APPENDIX H

ENERGY TECHNICAL REPORT

Prepared for
The Los Angeles Aerial Rapid Transit Draft Environmental Impact Report

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ENERGY TECHNICAL REPORT

LOS ANGELES AERIAL RAPID TRANSIT PROJECT
LOS ANGELES, CALIFORNIA

RAMBOLL

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ATCM	Airborne Toxic Control Measure
ART	aerial rapid transit
BTU	British thermal unit
CalEEMod®	California Emissions Estimator Model®
CalGreen	California Green Building Standards Code
CAAP	Climate Action and Adaptation Plan
CAFE	Corporate Average Fuel Economy
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO_2	carbon dioxide
EIR	Environmental Impact Report
GHG	greenhouse gas
GHS	grid harmonization strategies
GWh	gigawatt hours
HVAC	Heating, Ventilation and Air Conditioning
IEPR	Integrated Energy Policy Report
IRP	Power Integrated Resource Plan
ISTEA	Intermodal Surface Transportation Efficiency Act
kWh	kilowatt hours
LA	Los Angeles
LADWP	City of Los Angeles Department of Water and Power
LAUS	Los Angeles Union Station
LCFS	Low Carbon Fuel Standard
LID	low-impact development
Metro	Los Angeles County Metropolitan Transportation Authority
MMBtu	million British thermal unit
mpg	miles per gallon
MPO	Metropolitan Planning Organization
mW	megawatts
MWh	megawatt hours
NHTSA	National Highway Traffic Safety Administration
NO_X	oxides of nitrogen
pLAn	Sustainable City pLAn
PM	particulate matter
Project	Los Angeles Aerial Rapid Transit Project
PV	photovoltaic
ROW	right-of-way
RPS	Renewables Portfolio Standard
RTPs	regional transportation plans
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill
SCAG	Southern California Association of Governments

ACRONYMS AND ABBREVIATIONS *(CONTINUED)*

SCS	Sustainable Communities Strategy
SLTRP	Strategic Long-Term Resource Plan
TCR	The Climate Registry
TDV	Time Dependent Valuation
TEA	Transportation Equity Act
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VDECS	Verified Diesel Emission Control Strategies
VMT	vehicle miles travelled
Vision 2028	Vision 2028 Strategic Plan
ZEV	zero emission vehicle
ZNE	Zero Net Energy

1. INTRODUCTION

This Energy Technical Report analyzes the Los Angeles Aerial Rapid Transit Project ("Project") impacts on energy demand from construction and operations. In particular, this report describes the existing setting of the Project site, describes the relevant regulatory setting, discusses the methodology used to evaluate energy resources related to the Project, and evaluates potential impacts related to those energy resources that would be affected as a result of implementation of the Project.

The existing condition for the Project entails current (2019) traffic modes and associated vehicle miles travelled (VMT) and energy (i.e., fuel) usage for traffic to and from Dodger Stadium on game days and for other events.

1.1 Project Description

1.1.1 Project Overview

The Project would connect Los Angeles Union Station (LAUS) to the Dodger Stadium property via an aerial gondola system. The Project would include an intermediate station at the southernmost entrance of the Los Angeles State Historic Park. The Project would provide an aerial rapid transit (ART) option for visitors to Dodger Stadium, while also providing access between the Dodger Stadium property, the surrounding communities, including Chinatown, Mission Junction, the Los Angeles State Historic Park, Elysian Park, and Solano Canyon, to the regional transit system accessible at LAUS. The aerial gondola system would be approximately 1.2 miles and consist of cables, three passenger stations, a non-passenger junction, towers, and gondola cabins. When complete, the Project would have a maximum capacity of approximately 5,000 people per hour per direction, and the travel time from LAUS to Dodger Stadium would be approximately seven minutes.

The Project would provide amenities at Los Angeles State Historic Park and would provide pedestrian improvements, including hardscape and landscape improvements. The ART system has the ability to overcome grade and elevation issues between LAUS and Dodger Stadium, be powered by renewable electricity, and provide safe, environmentally friendly, and high-capacity transit connectivity in the Project area. The Project would operate daily to serve existing residents, workers, park users, and visitors to Los Angeles.

1.1.2 Project Location

The Project is located in the City of Los Angeles, situated northeast of downtown Los Angeles.

The Project would commence adjacent to LAUS and El Pueblo de Los Angeles ("El Pueblo") and terminate at Dodger Stadium, with an intermediate station at the southernmost entrance of the Los Angeles State Historic Park. The Project would include three stations, a non-passenger junction, and three cable-supporting towers at various locations along the alignment. The Project "alignment" is defined as the length and width of suspended above-grade cables and cabins following the position of the Project components along the proposed alignment from Alameda Station to Dodger Stadium Station.

The Project location would generally be located within public right-of-way (ROW), or on publicly owned property, following Alameda Street, and then continuing along Spring Street in a northeast direction through the community of Chinatown to the southernmost corner of the Los Angeles State Historic Park. The alignment would then continue northeast over the

western edge of the Los Angeles State Historic Park and the Los Angeles County Metropolitan Transportation Authority (Metro) L Line (Gold) to the intersection of North Broadway and Bishops Road. At this intersection, the Project alignment would turn and continue northwest following Bishops Road towards its terminus at Dodger Stadium, located in the Elysian Park community.

1.1.3 Project System Operations

During operations, the cabins would travel on a continuous loop between Alameda Station and Dodger Stadium Station. Cabins would pass through passenger stations at roughly one foot per second (less than one mile per hour) to allow for unloading and loading. Operation of the Project would require approximately 20 personnel.

The Project would require routine maintenance that would be performed by the system operator. The overall system would be observed on a daily basis as part of the start-up routine.

Operational power requirements can be separated into two categories: normal operations and emergency operations. Power requirements for 100 percent of the power for the Project would be provided by the City of Los Angeles Department of Water and Power's (LADWP's) Green Power Program through a connection to their power grid, and would include the power to operate the gondola system and the non-gondola system components (i.e. lights, ventilation, escalators, elevators). When operating at capacity, normal operations are estimated to require a total of approximately 2.5 megawatts of power.

Power requirements for emergency operations consist of the energy needed for operations in the event of a temporary power grid failure. The Project would install backup battery storage at each station, tower, and junction to provide backup power to allow unloading of the system in the event of a temporary power grid failure. The total backup power required to allow unloading of the system is 1.4 megawatts.

1.1.4 Project Sustainability Features

The Project's stations, junction, towers, and gondola cabins would incorporate energy efficient, sustainable, water and waste efficient, and resilient features, as feasible. The proposed stations and junction are designed to be open-air buildings, allowing for passive ventilation strategies and providing direct access to outdoor air and natural daylight, while also providing adequate shade protection from heat. The cabins would be ventilated to enhance air quality for passengers. The electrical power for the operation of the aerial gondola system and associated stations, junction, and towers would be supplied by LADWP through the utility's Green Power Program. Accordingly, the primary electricity usage associated with the Project would come from renewable resources. In addition, the Project would install backup battery storage at each station, tower, and junction to provide backup power to allow unloading of the system in the event of a temporary power grid failure.

The design intent and structural strategy for the stations and towers also provides an efficiency of materials. The steel plate tower forms have been designed as "Monocoque" structures, where structure, form, and finish are unified. Materials for the stations, junction, and towers would be locally sourced where possible and would include recycled content where possible. Light-toned finish materials will also serve to minimize heat island concerns.

The Project would be designed to comply with all applicable state and local codes, including conformance with the City of Los Angeles Green Building and Low-Impact Development (LID) Ordinances.

This Project would reduce the traffic to and from Dodger Stadium on game days and for other events, with resulting benefits to energy (fuel) usage.

1.2 Project Analysis

This report evaluates the energy consumption associated with Project-related construction activities and operational activities after complete build out of the Project. Project build out is expected to occur as early as 2026.

As discussed in Chapter 2, California has adopted several regulatory measures related to energy efficiency and greenhouse gas (GHG) emissions that implement progressively stringent standards over time (e.g., under Senate Bill [SB] 100, utilities must achieve a 50 percent renewable resources target by December 31, 2026) and serve to influence future energy consumption. This energy inventory incorporates the effects of these regulations to the extent feasible; however, the analysis provided by this report is conservative because further beneficial changes to California's regulatory framework, serving to reduce energy consumption and enhance energy efficiency, are reasonably anticipated with the passage of time.

2. ENERGY PRODUCTION AND CONSUMPTION AND REGULATORY OVERVIEW

2.1 Energy Overview

2.1.1 Energy Production and Distribution

Among U.S. states, California ranks seventh in the nation in production of crude oil, 14th in production of natural gas, fourth in generation of hydroelectric power, and first as a producer of electricity from biomass, geothermal, and solar energy.[1] California produces approximately 10 percent of the natural gas used in the state; approximately 90 percent of the natural gas used in California is imported from Canada, the Southwest, and the Rocky Mountains region of the United States. Over half of the crude oil refined in California is from foreign countries, including Saudi Arabia, Ecuador, and Colombia. Additional crude oil is imported from Alaska. Over one-fourth of California's electricity is from out-of-state locations in the Pacific Northwest and the Southwest.[2]

Electricity and Natural Gas Supply

The production of electricity requires the combustion, consumption, or conversion of other energy resources, including water, wind, oil, natural gas, coal, solar, geothermal, and nuclear. Of the electricity that is generated within the state, 48 percent is generated by natural gas-fired power plants, nine percent by nuclear power plants, nine percent by hydroelectric, and 33 percent by other renewables.[3]

Natural gas ultimately supplies the largest portion of California's electricity market; natural gas-fired power plants in California meet approximately 37 percent of the in-state electricity demand.[3] In addition to the generation of electricity, natural gas is also widely used for industrial, commercial, and residential heating. Most of the natural gas consumed in California comes from the Southwest, the Rocky Mountain region, and Canada, while the remainder is produced in California. Although contractually California can receive natural gas from any producing region in North America, it can only take supplies from these three producing regions due to the current pipeline configuration.

For the City of Los Angeles, LADWP is the sole supplier of electricity to businesses and residents of the area. In 2020, approximately 37 percent of the energy delivered to LADWP's customers came from eligible renewable energy resources, while 28 percent came from natural gas power resources, 16 percent from coal power resources, and 14 percent from nuclear power resources.[4] The primary supplier of natural gas in the Los Angeles region is Southern California Gas Company.

Transportation Fuels Supply

Most petroleum fuel refined in California is for use in on-road motor vehicles and is refined within California to meet state-specific formulations required by the California Air Resources

[1] U.S. Energy Information Administration. 2022. California State Profile and Energy Estimates: Profile Overview. Available online at: http://www.eia.gov/state/?sid=CA. Accessed: April 2022.

[2] Ibid.

[3] California Energy Commission (CEC). 2021. 2020 Total System Electric Generation in Gigawatt Hours. Available online at: https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html. Accessed: April 2022.

[4] LADWP. 2021. 2020 Power Content Label. October. Available at: https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-powercontentlabel?_adf.ctrl-state=pf527sf87_17&_afrLoop=419132207075050. Accessed: April 2022.

Board (CARB). The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, and rail vehicles; and fuel oil for industry and emergency electrical power generation. Other liquid fuels include kerosene, jet fuel, and residual fuel oil for marine vessels.

California's oil fields make it the third-largest state in the United States for oil refining capacity, behind Texas and North Dakota (federal offshore production is the biggest producer in the United States).[5] Crude oil is moved from area to area within California through a network of pipelines that carry it from both onshore and offshore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley. Currently, 14 petroleum refineries operate in California, processing approximately 1.7 million barrels per day of crude oil.[6]

Other transportation fuel sources are alternative fuels, such as methanol and denatured ethanol (alcohol mixtures that contain no less than 70 percent alcohol), natural gas (compressed or liquefied), liquefied petroleum gas, hydrogen, and fuels derived from biological materials (i.e., biomass).

2.1.2 Energy Consumption

Electricity and Natural Gas Consumption

Californians consumed 279,510 gigawatt hours (GWh) of electricity in 2020, which is the most recent year for which data is available.[7] Of this total, Los Angeles County consumed 65,650 GWh.[8]

Californians consumed 1,232,858,282 million British thermal unit (MMBtu) of natural gas in 2020.[9] Of this total, Los Angeles County consumed 293,598,523 MMBtu of natural gas.[10]

Transportation Sector Fuels Consumption

The transportation sector is a major end use of energy in California, accounting for approximately 39.3 percent of total statewide energy consumption in 2019, the most recent

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[5] U.S. Energy Information Administration. 2022. California State Profile and Energy Estimates: Profile Overview. Available online at: http://www.eia.gov/state/?sid=CA. Accessed: April 2022.

[6] U.S. Energy Information Administration. 2021. Petroleum & Other Liquids. Number and Capacity of Petroleum Refineries. Available online at: https://www.eia.gov/dnav/pet/PET_PNP_CAP1_DCU_SCA_A.htm. Accessed: April 2022.

[7] A watt hour is a unit of energy equivalent to one watt of power expended for one hour. For example, a typical light bulb is 60 watts, meaning that if it is left on for one hour, 60-watt hours have been used. One kilowatt equals 1,000 watts. The consumption of electrical energy by homes and businesses is usually measured in kilowatt hours (kWh). Some large businesses and institutions also use megawatt hours (MWh), where one MWh equals 1,000 kWh. One gigawatt equals one thousand (1,000) megawatts, or one million (1,000,000) kilowatts. The energy output of large power plants over long periods of time, or the energy consumption of jurisdictions, can be expressed in gigawatt hours (GWh).

[8] Electricity data for Los Angeles County and the State of California in 2020 are obtained from the California Energy Commission, electricity consumption by county. Available at: https://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed: April 2022.

[9] A British Thermal Unit (BTU) is the amount of energy needed to raise the temperature of one pound of water by one degree Fahrenheit. A kBTU is 1,000 BTUs. A MMBtu is 1,000,000 BTUs. A therm is 100,000 BTUs.

[10] Natural gas data for Los Angeles County and the State of California in 2020 are obtained from the California Energy Commission, gas consumption by county. Available at: https://ecdms.energy.ca.gov/gasbycounty.aspx. Accessed: April 2022.

year for which data is available.[11] In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 16 billion gallons of gasoline and more than 3 billion gallons of diesel each year.[12]

2.2 Regulatory Overview

2.2.1 Federal Programs

2.2.1.1 Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act requires that all vehicles sold in the U.S. meet certain fuel economy goals, known as the Corporate Average Fuel Economy (CAFE) standards. The National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (USDOT) administers the CAFE program, and the U.S. Environmental Protection Agency (USEPA) provides the fuel economy data.

In April 2010, the USEPA and NHTSA issued a final rulemaking establishing new federal fuel economy standards for model years 2012 to 2016 passenger cars and light-duty trucks. For model year 2012, the fuel economy standards for passenger cars, light trucks, and combined cars and trucks were 33.3 miles per gallon (mpg), 25.4 mpg, and 29.7 mpg, respectively.[13] These standards increase progressively up to 37.8 mpg, 28.8 mpg, and 34.1, respectively, for model year 2016. In subsequent rulemakings, the agencies extended the national program of fuel economy standards to passenger vehicles and light-duty trucks of model years 2017-2025, culminating in fuel economy of 54.5 mpg by model year 2025,[14] as well as to medium- and heavy-duty vehicles of model years 2014-2018, including large pickup trucks and vans, semi-trucks, and all types and sizes of work trucks and buses. [15]

In August 2016, the USEPA and NHTSA adopted the next phase (Phase 2) of the fuel economy and GHG standards for medium- and heavy-duty trucks, which apply to vehicles with model year 2018 and later.[16] In response to the USEPA's adoption of the Phase 2 standards, CARB staff brought a proposed California Phase 2 program before its Board in 2017; and the Board approved the program in March 2018.[17]

In 2018, the USEPA and NHTSA proposed to amend certain existing CAFE standards for passenger cars and light trucks and establish new standards, covering model years

[11] U.S. Energy Information Administration. California State Profile and Energy Estimates: California Energy Consumption by End-Use Sector, 2019. Available online at: http://www.eia.gov/state/?sid=CA#tabs-2. Accessed: May 2021.

[12] CEC. 2016. Summary of California Vehicle and Transportation Energy. Available online at: http://www.energy.ca.gov/almanac/transportation_data/summary.html#vehicles. Accessed: April 2022.

[13] United States Environmental Protection Agency (USEPA) and United States Department of Transportation (USDOT). 2010. *Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards*. Final Rule. 75 Fed. Reg. 25324-25728.

[14] USEPA and USDOT. 2012. *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards*; Final Rule. 77 Fed. Reg. 62623.

[15] USEPA and USDOT. 2011. *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles.* 76 Fed. Reg. 57106.

[16] USEPA. 2016. Final Rule for Phase 2 Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-and-fuel-efficiency. Accessed: May 2022.

[17] CARB. CA Phase 2 GHG webpage: https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-standards-medium-and-heavy-duty-engines-and-vehicles/phase2. Accessed: April 2022.

2022-2025. Compared to maintaining the post-2020 standards now in place, the proposal would increase U.S. fuel consumption.[18] California and other states have announced their intent to challenge federal actions that would delay or eliminate GHG reductions. In April 2020, NHTSA and USEPA amended the CAFE and GHG emissions standards for passenger cars and light trucks and established new less-stringent standards, covering model years 2021 through 2026.

On September 27, 2019, the USEPA and NHTSA published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One.[19] The SAFE Rule (Part One) went into effect in November 2019, and revoked California's authority to set its own GHGs standards and set zero emission vehicle (ZEV) mandates in California. The SAFE Rule (Part One) froze requirements for new ZEV sales at model year 2020 levels for year 2021 and beyond, and would have likely resulted in a lower number of future ZEVs and a corresponding greater number of future gasoline internal combustion engine vehicles. The SAFE Rule was subject to ongoing litigation and on February 8, 2021 the D.C. Circuit Court of Appeals granted the Biden Administration's motion to stay litigation over Part 1 of the SAFE Rule. On April 22 and April 28, 2021, respectively, NHTSA and USEPA formally announced their intent to reconsider the Safe Rule (Part One).[20,21] In December 2021, after reviewing all the public comments submitted on NHTSA's April 2021 Notice of Proposed Rulemaking, NHTSA finalized the CAFE Preemption rulemaking to withdraw its portions of the SAFE Rule (Part One).[22] Also in December 2021, USEPA finalized revised national GHG emissions standards for passenger cars and light trucks for Model Years 2023- 2026.[23] On March 9, 2022, USEPA reinstated California's authority under the Clean Air Act to implement its own GHG emission standards and ZEV sales mandate and entirely rescinded the SAFE Rule (Part One).

2.2.1.2 Energy Policy Act of 2005 and Energy Independence and Security Act of 2007

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Energy Policy Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products. Because driving fuel-efficient vehicles and installing energy-efficient appliances can provide many benefits, such as lower energy bills, increased

[18] USEPA and NHTSA. 2018. Federal Register, Vol. 83, No. 165, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*. August 24. Available at: https://www.federalregister.gov/documents/2018/08/24/2018-16820/the-safer-affordable-fuel-efficient-safe-vehicles-rule-for-model-years-2021-2026-passenger-cars-and. Accessed: April 2022.

[19] USEPA and NHTSA. 2019. Federal Register, Vol. 84, No. 188, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program*. September 27. Available at: https://www.govinfo.gov/content/pkg/FR-2019-09-27/pdf/2019-20672.pdf. Accessed: April 2022.

[20] NHTSA. 2021. NHTSA Advances Biden-Harris Administration's Climate & Jobs Goals. April 22. Available at: https://www.nhtsa.gov/press-releases/nhtsa-advances-biden-harris-administrations-climate-jobs-goals. Accessed: April 2022.

[21] USEPA. 2021. Federal Register, Vol. 86, No. 80, *California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment*. April 28. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/notice-reconsideration-previous-withdrawal-waiver. Accessed: April 2022.

[22] NHTSA. 2021. NHTSA Repeals SAFE I Rule. December 21. Available at: https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy. Accessed: April 2022.

[23] USEPA. 2021. *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026.* Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed: April 2022.

indoor comfort, and reduced air pollution, businesses are eligible for tax credits for buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are given for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

The Energy Policy Act of 2005 also established the first renewable fuel volume mandate in the United States. The original Renewable Fuel Standard program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act of 2007, the Renewable Fuel Standard program was expanded to include diesel and to increase the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.

2.2.1.3 American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 was passed in response to the economic crisis of the late 2000s, with the primary purpose of maintaining existing jobs and creating new jobs. Among the secondary objectives of the American Recovery and Reinvestment Act was investment in "green" energy programs, including funding the following through grants, loans, or other mechanisms: private companies developing renewable energy technologies; local and state governments implementing energy efficiency and clean energy programs; research in renewable energy, biofuels, and carbon capture; and development of high efficiency or electric vehicles.[24]

2.2.1.4 Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 promotes the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. The Intermodal Surface Transportation Efficiency Act contains factors that metropolitan planning organizations (MPO), such as the Southern California Association of Governments (SCAG), are to address in developing transportation plans and programs, including some energy-related factors. To meet the ISTEA requirements, MPOs have adopted explicit policies defining the social, economic, energy, and environmental values that guide transportation decisions in their respective metropolitan areas. The planning process for specific projects would then address these policies. Another requirement of the ISTEA is to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption is expected to be a decision criterion, along with cost and other values to determine the best transportation solution.

2.2.1.5 Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century ("TEA-21") was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment

[24] USEPA. 2009. *Recovery: EPA Gets Involved.* Available at: https://archive.epa.gov/recovery/web/html/. Accessed: April 2022.

of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

2.2.1.6 Executive Order 14008

On January 27, 2021, President Biden issued an Executive Order on Tackling the Climate Crisis at Home and Abroad (Executive Order 14008).[25] Part I of the Order highlights putting the climate crisis at the center of United States foreign policy and national security. Addressing the climate crisis will require significant short-term global reductions in GHG emissions and net-zero global emissions by mid-century or sooner. The United States will pursue green recovery efforts and initiatives to advance the clean energy transition.

Part II of the Order relays the government-wide approach to the climate crisis, which involves reducing climate pollution in every sector of the economy, especially through innovation, commercialization, and deployment of clean energy technologies and infrastructure. A National Climate Task Force is established to focus on addressing the climate crisis through key federal actions to reduce climate change impacts. A 100 percent carbon pollution-free electricity sector is targeted by no later than 2035 and a net-zero emissions economy is to be achieved by no later than 2050. Electricity production by offshore wind resources is aimed to be doubled by 2030. Opportunities for federal funding of clean energy technology and infrastructure shall be identified. Federal permitting decisions need to consider the effects of GHG emissions and climate change.

2.2.2 State Programs

2.2.2.1 AB 32 and SB 32 (Statewide GHG Reductions with Energy Co-Benefits)

The California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) was signed into law in September 2006.[26] The law instructed CARB to develop and enforce regulations for the reporting and verification of state-wide GHG emissions. The bulk of GHG emissions in California are carbon dioxide that result from fossil fuel consumption. Therefore, a reduction in GHG emissions typically translates into reduced fuel and increased energy efficiency. The bill directed CARB to set a state-wide GHG emission limit based on 1990 levels, to be achieved by 2020.

AB 32 requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. In December 2008, CARB adopted its Climate Change Scoping Plan: A Framework for Change ("Scoping Plan"),[27] which included the state's strategies for achieving AB 32's reduction targets. These strategies are implemented with additional rules and regulations of relevance to energy analysis, such as the Advanced Clean Cars Program, the low carbon fuel standard (LCFS), Title 24 building efficiency standards, and the Renewable Portfolio Standard (RPS). These are discussed further below. In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* ("2014 First Update").[28] The stated purpose of the

[25] White House Briefing Room. 2021. *Executive Order on Tackling the Climate Crisis at Home and Abroad.* January 27. Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/. Accessed: April 2022.

[26] CARB. Assembly Bill 32 Overview. 2006. Available at: http://www.arb.ca.gov/cc/ab32/ab32.htm. Accessed: April 2022.

[27] CARB. 2008. Climate Change Scoping Plan: A Framework for Change. December. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed: April 2022.

[28] Health & Safety Code Section 38561(h) requires CARB to update the Scoping Plan every five years.

2014 First Update is to "highlight[…] California's success to date in reducing its GHG emissions and lay[…] the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050."[29] In November 2017, CARB published California's 2017 Climate Change Scoping Plan ("2017 Scoping Plan"), which was subsequently adopted by CARB's Board in December 2017.[30] The 2017 Scoping Plan identifies CARB's strategy for achieving the State's 2030 GHG target as established in SB 32. The strategy includes continuation of the Cap-and-Trade Program through 2030 and incorporates a Mobile Source Strategy that includes strategies targeted to increase zero emission vehicle fleet penetration and a more stringent target for the Low Carbon Fuel Standard by 2030. The 2022 Scoping Plan Update, which is currently under review, assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045.[31]

Enacted in 2016, SB 32 codifies a 2030 GHG emissions reduction target and requires CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. Similar to AB 32, a reduction in GHG emissions typically corresponds with a reduction in energy usage as the bulk of GHGs result from the combustion of fossil fuel.

2.2.2.2 Integrated Energy Policy Report

The Integrated Energy Policy Report (IEPR) provides an assessment of major energy trends and issues for a variety of energy sectors, as well as policy recommendations.[32] Prepared by the California Energy Commission (CEC), this report details the key energy issues facing California and develops potential strategies to address these issues. The 2020 IEPR Update includes a discussion of several strategies to reduce climate change impacts and lessen energy consumption and recommendations for each topic. Examples include a discussion of California's transportation future and the transition to zero-emission vehicles, as well as the potential of microgrids to contribute to a clean and resilient energy system. The assessments and forecasted energy demand within the IEPR will be used by the CEC to develop future energy policies.

2.2.2.3 Title 24 Building Energy Efficiency Standards

The California Green Building Standards Code, as specified in Title 24, Part 11 of the California Code of Regulations, commonly referred to as CalGreen Building Standards (CalGreen), establishes voluntary and mandatory standards to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and

[29] CARB. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework. May. Available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2013-scoping-plan-documents. Accessed: April 2022.

[30] CARB. 2017. California's 2017 Climate Change Scoping Plan. November. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: April 2022.

[31] CARB. 2022. 2022 Scoping Plan Documents. Available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents#:~:text=The%202022%20Scoping%20Plan%20Update%20focuses%20on%20outcomes%20needed%20to,economic%2C%20environmental%2C%20energy%20security%2C. Accessed June 2022.

[32] CEC. 2020. 2020 Integrated Energy Policy Report Update. Available at: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2020-integrated-energy-policy-report-update. Accessed: April 2022.

environmental quality. The provisions of this code apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California. Examples of CalGreen provisions include reducing indoor water use, moisture sensing irrigation systems for landscaped areas, construction waste diversion goals, and energy system inspections. CalGreen is periodically amended; the most recent 2019 standards became effective on January 1, 2020.

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, and 2013 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher efficiency lighting, heating, ventilation, and air conditioning (HVAC) systems, and water heating systems. Additionally, some standards focused on larger energy saving concepts such as reducing loads at peak periods and seasons and improving the quality of such energy-saving installations. Past updates to the Title 24 standards have proven very effective in reducing building energy use, with the 2013 update estimated to reduce energy consumption in residential buildings by 25 percent and energy consumption in commercial buildings by 30 percent, relative to the 2008 standards.[33] The 2016 updates included additional high efficiency lighting requirements, high performance attic and walls, and higher efficiency water and space heaters. The 2016 standards were expected to reduce residential electricity consumption by 28 percent and non-residential electricity by five percent.[34] The CEC has developed and adopted 2019 standards, which went into effect on January 1, 2020.

The 2019 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2020.[35] The 2019 updates include a requirement for solar photovoltaic systems for new homes, requirements for newly constructed healthcare facilities, additional high efficiency lighting requirements, high performance attic and walls, higher efficiency water and space heaters, and high efficiency air filters. Relative to the 2016 standards, the 2019 standards are expected to reduce high-rise residential and non-residential electricity consumption by approximately 10.7 percent and natural gas consumption by one percent and require new low-rise residential buildings to achieve zero net electricity consumption using a combination of building efficiency and on-site renewable electricity generation.[36]

The California Public Utilities Commission, CEC, and CARB also have a shared, established goal of achieving Zero Net Energy (ZNE) for new construction in California. The key policy timelines include: (1) all new residential construction in California will be ZNE by 2020, and

[33] CEC. 2012. Energy Commission Approves More Efficient Buildings for California's Future. Available at: https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/C17.pdf. Accessed: April 2022.

[34] CEC. 2015. 2016 Building Energy Efficiency Standards Adoption Hearing. Available at: https://www.calbo.org/sites/main/files/file-attachments/2015-06-10_adoption_hearing_presentation.pdf?1520982919. Accessed: April 2022.

[35] CEC. 2019. California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Available online at: https://www.energy.ca.gov/title24/2019standards/. Accessed: April 2022.

[36] CEC. 2018. 2019 Title 24 Impact Analysis. June.

(2) all new commercial construction in California will be ZNE by 2030. The ZNE goal generally means that new buildings must use a combination of improved efficiency and renewable energy generation to meet 100 percent of their annual energy need.[37]

While the adopted 2019 Title 24 standards do not achieve the Zero Net Energy goal, they do move the State further along the path to achieving this goal. The CEC has more recently focused on grid harmonization strategies (GHS), to bring maximum benefits to the grid, environment, and occupants; and GHG emissions reductions.[38]

2.2.2.4 Renewables Portfolio Standard

SB 1078 (2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to obtain at least 20 percent of their energy supply from renewable sources by 2017. SB 107 (2006) changed that target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expanded the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In April 2011, then-Governor Brown signed SB 2X, which legislated the prior Executive Order S-14-08 renewable standard. SB 350 (2015) set an additional RPS goal of 50 percent renewables by 2030. SB 100 (2018) accelerated and extended again the RPS – requiring achievement of a 50 percent RPS by 2026 and a 60 percent RPS by 2030. SB 100 also established a state policy goal to achieve 100 percent carbon-free electricity by 2045, a goal which was accompanied by Executive Order B-55-18 (2018) which established a goal to achieve carbon neutrality as soon as possible, and no later than 2045, achieve and maintain net negative greenhouse gas emissions thereafter.[39]

2.2.2.5 Mobile Source Regulations

SB 743 (Transportation Analysis under CEQA)

Public Resources Code Section 21099(c)(1), as codified through enactment of SB 743, was enacted with the intent to change the focus of transportation analyses conducted under the California Environmental Quality Act (CEQA). SB 743 reflects a legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. As finalized in December 2018, amendments to the State CEQA Guidelines adopted in furtherance of SB 743 establish VMT, in lieu of level of service, as the new metric for transportation analysis. Implementation of SB 743 is anticipated to reduce transportation fuels consumption.

SB 375 (Land Use Planning)

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning. SB 375 required CARB to establish GHG emission reduction targets (Regional Targets) for each metropolitan planning region. On September 23, 2010, CARB adopted Regional Targets applying to the years 2020 and 2035. In 2011, CARB adopted

[37] CEC. 2015. Integrated Energy Policy Report. p. 41. Available at: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report. Accessed: April 2022.

[38] CEC. 2018. The 2019 Building Energy Efficiency Standards ZNE Strategy. September 11. Available at: https://www.cesa.org/wp-content/uploads/CESA-webinar-slides-9.11.2018.pdf. Accessed: April 2022.

[39] California Executive Department. 2018. Executive Order B-55-18 to Achieve Carbon Neutrality. Available at: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf. Accessed June 2022.

Regional Targets of eight percent for 2020 and 13 percent for 2035 for the area under the jurisdiction of SCAG. These targets were in place through September 30, 2018. In March 2018, CARB approved updated regional targets of eight percent for 2020 and 19 percent for 2035 for SCAG, which will be applied by SCAG in future planning cycles.

SB 375 requires MPOs, including SCAG, to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans (RTPs) that will achieve the GHG emission Reduction Targets set by CARB, primarily by reducing VMT from light-duty vehicles through development of more compact, complete, and efficient communities. SCAG prepared the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy[40] to fulfill this requirement; and, the CARB accepted SCAG's GHG quantification demonstration for that plan, which demonstrates achievement of the targets set prior to 2018.

In May 2020, SCAG released the Adopted Final 2020-2045 RTP/SCS called *Connect SoCal*.[41] This update to the RTP/SCS is also expected to meet the state's goal of 19 percent reductions per capita transportation emissions in 2035 as compared to 2005. *Connect SoCal* was adopted by SCAG's Regional Council on May 7, 2020 and on September 3, 2020, the final plan was unanimously adopted.

Clean Cars

In January 2012, CARB approved the Advanced Clean Cars Program, which established an emissions control program for cars and light-duty trucks (such as SUVs, pickup trucks, and minivans) of model years 2017-2025. When the program is fully implemented, new vehicles would emit 75 percent less smog-forming pollutants than the average new car sold today, and greenhouse gas emissions would be reduced by nearly 35 percent. This Program would help reduce fossil fuel usage for internal combustion engine powered vehicles. In 2018, the USEPA and NHTSA proposed to amend certain existing CAFE standards for passenger cars and light trucks and establish new standards, covering model years 2021-2026. Compared to maintaining the post-2020 standards now in place, the proposal would increase U.S. fuel consumption.[42]

Commercial Motor Vehicle Idling Regulation

In July 2004, CARB initially adopted an Airborne Toxic Control Measure (ATCM) to limit idling of diesel-fueled commercial motor vehicles (idling ATCM) and subsequently amended it in October 2005, October 2009, and December 2013. This ATCM is set forth in Title 13, California Code of Regulations, Section 2485, and requires, among other things, that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and sleeper berth equipped trucks, not idle the vehicle's primary diesel engine longer than five minutes at any location. This anti-idling regulation helps to reduce fuel consumption by reducing engine usage. The ATCM also requires owners

[40] Southern California Association of Governments (SCAG). 2016. The 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy: The Regional Plan 2019-2050. Available at: https://scag.ca.gov/sites/main/files/file-attachments/f2016rtpscs.pdf?1606005557. Accessed April 2022.

[41] SCAG. 2020. The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Adopted September 3, 2020. Available at: https://scag.ca.gov/read-plan-adopted-final-plan. Accessed: April 2022.

[42] USEPA and NHTSA. 2018. Federal Register, Vol. 83, No. 165, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*. August 24. Available at: https://www.federalregister.gov/documents/2018/08/24/2018-16820/the-safer-affordable-fuel-efficient-safe-vehicles-rule-for-model-years-2021-2026-passenger-cars-and. Accessed: April 2022.

and motor carriers that own or dispatch these vehicles to ensure compliance with the ATCM requirements. The regulation consists of new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck's main engine. Under the new engine requirements, 2008 and newer model year heavy-duty diesel engines need to be equipped with a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling or optionally meet a stringent oxides of nitrogen idling emission standard.

In-Use Off-Road Diesel Fueled Fleets Regulation

In May 2008, CARB approved the In-Use Off-Road Diesel Fueled Fleets Regulation (Off-Road Regulation), which was later amended in December 2009, July 2010, and December 2011. The overall purpose of the Off-Road Regulation is to reduce emissions of oxides of nitrogen (NO_X) and particulate matter (PM) from off-road diesel vehicles operating within California. The regulation applies to all self-propelled off-road diesel vehicles 25 horsepower (hp) or greater used in California and most two-engine vehicles. The Off-Road Regulation:

- Imposes limits on idling (i.e., fleets must limit unnecessary idling to 5 minutes), requires a written idling policy, and requires a disclosure when selling vehicles;
- Requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System, DOORS) and labelled;
- Restricts the adding of older vehicles into fleets starting on January 1, 2014; and
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (VDECS) (i.e., exhaust retrofits).

The anti-idling component of this Off-Road Regulation helps to reduce fuel consumption by reducing engine usage.

Tractor-Trailer Greenhouse Gas Regulation

CARB's Tractor-Trailer Greenhouse Gas regulation approved in 2008 reduces the energy consumption of large trucks.[43] CARB developed this regulation to make heavy-duty tractors more fuel efficient. Fuel efficiency is improved by requiring the use of aerodynamic tractors and trailers that are also equipped with low rolling resistance tires. The tractors and trailers subject to this regulation must either use USEPA's SmartWay (SmartWay) certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies. The SmartWay certification process is part of their broader voluntary program called the SmartWay Transport Partnership Program. The regulation applies primarily to owners of 53-foot or longer box-type trailers, and owners of the heavy-duty tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. All owners regardless of where their vehicle is registered must comply with the regulation when they operate their affected vehicles on California highways. Besides the owners of these vehicles, drivers, motor carriers, California-based brokers and California-based shippers that operate or use them also share in the responsibility for compliance with the regulation.

[43] CARB. Tractor-Trailer Greenhouse Gas Regulation. Available at: https://ww2.arb.ca.gov/our-work/programs/ttghg#:~:text=The%20California%20Air%20Resources%20Board,Regulation%20took%20effect%20in%202010. Accessed: April 2022.

Advanced Clean Trucks

The Advanced Clean Trucks regulation was approved on June 25, 2020 and has two main components, a manufacturers ZEV sales requirement and a one-time reporting requirement for large entities and fleets.[44] The goal of this proposed strategy is to achieve NOx and GHG emission reductions through advanced clean technology, and to increase the penetration of the first wave of zero-emission heavy-duty technology into applications that are well suited to its use.

Executive Order N-79-20

On September 23, 2020, California Governor Gavin Newsom issued Executive Order N-79-20, which entails the following actions:

- All new passenger vehicles sold in California be zero-emission by 2035
- All medium- and heavy-duty vehicles be zero-emission where feasible by 2045
- All off-road vehicles and equipment be zero-emission where feasible by 2035

Governor Newsom ordered extensive inter-agency efforts to support the Executive Order, including evaluations of technological feasibility and cost effectiveness, expansion of electric vehicle charging options and affordable fueling, as well as identification of near-term strategies to increase zero-emission public transportation options.

The Executive Order was generally aimed at transitioning away from fossil fuel dependence in the State, with emphasis on transportation initiatives. However, Governor Newsom addressed efforts to repurpose oil production facilities and extraction sites while continuing the State's existing goals to reduce the carbon intensity of fuels.

2020 Mobile Source Strategy

CARB staff is developing the 2020 Mobile Source Strategy to take an integrated planning approach to identify the level of transition to cleaner mobile source technologies needed to achieve all of California's targets. The 2020 Mobile Source Strategy was heard by the Board on October 28, 2021 and will be forwarded to the appropriate policy and fiscal committees of the California Legislature as required by SB 44 (Skinner). The 2020 Strategy continues the multi-pollutant planning approach to illustrate the pathways forward for the various mobile sectors that are necessary to achieve California's numerous goals and targets over the next 30 years. As specified in SB 44, the 2020 Strategy includes scenarios and programmatic concepts that comprehensively address the mechanisms needed to provide for the deployment of clean medium- and heavy-duty on-road vehicles.[45]

2.2.3 Regional Programs

2.2.3.1 2019 Metro Climate Action and Adaptation Plan

Approved by the Metro Board in June 2012, the Climate Action and Adaptation Plan (CAAP) establishes a framework to identify the areas of greatest opportunity for Metro to reduce GHG emissions and evaluates opportunities based on their costs and the volumes of

[44] CARB. Advanced Clean Trucks. Available at: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks. Accessed: April 2022.

[45] CARB. 2020 Mobile Source Strategy. Available at: https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy. Accessed: April 2022.

emissions they reduce. Metro's influence on GHG emissions extends to all of the County's transportation systems.

The 2019 CAAP outlines how Metro will reduce operational GHG emissions and protect riders from climate change. Since the adoption of the first CAAP, Metro has reported that its GHG emissions have decreased by 12 percent, despite an increase in service by four percent.[46] The CAAP includes a GHG emissions inventory for Metro activities from 2017 and demonstrates how these emissions are expected to change by 2030 and 2050. Metro outlines 13 GHG reduction measures in the CAAP that will enable Metro to achieve a goal of 79 percent reduction in emissions relative to 2017 levels by 2030 and 100 percent by 2050. It also includes climate adaptation actions to protect its infrastructure, along with Metro staff and riders.

Metro will use the CAAP to inform and align other programs, including the Vision 2028 Strategic Plan.

2.2.3.2 Metro Vision 2028 Strategic Plan

Metro approved the Vision 2028 Strategic Plan ("Vision 2028") in June 2018 following the passage of Measure M in November 2016, a voter-approved sales tax anticipated to inject $120 billion of transportation funds into the Los Angeles Metropolitan area over the next 40 years.[47] By 2028, Metro intends to double the percent usage of transportation modes besides passenger vehicles, which generate the highest GHG emissions per person per trip. The Plan serves as a guide to Metro's other specific plans, including the Long-Range Transportation Plan.

2.2.3.3 Metro Green Construction Policy

Metro adopted a Green Construction Policy in August 2011 and is committed to using more sustainable construction equipment and vehicles, as well as implementing best practices, to reduce harmful diesel emissions from all Metro construction projects performed on Metro properties and in Metro rights-of-way. The Green Construction Policy requires the use of construction equipment with technologies such as hybrid drives and specific fuel economy standards, both of which are methods to reduce fossil fuel consumption and GHG emissions during the construction period.

2.2.3.4 Metro Moving Beyond Sustainability

In September 2020, the Metro Board of Directors approved Moving Beyond Sustainability,[48] a plan outlining a comprehensive strategy for the next decade to make Metro facilities greener, reduce air pollution and trash from construction, and reduce smog and greenhouse gases across L.A. County. The plan has goals tied to water quality and conservation, solid waste, materials, construction and operations, energy resource management, emissions and pollution control, resilience and climate adaptation, and economic and workforce development. Moving Beyond Sustainability will be updated every five years with formal

[46] Metro. 2019. Metro Climate and Adaptation Plan 2019. Available at: https://media.metro.net/projects_studies/sustainability/images/Climate_Action_Plan.pdf. Accessed: April 2022.

[47] Metro. Metro Vision 2028 Strategic Plan. Available at: http://media.metro.net/about_us/vision-2028/report_metro_vision_2028_plan_2018-0628.pdf. Accessed: May 2021.

[48] Metro. We Are Moving Beyond Sustainability. Sustainability Strategic Plan 2020. Available at: http://media.metro.net/2020/Moving-Beyond-Sustainability-Strategic-Plan-2020.pdf. Accessed: April 2022.

progress reports every two years, and annual performance updates through Metro's Sustainability dashboard.

2.2.4 Local Programs

2.2.4.1 Sustainable City pLAn and Los Angeles' Green New Deal

The Sustainable City pLAn (pLAn), first introduced by Mayor Eric Garcetti in April 2015, identifies goals and strategies for improving Los Angeles' sustainability related to the environment, economy, and equity. One of the initial action steps within the pLAn is the appointment of a Chief Sustainability Officer within 18 key departments.

In April 2019, Mayor Eric Garcetti released Los Angeles' Green New Deal, which provides greater detail to the former pLAn, and offers more accelerated targets and new goals. The climate-oriented goals of the Green New Deal are inspired by the initiatives set forth by the 2017 Paris Climate Agreement. With respect to energy consumption, the Green New Deal commits to increasing solar power generation and increasing energy efficiency. In addition, it accelerates the City's commitment to attaining GHG reductions, with the goals of reducing levels 50 percent by 2025, 73 percent by 2035, and 100 percent by 2050 in comparison to 1990 baseline emissions[49]. Other targets identified in the Green New Deal include a 13 percent reduction in VMT per capita by 2025 and a 39 percent reduction by 2035, as well increasing the percentage of trips made by walking, biking, or transit to 35 percent by 2025, 50 percent by 2035, and maintain at least 50 percent by 2050.

2.2.4.2 LADWP 2017 Strategic Long-Term Resource Plan

The LADWP Strategic Long-Term Resource Plan (SLTRP) was first developed in 2017 as an expansion of the existing Power Integrated Resource Plan (IRP). The SLTRP provides an in-depth analysis of 11 different energy portfolios case scenarios that are extended through 2050. The recommended scenario most effectively balances economic feasibility, risk, reliability, and environmental priorities with the City's future energy demands. LADWP determined that the recommended scenario (Case 8MLS) would rely upon measures such as coal power replacement by 2025, 1,500 megawatts (MW) of solar energy by 2035, and high electrification of the transportation sector.

[49] City of Los Angeles. L.A.'s Green New Deal: Sustainable City pLAn. Available at: https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf. Accessed: April 2022.

3. SIGNIFICANCE THRESHOLDS

The analysis provided in this report evaluates the significance of the Project's energy by evaluating the following questions from Section VI, Energy, of Appendix G of the CEQA Guidelines:

Threshold 1. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Threshold 2. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

While no quantitative thresholds related to energy are included in the CEQA Guidelines, Part I of Appendix F of the CEQA Guidelines states as follows:

"The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

1. decreasing overall per capita energy consumption,
2. decreasing reliance on fossil fuels such as coal, natural gas, and oil, and
3. increasing reliance on renewable energy resources."

Appendix F states that an Environmental Impact Report (EIR) should include a discussion of the potential energy impacts of a project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Appendix F of the CEQA Guidelines identifies six factors for consideration:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

For Threshold 1, this report assesses whether the Project would result in a potentially significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources by evaluating the Project's electricity, natural gas, and fossil fuel use during construction and operation while considering the six Appendix F factors above. For Threshold 2, this report evaluates whether the Project would conflict with or obstruct applicable state or local plans related to renewable energy and energy efficiency (see **Appendix A**).

4. METHODOLOGY FOR DEVELOPMENT OF ENERGY PROJECTIONS

This section describes the methodology that Ramboll used to develop the energy projections associated with the Project, which includes one-time demand due to construction, as well annual demand associated with Project operations. Additional information regarding calculation methodology can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the Project; only the methodology specific to energy usage is discussed in this report.

4.1 Scenarios Evaluated

4.1.1 Construction Scenarios Evaluated

Ramboll evaluated energy demand associated with the construction of the Project. As described in the Project Description in **Section 1.1**, the Project would include the construction of infrastructure for an aerial gondola system. Construction of the Project alignment is phased, and construction activities would occur at multiple stations/junction/ towers at the same time within the construction period.

Construction activities could commence as early as 2024 through 2026 and are anticipated to occur predominantly on weekdays (i.e., Monday through Friday) from approximately 7am to 5pm.

4.1.2 Operational Scenarios Evaluated

Ramboll evaluated energy demand associated with the operation of the Project. The availability and use of the gondola system are expected to decrease the number of people traveling to Dodger Stadium (and surrounding areas) in passenger vehicles and increase the number of people using public transit. This shift in transportation mode is anticipated to reduce total VMT and vehicle idling time in and around Dodger Stadium, associated with passenger vehicles. Operation of the gondola system itself will involve energy usage associated with electricity consumption (supplied from LADWP's renewable Green Power Program) and back-up power supplied by battery storage. In this technical report, Ramboll evaluated two primary energy usage categories related to the operation of the Project: fuel usage associated with VMT and electricity usage associated with the operation of the gondola system.

Furthermore, Ramboll evaluated energy usage for the following:

1. Baseline/Existing – calculated existing conditions in year 2019
2. Project Build-out– calculated projected emissions in year 2026, after completion of all construction activity
3. Horizon Year Projection – calculated projected emissions in year 2042

4.2 Construction Equipment & Activities

Construction of the Project is anticipated to result in some electricity demand, such as due to the presence of on-site trailers and uses of various types of equipment. This electricity demand would be supplied by the grid. The total and peak electricity usage for Project construction was estimated by quantifying the power requirements for the larger items onsite (e.g., trailers, welders), as well as coming up with an estimate based on the size of each construction site and the planned duration of construction. Construction of the Project

is not anticipated to require natural gas. As such, natural gas usage related to construction of the Project is not discussed further.

Construction of the Project would involve the use of transportation fuel, including gasoline, diesel, and natural gas use in off-road construction equipment, haul trucks, vendor trucks, construction worker vehicles, and worker shuttles. Fuel consumed by off-road construction equipment would be the primary energy resource expended over the course of construction, while VMT associated with the transportation of construction materials and construction worker commutes would also result in fuel consumption.

Off-road construction equipment of various types would be used during each phase of construction. Methodology consistent with the California Emissions Estimator Model® (CalEEMod®) was used to estimate off-road construction equipment emissions based on an assumption that construction of the Project would begin in 2024, with full build-out expected in 2026. Complete emissions results are included in the appendices to the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the Project. Fuel consumption from off-road construction equipment was estimated by converting the total estimated carbon dioxide (CO_2) emissions from that equipment to gallons of fuel using conversion factors from The Climate Registry (TCR).[50]

Fuel consumption from worker, vendor, haul trips, and shuttles are estimated by converting the total estimated CO_2 emissions from each source to gallons of fuel using conversion factors from TCR. Worker vehicles are assumed to include light duty automobiles and trucks, vendor vehicles are assumed to include an equal mix of medium-heavy duty trucks and heavy-heavy duty trucks, hauling vehicles are assumed to be heavy-heavy duty trucks. The vehicle class assumed for the worker shuttles is based on Project-specific information.

4.3 Operational Energy Sources

4.3.1 Electricity

Operation of the Project would result in electricity demand for the proposed gondola operations as well as energy needed for complementary components such as station lighting, escalators, etc. The annual electricity usage for the Project is based on the anticipated usage of the system.

Additional information and tables regarding electricity usage estimates can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the Project.

4.3.2 Fuel Usage

4.3.2.1 Mobile Fuel Usage

There are existing on-road mobile emissions associated with Dodger Stadium that result from passengers in vehicles traveling to games or other special events (i.e., total VMT). The Project would decrease the number of people traveling to Dodger Stadium and surrounding attractions in passenger vehicles and increase the number of people using public transit. While the employees of the Project would result in a small amount of new VMT, the overall shift in transportation mode is anticipated to reduce total VMT and vehicle idling time in and

[50] The Climate Registry. 2020. 2020 Default Emission Factor Document. April. Available at: https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf. Accessed: May 2021.

around Dodger Stadium associated with passenger vehicles, and by proxy, associated emissions and fuel use.

The anticipated reduction in on-road mobile fuel consumption from existing conditions was estimated by calculating the net difference in VMT between the baseline year (2019) and the Project build-out year (2026) and horizon year (2042) and using that data to estimate the associated reduction in CO_2 emissions. Mobile activity data (i.e., VMT and average trip length) was provided by Fehr & Peers. These estimated reductions in CO_2 emissions were then converted to gallons of fuel using conversion factors from TCR.

Additional information and tables regarding CO_2 emissions calculations can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the Project.

5. ANALYSIS OF PROJECT IMPACTS

This section assesses the significance of the Project's energy demand for purposes of CEQA.

5.1 Threshold 1

Would the Project Result in a Potentially Significant Environmental Impact Due to Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources, during Project Construction or Operation?

To evaluate whether the Project would result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, Ramboll evaluated the Project's energy usage during construction and operation in consideration with the six factors identified in Appendix F of the CEQA Guidelines, as provided in **Sections 5.1.1 through 5.1.7**, below.

5.1.1 Energy Requirements and Energy Use Efficiencies

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate the energy intensiveness of materials may be discussed.*

5.1.1.1 Construction

Electricity

Construction of the Project would result in a demand of approximately 864,544 kWh of electricity from the grid. This demand would be temporary, and in some cases would supplant electricity that would have otherwise been provided by another energy source (e.g., diesel generators). Additional information regarding this estimate can be found in **Appendix B of the Draft Environmental Impact Report** for the Project

Fuel Usage

The estimated diesel fuel usage from off-road construction equipment related to the construction of the Project is 171,998 gallons of diesel, as shown in **Table 5-1**. The estimated fuel usage from on-road vehicle trips associated with the construction of the Project is 78,012 gallons of gasoline, 95,529 gallons of diesel, and 6,474 gallons of natural gas as shown in **Table 5-2**.

Construction of the Project would result in total fuel usage as shown in **Table 5-3**. Project construction equipment would conform to current emissions standards (and related fuel efficiencies).

5.1.1.2 Operations

Electricity

Operation of the Project would result in electricity demand of approximately 6.9 GWh/year. The Project would incorporate energy efficient features, such as open-air stations and high-efficiency lighting, and use state-of-the-art gondola technologies, such as automated controls and contactless fare checking. The electrical power for Project operations of the aerial gondola system and associated stations, junction, and towers would be supplied by LADWP through the utility's Green Power Program. Accordingly, the primary electricity usage

associated with the Project would come from renewable resources. A small portion (i.e., <0.5%) of the Project's electricity usage would be related to the operation of park amenities at Chinatown/State Park Station.[51] These amenities will be operated by the Los Angeles State Historic Park. This electricity would be supplied by LADWP's standard electricity portfolio and would result in a small amount of indirect GHG emissions.

Fuel Usage

Operation of the Project would decrease the number of people traveling to Dodger Stadium and surrounding area in passenger vehicles and increase the number of people using public transit. The overall shift in transportation mode is anticipated to reduce total VMT and vehicle idling time in and around Dodger Stadium associated with passenger vehicles, and by proxy, associated emissions and fuel use. When compared against existing conditions, the Project would reduce fuel usage from on-road mobile sources by 79,982 gallons of gasoline and 95 gallons of diesel in 2026, respectively, and 141,294 gallons of gasoline and 168 gallons of diesel in 2042, respectively, as shown in **Table 5-4**.

5.1.1.3 Summary

The Project involves efficient electricity usage and will rely upon LADWP's renewable Green Power Program for Project operations. In addition, the Project would result in a substantial reduction in VMT, with concurrent reductions in fuel usage compared to existing conditions.

5.1.2 Local and Regional Energy Supplies

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The effects of the project on local and regional energy supplies and on requirements for additional capacity.*

5.1.2.1 Construction

Electricity

The Project's electricity demand during construction is discussed in **Section 5.1.1.1**.

In 2020, total in-state electric consumption was 279,510 GWh.[52] The CEC estimates that state-wide energy demand will increase to approximately 324,000 GWh by 2026.[53] The Project's anticipated electricity usage during construction is anticipated to be approximately 0.9 GWh in total or 0.45 GWh/year, which would constitute approximately 0.00014% to 0.00016% of the projected state-wide demand from 2019 to 2026.

The Project's construction electricity use also represent a small percentage of regional estimates for LADWP. The CEC estimates that energy demand in the LADWP planning area will increase to approximately 27,000 to 28,000 GWh in the 2024 to 2026 timeframe,[54] meaning that the Project's contribution in that period would be approximately 0.002% of the projected demand.

[51] These amenities will include approximately 740 square feet of concessions, 770 square feet of restrooms, and a 220 square foot covered breezeway connecting the concessions and restrooms.

[52] CEC. 2020. Electricity consumption by county. Available at: https://ecdms.energy.ca.gov/elecbycounty.aspx Accessed: April 2022.

[53] CEC. 2018. California Energy Demand 2018-2030 Revised Forecast. Available online at: https://efiling.energy.ca.gov/getdocument.aspx?tn=223244. Accessed: April 2022.

[54] Ibid.

Overall, the Project's construction electricity demand is consistent with, and an extremely small percentage of, state and regional projections. Therefore, the Project would not adversely impact local or regional energy supplies and will not require additional generation capacity.

Fuel Usage

The Project's anticipated fuel consumption during construction is discussed in **Section 5.1.1.1**.

To put the amount of fuel use in perspective, construction of the Project would equate to approximately 0.19% of the annual amount of diesel, approximately 0.009% of the annual amount of gasoline, and approximately 0.03% of the amount of natural gas that would be used citywide during Project construction (**Table 5-3**). Furthermore, construction of the Project would equate to approximately 0.004% of the annual amount of diesel, approximately 0.0003% of the annual amount of gasoline, and approximately 0.001% of the annual amount of vehicle fuel natural gas that would be used statewide during Project construction (**Table 5-3**).

These figures demonstrate that fuel use during Project construction would be considered negligible when evaluated on a local and regional scale and would not adversely impact local or regional energy supplies and would not require additional capacity. In addition, the temporary energy consumption associated with Project construction would allow for a long-term reduction in energy consumption associated with Project operations, as discussed below.

5.1.2.2 Operations

Electricity

The Project's electricity demand during operation is discussed in **Section 5.1.1.2**.

For comparison purposes, operation of the Project would equate to approximately 0.01% of the total electricity demand countywide when compared against 2020 values.

In 2020, total in-state electric consumption was 279,510 GWh.[55] The CEC estimates that state-wide energy demand will increase to approximately 324,000 GWh by 2026.[56] The Project's anticipated electricity usage at full build-out (2026) is anticipated to be approximately 6.9 GWh/year which would constitute approximately 0.002% of the projected state-wide demand in that year. Given that the annual growth rate for the state is estimated at 1.27% for 2016-2030, the anticipated state-wide energy demand for 2042 will likely be greater than that in 2026, and thus the Project's relative percentage contribution to the state-wide energy demand would be even less and the Project would be consistent with planned long-term electricity usage.

The Project's electricity use projections also represent an extremely small percentage of regional estimates for LADWP. The CEC estimates that energy demand in the LADWP planning area will increase to approximately 28,000 GWh in 2026,[57] meaning that the Project's contribution in that timeframe would be approximately 0.025% of the projected

[55] CEC. 2020. Electricity consumption by county. Available at: https://ecdms.energy.ca.gov/elecbycounty.aspx Accessed: April 2022.

[56] CEC. 2018. California Energy Demand 2018-2030 Revised Forecast. Available online at: https://efiling.energy.ca.gov/getdocument.aspx?tn=223244. Accessed: April 2022.

[57] Ibid.

demand and the Project would be consistent with planned long-term electricity usage. Accordingly, the Project would not require new state-wide or local generation capacity.

Overall, the Project's projected electricity demand is consistent with state and regional projections. The Project would not adversely impact local or regional energy supplies and will not require additional generation capacity.

5.1.2.3 Summary

The Project would not have a substantial impact on local or regional energy supplies or require additional capacity to be constructed.

5.1.3 Peak and Base Period Demands

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The effects of the project on peak and base period demands for electricity and other forms of energy.*

5.1.3.1 Construction

During Project construction, peak electricity demand is estimated to reach approximately 2.0 MW of power, which may occur during peak and non-peak periods. The peak demand in the LADWP planning area is expected to reach 6,400 to 6,500 MW in the 2024 to 2026 timeframe.[58] As a result, the Project would have a negligible effect on LADWP peak demands and the Project would be consistent with planned electricity usage during peak periods.

The remaining equipment and activity associated with Project construction will be predominantly powered by diesel fuel. As discussed in **Section 5.1.2**, this fuel usage is expected to represent an insignificant amount of local and regional demand. Therefore, the Project would not significantly affect energy demand, including during peak and base periods, during construction.

5.1.3.2 Operation

The Project would incorporate energy efficient features, such as open-air stations and high-efficiency lighting, and use state-of-the-art gondola technologies, such as automated controls and contactless fare checking. When operating near capacity, normal operations are estimated to require approximately 2.5 MW of power which may occur during peak and non-peak periods. The peak demand in the LADWP planning area is expected to be 6,500 MW at Project build-out (2026).[59] As a result, the Project would have a negligible effect on LADWP peak demands and the Project would be consistent with planned electricity usage during peak periods.

5.1.3.3 Summary

As described above, the Project would not have a substantial impact on peak and base period demands for electricity and other forms of energy.

5.1.4 Existing Energy Standards

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The degree to which the project complies with existing energy standards.*

[58] Ibid.

[59] Ibid.

5.1.4.1 Construction

Electricity

The Project's electricity usage during construction is temporary and would allow for a long-term reduction in associated energy consumption related to the reduced VMT, along with a decreased reliance on fossil fuels. All electric equipment operating during this period would comply with applicable standards and codes.

Fuel Usage

Project construction would require the use of on-road trucks for soil hauling and deliveries, and off-road equipment such as excavators, cranes, forklifts, and pavers. The construction activities would comply with state requirements designed to minimize idling and associated emissions, which also minimizes the use of fuel. Specifically, idling of commercial vehicles and off-road equipment would be limited to five minutes in accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation, and the trucks used would be compliant with the requirements of the Tractor-Trailer Greenhouse Gas Regulation.

5.1.4.2 Operation

Electricity

The Project's anticipated electricity usage is discussed in the sections above.

The Project will be designed to comply with all applicable state and local codes, including conformance with the City of Los Angeles Green Building and Low-Impact Development (LID) Ordinances. Furthermore, the passenger stations are designed to be open-air buildings, which lowers the energy needs of the Project by allowing for passive ventilation strategies and natural daylight.

Fuel Usage

Vehicle use for the Project has been evaluated pursuant to the technical advisory that the Governor's Office of Planning and Research published under SB 743, which created a process to change the methods used for transportation impacts analyses under CEQA from focusing on level of service to VMT.[60] (See Cal. Code Regs., tit. 14, § 15064.3.) VMT has a direct correlation to fuel usage.

As discussed previously, the Project would result in a substantial reduction in VMT, with concurrent reductions in fuel usage compared to existing conditions. Reductions in net VMT would result in reduced mobile fuel use per Dodger employee and per event attendee under the Project.

5.1.4.3 Summary

As described above, the Project would comply with all applicable energy standards.

5.1.5 Energy Resources

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The effects of the project on energy resources.*

[60] Governor's Office of Planning and Research. Transportation Impacts (SB 743). Available at: https://opr.ca.gov/ceqa/sb-743/#:~:text=SB%20743%20(Steinberg%2C%202013),more%20options%20to%20drive%20less. Accessed: April 2022.

The Project's energy use is discussed in **Section 5.1.1** above, which includes discussion on the Project's electricity usage, along with the Project's consumption of gasoline and diesel fuel associated with on-road mobile sources and construction activity. The Project's use of energy would not have a substantial effect on statewide or regional energy resources. Furthermore, the temporary energy consumption associated with Project construction would allow for a long-term reduction in associated energy consumption related to the reduced VMT, along with a decreased reliance on fossil fuels. During operations, Project electricity use would come from LADWP's renewable Green Power Program. Programs and measures relevant to energy resources are discussed in detail above.

The Project would not significantly impact energy resources.

5.1.6 Transportation Energy Use

This section addresses the following factor from Appendix F of the CEQA Guidelines:

> *The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.*

The Project's transportation energy use is discussed in **Section 5.1.1** above. As discussed previously, the Project itself is an innovative transportation alternative that would decrease the number of people traveling to Dodger Stadium (and surrounding area) in passenger vehicles and increase the number of people using public transit. This shift in transportation mode would reduce total VMT and vehicle idling time in and around Dodger Stadium. Because the Project involves the creation of a new transportation alternative that is more efficient than passenger vehicles, the Project's impacts would be less than significant.

5.1.7 Summary

Based on the above analysis above and of each of the environmental factors identified in CEQA Guidelines Appendix F, the Project would not result in a potentially significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources and the Project impact for this threshold would be **less than significant.**

5.2 Threshold 2

Would the Project Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency?

The Project is an innovative transportation alternative that would reduce VMT and increase the number of people using public transit, resulting in decreased use of fossil fuels for passenger vehicles. The Project's alignment with local- and state-level plans for increased renewable energy or energy efficiency is outlined in **Appendix A**: Los Angeles County Metropolitan Transportation Authority's 2019 *Climate Action and Adaptation Plan,*[61] CARB's AB 32 *Climate Change Scoping Plan*,[62] and SCAG's 2020-2045 RTP/SCS *Connect SoCal*.[63] As shown in this analysis, the Project would not obstruct local- or state-level plans for increased renewable energy or energy efficiency.

[61] L.A. Metro. 2019. Metro Climate and Adaptation Plan 2019. Available at: https://media.metro.net/projects_studies/sustainability/images/Climate_Action_Plan.pdf. Accessed: April 2022.

[62] CARB. 2017. California's 2017 Climate Change Scoping Plan. November. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf. Accessed: April 2022.

[63] SCAG. 2020. The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Adopted September 3, 2020. Available at: https://scag.ca.gov/read-plan-adopted-final-plan. Accessed: April 2022.

Overall, by reducing VMT, along with a decreased reliance on fossil fuels, while incorporating battery storage, the Project would be consistent with state and local plans for renewable energy and energy efficiency. The Project impact for this threshold is **less than significant**.

TABLES

Table 5-1. Construction Off-Road Equipment Fuel Consumption
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

Year	Diesel Consumption[1,2] (gallons)
2024	116,980
2025	55,018
Total	171,998

Conversions:

10.21 kg CO_2/gallon diesel

Notes:

[1] Diesel consumption is derived from the estimated CO_2 emissions from this source category using a conversion factor from The Climate Registry.

Abbreviations:

CO_2 - carbon dioxide

kg - kilograms

References:

The Climate Registry (April 2020), 2020 Default Emission Factor Document. Available at: https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf. Accessed: April 2022.

Table 5-2. Construction On-Road Fuel Consumption
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

Year	Gasoline Consumption[1,2] (gallons)	Diesel Consumption[1,2] (gallons)	Natural Gas Consumption[1,2] (gallons)
2024	42,275	71,645	4,964
2025	35,736	23,885	1,510
Total	78,012	95,529	6,474

Conversions:

8.78 kg CO_2/gallon gasoline
10.21 kg CO_2/gallon diesel
7.36 kg CO_2/gallon natural gas
1,000 kg CO_2/MT CO_2

Notes:

[1] Diesel and gasoline consumption are derived from the estimated CO_2 emissions from this source category using conversion factors from The Climate Registry.

[2] The breakdown of diesel versus gasoline was derived from EMFAC2021 by querying fuel consumption by vehicle class and fuel type and proportioning it out according to the assumed fleet mix for workers, vendors, haul trucks, and shuttles.

Abbreviations:

CO_2 - carbon dioxide

kg - kilograms

References:

The Climate Registry (April 2020), 2020 Default Emission Factor Document. Available at: https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf. Accessed: April 2022.

Table 5-3. Construction Annual Fuel Consumption
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

Energy Resource	Project Construction Annual Fuel Consumption[1]	City of Los Angeles		California	
		Annual Fuel Consumption	Project's Contribution (%)	Annual Fuel Consumption	Project's Contribution (%)
Gasoline (gallons/yr)[2,3]	39,006	422,523,977	0.009%	13,822,186,081	0.0003%
Diesel (gallons/yr)[4,5]	133,764	72,053,372	0.186%	3,141,798,776	0.0043%
Natural Gas (gallons/yr)[6,7]	3,237	10,681,597	0.030%	306,305,979	0.0011%

Notes:

[1] Project fuel consumption data derived from the estimated CO_2 emissions for on-road vehicles and off-road equipment using conversions factor from The Climate Registry and normalized over the approximate duration of the construction (i.e., 2 years).

[2] Gasoline data for the City is calculated based on the metric tons of CO_2 emissions for fuel combustion from on-road and off-road transportation occurring in the City as reported in the 2017 Community-Wide Greenhouse Gas Emissions Inventory. Available at: https://data.lacity.org/A-Livable-and-Sustainable-City/2017-Community-Wide-Greenhouse-Gas-Emissions/kkrh-b4e3/data. Accessed: April 2022.

[3] Gasoline data for the State is for 2021 and was obtained from CDTFA. Available at: https://www.cdtfa.ca.gov/taxes-and-fees/MVF-10-Year-Report.xlsx. Accessed: April 2022.

[4] Diesel data for the City is calculated based on the metric tons of CO_2 emissions for fuel combustion from on-road and off-road transportation occurring in the City as reported in the 2017 Community-Wide Greenhouse Gas Emissions Inventory. Available at: https://data.lacity.org/A-Livable-and-Sustainable-City/2017-Community-Wide-Greenhouse-Gas-Emissions/kkrh-b4e3/data. Accessed: April 2022.

[5] Diesel data for the State is for 2021 and was obtained from CDTFA. Available at: https://www.cdtfa.ca.gov/taxes-and-fees/Diesel-10-Year-Report.xlsx. Accessed: April 2022.

[6] Natural gas data for the City is calculated based on the metric tons of CO_2 emissions for fuel combustion from on-road and off-road transportation occurring in the City as reported in the 2017 Community-Wide Greenhouse Gas Emissions Inventory. Available at: https://data.lacity.org/A-Livable-and-Sustainable-City/2017-Community-Wide-Greenhouse-Gas-Emissions/kkrh-b4e3/data. Accessed: April 2022.

[7] Natural gas data associated with vehicle fuel for the State is for 2021 and was obtained from the U.S. Energy Information Administration. Available at: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm. Accessed: April 2022.

Abbreviations:

CDTFA - California Department of Tax and Fee Administration

CO_2 - carbon dioxide

Table 5-4. Operational Annual On-Road Fuel Consumption
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

Year	Net Annual VMT[1]	Net Annual Trips[2]	Net Mobile Emissions[3] (MT/yr)	Annual Fuel Consumption[4,5] (gallons/yr)	
			CO_2	Gasoline	Diesel
2026	-2,434,000	-109,246	-703	-79,982	-95
2042	-5,067,000	-227,424	-1,242	-141,294	-168

Conversions:

8.78 kg CO_2/gallon gasoline[4]

10.21 kg CO_2/gallon diesel[4]

Notes:

[1] The net annual VMT estimates were developed by Fehr & Peers and represent the difference from existing conditions (2019) in VMT from the travel associated with those going to and from major events at Dodger Stadium (i.e., Dodger games and concerts). This estimate also includes VMT associated with LA ART employees and Dodger employees traveling to/from the stadium.

[2] The annual trip estimate was calculated using an average trip length value derived from Fehr & Peers data.

Trip Length (mi) 22.3

[3] Net mobile emissions were calculated using annual VMT and trip estimates along with emission factors in g/VMT and g/trip derived from EMFAC2021 for light duty vehicles.

[4] Diesel and gasoline consumption is derived from the estimated net CO_2 emissions from this source category using conversion factors from The Climate Registry.

[5] The breakdown of diesel versus gasoline was derived from EMFAC2021 by querying fuel consumption by vehicle class and fuel type and proportioning it out according to the assumed fleet mix.

Abbreviations:

CO_2 - carbon dioxide
EMFAC - Emission Factors model
g - grams
kg - kilograms
mi - miles
MT - metric ton
VMT - vehicle miles traveled
yr - year

APPENDIX A:
PLAN CONSISTENCY ANALYSIS

Table A-1. Consistency with Applicable State Renewable Energy and Energy Efficiency Strategies
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

#	Sector/Source	Strategy Description	Consistency Analysis
Energy			
1	California Renewables Portfolio Standard (RPS) and SB 350	As most recently amended by SB 100 (2018), California's RPS increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020; 50 percent renewable power by 2026; and, 60 percent renewable power by 2030. SB 350 (2015) also requires the State Energy Resources Conservation and Development Commission to double (by 2030) the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.	**Consistent.** Although this goal is not applicable to an individual transportation project, the electrical power for the operation of the Project's aerial gondola system and associated stations, junction, and towers would be supplied by the City of Los Angeles Department of Water and Power (LADWP) through the utility's Green Power Program. As such, the primary electricity usage associated with the Project would come from renewable resources. Furthermore, the Project would incorporate energy efficient features, such as open-air stations and high-efficiency lighting. As a result, the Project would not impair implementation of the state's RPS or the energy efficiency and conservation targets of SB 350. LADWP is a municipal electricity generation service provider. In 2017, LADWP developed its own Power Strategic Long-Term Resource Plan (SLTRP) as an outline for supplying energy in accordance with the state's renewable energy goals. (See https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-p-doc?_adf.ctrl-state=rmkf94oql_25&_afrLoop=764064428747531.)
2	California Code of Regulations, Title 24, Part 6	Energy efficiency standards for residential and nonresidential buildings that are updated approximately every three years.	**Consistent.** To the extent applicable to the Project's components, the Project would meet or exceed the Title 24 energy efficiency standards in effect at the time of building permit application.
3	Assembly Bill 1109	The Lighting Efficiency And Toxics Reduction Act (AB 1109) requires a reduction in average statewide electrical energy consumption by not less than 50 percent from the 2007 levels for indoor residential lighting and not less than 25 percent from the 2007 levels for indoor commercial and outdoor lighting by 2018.	**Consistent.** Although AB 1109 does not impose specific requirements on individual development projects, the Project will utilize highly efficient light emitting diode (LED) lighting (or equivalent) for indoor and outdoor lighting.
4	California Code of Regulations, Title 24, Part 11	The California Green (CalGreen) Building Standards Code establishes green building standards for residential and nonresidential buildings to meet the goals of AB 32. Standards include requirements for site development, indoor and outdoor water use reduction, construction waste reduction, disposal and recycling, and building maintenance and operation.	**Consistent.** To the extent applicable to the Project's components, the Project would meet the CalGreen Building Standards Code in effect at the time of building permit application. Water-efficient restroom fixtures will be installed at Dodger Stadium Station and the Chinatown/State Park Station. Landscaping will utilize drought-tolerant plants and high-efficiency irrigation devices. Each gondola station will feature recycling receptacles. In addition, at least 65% of the construction waste from the Project will be salvaged for reuse, recycled, or diverted from landfills.

Table A-1. Consistency with Applicable State Renewable Energy and Energy Efficiency Strategies
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

#	Sector/Source	Strategy Description	Consistency Analysis
Mobile Sources			
5	AB 1493 (Pavley Regulations)	Reduces GHG emissions in new passenger vehicles from model years 2012-2016 (Phase I) and model years 2017–2025 (Phase II). Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.	**Consistent.** The Project would not impair implementation of the AB 1493 regulations.
6	Low Carbon Fuel Standard (LCFS)	Establishes protocols for measuring and reducing the life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** The Project would not conflict with implementation of the LCFS.
7	Advanced Clean Cars (ACC) Program	In 2012, the California Air Resources Board (CARB) adopted the ACC program to reduce criteria pollutant emissions and GHG emissions for model year vehicles 2015 through 2025. ACC includes the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulations that require manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.	**Consistent.** The Project would not conflict with implementation of the ACC program.

Table A-1. Consistency with Applicable State Renewable Energy and Energy Efficiency Strategies
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

#	Sector/Source	Strategy Description	Consistency Analysis
8	SB 375	SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035.	**Consistent.** The Project would reduce passenger vehicle miles traveled by providing a new mode of public transportation. Therefore, the Project would assist with the implementation of SB 375. Furthermore, the Project would be consistent with the goals of the Southern California Association of Government's (SCAG's) Connect SoCal plan (see **Table A-3**), which demonstrates how the Southern California region under SCAG's jurisdiction will meet the emission reduction targets of SB 375.

Abbreviations:

AB - Assembly Bill
ACC - Advanced Clean Cars
CalGreen - California Green Building Standards Code
CARB - California Air Resources Board
GHG - Greenhouse Gas
LADWP - Los Angeles Department of Water and Power
LED - light emitting diode
LEV - Low-Emission Vehicle
PHEV - plug-in hybrid electric vehicles
RPS - Renewable Portfolio Standard
SB - Senate Bill
SLTRP - Strategic Long-Term Resource Plan
ZEV - Zero-Emission Vehicle

Table A-2. Consistency with 2017 CARB Scoping Plan Update
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

Programs and Policies	Primary Objective	Consistency
SB 350	Reduce GHG emissions in the electricity sector through the implementation of the 50 percent Renewables Portfolio Standard (RPS), doubling of energy savings, and other actions as appropriate to achieve GHG emissions reductions planning targets in the Integrated Resource Plan (IRP) process.	**Consistent.** Although this goal is not applicable to an individual transportation project, the electrical power for the operation of the Project's aerial gondola system and associated stations, junction, and towers would be supplied by the City of Los Angeles Department of Water and Power (LADWP) through the utility's Green Power Program. As such, the primary electricity usage associated with the Project would come from renewable resources. Furthermore, the Project would incorporate energy efficient features, such as open-air stations and high-efficiency lighting. As a result, the Project would not impair implementation of the state's RPS or the energy efficiency and conservation targets of SB 350. LADWP is a municipal electricity generation service provider. In 2017, LADWP developed its own Power Strategic Long-Term Resource Plan (SLTRP) as an outline for supplying energy in accordance with the state's renewable energy goals. (See https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-p-doc?_adf.ctrl-state=rmkf94oql_25&_afrLoop=764064428747531.)
Low Carbon Fuel Standard (LCFS)	Transition to cleaner/less-polluting fuels that have a lower carbon footprint.	**Consistent.** The Project would not conflict with implementation of the LCFS.
Mobile Source Strategy (Cleaner Technology and Fuels)	Reduce GHGs and other pollutants from the transportation sector through transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled.	**Consistent.** The Project is an urban gondola system which would be an innovative mode of transportation option in the City of Los Angeles that would reduce vehicle miles travelled (VMT). The gondola system and its components (i.e. lights, ventilation, escalators, elevators) would operate on renewable electricity provided by LADWP. As a breakthrough and innovative technology for the region, the Project would also advance future alternative transportation modes in the Los Angeles area while providing a template for aerial projects elsewhere in California.
California Sustainable Freight Action Plan	Improve freight efficiency, transition to zero emission technologies, and increase competitiveness of California's freight system.	**Consistent.** The Project would not conflict with implementation of the California Sustainable Freight Action Plan.

Abbreviations:
CARB - California Air Resources Board
GHG - greenhouse gas
IRP - Integrated Resource Plan
LCFS - Low Carbon Fuel Standard
LADWP - City of Los Angeles Department of Water and Power
SB - Senate Bill
SLTRP - Strategic Long-Term Resource Plan
VMT - vehicle miles traveled

Table A-3. Consistency with Connect SoCal (2020-2045 Regional Transportation Plan/Sustainable Communities Strategy)
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

#	Goals	Consistency Analysis
1	Encourage regional economic prosperity and global competitiveness	**Consistent.** Although this goal is not applicable to an individual transportation project, the Project would encourage regional economic prosperity and global competitiveness by serving existing residents, workers, and visitors from local communities.
2	Improve mobility, accessibility, reliability, and travel safety for people and goods	**Consistent.** The Project would improve mobility, accessibility, reliability, and travel safety for people and goods by reducing passenger vehicle miles traveled and by providing a new mode of public transportation.
3	Enhance the preservation, security, and resilience of the regional transportation system	**Consistent.** Although this goal is not applicable to an individual transportation project, by creating an additional transit option that links to the existing Union Station, the Project helps to build the resilience of the regional transportation system.
4	Increase person and goods movement and travel choices within the transportation system	**Consistent.** The Project would create an increase in person and goods movement and travel choices within the transportation system would by providing an aerial rapid transit option in Downtown Los Angeles that would facilitate travel between Dodger Stadium, the surrounding communities, and the regional transit system accessible at Union Station.
5	Reduce greenhouse gas emissions and improve air quality	**Consistent.** The Project would result in a net decrease of GHG emissions, thus the proposed Project would be consistent with the Plan's efforts to reduce GHG emissions by 8% in 2020 and 19% in 2035, per the targets set by the California Air Resources Board for the region.
6	Support healthy and equitable communities	**Consistent.** Although this goal is not applicable to an individual transportation project, the Project would support healthy and equitable communities by providing a potential mobility hub at the Dodger Stadium property where passengers would be able to access a suite of first and last mile multi-modal options, such as a bike share program to provide connectivity to Elysian Park and the surrounding communities as well as a potential mobility hub at the Chinatown/State Park Station.

Table A-3. Consistency with Connect SoCal (2020-2045 Regional Transportation Plan/Sustainable Communities Strategy)
Los Angeles Aerial Rapid Transit Project
Los Angeles, California

#	Goals	Consistency Analysis
7	Adapt to a changing climate and support an integrated regional development pattern and transportation network	**Consistent.** Although this goal is not applicable to an individual transportation project, the Project will facilitate adapting to a changing climate and supporting an integrated regional development pattern and transportation network by reducing emissions from on-road vehicles through offering an alternative mode of transportation. The proposed Project would facilitate integration of travel between Dodger Stadium, the surrounding communities, and the regional transit system accessible at Los Angeles Union Station.
8	Leverage new transportation technologies and data-driven solutions that result in more efficient travel	**Consistent.** As a breakthrough and innovative technology for the region, the proposed Project would leverage new transportation technologies and data-driven solutions that result in more efficient travel. The proposed Project would advance future alternative transportation systems and technology in the Los Angeles area while providing a template for other innovative aerial projects elsewhere in the state and the country.
9	Encourage development of diverse housing types in areas that are supported by multiple transportation options	**Consistent.** Although this goal is not applicable to an individual transportation project, the Project would encourage development of diverse housing types in areas that are supported by multiple transportation options by providing an additional transportation option for the residents and visitors in the City of Los Angeles and enabling access between Dodger Stadium, the surrounding communities, and the regional transit system accessible at Los Angeles Union Station.
10	Promote conservation of natural and agricultural lands and restoration of habitats	**Consistent.** Although this goal is not applicable to an individual transportation project, the Project would promote conservation of natural and agricultural lands and restoration of habitats by being constructed in a previously developed area and would not impede the region's goal of conserving land and restoring habitats.

Abbreviations:
CARB - California Air Resources Board
GHG - greenhouse gas

Table A-4. Consistency with 2019 Metro Climate Action and Adaptation Plan
Los Angeles Aerial Rapid Transit Project
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Measure	Strategies	Consistency Analysis
Greenhouse Gas Mitigation Measures		
E-1 Renewable Energy Procurement	Expand use of renewable energy in electricity procurement (100% renewable electricity by 2035)	**Consistent.** Although this goal is not applicable to an individual transportation project, the electrical power for the operation of the Project's aerial gondola system and associated stations, junction, and towers would be supplied by the City of Los Angeles Department of Water and Power (LADWP) through the utility's Green Power Program. As such, the primary electricity usage associated with the Project would come from renewable resources. LADWP is a municipal electricity generation service provider. In 2017, LADWP developed its own Power Strategic Long-Term Resource Plan (SLTRP) as an outline for supplying energy in accordance with the state's renewable energy goals. (See https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-p-doc?_adf.ctrl-state=rmkf94oql_25&_afrLoop=764064428747531.)
F-1 Photovoltaic Installations	Increase on-site solar photovoltaic installations	**Consistent.** The Project supports use of renewable power generation and use by committing to use green power from LADWP's Green Power Program. As such, the primary electricity usage for the Project would come from renewable resources.
F-2 Water-Saving Fixture Installation	Install new designs or retrofits of low-water sanitary fixtures that require less water and energy	**Consistent**. The Dodger Stadium Station and Chinatown/State Park Station will feature water-efficient fixtures to help reduce water and energy consumption.
F-3 Water Recycling System Installation	Install non-potable recycled water systems	**Consistent.** Although this measure applies to Metro and not directly to an individual aerial transit project, the Project would not inhibit the installation of non-potable recycled water systems by Metro.
F-4 Facility LED Lighting Installation	Replace lighting fixtures with LED lights	**Consistent.** The Project will utilize light emitting diode (LED) lighting (or equivalent) for indoor and outdoor lighting needs.
F-6 Facility Heating, Ventilation and Air Conditioning (HVAC) Electrification	Replace existing HVAC systems with electric systems	**Consistent.** While the proposed stations will be designed to be open-air buildings that allow for passive ventilation strategies, there will be HVAC at the Dodger Stadium Station employee area, which will be electric.

Table A-4. Consistency with 2019 Metro Climate Action and Adaptation Plan
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Measure	Strategies	Consistency Analysis
Climate Adaptation Measures		
Increase redundancy in power systems, installing additional backup generators and establishing micro grids		**Consistent.** Although this measure applies to Metro and not directly to an individual aerial transit project, the Project will have backup battery storage to use if electric power is disrupted.
Ensure adequate fuel storage before an extreme climate event occurs		**Consistent.** Although this goal is not applicable to an individual transportation project, the Project will have backup battery storage to ensure that passengers can safely disembark in the event of an extreme climate event.

Abbreviations:
AC - air conditioning
GHG - greenhouse gas
HVAC - heating, ventilation, and air conditioning
LADWP - Los Angeles Department of Water and Power
LED - light emitting diode
SLTRP - Strategic Long-Term Resource Plan
VMT - vehicle miles traveled