies than the currently adopted SCS.
- **Equity.** Report on the efforts that MPOs are taking to meet federal and State requirements related to equity.

The Policy Commitments component is the only component used by CARB as the basis for accepting or rejecting the MPO's SB 375 GHG emission reduction target determination (CARB 2019b).

- **SB 743, Chapter 386, Statutes of 2013.** SB 743 of 2013 required that OPR propose changes to the State CEQA Guidelines to address transportation impacts in transit priority areas and other areas of the state. In response, Section 15064.3 was added to CEQA in December 2018, requiring that transportation impacts no longer consider congestion but instead focus on the impacts of VMT. Agencies have until July 1, 2020 to

implement these changes, but can also choose to implement these changes immediately. In support of these changes, OPR published its *Technical Advisory on Evaluating Transportation Impacts in CEQA*, which recommends that the transportation impact of a project be based on whether the project would generate a level of VMT per capita (or VMT per employee or some equivalent metric) that is 15 percent lower than that of existing development in the region, or that a different threshold is used based on substantial evidence (OPR 2018). OPR's technical advisory explains that this criterion is consistent with Public Resources Code Section 21099, which states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions" (OPR 2018). This metric replaces the use of automobile delay metrics such as level of service to measure transportation-related impacts.

Fuel Economy Standards

- **Advanced Clean Cars Program (Passenger Vehicles).** AB 1493 of 2002 (known as Pavley I, Chapter 200, Statutes of 2002) provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that lowered GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards referred to as the Advanced Clean Cars (ACC) Program's Low Emission Vehicle (LEV) III Regulation) was adopted for vehicle model years 2017–2025 in 2012 (13 California Code of Regulations [CCR] Section 1900 et seq.).

The ACC Program also includes the Zero Emission Vehicle Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of zero-emission vehicles (ZEVs), which include battery electric, fuel cell, and plug-in hybrid electric vehicles. The Clean Fuels Outlet regulation is intended to ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of new advanced technology vehicles as they come to market.

The Final SAFE Vehicle Rule (discussed above) revokes California's authority to set its own GHG emissions standards and establish ZEV mandates in the state, which affects some of the underlying assumptions in CARB's Emission Factor (EMFAC) models. CARB staff has developed guidance and adjustment factors to be applied to EMFAC emissions outputs to adjust for the revised (reduced) ZEV sales in future years and associated increase in emissions.

- **Low Carbon Fuel Standard.** Originally mandated a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 (17 CCR Section 95480 et seq.). In September 2018, to help achieve, SB 32's emission reduction target, the LCFS regulation was amended to increase the statewide goal to a 20 percent reduction in carbon intensity of California's transportation fuels by at least 2030. Note that the majority of the emissions benefits due to the LCFS come from the production cycle (upstream emissions) of the fuel rather than the combustion cycle (tailpipe) (CARB 2020e).
- **Medium and Heavy-Duty Vehicles.** In 2008, CARB approved the Phase 1 Tractor-Trailer Greenhouse Gas Regulation to reduce GHG emissions by requiring the use of aerodynamic tractors and trailers that are also equipped with low rolling resistance tires (13 CCR Section 2020 et seq.). The regulation applies to certain Class 8 tractors manufactured for use in California and is harmonized with the parallel EPA and NHTSA Phase 1 heavy-duty truck standards. CARB amended the Tractor-Trailer Greenhouse Gas Regulation in 2019 (Phase 2 standards) to align with EPA and NHTSA Phase 2 heavy-duty truck standards.

Electric Vehicles

CARB has three different types of ZEV programs: regulatory, incentive, and supporting. As of July 2019, CARB has 28 ZEV programs either in place or under development (CARB 2019c). Key programs are described below.

- **Executive orders**

- **EO B-16-12 and EO B-48-18.** On March 23, 2012, Governor Brown issued EO B-16-2012 to encourage the use of ZEVs and related infrastructure. The EO orders CARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks concerning ZEVs. By 2020, the State's ZEV infrastructure should support up to one million vehicles. By 2025, EO B-16-2012 aims to put over 1.5 million ZEVs on California roads and displace at least 1.5 billion gallons of petroleum. EO B-48-18 set an expanded target of 5 million ZEVs on the road by 2030, as well as a network of 200 hydrogen fueling stations and 250,000 electric vehicle charging stations, including 10,000 DC fast chargers, installed or constructed by 2025 (CEC 2020a).
- **EO N-79-20**, signed by Governor Newsom on September 23, 2020, provides even more ambitious goals and requirements. These include 100 percent of in-state sales of passenger cars and trucks being ZEVs by 2035; 100 percent of operating medium- and heavy- duty vehicles being ZEVs by 2045; and 100 percent of drayage trucks and off-road vehicles and equipment being ZEVs by 2035. The order also tasks CEC with providing an updated assessment of the infrastructure needed to support this level of ZEV adoption (CEC 2020a).

The Governor's Interagency Working Group on Zero-Emission Vehicles (ZEVs) developed the ZEV Action Plan, issued in 2013 and subsequently updated in 2016 and 2018, to identify actions that support the State's ZEV goals. Some actions in the ZEV Action Plan that are particularly relevant to the Clean Transportation Program include ensuring ZEVs are accessible to a broad range of Californians and making ZEV technologies commercially viable in the medium- and heavy-duty and freight sectors. Many recommendations in the ZEV Action Plan have been captured in the Clean Transportation Program since the inception of the program and continue to be program priorities (CEC 2020a).

- **Zero Emission Vehicle Regulation (13 CCR Section 1962 et seq.).** The Zero Emissions Vehicle (ZEV) Regulation is a part of CARB's ACC Program and requires manufactures to sell an increasing number of ZEVs over time. Manufacturers are required to produce a number of ZEVs and plug-in hybrids each year, based on the total number of cars sold in California by the manufacturer. Manufacturers with higher overall sales of all vehicles are required to make more ZEVs. Requirements are in terms of percent credits, ranging from 4.5 percent in 2018 to 22 percent by 2025. Each vehicle receives credits based on its electric driving range. The more range a vehicle has, the more credit it receives. CARB's goal is for a minimum of approximately 1 million ZEVs to be on the road by 2025 based on this regulation. EO B-16-12 calls for 1.5 million ZEVs by 2025 (CARB 2018b). As of June 2021, CARB is preparing an update to the ZEV Regulation to accelerate the deployment of ZEVs to the regulated fleets. The update also includes a provision to recognize non-regulated fleets that comply with the incorporation of ZEVs into their fleets through a CARB-developed website.
- **Zero Emission Trucks.** CARB adopted the Advanced Clean Trucks (ACT) Regulation in June 2020, which aims to accelerate the sales of heavy-duty electric vehicles. It consists of two parts, a manufacturer component and a fleet reporting component. Manufacturers are required to sell an increasing percentage of heavy-duty zero-emission vehicles between 2024 and 2035. By 2035, 40 percent of Class 8 truck purchases will be required to be zero emission. Fleets with 50 or more vehicles will be required to report on their fleet's composition and activities in order to help CARB craft new strategies to hasten the adoption of zero-emission vehicles (CARB 2020f).
- **Innovative Clean Transit.** CARB's innovative Clean Transit (ICT) Regulation (13 CCR Section 2023) requires all public transit agencies to gradually transition to a 100 percent zero-emissions bus fleet and encourage them to provide innovative first and last mile connectivity and improved mobility for transit riders. The ICT Regulation requires that 25 percent of their new bus purchases for large transit agencies

are zero-emission starting in 2023 extending to 100 percent in 2029. By 2026, 25 percent of small transit agencies new bus purchases are zero-emission starting in 2026 extending to also 100 percent in 2029.

Renewable Energy

- **Renewables Portfolio Standard** Earlier legislation established California’s Renewables Portfolio Standard (RPS). The program sets continuously escalating renewable electricity procurement requirements for the State’s load-serving entities. Generation must be procured from RPS-certified facilities SB 2 (1X) of 2011 obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020. The CPUC and CEC are jointly responsible for implementing the program
- **SB 350 (Chapter 547, Statutes of 2015)**. This bill’s key provisions are to require the following by 2030: (1) an RPS of 50 percent and (2) a doubling of efficiency for existing buildings.
- **SB 100 (Chapter 312, Statutes of 2018)**. This bill establishes a new RPS target of 50 percent by 2026, increases the RPS target in 2030 from 50 to 60 percent, and establishes a goal of 100 percent zero-carbon energy sources by 2045.

As of 2019, San Diego Gas and Electric’s (SDG&E) eligible renewable (i.e., solar, wind, eligible hydroelectric, geothermal, and biomass and biowaste) procurement was approximately 31 percent (CEC 2020b). However, through SDG&E’s EcoChoice mix, customers in SDG&E’s service area may voluntarily choose to receive their electricity from 100 percent eligible renewable sources.

The cities of Chula Vista, Encinitas, Imperial Beach, La Mesa, and San Diego have formed the San Diego Community Power (SDCP) Community Choice Energy (CCE) Program. Additionally, the cities of Carlsbad, Del Mar, and Solana Beach have formed the Clean Energy Alliance (CEA), another CCE Program. These programs are discussed in greater detail below under the heading, “Local Community Choice Energy Programs.”

Building Efficiency

- California Building Energy Efficiency Standards.** The energy consumption of new residential and nonresidential buildings in California is regulated by the Building Energy Efficiency Standards (California Energy Code). CEC updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The 2016 California Energy Code was replaced by the 2019 standards, effective January 1, 2020. The 2019 California Energy Code requires builders to use more energy-efficient building technologies for compliance with increased restrictions on allowable energy use. Additionally, new residential units are required to include solar panels, sized to offset the estimated electrical requirements of each unit (24 CCR Part 6, Section 150.1[c]14). CEC estimates that the combination of required energy-efficiency features and mandatory solar panels in the 2019 California Energy Code will result in new residential buildings that use 53 percent less energy than those designed to meet the 2016 California Energy Code. CEC also estimates that the 2019 California Energy Code will result in new commercial buildings that use 30 percent less energy than those designed to meet the 2016 standards, primarily through the transition to high-efficacy lighting (CEC 2018). CEC's 2018 Integrated Energy Policy Report (IEPR) identified policy goals for carbonizing buildings to assist the State in meeting its long-term GHG reduction targets (CEC 2019). The development of the 2022 California Energy Code and other future triennial updates would likely allow less on-site natural gas usage consistent with the goals of the 2018 IEPR and SB 100. Based on the Draft 2022 California Energy Code, CEC estimates that the implementation of the proposed standards will reduce anticipated increases in statewide natural gas consumption (CEC 2021). See Section 4.6 for additional information regarding CEC's most recent IEPR.
- California Green Building Standards Code.** California has adopted the Green Building Standards Code (CALGreen, 24 CCCR Part 11), which identify aggressive energy efficiency standards for new residential and non-residential buildings that are continuously updated every few years. The most recent update was the 2019 Building Energy Efficiency Standards, which were adopted in May 2018 and took effect on January 1, 2020. Future standards are expected to result in zero net energy for newly constructed commercial buildings. CalGreen requirements are complementary with California Energy Code discussed above,

California Cap-and-Trade Program

- Cap-and-Trade.** CARB adopted the Cap-and-Trade program in October 2011. The program is a market-based system with an overall emissions limit for affected emission sources. Affected sources include in-state electricity generators, hydrogen production, petroleum refining, and other large-scale manufacturers and fuel suppliers and distributors. The original Cap-and-Trade program set a compliance schedule through 2020. AB 398 (Chapter 135, Statutes of 2017) extends the program through 2030 and requires CARB to make refinements, including establishing a price ceiling. Revenue generated from the Cap-and-Trade program is used to fund various programs. AB 398 established post-2020 funding priorities to include (1) Air Toxics and Criteria Pollutants, (2) Low and Zero Carbon Transportation, (3) Sustainable Agricultural Practices, (4) Healthy Forests and Urban Greening, (5) Short-lived Climate Pollutants, (6) Climate Adaptation and Resiliency, and (7) Climate and Clean Energy Research.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

SANDAG

SANDAG's Climate Resilience Program helps to reduce regional GHG emissions in alignment with statewide goals to prepare for the impacts of climate change. Efforts include climate action planning and energy

engineering technical services for local jurisdictions, support for electric vehicle deployment and charging installation, and regional climate action and resilience guidance.

San Diego Forward: The Regional Plan

The 2015 San Diego Forward: The Regional Plan (2015 Regional Plan) (SANDAG 2015) is an update of the Regional Comprehensive Plan (RCP) for the San Diego Region and the 2050 RTP/SCS (2050 RTP/SCS) combined into one document. The 2015 Regional Plan provides a blueprint for San Diego’s regional transportation system in order to effectively serve existing and projected workers and residents within the San Diego region. In addition to the RTP, the Regional Plan includes the SCS, in compliance with SB 375. The SCS aims to create sustainable, mixed-use communities conducive to public transit, walking, and biking by focusing future growth in the previously developed, western portion of the region along the major existing transit and transportation corridors. The purpose of the SCS is to help the San Diego region meet the GHG emissions reductions set by CARB. The 2015 Regional Plan has a horizon year of 2050, and projects regional growth and transportation projects over this time period.

2019 Federal Regional Transportation Plan

SANDAG prepared a 2019 Federal Regional Transportation Plan (2019 Federal RTP) that demonstrates compliance with federal requirements for the development of regional transportation plans. The 2019 Federal RTP also retains air quality conformity approval from the U.S. Department of Transportation and preserves funding for the San Diego region’s transportation investments (SANDAG 2019a).

ReCAP

The SANDAG Board of Directors (Board) accepted the Regional Climate Action Planning Framework (ReCAP) in 2018 (SANDAG 2018a). ReCAP identifies best practices and guidance for preparing Climate Action Plans (CAPs) and monitoring implementation over time. ReCAP establishes a technical framework for regionally-consistent climate action planning that preserves local policy flexibility for the unique needs and circumstances of each local jurisdiction.

Electric Vehicle Readiness Planning and Plug-in San Diego

SANDAG has provided a forum for local governments and other regional stakeholders to address barriers to deploying alternative fuel vehicles and siting charging and fueling stations. In 2014, SANDAG completed a regional readiness plan for plug-in electric vehicles and charging stations titled the San Diego Regional Plug-in Electric Vehicle Readiness Plan (SANDAG 2014). The plan is part of a statewide effort funded through the CEC to prepare local governments for the deployment of EVs. San Diego’s Readiness Plan identifies barriers to the deployment of electric vehicle (EV) charging infrastructure and includes recommendations and resources for public agencies, property owners, consumers, and other stakeholders to overcome those barriers. This effort was expanded to planning for all alternative fuels, with a regional alternative fuel plan completed in 2016.

With additional funding from the CEC, SANDAG transitioned from readiness planning to implementation via the Plug-in SD initiative. The initiative is a combination of resource development, training, technical assistance, and outreach. The primary audience of the project includes member agencies, employers, and multi-family properties. The project is also developing a needs assessment to help document existing infrastructure and identify gaps, including access, in the current EV charging network. One of the novel aspects of the initiative is the availability of a technical expert (the “EV Expert”) who is made available in person, via phone, and email to assist stakeholders. The San Diego Regional Plug-In Electric Vehicle Readiness Plan also identifies the Electric

Vehicle Infrastructure Training Program (EVITP) as a training resource for local electrical contractors looking to support EVSE installations, provides an overview of previous EVITP trainings, and outlines how contractors can incorporate EVITP certification in a response to Requests for Proposals to deploy charging infrastructure (SANDAG 2019b).

SANDAG Board of Directors Resolution No. 2021-17

Among other things, SANDAG Board of Directors Resolution No. 2021-17 (adopted April 9, 2021) directed its staff to consider the following when drafting the proposed Plan:

- Consistency with local Climate Action Plans.
- At least a 30 percent per capita GHG emissions reduction from the entire on-road transportation sector by 2035.

Although no baseline for the 30 percent per capita reduction was specifically included in Resolution 2021-17, the EIR analysis uses a 2016 baseline for internal consistency.

General Plans

Several of SANDAG’s member agencies have general plan elements and policies that specifically address energy use and conservation, VMT reduction, alternative fuels, and modes of transportation, as well as the reduction of GHG emissions and strategies to prepare for the effects of climate change. Such general plans contain goals, objectives, and policies aimed at reducing energy consumption and GHG emissions. These include policies on topics such as energy retrofits to existing residential and commercial buildings, zoning and building ordinances to increase energy efficiency in new construction, and ways to reduce VMT through land use and transportation planning.

Local Plans to Reduce GHG Emissions

Most of SANDAG’s member jurisdictions have adopted CAPs, GHG reduction plans, and/or sustainability plans that set goals and targets for the reduction of GHG emissions, and outline policies and/or measures to achieve those goals and targets. Table 4.8-5 summarizes the status of local plans to reduce GHG emissions in the San Diego region (as of June 2021).

**Table 4.8-5
Summary of Local Plans to Reduce GHG Emissions (as of ~~November~~ June 2021)**

Jurisdiction	Document Title	Adopted (year)	New Plan or Update In Progress?	CEQA Qualified Plan?¹
Carlsbad	Climate Action Plan	2020	No	Yes
Chula Vista	Climate Action Plan	2017	No	No
Coronado	Climate Action Plan	n/a	Yes ²	n/a
Del Mar	Climate Action Plan	2016	No	No
El Cajon	El Cajon Sustainability Initiative: Policies to Reduce Greenhouse Gas Emissions	2020	No	No
Encinitas	Climate Action Plan	2020	No	Yes

Jurisdiction	Document Title	Adopted (year)	New Plan or Update In Progress?	CEQA Qualified Plan? ¹
Escondido	Climate Action Plan	2021	No	Yes
Imperial Beach	Resilient Imperial Beach: Climate Action Plan	2019	No	No
La Mesa	Climate Action Plan	2018	No	Yes
Lemon Grove	Climate Action Plan	2020	No	No
National City	Climate Action Plan	2011	No	Yes
Oceanside	Climate Action Plan	2019	No	No
Poway	None	n/a	No	n/a
San Diego (City)	Climate Action Plan	2015	Yes	Yes
San Diego (County)	Climate Action Plan	n/a	Yes	n/a
San Diego (Port)	Climate Action Plan	2013	No	Yes
San Diego County Regional Airport Authority	Sustainability Management Program	2020	No	No
San Marcos	Climate Action Plan	2020	No	Yes
Santee	Sustainable Santee Plan	2019	No	Yes
Solana Beach	Climate Action Plan	2017	No	No
Vista	Climate Action Plan	2012	Yes ²	Yes

Sources: City of Carlsbad 2020, City of Chula Vista 2017, City of Coronado 2021, City of Del Mar 2016, City of El Cajon 2020, City of Encinitas 2020, City of Escondido 2021, City of Imperial Beach 2019, City of La Mesa 2018, City of Lemon Grove 2020, National City 2011, City of Oceanside 2019, City of Poway 2009, City of San Diego 2015, Port of San Diego 2013, San Diego County Regional Airport Authority 2020, City of San Marcos 2020, City of Santee 2019, City of Solana Beach 2017, and City of Vista 2021.

¹ CEQA Qualified Plan = a plan for the reduction of GHG emissions that includes the elements listed in CEQA Guidelines Section 15183.5(b)(1) (as determined by the agency adopting the plan).

² The City of Coronado authorized the release of a public draft Climate Action Plan (CAP) on September 7, 2021.

³ The City of Vista published a public draft of a CAP update in 2021 that has not been adopted as of August 6, 2021.

Local Community Choice Energy Programs

The cities of Chula Vista, Encinitas, Imperial Beach, La Mesa, and San Diego formed the SDCP CCE Program, which started delivering power to municipal customers in March 2021. In June 2021 SDCP started providing service to commercial customers, and service to residential customers is anticipated to begin in early 2022. Once fully launched, SDCP will provide electricity service to approximately 770,000 customer accounts. SDCP plans to deliver 55 percent GHG-free electricity in 2021 and supply 100 percent renewable electricity by 2030 or 2035 (SDCP 2021, CalCCA 2021).

Additionally, the cities of Carlsbad, Del Mar, and Solana Beach have formed the CEA, another CCE Program, started delivering power to customers in May 2021. SDCP and CEA work in partnership with San Diego Gas & Electric to deliver GHG-efficient electricity to customers within its member jurisdictions.

4.8.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. The significance criteria specifically developed for this EIR are based on the Appendix G checklist questions and CEQA Guidelines Section 15064.4. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, the unique nature of the proposed Plan's GHG impacts, and the unique characteristics of the proposed Plan.

Checklist questions for GHGs are provided in Section VIII of Appendix G. To better focus the potential impacts associated with the proposed Plan, the Appendix G questions have been combined and modified. Both checklist questions for GHGs have been modified and expanded upon to better focus the potential impacts of Plan implementation against varying regulations and across various benchmark years. For purposes of this EIR, the implementation of the proposed Plan would have a significant GHG impact if it would:

- GHG-1** Directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016).
- GHG-2** Conflict with the SANDAG region's achievement of SB 375 GHG emissions reduction targets for 2035.
- GHG-3** Conflict with or impede achievement of an at least 30% reduction in per capita GHG emissions from the entire on-road transportation sector by 2035 compared to existing conditions (2016).
- GHG-4** Conflict with or impede the implementation of local plans adopted for the purpose of reducing GHG emissions.
- GHG-5** Be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18.

4.8.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

- GHG-1 DIRECTLY OR INDIRECTLY RESULT IN AN INCREASE IN GHG EMISSIONS COMPARED TO EXISTING CONDITIONS (2016)**

ANALYSIS METHODOLOGY

This analysis is based on the *2016 GHG Inventory and Projections for the San Diego Region* report prepared by SANDAG (Appendix H). This report provides an estimate of 2016 GHG emissions for the San Diego region and GHG projections for the years 2025, 2030, 2035, 2045, and 2050. This analysis compares regional GHG emissions projections for 2025, 2035, and 2050 to 2016 baseline regional GHG emissions to determine if implementation of the proposed Plan would directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016).

The 2016 GHG inventory and projections report includes 15 emissions categories calculated based on the *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (ICLEI 2019) and CARB statewide GHG inventory methodology. The projections take into account the forecast regional growth and land use change and planned transportation network improvements and programs of the proposed Plan, and the effect of existing federal and State regulations and regional policies to reduce GHG emissions. The report includes a summary of the methodologies and data used to calculate baseline emissions and emissions projections for each of the 15 emissions categories. For each emissions category the report also describes how

the methods used vary from those used in the previous 2012 GHG inventory prepared as part of the 2015 Regional Plan.

The 2016 inventory and projections report takes into account existing laws, regulations, programs, and policies in effect as of May 2021 to project future GHG emissions out to 2050. The report does not attempt to predict the types of legal, regulatory, policy, economic, technological, and social changes that governments, the private sector, and individuals might make to reduce GHG emissions by 2050. This is because there is substantial uncertainty in projecting future emissions especially for 2050; in general, the level of uncertainty regarding future emissions increases as the projections get closer to 2050. The 2016 inventory and projections report does not and cannot account for several factors that are unknown at this time but will affect future GHG emissions in the San Diego region: future changes in local, State, and federal laws, regulations, and public policy; local, State, national, and global economic conditions; multinational or global agreements; investments and decision-making by private sector actors, including local, national, and global businesses; and personal and group behavior. The following analysis is therefore considered conservative and may overstate actual GHG emission trends in future years.

The 2016 inventory and projections report provides two emissions estimates for the on-road transportation – passenger cars and light-duty vehicles sector: one that reflects implementation of Parts One and Two of the SAFE Rule (discussed in greater detail in Section 4.8.2, *Regulatory Setting*), and another that projects emissions assuming Parts One and Two of the SAFE Rule are not implemented. The analysis included in this EIR reflects implementation of SAFE Rule Parts One and Two. GHG emissions from the two on-road transportation sectors included in this analysis – passenger cars and light-duty vehicles and heavy duty-trucks and vehicles – were calculated using CARB’s EMFAC2017 model, which was the most recent version available when EIR preparation commenced following publication of the NOP in November 2016.

For the purpose of evaluating impacts under Impact GHG-1, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because total annual regional GHG emissions are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

From 2016 to 2025, the region is forecast to increase by 161,338 people, 97,661 housing units, and 115,328 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 22.4 MMTCO₂e in 2025, or about 13 percent less than total GHG emissions in 2016 (Table 4.8-6).

**Table 4.8-6
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2025**

GHG Emissions Category	2016 (Annual MMTCO_{2e})¹	2025 (Annual MMTCO_{2e})¹
On-Road Transportation– Passenger Cars and Light-Duty Vehicles ²	10.45	8.0
Electricity	5.3	3.4
Natural Gas	3.1	3.3
Industrial	2.1	2.2
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.4
Off-Road Transportation	0.6	0.7
Solid Waste	0.6	0.6
Water	0.2	0.3
Aviation	0.2	0.3
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission (MMTCO_{2e})	25.8	22.4
Change from 2016 to 2025	- 3.4 MMTCO_{2e} (13%)	

Source: Appendix H.

¹ Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change’s Fourth Assessment Report.

² Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the “One National Program” that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2025 would be approximately 7.8 MMTCO_{2e}, 0.2 MMTCO_{2e} (2.5%) lower than with the SAFE Rule implementation.

While the San Diego region is forecast to experience population, employment, and housing growth by 2025, overall GHG emissions are anticipated to decrease compared to 2016 levels due to the implementation of a series of regulations combined with the land use planning strategies and transportation network improvement programs. For instance, while total VMT in the San Diego region is projected to increase by 2025 (see Table H.5 of Appendix H) as compared to total VMT in 2016, total GHG emissions associated with this VMT in 2025 would be less than in 2016 as vehicles become more fuel efficient to comply with the CAFE standards and electrified as CARB’s ACC Program continues to be implemented.

The GHG emissions associated with the electricity and natural gas sectors reflect CEC’s latest California Energy Demand 2020–2030 Revised Forecast in the SDG&E service area and account for the improved electricity efficiency and increased renewable energy capacity from photovoltaics (PV) and non-PV electricity generation, behind-the-meter storage,² current electricity rate structure, and the appliance and building energy efficiency

² Behind-the-meter storage refers to an energy storage system that powers a house or building without passing through an electric meter.

of the California Energy Code up to 2019. Emissions also account for the statutory requirements of SB 100 and the RPS, which require utilities to procure a greater percentage of their electricity supplies from renewable resources by certain benchmark years, including 44 percent of retail sales by 2024.

Notably, as the California Energy Code continues to be updated on a triennial basis, future iterations of the California Code will likely become more energy efficient than the current 2019 code as well as include restrictions on the use of on-site natural gas consumption as the building sector trends towards decarbonization. However, the level of energy efficiency and allowed on-site natural gas associated with future versions of the California Energy Code are unknown at this time because the specific requirements of such future code versions are not known; therefore, emissions from building energy consumption in 2025 may be overestimated.

Additionally, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that will reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities in the San Diego region anticipated to experience the most population, jobs, and housing growth by 2025 include San Diego, Chula Vista, Escondido, and San Marcos. Major transportation network improvements include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift, new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE), Interchange and Arterial Operational improvements at SR 94 and SR 125. Smart Intersection Systems (SIS) technology investments would be made on the following corridors: I-5, I-15, SR 15, I-805, I-8, SR 78, SR 56, SR 52, SR 94, SR 54, SR 163, SR 125, SR 905, and SR 67. Approximately 10 additional regional active transportation projects would be constructed by 2025 in addition to funding support of local bike investments made by the jurisdictions. Transit Leap improvements and programs would include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor along with a station addition in the Gaslamp Quarter, San Diego, and the inclusion of local bus route frequency enhancements.

These projects would play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed high-occupancy vehicle (HOV), carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2025 as compared to 2016.

2025 Conclusion

As shown in Table 4.8-6, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 13 percent lower in 2025 relative to 2016. Therefore, this impact (GHG-1) in the year 2025 is less than significant.

2035***Regional Growth and Land Use Change and Transportation Network Improvements and Programs***

From 2016 to 2035, the region is forecasted to increase by 310,838 people, 219,311 housing units, and 275,056 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 19.1 MMTCO_{2e} in 2035, or about 26 percent less than GHG emissions in 2016 (Table 4.8-7).

While the San Diego region is forecast to experience population, employment, and housing growth by 2035, overall GHG emissions are anticipated to decrease compared to 2016 levels due to regulations and programs implemented on the State and regional levels to reduce emissions of GHGs. These programs include implementation of the RPS and SB 100 (60% by 2030), the ACC programs, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, solid waste diversion, refrigerant programs, and emission standards for off-road equipment. The discussion of regulations and programs provided above for 2025 also would apply to emissions in 2035. Also refer to Appendix H for a detailed discussion of how federal and State regulations and programs are accounted for in the regional GHG emissions projections for 2035).

**Table 4.8-7
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2035**

GHG Emissions Category	2016 (Annual MMTCO_{2e})¹	2035 (Annual MMTCO_{2e})¹
On-Road Transportation– Passenger Car and Light-Duty Vehicles ²	10.45	6.45
Electricity	5.3	1.3
Natural Gas	3.1	3.4
Industrial	2.1	2.4
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.5
Off-Road Transportation	0.6	0.8
Solid Waste	0.6	0.7
Water	0.2	0.2
Aviation	0.2	0.3
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission (MMTCO_{2e})	25.8	19.1
Change from 2016 to 2035	- 6.7 MMTCO_{2e} (26%)	

Source: Appendix H.

¹ Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change’s Fourth Assessment Report.

² Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the “One National Program” that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2035 would be approximately 5.9 MMTCO_{2e}, 0.6 MMTCO_{2e} (9%) lower than with the SAFE Rule implementation.

As described above for 2025, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that would reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities anticipated to experience the most population, jobs, and housing growth between 2026 and 2035 include the cities of San Diego, Chula Vista, Escondido, La Mesa, and National City. Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, and I-805. By 2035, there would be five additional improvements to local arterial streets and over 50 additional regional active transportation projects in locations throughout the region. Transit Leap improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, the Del Mar Tunnel, new stations at Central Mobility Hub and at Camp Pendleton, and a grade separation at Leucadia Boulevard. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa in addition to light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. An additional Anchor Mobility Hub is assumed at the San Ysidro Transit Center.

These projects would play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed HOV, carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements and programs of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2035 as compared to 2016.

2035 Conclusion

As shown in Table 4.8-7, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 26 percent lower in 2035 relative to 2016. Therefore, this impact (GHG-1) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

From 2016 to 2050, the region is forecasted to increase by 436,563 people, 280,744 housing units, and 439,899 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 18.35 MMTCO₂e in 2050, or about 29.8 percent less than GHG emissions in 2016 (Table 4.8-8).

Table 4.8-8
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2050

GHG Emissions Category	2016 (Annual MMTCO_{2e})¹	2050 (Annual MMTCO_{2e})¹
On-Road Transportation – Passenger Car and Light-Duty Vehicles ²	10.45	6.34
Electricity	5.3	0.2
Natural Gas	3.1	3.6
Industrial	2.1	2.5
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.5
Off-Road Transportation	0.6	1.0
Solid Waste	0.6	0.7
Water	0.2	(0.0)
Aviation	0.2	0.4
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission (MMTCO_{2e})	<u>25.826</u>	<u>18.3</u>
Change from 2016 to 2050	<u>-7.58 MMTCO_{2e} (29.28%)</u>	

Source: Appendix H.

¹ Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.

² Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2050 would be approximately 5.7 MMTCO_{2e}, 0.7 MMTCO_{2e} (11%) lower than with the SAFE Rule implementation.

While the San Diego region is forecast to experience population, employment, and housing growth by 2050, overall GHG emissions are anticipated to decrease by 2050 due to the implementation of a series of regulations combined with the land use planning strategies and transportation network improvement programs. These programs include implementation of SB 100 (100 percent of retail electricity sales from eligible renewable energy resources and zero-carbon resources by 2045), the ACC programs, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, solid waste diversion, refrigerant programs, and emission standards for off-road equipment. The discussion of regulations and programs provided above for 2025 and 2035 also would apply to emissions in 2050. Also refer to Appendix H for a detailed discussion of how federal and State regulations and programs are accounted for in the regional GHG emissions projections for 2035.

Additionally, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that would reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities in the San Diego region anticipated to experience the most population, jobs, and housing growth between 2036 and 2050 include the cities of San Diego, Chula Vista, Escondido, La Mesa, National City, and San Marcos.

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905, and on I-5, I-8, I-15, and I-805. Rural corridor investments are assumed on SR 76, SR 78, SR 79, SR 94, and I-8. By 2050, there are nearly 60 additional regional active transportation projects planned in locations throughout the region. Transit Leap network improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, Sorrento Mesa and UTC tunnels, and a new station at Balboa Avenue. The 2050 phase also includes three major new commuter rail lines. These include routes between Downtown San Diego and El Cajon (Route 581), National City to the U.S. Border (Route 582 [Extension]), and Central Mobility to the U.S. Border (Route 583). They also include light rail investments with SPRINTER, Green Line, and Orange Line double tracking. Double tracking and grade separations on the Blue Line also are included.

These projects play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed HOV, carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2050 as compared to 2016.

2050 Conclusion

As shown in Table 4.8-8, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 298 percent lower in 2050 relative to 2016. Therefore, this impact (GHG-1) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, *Existing Conditions*, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-2 CONFLICT WITH THE SANDAG REGION'S ACHIEVEMENT OF SB 375 GHG EMISSIONS REDUCTIONS TARGETS FOR 2035

ANALYSIS METHODOLOGY

The analysis evaluates whether the proposed Plan would conflict with SB 375 GHG emission reduction target for 2035. SB 375 requires CARB to develop and update regional GHG emission reduction targets compared to 2005 emissions for passenger vehicles for 2020 and 2035. The updated targets established for SANDAG by CARB in 2018 are to reduce per capita CO₂ emissions 15 percent below 2005 levels by 2020, and to 19 percent below 2005 levels by 2035 (CARB 2018c). CARB has not developed any post-2035 targets (CARB 2018c).

The San Diego region exceeded the 2020 target because by 2020 it had reduced per capita CO₂ emissions from passenger cars and light-duty trucks to 17 percent below 2005 levels. Because the proposed Plan is anticipated to be adopted in 2021, its implementation is unrelated to SANDAG's compliance with the 2020 target, because 2020 is in the past. Therefore, compliance with the 2020 target is not addressed herein. SANDAG's methodology for measuring 2020 target achievement is provided in the Sustainable Communities Strategy documentation prepared for the proposed Plan and has been submitted to CARB for review (Appendix I).

Because SB 375 does not establish 2050 GHG emissions reduction targets, this EIR does not present a 2050 analysis of conflicts with SB 375 emissions reduction targets.

The SB 375-related GHG emissions reductions in 2035 from implementation of the proposed Plan were calculated by SANDAG using the CARB model EMFAC2014 and adjustment factors provided by CARB to account for differences in emissions rates between EMFAC2007 (used to set the 2005 baseline and original targets in 2010) and EMFAC2014. Off-model calculators were used to calculate emission reductions associated with strategies that are not accounted for in SANDAG travel demand modeling tools. Refer to Appendix I for discussion of the CARB methodology that SANDAG is required to use when performing SB 375 calculations, including the reasons for using the EMFAC2014 model.

For the purpose of evaluating impacts under Impact GHG-2, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because the per-capita CO₂ emissions from passenger cars and light-duty trucks addressed by SB 375 targets are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

CARB requires SANDAG to reduce per capita CO₂ emissions from passenger cars and light-duty trucks to 19 percent below 2005 levels by 2035. Table 4.8-9 summarizes the CO₂ per capita reductions from on-model and off-model strategies after accounting for the EMFAC adjustment factor and induced demand adjustment factor. As shown in Table 4.8-9, implementation of the Proposed Plan would reduce per capita CO₂ emissions from passenger cars and light-duty trucks to ~~20.0~~20.4 percent below 2005 levels by 2035. Therefore, implementation of regional growth and land use change and transportation network improvements and programs would not conflict with SB 375 GHG emission reduction targets.

**Table 4.8-9
SB 375 GHG Reduction Targets and GHG Emissions under the Proposed Plan from Passenger Vehicles
and Light-Duty Trucks, 2035**

	Per Capita Reductions from 2005 Levels
Per Capita Reduction under the Proposed Plan (On-Model Results Only)	-19.03 <u>-19.3</u> %
Per Capita Reduction under the Proposed Plan (Off-Model Results Only)	-3.05 <u>-3.03</u> %
CARB Adjustment Factor for EMFAC 2007–2014 ¹	+1.7%
Induced Demand Adjustment Factor ²	+0.38 <u>+0.20</u> %
Per Capita Reductions	-20.0 <u>-20.4</u> %

	Per Capita Reductions from 2005 Levels
CARB Target	-19%

Source: Appendix I.

¹The GHG reductions for the 2021 Regional Plan were calculated using the CARB model EMFAC 2014 and adjustment factors provided by CARB to account for differences in emissions rates between EMFAC 2007 (used to set the original targets in 2010) and EMFAC 2014.

²The induced demand adjustment factor methodology is described in Attachment 3 of Appendix I.

2035 Conclusion

Implementation of the proposed Plan would not conflict with SB 375 emission reduction targets for 2035 because it would result in a 20 percent reduction in per capita CO₂ emissions from passenger cars and light-duty trucks from 2005 levels by 2035, which exceeds the 2035 target of a 19 percent reduction for the SANDAG region. Therefore, this impact (GHG-2) in the year 2035 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-3 CONFLICT WITH OR IMPEDE ACHIEVEMENT OF AN AT LEAST 30% REDUCTION IN PER CAPITA GHG EMISSIONS FROM THE ENTIRE ON-ROAD TRANSPORTATION SECTOR BY 2035 COMPARED TO EXISTING CONDITIONS (2016)

ANALYSIS METHODOLOGY

The analysis evaluates whether the proposed Plan would achieve at least a 30 percent reduction in per capita emissions from the entire on-road transportation sector by 2035 as compared to baseline conditions (2016). This target was included in SANDAG Board of Directors Resolution No. 2021-17, which was adopted April 9, 2021. For purposes of this analysis, the entire on-road transportation sector includes the following sectors from the regional inventory:

- On-road transportation – passenger cars and light-duty trucks, and
- On-road transportation – heavy-duty trucks and vehicles.

To perform this analysis, SANDAG has summed existing GHG emissions in the above sectors for 2016, and divided by the 2016 regional population to determine existing on-road transportation emissions per capita. SANDAG used the same method to determine on-road transportation emissions per capita in 2035. The per-capita metrics for 2016 and 2035 are then compared to determine if the proposed Plan would achieve the at least 30 percent reduction identified in Resolution No. 2021-17.

The GHG emissions used in this analysis were calculated using CARB's EMFAC2017 model, which was the most recent version available when EIR preparation commenced following publication of the NOP in November 2016.

For the purpose of the Impact GHG-3 analysis, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because on-road

transportation sector GHG emissions are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Per capita emissions from the entire on-road transportation sector were 3.714 MTCO₂/person/day in 2016. Under implementation of the proposed Plan, GHG emissions from the on-road transportation sector would be reduced to 2.246 MTCO₂/person/day in 2035, a ~~40.39~~ percent reduction from 2016 levels. The GHG emissions reductions under the proposed Plan would exceed the SANDAG Board Resolution target of a 30 percent reduction by 2035 by 10.9 percent (Table 4.8-10). Therefore, implementation of regional growth and land use change and transportation network improvements and programs would not conflict with or impede achievement of an at least 30 percent reduction in per capita GHG emissions from the entire on-road transportation sector by 2035 compared to existing conditions (2016). This impact would be less than significant.

**Table 4.8-10
Calculation to Estimate Per-Capita GHG Emissions from the Entire On-Road Transportation Sector,
2035 compared to 2016**

Components Used in the Calculation	2016	2035
Total Emissions from the Entire On-Road Transportation Sector (MMTCO ₂)	12,233	8,121 ¹
Total Population in the San Diego Region (Residents)	3,287,280	3,620,348
Per Capita Emissions (MTCO ₂ /capita)	3.714	2.246
Percent Reduction under the proposed Plan, 2035 compared to 2016	-40.39%	

Source of Total Emissions from the Entire On-Road Transportation Sector: Appendix H.

¹ Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, on-road transportation emissions in 2035 would be approximately 7.56 MMTCO₂e, 0.6 MMTCO₂e (7%) lower than with the SAFE Rule implementation. The resultant per capita emissions would be 2.079 MTCO₂/capita.

2035 Conclusion

Implementation of the proposed Plan would reduce 2035 per-capita GHG emissions from the on-road transportation sector by 39 percent compared to 2016 levels, which is higher than the 30 percent reduction identified in SANDAG Board Resolution No. 2021-17. Therefore, this impact (GHG-3) in the year 2035 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

**GHG-4 CONFLICT WITH OR IMPEDE THE IMPLEMENTATION OF LOCAL PLANS ADOPTED FOR
THE PURPOSE OF REDUCING GHG EMISSIONS**

ANALYSIS METHODOLOGY

Section 4.8.2, *Regulatory Setting*, describes adopted CAPs, GHG reduction plans, and/or sustainability plans relevant to the proposed Plan. Most of SANDAG's member jurisdictions have adopted CAPs, GHG reduction plans, and/or sustainability plans that set goals and targets for the reduction of GHG emissions, and outline policies and/or measures to achieve those goals and targets. Generally, these local targets are developed in consideration of the State's long-term GHG reduction goals by legislatively significant benchmark years (e.g., 2030).

The proposed Plan is generally evaluated against the goals, measures, and implementing actions of local CAPs and GHG reduction plans to determine any conflicts in this analysis. A detailed CAP consistency analysis by jurisdiction is provided in Appendix J. The analysis of the proposed Plan and local CAPs is provided for 2025, 2035, and 2050. Although no adopted local CAPs or GHG reduction plans have 2050 horizon years, the analysis addresses potential conflicts between the proposed Plan and such adopted plans in 2050 because the effects of these plans would extend beyond their horizon years, including through 2050. Because the local CAPs establish goals, objectives, and policy measures for both regional growth and land use change and transportation network improvements, the analysis of conflicts with local climate action plans does not separate the two categories. The impact assessment addresses both forecast regional growth and land use change and the planned transportation network improvements and programs.

IMPACT ANALYSIS

2025, 2035, and 2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As of June 2021, 16 of the 19 local jurisdictions in the San Diego region have an adopted CAP or similar plan to reduce GHG emissions. One city and the County do not have an adopted CAP or plan to reduce GHG emissions but are in the process of preparing one; another city does not have an adopted plan and is not in the process of preparing one.

An analysis of whether the proposed Plan would conflict with the policies, measures, and actions of adopted plans is provided in Appendix J. Typically, CAPs include various measures and actions to reduce GHG emissions by sector including, but not limited to, transportation, energy, solid waste, water and wastewater, and carbon sequestration. Common measures to reduce emissions from the transportation sector include the promotion of near-zero and zero-emission vehicles and associated infrastructure, the deployment of TDM strategies such as iCommute and commuter benefits programs, and the development of Complete Streets that include pedestrian and bicycle programs, among others. A major objective of the proposed Plan is to reduce GHG emissions from passenger cars and light-duty trucks. Therefore, many transportation network improvements and programs that would be implemented under the proposed Plan would complement these existing and future local efforts to reduce GHG emissions from the on-road transportation sector.

Other examples of local CAP measures that reduce GHG emissions include renovations to existing buildings to be more energy efficient, deployment of solar PV to existing and new residential and nonresidential buildings, additional waste diversion goals exceeding statewide requirements, capture and control of landfill emissions, improved water efficiency in existing and new residential and nonresidential development, and tree planting to increase carbon sequestration. These implementing actions would be outside of the scope of the proposed Plan and SANDAG's direct authority and therefore, their implementation would not be impeded or obstructed

by implementation of the regional growth and land use changes and transportation network improvements and programs included in the proposed Plan.

2025, 2035, and 2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs under the proposed Plan would not conflict with or impede the implementation of adopted CAPs, GHG reduction plans, and/or sustainability plans. Therefore, this impact (GHG-4) in the years 2025, 2035, and 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-5 **BE INCONSISTENT WITH THE STATE’S ABILITY TO ACHIEVE THE 2030 REDUCTION TARGET OF SB 32 AND LONG-TERM REDUCTION GOALS OF EXECUTIVE ORDERS S-3-05 AND B-55-18**

ANALYSIS METHODOLOGY

This analysis evaluates whether the proposed Plan would be inconsistent with the State’s ability to achieve the SB 32 target of reducing statewide GHG emissions to 40 percent below the 1990 levels by 2030 and whether the proposed Plan is inconsistent with the State’s ability to achieve the EO B-55-18 goal of statewide carbon neutrality by 2045 across all sectors. The analysis also evaluates whether the proposed Plan is inconsistent with the State’s ability to achieve the EO S-3-05 goal of reducing California’s GHG emissions to 80 percent below 1990 levels by 2050.

To perform this analysis, SANDAG identified estimated emissions reduction reference points for the region for 2030, 2045, and 2050, based on the target dates from SB 32 and Executive Orders S-3-05 and B-55-18. The GHG emissions results for 2030, 2045, and 2050 from the 2016 GHG inventory and projections prepared for Appendix H are then compared to the reference points. Note that there is no requirement that the SANDAG region’s emissions be reduced by the same percentage (“equal share”) as the statewide percentage in order for the State to achieve the goals of SB 32, EO S-3-05, and EO-B-55-18. For purposes of this EIR, the proposed Plan’s impacts nevertheless are considered significant if total emissions in the San Diego region exceed the estimated 2030, 2045, and 2050 GHG reduction reference points.

Because there is not an available 1990 emissions inventory for the San Diego region that is comparable to the regional inventory and projections prepared for the proposed Plan, reference points were developed for this analysis to show the level of GHG reductions needed between 2016 (the baseline year of the inventory and

proposed Plan) and future years of 2030, 2045, and 2050 that would be equivalent to level of reductions needed when measured against 1990.³

In 2016, total statewide emissions equaled 429 MMTCO_{2e}, which was 2 MMTCO_{2e} (less than 1 percent) lower than the statewide 1990 emissions level of 431 MMTCO_{2e} (CARB 2018d). Because total statewide emissions in 2016 were essentially equal to the statewide 1990 level, for purposes of this analysis, total regional emissions in 2016 are assumed to be representative of total regional emissions in 1990. Therefore, to identify the reference point for 2030 a 40 percent reduction was applied to the total regional emissions in 2016, which results in a 2030 reference point of 15.6 MMTCO_{2e}. Similarly, to identify a reference point for 2050, an 80 percent reduction was applied to the total regional emissions in 2016, which results in a 2050 reference point of 5.2 MMTCO_{2e}. The reference point for 2045 is 0 MMTCO_{2e} because EO-55-18 sets a goal of statewide carbon neutrality no later than that year.⁴

For purposes of evaluating impacts under Impact GHG-5, because the SB 32, EO S-3-05, and EO-B-55-18 targets and regional reference points reflect GHG emissions from the proposed Plan's regional growth and land use change and the planned transportation network improvements and programs, the analysis does not separate the two categories. The impact assessment includes both forecasted regional growth and land use change and planned transportation network improvements and programs.

IMPACT ANALYSIS

2030

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Total regional emissions in 2016 were estimated to be approximately 25.8 MMTCO_{2e}. Under implementation of the proposed Plan, total GHG emissions for the San Diego region would be 20.34 MMTCO_{2e} in 2030, which is above the 2030 reference point of 15.6 MMTCO_{2e} (Table 4.8-11). Therefore, total regional emissions in 2030 under implementation of regional growth and land use change and transportation network improvements and programs would be inconsistent with the levels of reductions required by SB 32.

³ The 2012 inventory report prepared for the 2015 Regional Plan included an estimated 1990 emissions level for the San Diego region, but it was prepared using data sources and methods that do not allow for a direct comparison with the GHG emissions projections provided in the 2016 GHG Inventory and Projections report prepared for the proposed Plan.

⁴ As of July 2021, the State has yet to develop or adopt an overarching plan that provides the framework for how California will achieve carbon neutrality by 2045. It is anticipated that achieving this goal would require a combination of GHG emissions reduction and GHG emissions removal strategies; however, it is unknown at this time what combination of reduction and removal strategies will be pursued in California to achieve this goal. Therefore, in this EIR SANDAG uses a net-zero GHG emissions reference point for 2045 for evaluating consistency with EO B-55-18 with the acknowledgement that, between now and 2045, the State is likely to complete a plan for achieving carbon neutrality that includes details addressing which, if any, sectors will have greater than zero emissions, and identifies GHG emissions removal strategies that would offset residual emissions to result in net zero total emissions.

**Table 4.8-11
Reference Point and GHG Emissions under the Proposed Plan, 2030**

	Annual Emissions (MMTCO_{2e})
GHG Emissions in the San Diego Region in 2016	25.8
GHG emissions in the San Diego Region in 2030 ^{1,2}	20.34
2030 Reference Point (40% below 2016 levels)	15.6

Source: Appendix H.

¹Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.

² Emissions estimates for passenger vehicles and light-duty trucks reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, total emissions in the region would be 19.9 MMTCO_{2e}, 0.45 MMTCO_{2e} (2%) lower than with the SAFE Rule implementation.

As shown in Table 4.8-11, the projected emissions in the San Diego region in 2030 would not meet the 2030 reference point of 15.6 MMTCO_{2e} following implementation of the proposed Plan. However, as discussed in the 2017 Scoping Plan, GHG emissions reduction will need to be achieved by every GHG emitting sector beyond the land use and transportation sectors to achieve the statewide 2030 target.

Under proposed Plan implementation, total GHG emissions from the on-road transportation would decrease to 7.24 MMTCO_{2e} by 2030, which is 3.21 MMTCO_{2e} (31 percent) lower than the 2016 level of 10.45 MMTCO_{2e} (Appendix H). These reductions are achieved through a combination of the proposed Plan's land use pattern and transportation network improvements and programs that reduce VMT and improve the efficiency of vehicle travel, as well as the federal and State regulations improving vehicle efficiency and increasing use of zero-emission vehicles. Despite these transportation-related reductions under proposed Plan implementation, total regional GHG emissions would exceed the reference point for 2030.

To meet the statewide target of SB 32, California will need to achieve reductions across all GHG-emitting sectors including, but not limited to, the energy, solid waste, wastewater, industrial, agricultural, and high-GWP sectors, among others. The major strategies identified in the 2017 Scoping Plan to reduce GHG emissions from these sources and achieve the statewide 2030 target are summarized in Table 4.8-13.

2030 Conclusion

Because the total emissions in the San Diego region of 20.34 MMTCO_{2e} in 2030 would exceed the regional 2030 GHG reference point of 15.6 MMTCO_{2e} (which is based on SB 32 targets for 2030), the proposed Plan's 2030 GHG emissions would be inconsistent with the State's ability to achieve the goals of SB 32. Therefore, this impact (GHG-5) in the year 2030 would be significant.

2045 and 2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Total regional emissions in 2016 were estimated to be 25.8 MMTCO_{2e}. Under implementation of the proposed Plan, total GHG emissions for the San Diego region would be 18.2 MMTCO_{2e} in 2045 and 18.3 MMTCO_{2e} in

2050,⁵ which is above the 2045 reference point of 0 MMTCO_{2e} and 2050 reference point of 5.2 MMTCO_{2e} (Table 4.8-12). Therefore, total regional emissions in 2045 and 2050 under implementation of regional growth and land use change and transportation network improvements and programs would be inconsistent with the levels of reductions required by EO S-3-05 and EO B-55-18.

**Table 4.8-12
Reference Points and GHG Emissions under the Proposed Plan, 2045 and 2050**

	Annual Emissions (MMTCO _{2e})
GHG Emissions in the San Diego Region in 2016	25.8
GHG Emissions in the San Diego Region in 2045 with Proposed Plan ^{1,2,3}	18.2
2045 Reference Point (carbon neutral target in EO B-55-18)	0
GHG Emissions in the San Diego Region in 2050 with Proposed Plan ^{1,2,3}	18.3
2050 Reference Point (80% below 2016 levels per EO S-3-05)	5.2

Source of GHG Emissions in the San Diego Region: Appendix H.

¹Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.

² Emissions estimates for passenger vehicles and light-duty trucks reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, total emissions in the region in 2045 would be approximately 17.5 MMTCO_{2e}, 0.75 MMTCO_{2e} (4%) lower than with the SAFE Rule implementation, and in 2050 would be approximately 17.67 MMTCO_{2e}, 0.63 MMTCO_{2e} (3%) lower than with the SAFE Rule implementation.

³ Emissions estimates reflect implementation of the land use changes and planned transportation network improvements included in the proposed Plan.

As addressed in Impact GHG-2, the proposed Plan would reduce per capita CO₂ emissions from passenger cars and light-duty trucks to meet the per capita target for 2035 established by SB 375. These reductions are achieved through a combination of land use planning and transportation network improvements and programs that reduce VMT and improve the efficiency of vehicle travel. In addition, the proposed Plan would reduce per capita GHG emissions from the entire on-road transportation sector by ~~40-49~~ percent in 2035 relative to 2016 levels, as detailed in Impact GHG-3. The reductions from the entire on-road transportation sector account for the land use and transportation components of the proposed Plan as well as the federal and State regulations improving vehicle efficiency and increasing use of zero-emission vehicles.

⁵ Total GHG emissions levels are projected to be generally the same in 2045 and 2050, at 18.2 and 18.3 MMTCO_{2e}, respectively. One reason is because the adopted laws and regulations accounted for in the projections are expected to be in place for the duration of the planning period, but many do not place additional requirements on the regulated entities/activities after 2025 or 2030, so their effect on emissions-generating activities (e.g., driving, building energy use) becomes constant during the later years of the proposed Plan, while the total amount of emissions-generating activities continues to increase through the proposed Plan horizon year of 2050 due to forecasted growth. The downward trend in total GHG emissions from 2016 to 2045 shows that the effectiveness of adopted laws and regulations and the proposed Plan in reducing total GHG emissions outweighs the increase in emissions-generating activities that occurs under the proposed Plan. The flatline in total GHG emissions from 2045 to 2050 shows that the adopted laws and regulations and the proposed Plan would not be able to achieve additional reductions in total GHG emissions because of the forecasted growth and associated increase in emissions-generating activities that would occur during this period.

Despite these transportation-related reductions under proposed Plan implementation, total regional GHG emissions would exceed the reference points for 2045 and 2050. Additional reductions would be needed in the transportation sector and all other GHG sectors to achieve the goals of EO B-55-18 and S-3-05. The other sectors include how energy is sourced, generated, and used; how solid waste is generated, managed, and disposed of; treatment, conveyance, and uses of water supply and wastewater; energy sources and feedstocks for industrial processes and activities; management of natural and working lands; and uses of high-GWP gases. Achieving GHG reductions from these sectors at the scale required to meet the goals of EO B-55-18 and S-3-05 would require major changes to government regulation, private sector activity, consumer behavior, and other facets of life throughout California and beyond.

2045 and 2050 Conclusion

Because total regional GHG emissions in 2045 and 2050 would exceed the 2045 and 2050 reference points of net zero and 5.2 MMTCO_{2e}, respectively (based on the goals of EO B-55-18 and S-3-05), the proposed Plan's 2045 and 2050 GHG emissions would be inconsistent with the State's ability to achieve the goals of EO B-55-18 and S-3-05. Therefore, this impact (GHG-5) in the years 2045 and 2050 would be significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

MITIGATION MEASURES

GHG-5 **BE INCONSISTENT WITH THE STATE'S ABILITY TO ACHIEVE THE 2030 REDUCTION TARGET OF SB 32 AND LONG-TERM REDUCTION GOALS OF EXECUTIVE ORDERS S-3-05 AND B-55-18**

Basis for Selection of GHG Mitigation Measures

Overview

Many features currently included in the proposed Plan (e.g., the SCS, increased transit, and active transportation investments) have the effect of reducing GHG emissions that might otherwise occur. Mitigation measures presented in this section are additional feasible GHG reduction measures not included in the proposed Plan that SANDAG or other agencies could implement. Presented below are three types of feasible GHG reduction mitigation measures presented later in this section:

- Plan- and policy-level mitigation measures SANDAG has committed to implement.
- Mitigation measures for transportation network improvements and programs, which SANDAG has committed to implement for its projects and which other transportation project sponsors can and should implement for their projects.
- Mitigation measures for development projects implementing regional growth and land use changes, which local jurisdictions can and should implement.

While SANDAG has the authority to implement the mitigation measures it has committed to, it has no legal or jurisdictional authority to require other transportation project sponsors or local jurisdictions to implement

mitigation measures for specific projects for which they have responsibility and jurisdiction. As explained in the introduction to Chapter 4, mitigation can include measures that are within the responsibility and jurisdiction of another public agency. SANDAG in its CEQA findings may find that those measures assigned to other agencies can and should be adopted by those other agencies (CEQA Guidelines Section 15091(a)(2)). Additional Plan-level measures to reduce GHG emissions are included as components of the project alternatives in Chapter 6, rather than as individual mitigation measures in this section. These include still more compact land use patterns and policies to reduce transit fares, increase parking prices, and establish road user fees.

To provide context for the EIR’s proposed GHG mitigation measures, it is important to first understand the State’s strategies for achieving statewide GHG reductions under SB 32, EO S-3-05, and EO B-55-18. It is also important to understand what GHG reduction measures are included in the proposed Plan, what GHG reductions are being achieved as a result of the 2015 Regional Plan EIR’s mitigation measures, and what other SANDAG GHG reduction plans and programs already exist. This information is provided below, following which the proposed Plan EIR GHG measures are presented.

Background

Background: State Strategy and Measures to Achieving the SB 32 Target

The 2017 Scoping Plan establishes the statewide framework for achieving the goal of a 40 percent reduction from 1990 GHG levels in 2030 and put post-2030 statewide emissions on a downward trajectory toward the long-term statewide GHG reduction goals for 2045 and 2050. The Scoping Plan accounts for several major climate statutes and regulations that will be integral to achieving the scale of GHG reductions necessary to achieve the statewide 2030 target and post-2030 goals. The 2017 Scoping Plan indicates that to achieve these targets and goals, long-term investments in renewable energy generation, electrified transportation, energy efficient and decarbonized buildings, enhanced industry efficiency, restoration of California’s natural and working lands, and sustainable solid waste management are among many actions the State must take. CARB notes that to reach the State’s long-term GHG reduction goals, local, regional, and State agencies must engage with each other and local stakeholders to coordinate climate change solutions and programs to reduce local GHG emissions. The proposed Plan would assist in meeting the statewide 2030 GHG target in putting statewide emissions on a downward trajectory toward statewide post-2030 goals by reducing GHG emissions in the passenger vehicle sector through the implementation of transportation network improvements and programs and efficient land use patterns to ultimately reduce VMT and the combustion of gasoline and diesel fuels pursuant to SB 375.

Table 4.8-13 summarizes the 2017 Scoping Plan strategies to achieve the SB 32 statewide 2030 reduction target.

**Table 4.8-13
2017 Scoping Plan Strategies to Achieve the Statewide 2030 Target**

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 (MMTCO_{2e})¹
Cap-and-Trade	This statute clarifies the role of the Cap-and-Trade Program through 2030. In addition, the statute requires CARB to include a price ceiling, price containment points, specific offset credit usage limits for projects with direct	236 (38% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 (MMTCO _{2e}) ¹
	<p>environmental benefits within the state, and industry assistance factors for allowance allocation as part of the regulation. Other provisions include developing approaches to increase offset projects with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions, with a new Compliance Offsets Protocol Task Force providing guidance to CARB. The statute establishes a new Independent Emissions Market Advisory Committee to report annually on the environmental and economic performance of the Cap-and-Trade Regulation and other climate policies. Two reports are required: one by the California Workforce Development Board on resources needed for education, job training, and workforce development related to meeting GHG reduction goals; the other by the Legislative Analyst's Office on the economic impacts and benefits of the GHG targets.</p>	
Short-Lived Climate Pollutants	<p>The May 2014 First Update to the Climate Change Scoping Plan identified the need for a short-lived climate pollutant reduction strategy (SLCP Strategy) to minimize the impact of these short-term, yet powerful, climate forcers. SB 605 requires CARB to develop a plan to reduce emissions of SLCPs, and SB 1383 requires CARB to approve and begin implementing the plan by January 1, 2018. SB 1383 also sets targets for statewide reductions of SLCPs from 2013 levels by 2030—specifically, a 40 percent reduction of methane and HFCs, and a 50 percent reduction of anthropogenic black carbon. Over three-quarters of HFC emissions in California come from the use of refrigerants in the commercial, industrial, residential, and transportation sectors. The annual Montreal Protocol Meeting of Parties in October 2016 resulted in an international agreement to globally phase down HFC production. Per the SLCP strategy, depending on the level of future HFC reductions expected from this agreement, the State may also:</p> <ul style="list-style-type: none"> • Consider placing restrictions on the sale or distribution of refrigerants with a potential GWP >2,500; and • Consider prohibiting refrigerants with a GWP >150 in new stationary refrigeration equipment and refrigerants with a GWP >750 for new stationary air-conditioning equipment. <p>The strategy was approved by CARB on March 23, 2017. On October 24, 2017, CARB held a public workshop to discuss a proposal for reducing high-GWP refrigerant emissions from stationary refrigeration and air conditioning equipment using a two-step process: (1)</p>	217 (35% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 (MMTCO _{2e}) ¹
	begin a rulemaking process to adopt into State regulations the EPA's Significant New Alternatives Policy Rule provisions as they relate to prohibitions on certain HFCs; and (2) further evaluate the proposed HFC mitigation strategies in the SLCP Strategy for potential future rulemakings.	
Mobile Sources Strategy & Freight	<p>The Mobile Source Strategy identifies actions to be undertaken to simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease toxics health risk, and reduce petroleum consumption from transportation emissions by 2031.</p> <p>The California Sustainable Freight Action Plan (Action Plan) is a multi-State agency effort to improve freight system efficiency by 25 percent by 2030, and to deploy over 100,000 freight vehicles and equipment capable of zero-emission operation, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030. The Action Plan Includes recommendations on:</p> <ul style="list-style-type: none"> • A long-term 2050 Vision and Guiding Principles for California's future freight transport system. • Targets for 2030 to guide the State toward meeting the Vision. • Opportunities to leverage State freight transport system investments. • Actions to initiate over the next 5 years to make progress towards the Targets and the Vision. • Pilot projects to achieve on-the-ground progress in the near-term. • Additional concepts for further exploration and development, if viable. 	64 (10% of needed reductions by 2030)
Energy Efficiency from the Residential, Commercial, Industrial, Agriculture Sectors	Various statutes to improve energy efficiency from the residential, commercial, industrial, and agricultural sectors will combine to reduce statewide GHG emissions by 64 MMTCO _{2e} by 2030. Additionally, the Title 24 California Building Code will continue to be updated on a triennial basis to become more energy efficiency and trend towards decarbonization.	64 (10% of needed reductions by 2030)
Biofuels (Low Carbon Fuel Standard)	The LCFS requires producers of petroleum-based fuels to reduce the carbon intensity of their products, beginning with a quarter of a percent in 2011 culminating in a 10% total reduction in 2020, and a 20% total reduction by 2030. Petroleum importers, refiners, and wholesalers can either develop their own low carbon fuel products, or buy LCFS Credits from other companies that develop and	25 (4% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 (MMTCO _{2e}) ¹
	sell low carbon alternative fuels, such as biofuels, electricity, natural gas, or hydrogen.	
Renewables Portfolio Standard	California's RPS Program was established in 2002 (SB 1078) with the initial requirement to generate 20% of their electricity from renewable by 2017, 33% of their electricity from renewables by 2020 (SB X1-2 of 2011), 52% by 2027 (SB 100 of 2018), 60% by 2030 (also SB 100 of 2018), and 100% from carbon-free sources by 2045 (also SB 100 of 2018).	16 (3% of needed reductions by 2030)

Source: CARB 2017a.

¹ Emissions reductions are calculated from a statewide baseline inventory level of 431 MMTCO_{2e}, which comprises the 2020 target as mandated by AB 32. Emissions reflect a cumulative estimate of total emissions that would be reduced by 2030 over a 10-year period (2021 through 2030). Based on modeling performed by CARB, these emissions represent discrete reductions and do not overlap.

Background: State Strategy to Meeting California's Mid-Century Climate Goals

As of June 2021, the State has not adopted a plan analogous to the 2017 Scoping Plan that addresses achieving the EO S-3-05 goal of reducing statewide GHG emissions by 80 percent below 1990 levels by 2050 or the B-55-18 goal of achieving statewide carbon neutrality no later than 2045. Available research and reports indicate that achieving these long-term reduction goals will require major shifts or even fundamental transformations in the economic, social, technological, and political fabric of life in California and beyond including the development of new technologies; large-scale deployment of new and existing technologies; and the roles of local, State, and the federal government in regulating economic activities and personal behaviors that affect GHG emissions.

While no formal plan exists akin to the 2017 Scoping Plan to catalogue the State's framework to meeting the longer-term goals of EO S-3-05 and B-55-18, a 2020 Report prepared by Energy and Environmental Economics (E3) has been prepared to assist CARB in the development of the 2022 Scoping Plan, which will evaluate progress towards the 2030 GHG emissions target and chart a path for deep decarbonization by 2045 to reduce and/or replace fossil fuels (E3 2020). The report found that achieving carbon neutrality by 2045 requires ambitious near-term actions around deployment of building energy efficiency; transportation and building electrification; zero-carbon electricity; and reductions in nonenergy, non-combustion GHG emissions. In addition, achieving carbon neutrality will require scaling up research, development and deployment (RD&D) efforts around carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO₂.

The E3 Report also found that achieving the zero-carbon energy scenario requires rapid deployment of electrification in vehicles and buildings achieving 100 percent electric or zero-carbon energy sales shares by 2030, if expensive early retirement of equipment is to be minimized. Likewise, very low carbon, if not zero-carbon electricity will be needed by 2045 in order to support these high levels of electrification. This will require rapid adoption of renewable generation and renewable integration solutions, at a pace that exceeds recent historical levels of wind and solar adoption. An interagency research process is underway to evaluate in more detail the electricity sector implementation strategies and implications of achieving the State's SB 100 goal of meeting 100 percent of retail sales electricity with zero-carbon electricity.

The E3 Report states that all carbon neutral scenarios achieve dramatic reductions in fossil fuel combustion and fossil fuel emissions, which will result in global climate change benefits, as well as the potential for improvements in local air quality and associated health impacts. Scenarios with lower fossil fuel combustion will achieve greater improvements in statewide air quality and, likely, local health impacts. However, local health benefits in any specific community will be location and source specific. Although outside the scope of the E3 analysis, properly valuing the local air quality and health benefits associated with reducing fuel combustion is an important consideration in designing California’s carbon-neutral future.

Background: Conclusion Regarding State Strategy and Measures

Full implementation of many of the measures identified in the 2017 Scoping Plan that could result in a 40 percent reduction of GHG emissions by 2030 in the San Diego region would require major changes in clean technologies utilization; markets; and local, State, and federal policies and regulations. The precise pathway to meeting the State’s mid-century goals (e.g., achieving carbon neutrality no later than 2045; reducing emissions to 80 percent below 1990 levels by 2050) is still unclear, but would require the decarbonization of the State’s electrical sector, decarbonization of existing buildings and new construction, electrification of the entire transportation sector, investments in healthy soils, sustainable solid waste and wastewater management, and carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO₂. The required GHG reductions from the aforementioned sectors can only be achieved through a coordinated effort by, at minimum, State, regional, and local agencies, organizations, and stakeholders, and is well beyond the ability and jurisdiction of SANDAG alone.

Background: Role of SANDAG in Planning for GHG Emissions Reductions

As an MPO and Council of Governments (COG) with a mission of promoting quality of life in the region, SANDAG has engaged in climate planning efforts for over a decade, leveraging the agency’s position as a bridge between local and State governments and building upon its statutory requirements under SB 375. The agency has prepared a wide range of climate-related plans and programs. Some have been explicitly connected to climate change, while others are more indirectly related and result in GHG reductions or carbon emissions removal that is incidental to their primary purpose (e.g., the Smart Growth Incentive Program supports land development and infrastructure improvements that also contribute to lower VMT and associated GHG emissions; the Environmental Mitigation Program conserves and restores native habitats to compensate for the loss of habitat resulting from transportation capital projects, which can retain carbon stored in soils and vegetation on the region’s natural lands and contribute to removal of emissions from the atmosphere).

This following describes SANDAG’s many activities for achieving GHG emissions reductions, including the proposed Plan strategies to reduce GHG emissions as required by SB 375, the GHG mitigation measures previously adopted by SANDAG as part of its 2015 Regional Plan, and other plans and programs that SANDAG proactively prepares and implements that are not required by State or federal law or regulation.

Background: Proposed Plan Strategies and Actions to Reduce GHG Emissions

SANDAG has direct responsibility for planning for achieving passenger vehicle GHG reduction targets through the development and implementation of an SCS pursuant to SB 375. The proposed Plan includes an SCS and demonstrates that, if the proposed Plan is implemented, the San Diego region would achieve its SB 375 target for 2035. Analysis performed by SANDAG and included in the SCS documentation for the proposed Plan demonstrates that the San Diego region has achieved its SB 375 target for 2020 (Appendix H).

The proposed Plan includes many strategies that contribute to GHG reductions under SB 375 and identifies implementation actions that SANDAG will take to realize these reductions. The strategies can be broadly categorized as transportation system infrastructure and operations, demand management, land use, and zero-emission vehicles.

The proposed Plan incorporates several transportation system infrastructure and operation strategies, including investments in:

- Managed Lanes
- High-occupancy vehicle (HOV) policies
- High-occupancy toll (HOT) policies
- The regional bike network
- Commuter and light rail
- Next generation *Rapid* buses
- Local buses
- Local Complete Streets program
- Parking management
- Microtransit
- Micromobility
- Pooling by transportation network companies (TNCs)
- E-bikes
- Active transportation demand management
- Smart signals

The proposed Plan also incorporates several demand management strategies, including:

- Teleworking
- Private pooling program
- Vanpool program
- Carshare program
- Regional TDM ordinance
- Transit fare subsidies
- Congestion pricing
- Parking pricing
- Road user charges

The land use strategy in the proposed Plan consists of the SCS land use pattern, which considers jobs-housing balance, mixing of uses, and transit-oriented development. The zero-emission vehicles strategies in the proposed Plan include the regional EV charger program (i.e., San Diego County California Electric Vehicle Infrastructure Project [CALeVIP]) and regional EV incentive program. Refer to Chapter 2, *Project Description*, for additional description of the proposed Plan components that reduce passenger vehicle GHG emissions addressed by SB 375.

The proposed Plan also includes several implementation actions (discussed in Appendix K) that would implement the above strategies, including:

- Near-term Action 3(c), which directs SANDAG to develop a Regional Active Transportation Plan, including an update of the San Diego Regional Bike Plan.

- Near-term Action 8(c), which directs SANDAG to “(l)aunch a regional housing incentive grant program to fund local plan updates in Mobility Hub Areas that can lead to more housing in transit-rich areas with infrastructure, services, and jobs.”
- Near-term Action 9(a), which directs SANDAG to “(c)omplete the following studies, plans, and strategies: Electric Vehicle Charger Management Strategy; Medium/Heavy-Duty Zero-Emissions Vehicle Blueprint; Regional Carbon-Reduction Program Feasibility Study; Regional Resilience Framework; Regional Transportation Demand Management Ordinance Policy Analysis.” The purpose of the Regional Carbon-Reduction Program Feasibility Study is to identify if such a program would be feasible for SANDAG to implement. If so, SANDAG will continue to work with partners to manage and implement a regionally relevant program.
- Near-term Action 9(e) directs SANDAG to “expand regional programs” for “nature-based climate solutions” with a program that, “expands on the Environmental Mitigation Program to continue regional management and monitoring, restoration, and habitat conservation activities” and “offers carbon-sequestration benefits.”
- Near-term Action 9(i), which directs SANDAG to continue to “co-fund and promote” the CALeVIP incentive project, providing rebates for public, workplace, and multifamily electric vehicle charging stations.

The proposed Plan also addresses the reduction of GHG emissions beyond passenger vehicle GHG reductions. For example, relative to existing land use plans, the proposed Plan’s compact land use pattern preserves more of the region’s natural and working lands instead of converting these lands to urban or developed uses. As a result, more carbon remains stored in soil and vegetation rather than being released into the atmosphere.

Background: Summary and Status of Previously Adopted GHG Mitigation Measures

The 2015 EIR included several mitigation measures to reduce GHG emissions. These are summarized below to provide context for more recent efforts undertaken by SANDAG to reduce GHGs within the San Diego region.

- Mitigation measure GHG 4a, *Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions*, directed SANDAG to revise the *TransNet* Smart Growth Incentive (SGIP) and Active Transportation Grant Program (ATGP) to facilitate local GHG reductions. The revisions included adding criterion to score projects based on their ability to reduce GHG emissions and requiring local jurisdictions to have an adopted CAP as pre-requisite for funding eligibility; SGIP funds were also made available for local jurisdictions to use in preparing a CAP if they had not already adopted one. As of April 2021, the SGIP and ATGP have provided more than \$80 million, leveraging \$52 million in local match (approximately \$132 million dollars invested in the San Diego region) through a competitive grant program to support more than 150 smart growth and active transportation plans, programs, and projects. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. SANDAG continues to operate these grant programs: the next and fifth cycle of the competitive grant programs is planned in December of 2022.
- Mitigation measure GHG-4b, *Adopt a Detailed Regional Mobility Hub Implementation Plan to Reduce GHG Emissions*, directed SANDAG to implement a “Regional Mobility Hub Implementation Strategy” to promote connectivity through investments in mobility hubs. The Regional Mobility Hub Strategy was completed in 2018 and demonstrates how transportation services, amenities, and supporting technologies can work together to make it easier for communities to access transit and other shared mobility choices. It served as an important precursor to the inclusion of major investments in Mobility Hubs as one of the 5 Big Moves in the proposed Plan; as described above, Mobility Hub investments are one of the many strategies that contribute to the proposed Plan meeting its SB 375 target for 2035. Implementation of this mitigation measure is complete, and it is not carried over into this EIR.

- Mitigation measure GHG-4c, *Fund Electric Vehicle Charging Infrastructure*, directed SANDAG to build a network of EV chargers to promote the use of EVs in the San Diego region. As of June 2021, SANDAG has collaborated with local and State agencies, industry, the local utility, and other key stakeholders to inform program development and identify more resources to support EV infrastructure. SANDAG is partnering with the San Diego County Air Pollution Control District, the CEC, and Center for Sustainable Energy on this regional charger program through the CALeVIP. The San Diego County CALeVIP project opened on October 27, 2020, and effectively combined State and regional incentives for EV chargers into one unified program under CALeVIP. The program is providing rebates to offset the purchase and installation costs for public and workplace EV chargers. Funding of more than \$17.76 million across both DC fast chargers and Level 2 chargers has been either reserved or provisionally reserved, and 38 percent of funds have been reserved or issued to disadvantaged and low-income communities in San Diego County. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. The CALeVIP program is currently operating. The GHG reductions from CALeVIP are accounted for in the SB 375 GHG emissions reductions that would result from the proposed Plan.
- Mitigation measure GHG-4d, *Adopt a Plan for Transportation Fuels that Reduce GHG Emissions*, directed SANDAG to adopt a regional readiness plan for the deployment of infrastructure for alternative fuels by 2016. On February 26, 2016, the SANDAG Board of Directors accepted the San Diego Regional Alternative Fuel Readiness Plan (Readiness Plan) as a regional resource to advance the deployment of alternative fuel vehicles and infrastructure in support of clean fuel and greenhouse gas emissions–reduction policies. This was done in partnership with the San Diego Regional Clean Cities Coalition and the San Diego County Air Pollution Control District. This effort began in October 2014 with funding from a 2-year, \$300,000 CEC grant and established Refuel: San Diego Regional Alternative Fuel Coordinating Council (Refuel San Diego). Refuel San Diego was a multistakeholder group composed of public agencies like SANDAG, alternative fuel vehicle manufacturers, industry representatives, and other stakeholders. Alternative fuels included electricity, biodiesel, ethanol, hydrogen, natural gas, and propane auto gas. Refuel San Diego provided key input to the Readiness Plan. Additionally, SANDAG has supported the implementation of the EV elements of the Refuel Plan through its Plug-in San Diego program, funded by two additional CEC grants. Plug-in San Diego developed resources to reduce barriers to EV infrastructure installations, including an EV charging infrastructure web-based planning tool that launched in 2019. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. These resources now help inform the allocation of funding for EV charging infrastructure through the CALeVIP.

Background: Other SANDAG Plans and Programs to Address GHG Emissions Reductions.

This section describes SANDAG plans and programs that support GHG emissions reductions that are in addition to those that would occur as a result of proposed Plan strategies or the GHG mitigation measures previously adopted in the 2015 Regional Plan.

Final Program Budget for Fiscal Year (FY) 2022

Outside of the proposed Plan, SANDAG’s Final Program Budget for Fiscal Year (FY) 2022 includes completion of a scenario planning project to quantify how the region’s land conservation efforts are helping the region meet State GHG emissions reduction targets (Work Element 3201900). The FY 2022 budget also allocates funding for activities to further the implementation of local CAPs, including the completion of updates to the Regional Climate Action Planning Framework (ReCAP) and provision of no-cost technical assistance and data to local jurisdictions (Work Element 3201700). It also allocates funding to support local jurisdiction climate adaptation planning (Work Element 3201800).

Regional Climate Action Planning Framework (ReCAP)

In recent years, nearly all of the San Diego region's 19 local jurisdictions have adopted a CAP or are in the process of developing one. Local agency staff members and elected officials communicated that ongoing efforts to adopt, update, and monitor the implementation of CAPs would benefit from regionally consistent approaches, methodologies, and data sources. In response, SANDAG collaborated with local agency staff and leading climate planning experts to prepare ReCAP, which identifies best practices and guidance for preparing CAPs and monitoring implementation over time. ReCAP establishes a technical framework consistent with State goals and policies while preserving local policy flexibility for the unique needs and circumstances of each local jurisdiction.

Climate Action Planning Services for Member Agencies

Since 2016, SANDAG has provided member agencies climate action planning assistance at no-cost through its Roadmap Program. This, coupled with ReCAP and other funding sources, has enabled local jurisdictions to prepare regionally-consistent CAPs and participate in regional monitoring efforts.

Energy Roadmaps and Energy Engineering Services

From 2010 to 2020, SANDAG had a Local Government Partnership (LGP) with SDG&E. The SANDAG LGP was one of five in the region and established the SANDAG Roadmap Program. Initially, the Roadmap Program focused on providing no-cost energy engineering technical support to SANDAG member agencies' municipal operations and in the community. In 2016, SANDAG expanded the technical support to include climate action planning, leveraging LGP funding in conjunction with other resources to ensure delivery of comprehensive services. In addition, SANDAG coordinated with SDG&E, the County of San Diego, the Port of San Diego, and the cities of San Diego and Chula Vista on regional energy efficiency programs through the San Diego Regional Energy Partnership.

Environmental Mitigation Program

Using revenues from the half-cent sales tax for local projects created under the *TransNet* program, SANDAG purchases, conserves, and restores native habitat to offset potential impacts from the development of transportation projects. It provides large-scale acquisition and management of critical habitat areas and creates a reliable approach for funding required mitigation for future transportation improvements. It goes beyond traditional mitigation for transportation projects by allocating funding for habitat acquisition, management, and monitoring activities, as needed, to help implement the Multiple Species Conservation Program and the Multiple Habitat Conservation Program. The program has supported nearly 100 grants to local organizations and jurisdictions for land acquisition and land management efforts, such as invasive species removal. The program also provides funds for the regional management and monitoring of natural habitats and sensitive species. The lands conserved and restored under this program retain carbon stored in soils and vegetation on the region's natural lands and contribute to removal of emissions from the atmosphere.

As of January 2021, the *TransNet* Environmental Mitigation Program (EMP) has awarded \$16.4 million through a competitive grant program to support land management throughout the region. An additional \$10.1 million of matching funds has been provided by grantees for their Land Management Grant Projects. In addition, the EMP has provided \$161 million to acquire and/or restore 8,780 acres of sensitive habitat and open space. A tenth cycle of the competitive land management grant program is planned to be released in the Fall of 2021 and awarded by the Summer of 2022.

Proposed Mitigation Measures to Address the Significant GHG Emissions Impact of the Proposed Plan

The following mitigation measures would help reduce regional GHG emissions by reducing VMT, increasing use of zero-emission fuels, sequestration of carbon from the atmosphere, and other measures; they would reduce inconsistency of the proposed Plan's GHG emissions with the State's ability to achieve the SB 32, EO B-55-18, and EO S-3-05 GHG reduction goals. However, full implementation of the changes required to achieve these goals is beyond SANDAG's and local agencies' current jurisdiction and authority.

As discussed in further detail in Sections 4.3, *Air Quality*, 4.16, *Transportation*, and Section 4.18, *Water Quality*, mitigation measures **AQ-3b**, **AQ-3c**, **AQ-4**, **TRA-2**, **WS-1a**, and **WS-1b** would also reduce emissions of GHGs by decreasing overall pollutant emissions from equipment, vehicles, and water consumption:

- **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment.**
- **AQ-3c Reduce Diesel Emissions During Construction from On-Road Vehicles.**
- **AQ-4 Reduce Exposure to Localized Particulate Emissions.**
- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**
- **WS-1a Implement Water Conservation Measures for Transportation Network Improvements**
- **WS-1b Implement Water Conservation Measures for Development Projects**

Program-Level Mitigation

GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans. ~~Prior to December 2025 (adoption of the next Regional Plan), and beginning as soon as~~ No later than December 2023, SANDAG shall implement a grant program(s) that allocate(s) funding on a competitive basis to underfunded GHG-reducing projects that implement the stated strategies or measures in local jurisdiction CAPs or GHG reduction plans. Examples of such projects to reduce GHG emissions include existing building retrofits to reduce electricity or natural gas use or install onsite renewable energy systems, activities at the local level that reduce VMT, Smart Cities⁶ measures that result in the reduction of GHG, programs and infrastructure to divert organic waste from landfills, and tree planting.

~~The purpose of such~~ new and/or revised grant program(s) shall be to: (1) achieve additional annual GHG emissions reductions during the proposed Plan horizon by implementing projects that would not otherwise occur due to insufficient funding, and (2) achieve additional cumulative GHG emissions reductions under the proposed Plan planning horizon by implementing projects ahead of schedule and realizing GHG reductions earlier than they would otherwise occur due to timing of funding availability. Reducing total annual and cumulative GHG emissions under the proposed Plan planning horizon would reduce the proposed Plan's contribution to climate change.

To be eligible for grant funding, local jurisdictions would be required to have a CAP or GHG reduction plan adopted by the agency's elected decision-making body. Applicants shall provide sufficient evidence in their

⁶ Smart Cities use Information and Communications Technology to enhance the quality and performance of public services in order to reduce resource consumption and operate efficiently. Investment in reliable technology and high-speed connectivity are critical to the success of Smart Cities.

funding proposals demonstrating, to SANDAG's satisfaction, that their projects would not be financially feasible, either due to insufficient funding or the timing of funding availability, in the absence of SANDAG funding. Applications shall include estimated GHG emissions reductions from the project, which shall be prepared using established methods or protocols and shall be reviewed and approved by SANDAG. The grant program(s) shall be structured (e.g., using evaluation criteria and/or weighting of evaluation criteria) to prioritize the allocation of allocate funds to projects based on the amount of that make measurable progress they achieve towards achieving the GHG emissions reductions targets identified in that jurisdiction's adopted CAP or GHG reduction plan.

Prior to December 2023, as part of next cycle of the *TransNet* Smart Growth Incentive and Active Transportation Grant Programs Smart Growth Incentive Program SANDAG shall: (1) continue to require locally adopted CAPs or GHG reduction as prerequisites to be eligible for grant funding, and (2) make funding available for local jurisdictions to prepare and update CAPs and GHG reduction plans that keep pace with future longer-term State targets and goals for GHG emissions reductions. Any new or updated CAP or GHG reduction plan receiving funding through this program shall also meet the following minimum criteria:

- The CAP or GHG reduction plan shall be adopted by the jurisdiction's elected decision-making body.
- The CAP or GHG reduction plan shall establish a locally appropriate 2030 GHG reduction target for communitywide GHG emissions derived from the State's legislative target for 2030 (as established by SB 32 or as amended by future legislation), and should establish long-term targets
- The CAP or GHG reduction plan shall quantify, using substantial evidence, how local GHG reduction strategies, programs, and measures would meet or exceed the local GHG reduction target.
- The CAP or GHG reduction plan shall establish a mechanism to monitor the plan's progress toward achieving the target, including reporting data to SANDAG consistent with, and inclusion in, the Climate Action Data Portal or similar database, and a requirement to amend the plan if it is not achieving adopted goals.

Sources of funding that SANDAG shall use include the grants to fund CAP implementation and the Resilient Capital Grants and Innovative Climate Solutions Program (approximately \$40 million dollars) identified in the proposed Plan (Table 2-13 in Chapter 2 and Near-Term Actions 9(b) and 9(d) in Appendix K, respectively). SANDAG shall also pursue federal and State partnerships to leverage additional dollars for these programs. SANDAG shall document and report to the SANDAG Board of Directors the activities funded by this grant program and the estimated GHG emissions reductions on an annual basis.

GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure. ~~Prior to December 2025,~~ SANDAG shall establish one or more new programs to allocate funding for zero-emission buses and infrastructure (e.g., EV charging equipment and/or hydrogen fueling stations), zero-emissions goods movement vehicles (e.g., medium- and/or heavy-duty trucks) and infrastructure, and electric micromobility (e.g., personal electric bikes, cargo delivery electric bikes, neighborhood electric vehicles) and associated infrastructure.

Eligible entities could include but are not limited to public transit operators for zero-emission bus and infrastructure funding; port tenants, distributors, wholesalers, warehouse developers and/or owners, truck owners and/or operators, truck manufacturers, infrastructure providers, and any company that has a fleet of medium- and/or heavy-duty trucks for zero-emission goods movement funding; and local residents, last mile delivery services, and ride-share and/or ride-hail services for electric micromobility funding and associated infrastructure.

SANDAG shall include approximately \$100 million by 2025 of the Electric Vehicle Program (Table 2-13 in Chapter 2 and Near-Term Action 9[b] in Appendix K), and approximately \$5 million of Transportation Demand Management funding for an electric bike incentive program (Table 2-13 in Chapter 2).

The funding for electric bikes will become available beginning in FY 2022 with the launch of a \$500,000 pilot incentive program and will be expanded through FY 2025. This pilot program will reduce GHG emissions by providing funding for, at minimum, 200 electric bikes and associated services.

The funding for zero-emission buses and infrastructure will become available in FY 2023 to enable investments in zero emission transit buses, zero emission school buses, and supporting infrastructure through partnerships with the transit agencies (the Metropolitan Transit System [MTS] and North County Transit District [NCTD]) and San Diego County Air Pollution Control District (APCD). This program will reduce GHG emissions by providing funding for, at minimum, 100 zero-emission buses, as well as associated fueling/charging infrastructure and services.

Beginning in FY 2022 SANDAG will begin two planning strategies to inform transition to zero-emission goods movement: the California Energy Commission-funded Medium Duty/Heavy Duty EV Blueprint grant for San Diego Region in partnership with Port of San Diego, and the Caltrans-funded San Diego and Imperial Counties Sustainable Freight Implementation Strategy. SANDAG will also rely on the Portside Community Emissions Reduction Plan (CERP) and Maritime Clean Air Strategy (MCAS) to inform investment decisions. Investments in goods movement vehicle and infrastructure will begin in FY 2024.

~~Prior to December 2025~~, SANDAG shall also establish one or more programs to allocate approximately \$30 million in funding for public and private light duty vehicle fleets in the San Diego region to install zero-emission vehicle infrastructure and/or purchase zero-emission vehicles (e.g., battery electric vehicles, fuel cell electric vehicles). Eligible entities could include, but are not limited to, school districts, water districts, local jurisdictions, TNCs, private businesses, and non-profit organizations. New funding will be above and beyond that for which reductions in GHG emissions have already been considered as part of the off-model calculations to achieve the SB 375 target.

Beginning in FY 2023, SANDAG will formalize a partnership with CALeVIP San Diego County Incentive Project administrator to make available incentives for fleet charging infrastructure. Beginning in FY 2024, SANDAG will establish a vehicle incentive program that allocates funding incentives for public and private fleet vehicles. This program will reduce GHG emissions by providing funding for a minimum of 5,000 light-duty vehicles and/or chargers.

To further support this mitigation measure, SANDAG shall also participate in federal and State processes to support transportation electrification as well as pursue federal, State, and local partnerships to leverage additional dollars for these programs.

GHG-5c. Implement Nature-Based Climate Solutions to Remove Carbon Dioxide from the Atmosphere. Beginning immediately upon adoption of the proposed Plan and p~~P~~rior to December 2025 (adoption of the next Regional Plan), SANDAG shall establish a Nature-Based Climate Solutions Program that will restore or enhance natural infrastructure that uses or mimics natural processes to benefit people and wildlife. Through this program SANDAG shall implement, or provide funding to implement, projects that restore or enhance native habitats to increase rates of carbon sequestration over baseline conditions. Examples include, but are not limited to, restoring buried or concreted watercourses to riparian habitat to return them to more natural

conditions, restoration of fallow agricultural native coastal sage scrub and chaparral, and removal of fill within salt and freshwater and restoration with wetland habitat.

Prior to implementation of any projects proposed for funding under this program, SANDAG shall prepare, or require the preparation of, studies demonstrating that such proposed projects would increase rates of carbon sequestration over baseline conditions. SANDAG shall document the proposed carbon sequestration for each project receiving funding under this program and provide a report to the SANDAG Board on an annual basis.

SANDAG shall use the Nature-Based Climate Solutions Program (approximately \$40 million) identified in the proposed Plan (Table 2-13 in Chapter 2 and Near-Term Action 9(e) in Appendix K) to fund projects under this program. Additional funding could come from the *TransNet* Environmental Mitigation Program Fund for mitigation projects that require restoration and/or land management grants for the restoration of land to native habitat. SANDAG shall also pursue federal and State partnerships to leverage additional dollars for this program.

GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide. Subsequent to adoption of the proposed Plan and pPrior to January 2023, SANDAG shall adopt a Regional Digital Equity Strategy and Action Plan that identifies and addresses gaps⁷ in accessing affordable, high-quality broadband service (Near-Term Action 6(c) in Appendix K). Access to broadband service allows for remote education, telemedicine, work from home, and the potential for other remote access opportunities that reduce car travel and the associated GHG emissions. Investment in reliable technology and high-speed connectivity are critical to close the digital divide and the foundation of a Smart Cities efforts to become more efficient, use less resources and reduce GHG. The Action Plan will identify specific actions, responsible parties, and a timeline for implementing the strategies identified in the Action Plan. Prior to December 2024, SANDAG commits to researching and evaluating methodologies for and quantifying, where possible, the corresponding GHG reductions– associated with improved access to remote services enabled by broadband (e.g., telehealth, remote work, distance learning, and other remote services). SANDAG shall implement the Next OS (approximately \$32 million) identified in the proposed Plan (Table B-1, Page B-5 in Appendix K) to fund projects that advance Smart Cities efforts and close the digital divide. SANDAG shall also participate in federal and State processes to support projects that increase access to broadband infrastructure, as well as pursue federal, State, and private partnerships to leverage additional dollars for these programs. SANDAG shall document SANDAG’s funding expenditures and progress on implementing the Action Plan and provide a report to the SANDAG Board on an annual basis. Prior to December 2025 (adoption of the next Regional Plan), SANDAG will identify and commit approximately \$32 million to undertake projects in the Action Plan that have quantified GHG reductions. SANDAG shall document the funding expenditures and quantified GHG reductions and provide a report to the SANDAG Board on an annual basis

~~SANDAG shall implement the Next OS (approximately \$32 million) identified in the proposed Plan (Table B-1, Page B-5 in Appendix K) to fund projects that advance smart cities and close the digital divide. SANDAG shall also participate in federal and State processes to support projects that increase access to broadband infrastructure, as well as pursue federal, State, and private partnerships to leverage additional dollars for these~~

⁷ This gap is often referred to as the *digital divide*, and represents the growing disparity between members of society who have reliable access to broadband service and an adequate device for connecting to the internet and those who do not—mainly people with limited incomes, seniors, tribal communities, and people in rural areas.

programs. SANDAG shall document the progress to expand access to broadband service and provide a report to the SANDAG Board on an annual basis.

Project-Level Mitigation

GHG-5e. Implement Measures to Reduce GHG Emissions from Transportation Projects. During the planning, design, project-level CEQA review, construction, operation, and maintenance of transportation network improvements, SANDAG shall, and transportation project sponsors can and should, implement measures to reduce GHG emissions and achieve zero-net energy,⁸ including but not limited to applicable transportation project measures from the California Air Pollution Control Officers Association's (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA 2010) and the Center for Resource Efficient Communities and the Center for the Built Environment's *Zero-Carbon Buildings in California Feasibility Study* (Center for Resource Efficient Communities and the Center for the Built Environment 2021). ~~These GHG reduction measures~~ include, but are not limited to, the following.

- Implement sustainable construction measures through construction bid specifications, including the following:
 - Use energy and fuel-efficient vehicles and equipment and/or use alternative fuel vehicles and equipment, where applicable.
 - Use lighting systems that are energy efficient, including light-emitting diode (LED) technology.
 - Use lighter-colored pavement, binding agents that are less GHG-intensive than Portland cement, and less-GHG intensive asphalt pavements.
 - Recycle 50–75 percent of construction and demolition waste.
- Install efficient lighting (including LEDs) for traffic, street, and other outdoor lighting.
- Incorporate infrastructure electrification into project design (e.g., EV charging; charging for electric bikes) above minimum code requirements.
- Plan, design and construct all new, upgraded, and regularly maintained infrastructure with electricity demand shall demonstrate how such infrastructure will achieve zero-net energy using onsite innovative technologies (e.g., photovoltaic system, battery storage, energy efficiency) or offsite solutions.
- Incorporate and increase electric vehicle charging equipment and preferred EV parking spots into projects that include commuter parking areas.
- Include design measures (e.g., curb management strategies) to accommodate flexible fleets.
- Install solar photovoltaic canopies over parking areas.
- Design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.
- Design measures to reduce water consumption, such as drought-resistant landscaping, smart irrigation systems, and other measures, including those listed in mitigation measures WS-1a and WS-1b in Section 4.18, *Water Supply*.

⁸ Zero-net energy describes a state in which the amount of energy provided by onsite renewable-energy sources is equal or equivalent to the amount of energy used.

- Construct buildings to Leadership in Energy and Environmental Design (LEED) certified standards or equivalent standards.

Funding for those measures that SANDAG selects would be included in individual project budgets.

GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects. During the planning, design, project-level CEQA review, construction, and operation of development projects, the County of San Diego and cities can and should implement measures to reduce GHG emissions and achieve zero-net energy, including but not limited to, applicable land use measures in CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA 2010) and the Center for Resource Efficient Communities and the Center for the Built Environment's *Zero-Carbon Buildings in California Feasibility Study* (Center for Resource Efficient Communities and the Center for the Built Environment 2021). These measures include, but are not limited to, the following.

- Measures that reduce VMT by increasing transit use, carpooling, bike-share and car-share programs, and active transportation, including the following:
 - Building or funding a major transit stop within or near development, in coordination with transit agencies.
 - Developing car-sharing and bike-sharing programs.
 - Providing pedestrian network improvements and a comprehensive bicycle network.
 - Providing traffic calming measures.
 - Providing transit incentives, including transit passes for Metropolitan/North County Transit District buses and trolleys.
 - Consistent with the Regional Bike Plan, incorporating bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network.
 - Implementing Complete Streets consistent with the SANDAG Regional Complete Streets Policy, including adopting local Complete Streets policies.
 - Implementing Mobility Hubs consistent with the Regional Mobility Hub Strategy.
 - Improving transit access to bus and trolley routes through incentives for constructing transit facilities within developments, and/or providing dedicated shuttle service to trolley and transit stations.
 - Implementing measures to increase transit use through service frequency and affordability as identified through community engagement activities, including but not limited to input from local residents, stakeholders, and Community-Based Organizations.
 - Building low stress bicycle networks including bike trails and connections, lanes, paring, and end of trip facilities.
 - Subsidizing transit service expansion by increasing service hours, decreasing fares, and adding additional transit fleets.
 - Implementing employer trip reduction measures to reduce employee trips and VMT such as vanpool and carpool programs, providing end-of-trip facilities, telecommuting, teleconferencing, and alternative work schedule programs.
 - Incorporating ride hailing and autonomous vehicle innovations.
 - Including design measures (e.g., curb management strategies) to accommodate flexible fleets.
 - Implementing a school bus program in areas currently not served by school buses.

- Measures that reduce VMT through parking strategies based on the SANDAG Regional Parking Management Toolbox, including the following:
 - Parking pricing strategies consistent with the Toolbox.
 - Reduced minimum parking requirements.
 - Residential parking permit programs.
 - Designation of a percentage of parking spaces for ride-sharing vehicles or high-occupancy vehicles, with adequate passenger loading and unloading for those vehicles.
 - Adequate bicycle parking.
 - Other strategies in the SANDAG Regional Parking Management Toolbox.
- Measures that reduce VMT through Transportation Systems Management (TSM), including measures included in Appendix DD of the proposed Plan.
- Land use siting and design measures that reduce GHG emissions, including the following:
 - Developing on infill and brownfields sites.
 - Building high density and mixed-use developments near transit.
 - Developing within areas with high jobs gravity to increase destination accessibility.
 - Orienting development towards transit or an active transport corridor.
 - Retaining onsite mature trees and vegetation, and planting new trees.
- Measures to plan, design, and build all new, renovated, and upgraded development and infrastructure with electricity demand to achieve zero-net energy using onsite innovative technologies (e.g., photovoltaic system, battery storage, energy efficiency) or offsite solutions.
- Measures that increase vehicle efficiency or reduce the carbon content of fuels, including constructing EV charging, alternative fueling stations, or neighborhood electric vehicle networks or charging for electric bicycles consistent with SANDAG’s regional readiness planning for alternative fuels.
- Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.
- Measures to reduce water consumption, including those listed in mitigation measure WS-1a and WS-1b in Section 4.18.

SIGNIFICANCE AFTER MITIGATION

Mitigation measure GHG-5a would reduce total regional GHG emissions in two ways: (1) allocating funding to under-funded GHG reducing project that implement local jurisdiction CAPs or GHG reduction plans and (2) allocating funding for local jurisdictions to prepare and update CAPs and GHG reduction plans that keep pace with future longer-term State targets and goals for GHG emissions reductions. Providing funding for these projects and plans would (1) achieve additional annual GHG emissions reductions by implementing projects that would not otherwise occur due to insufficient funding; and (2) achieve additional cumulative GHG emissions reductions by implementing projects ahead of schedule and realizing GHG reductions earlier than they would otherwise occur due to timing of funding availability. Reducing total annual and cumulative GHG emissions under the proposed Plan planning horizon would reduce the proposed Plan’s inconsistencies with the State’s ability to achieve long-term climate goals.

Mitigation measure GHG-5b would reduce total regional GHG emissions by allocating funding for zero-emission buses and infrastructure (e.g., electric vehicle charging equipment and/or hydrogen fueling stations); zero-emissions goods movement vehicles (e.g., medium- and/or heavy-duty trucks) and infrastructure; electric micromobility (e.g., personal electric bikes, cargo delivery electric bikes, neighborhood electric vehicles) and associated infrastructure; and for public and private light duty vehicle fleets in the San Diego region to install zero-emission vehicle infrastructure and/or purchase zero-emission vehicles (e.g., battery electric vehicles, fuel cell electric vehicles). Increasing the amount of vehicle miles traveled by zero emissions vehicles under the proposed Plan horizon would reduce the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals. Mitigation measure GHG-5c would reduce total regional GHG emissions by creating a program that will restore or enhance natural infrastructure that uses or mimics natural processes to benefit people and wildlife. Through this program SANDAG shall implement, or provide funding to implement, projects that restore or enhance native habitats to increase rates of carbon sequestration over baseline conditions. Increasing the rate of carbon sequestration from natural lands in the region would remove carbon dioxide from the atmosphere, thereby reducing the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals.

Mitigation measure GHG-5d would reduce total regional GHG emissions by increasing regional access to broadband services, which would displace VMT and associated GHG emissions by replacing vehicle trips with remote access opportunities (e.g., working from home, virtual medical appointments, virtual education). Reducing VMT and associated GHG emissions would reduce the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals.

Project-level mitigation measure GHG-5e shall be implemented by SANDAG and can and should be implemented by transportation project sponsors to reduce GHG emissions associated with transportation projects. The effectiveness of the actions included in this measure has been demonstrated by CAPCOA and the Center for Resource Efficient Communities and the Center for the Built Environment (CAPCOA 2010, Center for Resource Efficient Communities and the Center for the Built Environment 2021). SANDAG's implementation of this measure during transportation project implementation will reduce total GHG emissions under the proposed Plan. Implementation of this measure by other transportation project sponsors will also reduce total GHG emissions under the proposed Plan; however, SANDAG does not have the authority to require other agencies to implement this measure. It is the responsibility of the implementing agency to determine and adopt project-specific mitigation measures.

Similarly, project-level mitigation measure GHG-5f can and should be implemented by the County of San Diego and cities to reduce GHG emissions from development projects that implement the proposed Plan. The effectiveness of the actions included in this measure has been demonstrated by CAPCOA and the Center for Resource Efficient Communities and the Center for the Built Environment (CAPCOA 2010, Center for Resource Efficient Communities and the Center for the Built Environment 2021). Implementation of this measure by the County of San Diego and cities will also reduce total GHG emissions under the proposed Plan, however, SANDAG does not have the authority to require other agencies to implement this measure. It is the responsibility of the implementing agency to determine and adopt project-specific mitigation measures.

Implementation of mitigation measures GHG-5a through GHG-5f, as well as mitigation measures AQ-3b, AQ-3c, AQ-4, TRA-2, WS-1a, and WS-1b, would substantially lessen the amount of proposed Plan GHG emissions in 2030, 2054, and 2050. However, even full implementation of all identified mitigation measures would not be sufficient to reduce the proposed Plan's GHG emissions to below the regional 2030, 2045, and 2050 reference points based on SB 32, EO B-55-18, and EO S-3-05.

As described in the introduction to mitigation section, the 2017 Scoping Plan establishes the statewide framework for achieving the goal of a 40 percent reduction from 1990 GHG levels in 2030 and put post-2030 statewide emissions on a downward trajectory toward the long-term statewide GHG reduction goals for 2045 and 2050. The 2017 Scoping Plan indicates that to achieve these targets and goals, long-term investments in renewable energy generation, electrified transportation, energy efficient and decarbonized buildings, enhanced industry efficiency, restoration of California's natural and working lands, and sustainable solid waste management are among many actions the State must take. In addition, the State has not adopted a plan analogous to the 2017 Scoping Plan that addresses achieving the EO S-3-05 goal of reducing statewide GHG emissions by 80 percent below 1990 levels by 2050 or the B-55-18 goal of achieving statewide carbon neutrality no later than 2045.

Available research and reports indicate that achieving statewide GHG reduction goals will require major shifts or even fundamental transformations in the economic, social, technological, and political fabric of life in California and beyond, including the development of new technologies, large-scale deployment of new and existing technologies, the roles of local, State, and the federal government in regulating economic activities and personal behaviors that affect GHG emissions. The precise pathway to meeting the State's mid-century goals (e.g., achieving carbon neutrality no later than 2045; reducing emissions to 80 percent below 1990 levels by 2050) is still unclear, but would require the decarbonization of the State's electrical sector, decarbonization of existing buildings and new construction, electrification of the entire transportation sector, investments in healthy soils, sustainable solid waste and wastewater management, and carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO₂.

The required GHG reductions from the aforementioned sectors will be achieved through a coordinated effort by, at minimum, State, regional, and local agencies, organizations, and stakeholders, and is well beyond the scope and jurisdiction of SANDAG alone. Nevertheless, because the proposed Plan's 2030, 2045, and 2050 GHG emissions would remain inconsistent with the State's ability to achieve 2030, 2045, and 2050 GHG reduction goals, this impact (Impact GHG-5) remains significant and unavoidable.