APPENDIX F
ENERGY REPORT

Shadowbox Studios Project

Energy Utilization Study

prepared for

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1 Project Description

1.1 Introduction

This study analyzes the potential energy impacts of the proposed Shadowbox Studios Project (herein referred to as project) in Santa Clarita, California. Rincon Consultants, Inc. (Rincon) prepared this study for LA Railroad 93, LLC for use in support of environmental documentation being prepared for the project pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the energy impacts related to both temporary construction activity and long-term operation of the project.

1.2 Project Summary

Project Location

The project site is in the City of Santa Clarita in Los Angeles County, California. The regional location of the project site is shown in Figure 1. The 93.5-acre project site is located east of Railroad Avenue and north of 13th Street. The project location is depicted in Figure 2. Adjacent land uses include residential developments to the north and east, and commercial and light industrial uses to the south and west. Undeveloped land is also adjacent to the northeast of the parcel. Land uses in the greater vicinity include residential, commercial, and light industrial, as well as oilfields located approximately one mile to the east. The Newhall Metrolink right-of-way is located along the property's western boundary, parallel to Railroad Avenue. An existing developed and fenced utility corridor on Metropolitan Water District of Southern California property forms the eastern boundary, which is flanked by residential development along Alderbrook Drive to the east.

Project Description

Shadowbox Studios – Santa Clarita is a state-of-the-art, full-service film and television studio campus that is planned for the currently-vacant 93.5-acre parcel of land situated at the northeast corner of Railroad Avenue and 13th Street. The campus overall building total area is approximately 1,294,500 square feet in multiple use types. A five-level (four elevated) parking structure is also included in the proposed project. A detailed statistical summary of buildings and uses is included on the Project Site Plans, included with this application. The overall site includes approximately 476,000 square feet of sound stages; approximately 571,000 square feet of workshops, warehouses and support uses; approximately 210,000 square feet of production and administrative offices; and approximately 37,500 square feet of catering and other specialty services. The project proposes a bridge across Placerita Creek to access a graded employee parking area on the north side of Placerita Creek. The EIR also evaluates the adjacent 11.4 acre Metropolitan Water District (MWD) right of way parcel, which may potentially be utilized for excess parking, subject to agreement with MWD. See Figure 2 for the project site design features.

Figure 1 Regional Location

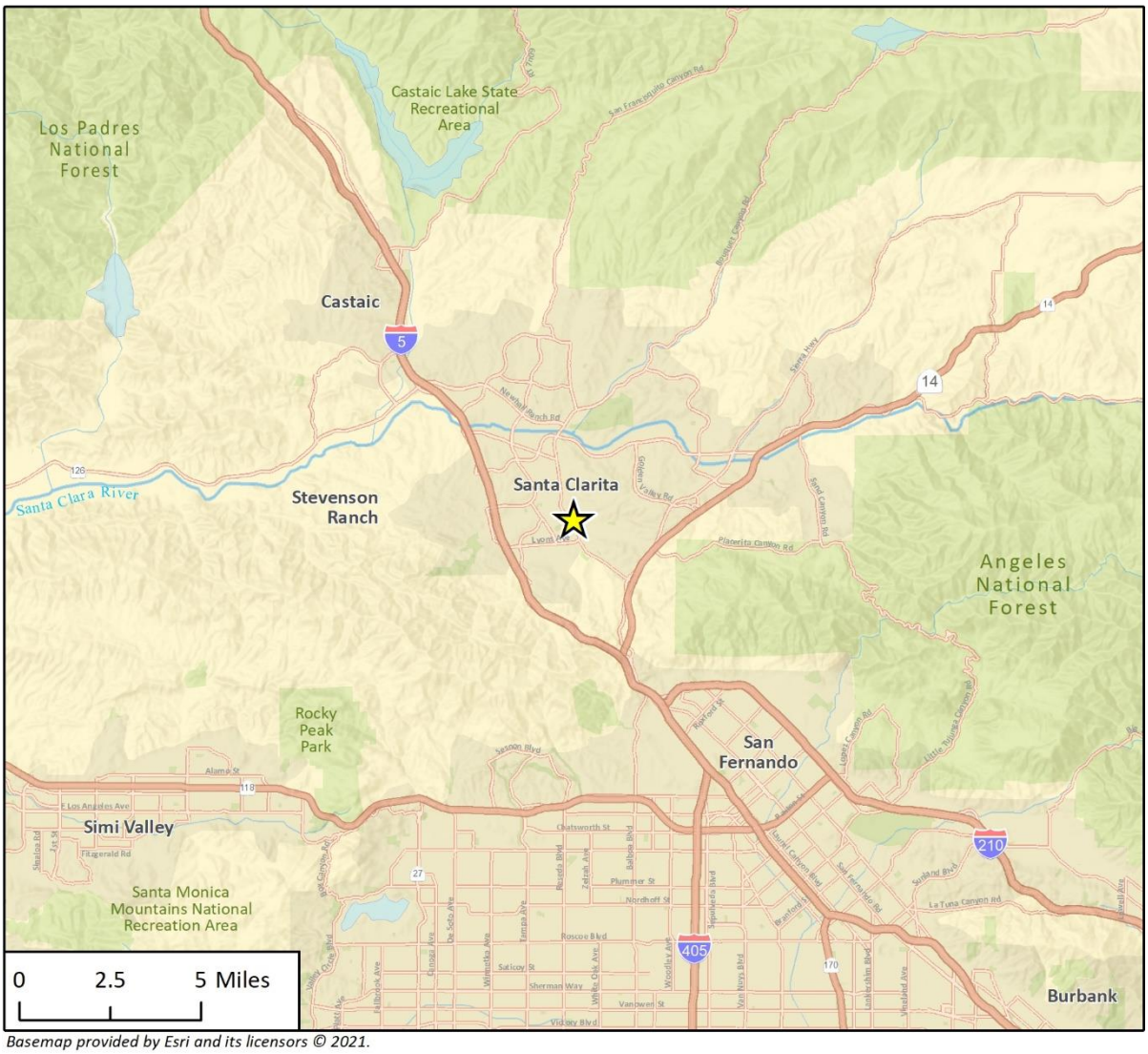

Figure 2 Project Location and Project Design Features

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Fig 2 Project Location_Proj Design_20220222a

2 Background

2.1 Overview of Energy

Energy use relates directly to environmental quality because it can adversely affect air quality and can generate greenhouse gas (GHG) emissions that contribute to climate change. Fossil fuels are burned to create electricity, heat and cool buildings, and power vehicles. Transportation energy use is related to the fuel efficiency of cars, trucks, and public transportation; multi-model transportation options; and the miles traveled by these modes.

Energy use is typically quantified using the British Thermal Units (Btu). The Btu is the amount of energy that is required to raise the temperature of one pound of water by 1 degree Fahrenheit. As points of reference, the approximate amount of energy contained in a cubic foot of natural gas, a kilowatt hour (kWh) of electricity, a gallon of gasoline, and a gallon of diesel are 1,037 Btu, 3,412 Btu, 120,286 Btu, and 137,381 Btu, respectively (United States Energy Information Administration [USEIA] 2021a). Natural gas usage is expressed in U.S. therms with one U.S. therm equal to 100,000 Btu (USEIA 2021b).

2.2 Regional and Local Energy Setting

As a state, California is one of the lowest per capita energy users in the United States, ranked 50th in the nation in 2019, due to its energy efficiency programs and mild climate (USEIA 2021c). In 2019, California consumed 7,802 trillion Btu of energy with total consumption per capita being 198 million Btu (USEIA 2021c).

Electricity and natural gas are primarily consumed by the built environment for lighting, appliances, heating and cooling systems, fireplaces, and other uses such as industrial processes in addition to being consumed by alternative fuel vehicles. Most of California's electricity is generated in-state with approximately 30 percent imported from the Northwest and Southwest in 2020 (California Energy Commission [CEC] 2022a) but the State relies on out-of-state natural gas imports for nearly 90 percent of its supply (CEC 2022b). In 2020, California consumed 272,576 gigawatt-hours (GWh) of electricity with approximately 190,913 GWh from in-State generation and approximately 33 percent of the in-State generation was from renewable energy sources, such as wind, solar photovoltaic, geothermal, and biomass (CEC 2022a).

To reduce statewide vehicle emissions, California requires that all motorists use California Reformulated Gasoline, which is sourced almost exclusively from in-state refineries. Gasoline is the most used transportation fuel in California with 12,572 million gallons sold in 2020 and is used by light-duty cars, pickup trucks, and sport utility vehicles (CEC 2022c). Diesel is the second most-used fuel in California with 1,744 million gallons sold in 2019 and is used primarily by heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles (CEC 2022c). Both gasoline and diesel are primarily petroleum-based, and their consumption releases GHG emissions, including CO_2 and N_2O. The transportation sector is the single largest source of GHG emissions in California, accounting for 40 percent of all inventoried emissions in 2019 (California Air Resources Board [CARB] 2021).

Electricity

In 2020 California's in-state electricity generation totaled 190,913 GWh (CEC 2022a). Table 1 lists the fuel types and percentage contribution from each source for the 2020 total in-state generation.

Table 1 2020 California In-State Generation

Fuel Type	California In-State Generation (GWh)	Percent of California In-State Generation
Non-Renewables		
Coal	317	0.17%
Natural Gas	92,298	48.35%
Oil	30	0.02%
Other (Waste Heat/Petroleum Coke)	384	0.20%
Nuclear	16,280	8.53%
Large Hydro	17,938	9.4%
Unspecified	–	0%
Total Non-Renewables and Unspecified Energy	**127,248**	**66.65%**
Renewables		
Biomass	5,680	2.97%
Geothermal	11,345	5.94%
Small Hydro	3,476	1.82%
Solar	29,456	15.43%
Wind	13,708	7.18%
Total Renewables	**63,665**	**33.35%**
Total System Energy	**190,913**	**100%**

Source: CEC 2022a

Electricity and Natural Gas Demand

Southern California Edison (SCE) would provide electricity to the project, while Southern California Gas (SoCalGas) would provide natural gas to the project. SCE is an independently owned utility that provides electrical service to approximately 15 million customers across a 50,000 square mile service including 180 incorporated cities across 15 counties (SCE 2022). SoCalGas provides natural gas to approximately 21.8 million customers across a 24,000 square mile territory including parts of Riverside County, Orange County, San Bernardino County, Los Angeles County, Ventura County, Santa Barbara County, Kern County, Inyo County, Tulare County, and Mono County (SoCal Gas 2022). Table 2 shows the electricity consumption by sector and total for SCE and Table 3 shows the natural gas consumption by sector and total for SoCalGas.

Table 2 Electricity Consumption in 2020 for the SCE Service Area

Agriculture and Water Pump	Commercial Building	Commercial Other	Industry	Mining and Construction	Residential	Streetlight	Total Usage
3,112	28,800	4,449	12,450	1,822	32,475	426	83,533

Notes: All usage expressed in gigawatt-hours (GWh)

Source: CEC 2022d

Table 3 Natural Gas Consumption in 2020 for the SoCalGas Service Area

Agriculture and Water Pump	Commercial Building	Commercial Other	Industry	Mining and Construction	Residential	Total Usage
74	802	88	1,616	226	2,426	5,231

Notes: All usage expressed in million of U.S. Therms

Source: CEC 2022e

Petroleum

Petroleum fuels are primarily consumed by on-road and off-road equipment in addition to some industrial processes. Transportation accounts for the largest share of the State's energy consumption with the sector accounting for two-fifths or 39 percent (3,073 trillion Btu) of California's 2019 end-use energy consumption total of 7,802 trillion Btu. Though California's population and economy are expected to grow, gasoline demand is forecasted to decline due to improvements in fuel efficiency and increased light-duty vehicle electrification (CEC 2020).

Energy Supply – Petroleum

California is one of the top producers of petroleum in the nation with drilling operations occurring throughout the state but concentrated primarily in Kern and Los Angeles counties (USEIA 2021c). A network of crude oil pipelines connects production areas to oil refineries in the Los Angeles area, the San Francisco Bay area, and the Central Valley. In 2019, the State supplied about four percent of the United States' overall production (USEIA 2021c). According to the USEIA, California's field production of crude oil totaled 143,114 thousand barrels in 2020 (USEIA 2021b).

California oil refineries also process Alaskan and foreign crude oil received at ports in Los Angeles, Long Beach, and the San Francisco Bay area. Crude oil production in California and Alaska is in decline, and California refineries depend increasingly on foreign imports. In 2021, California supplied 29 percent, Alaska supplied 15 percent of the total oil supply to California resources and the remaining 56 percent was supplied by foreign imports (CEC 2022f).

Table 4 summarizes the estimated petroleum fuel consumption for Los Angeles County, in which the project site would be located, as compared to statewide consumption.

Table 4 Annual Gasoline and Diesel Consumption in 2020 for Los Angeles County

Fuel Type	Los Angeles County (millions of gallons)	California (millions of gallons)	Proportion of Statewide Consumption
Gasoline	2,770	12,572	22%
Diesel	299	1,744	17%

Source: CEC 2022c

Alternative Fuels

A variety of alternative fuels are used to reduce petroleum-based fuel demand. Their use is encouraged through various statewide regulations and plans, such as the Low Carbon Fuel Standard and Senate Bill (SB) 32. Conventional gasoline and diesel may be replaced, depending on the capability of the vehicle, with alternative fuels such as hydrogen, biodiesel, and electricity. Currently, there are 17 biodiesel refueling stations, 47 hydrogen refueling stations, and 35,709 electric vehicle supply equipment ports across California (United States Department of Energy 2022). In addition, pursuant to Executive Order N-79-20, California has a goal that all new

passenger vehicles sales by 2035 would be zero-emission vehicles (ZEV) and by 2045 all new medium- and heavy-duty vehicles would also be ZEV.

2.3 Regulatory Setting

Federal Regulations

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce the United States' dependence on foreign oil. It expands the production of renewable fuels, reducing dependence on oil, and confronting climate change. Specifically, it does the following:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard, requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels
- Reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon (mpg) by 2020 – an increase in fuel economy standards of 40 percent

The Energy Independence and Security Act of 2007 also set energy efficiency standards for lighting (specifically light bulbs) and appliances. Development would also be required to install photosensors and energy-efficient lighting fixtures consistent with the requirements of 42 USC Section 17001 et seq.

Energy Policy and Conservation Act

Enacted in 1975, the Energy Policy and Conservation Act established fuel economy standards for new light-duty vehicles sold in the United States. The law placed responsibility on the National Highway Traffic and Safety Administration (NHTSA), a part of the United States Department of Transportation (DOT), for establishing and regularly updating vehicle standards. The United States Environmental Protection Agency (USEPA) administers the Corporate Average Fuel Economy (CAFE) program (discussed below), which determines vehicle manufacturers' compliance with existing fuel economy standards.

Corporate Average Fuel Economy Standards

The Energy Policy and Conservation Act in 1975 established CAFE standards, which are Federal rules established by NHTSA that set fuel economy standards for all new passenger cars and light trucks sold in the United States. The CAFE standards become more stringent each year, reaching an estimated 38.3 miles per gallon for the combined industry-wide fleet for model year 2020 (77 Federal Register 62624 et seq. [October 15, 2012, Table I-1). It is, however, illegal for individual municipalities to adopt more stringent fuel efficiency standards. The Clean Air Act (CAA) (42 United States Code [USC] Section 7543[a]) states that "no state or any political subdivision therefore shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part."

In August 2016, the USEPA and NHTSA announced the adoption of the phase two programs related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model

years 2021 through 2027 for semi- trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower carbon dioxide (CO_2) emissions by approximately 1.1 billion metric tons (MT) of CO_2 and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program (NHSTA 2021).

The NHTSA and the USEPA jointly published the "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program" in September 2019 and issued the Final SAFE Rule (i.e., SAFE Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks) in April 2020. The SAFE Vehicle Rule relaxes federal CAFE vehicle standards and revokes California's authority to set its own vehicle standards.

Construction Equipment Fuel Efficiency Standard

The USEPA sets emission standards for construction equipment. The first federal standards (Tier 1) were adopted in 1994 for all off-road engines over 50 horsepower (hp) and were phased in by 2000. A new standard was adopted in 1998 that introduced Tier 1 for all equipment below 50 hp and established the Tier 2 and Tier 3 standards. The Tier 2 and Tier 3 standards were phased in by 2008 for all equipment. The current iteration of emissions standards for construction equipment are the Tier 4 efficiency requirements are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068 (originally adopted in 69 Federal Register 38958 [June 29, 2004], and most recently updated in 2014 [79 Federal Register 46356]). Emissions requirements for new off-road Tier 4 vehicles were to be completely phased in by the end of 2015.

State Regulations

Assembly Bill 2076

Pursuant to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), the CEC and CARB prepared and adopted a joint-agency report, Reducing California's Petroleum Dependence, in 2003. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicle miles traveled (VMT). One of the performance-based goals of AB 2076 is to reduce petroleum demand to 15 percent below 2003 demand. Furthermore, in response to the CEC's 2003 and 2005 Integrated Energy Policy Reports, the Governor directed the CEC to take the lead in developing a long-term plan to increase alternative fuel use.

California Energy Plan

The CEC is responsible for preparing the California Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The 2008 California Energy Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies several strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs, as well as encouragement of urban designs that reduce vehicle miles travelled and accommodate pedestrian and bicycle access.

Integrated Energy Policy Report

SB 1389 (Chapter 568, Statutes of 2002) required the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC uses these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. The most recent assessment, the *2018 Integrated Energy Policy Report*, contains two volumes. Volume I highlights implementation of California's innovative policies and the role they have played in establishing a clean energy economy. Volume II, adopted February 20, 2019, provides more detail on several key energy policies, including decarbonizing buildings, increasing energy efficiency savings, and integrating more renewable energy into the electricity system.

California Renewable Portfolio Standard and Senate Bill 100

Established in 2002 under SB 1078, and accelerated by SB 107 (2006), SB X 1-2 (2011), and SB 100 (2018), California's Renewable Portfolio Standard (RPS) obligates investor-owned utilities, energy service providers, and community choice aggregators to procure 33 percent total retail sales of electricity from renewable energy sources by 2020, 60 percent by 2030, and 100 percent by 2045. SB 100 also states "that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045." The California Public Utilities Commission and the CEC are jointly responsible for implementing the program.

Title 24, California Code of Regulations

The California Code of Regulations (CCR), Title 24, is referred to as the California Building Code, or CBC. It consists of a compilation of several distinct standards and codes related to building construction including plumbing, electrical, interior acoustics, energy efficiency, handicap accessibility, and so on. The CBC's energy efficiency and green building standards are outlined below.

PART 6 – BUILDING ENERGY EFFICIENCY STANDARDS

The CCR, Title 24, Part 6 is the Building Energy Efficiency Standards. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings in order to reduce California's energy demand. The Building Energy Efficiency Standards is updated periodically to incorporate and consider new energy-efficiency technologies and methodologies as they become available. New construction and major renovations must demonstrate their compliance with the current Building Energy Efficiency Standards through submission and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission (CEC).

The 2019 standards became effective beginning on January 1, 2020, and therefore would be applicable to the project. The 2019 standards focus on four key areas: 1) smart residential photovoltaic systems; 2) updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa); 3) residential and nonresidential ventilation requirements; 4) and nonresidential lighting requirements (CEC 2018a). Under the 2019 standards, nonresidential buildings will be 30 percent more energy efficient compared to the 2016 standards, and single-family homes will be 7 percent more energy efficient (CEC 2018b).

PART 11 – CALIFORNIA GREEN BUILDING STANDARDS

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11 first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 CBC). The 2016 CALGreen institutes mandatory minimum environmental performance standards for all ground-up new construction of non-residential and residential structures. It also includes voluntary tiers (I and II) with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory Green Building Standards and may adopt additional amendments for stricter requirements.

The mandatory standards require:

- 20 percent reduction in indoor water use relative to specified baseline levels;
- 65 percent construction/demolition waste diverted from landfills;
- Inspections of energy systems to ensure optimal working efficiency;
- Low-pollutant emitting exterior and interior finish materials such as paints, carpets, vinyl flooring, and particleboards;
- Dedicated circuitry to facilitate installation of EV charging stations in newly constructed attached garages for single-family and duplex dwellings; and
- Installation of EV charging stations at least five percent of the parking spaces for new multi-family and non-residential developments.

Similar to the compliance reporting procedure for demonstrating Building Energy Efficiency Standards compliance in new buildings and major renovations, compliance with the CALGreen water-reduction requirements must be demonstrated through completion of water use reporting forms for new low-rise residential and non-residential buildings. Buildings must demonstrate a 20 percent reduction in indoor water use by either showing a 20 percent reduction in the overall baseline water use as identified in CALGreen or a reduced per-plumbing-fixture water use rate.

Local Regulations

City of Santa Clarita General Plan

The goals, objectives, and policies in the Conservation and Open Space Element of the City's General Plan applicable to energy, as related to the project, are provided below (City of Santa Clarita 2011).

- **Policy CO 8.3.1:** Evaluate site plans proposed for new development based on energy efficiency pursuant to LEED (Leadership in Energy and Environmental Design) standards for New Construction and Neighborhood Development, including the following: a) location efficiency; b) environmental preservation; c) compact, complete, and connected neighborhoods; and d) resource efficiency, including use of recycled materials and water.
- **Policy CO 8.3.2:** Promote construction of energy efficient buildings through requirements for LEED certification or through comparable alternative requirements as adopted by local ordinance.
- **Policy CO 8.3.6:** Require new development to use passive solar heating and cooling techniques in building design and construction, which may include but are not limited to building orientation, clerestory windows, skylights, placement and type of windows, overhangs to shade doors and windows, and use of light colored roofs, shade trees, and paving materials.

- **Policy CO 8.3.7:** Encourage the use of trees and landscaping to reduce heating and cooling energy loads, through shading of buildings and parking lots.
- **Policy CO 8.3.8:** Encourage energy-conserving heating and cooling systems and appliances, and energy-efficiency in windows and insulation, in all new construction.
- **Policy CO 8.3.9:** Limit excessive lighting levels, and encourage a reduction of lighting when businesses are closed to a level required for security.

City of Santa Clarita Climate Action Plan

The City of Santa Clarita adopted a Climate Action Plan in August 2012. The purpose of the CAP is to measure the amount of GHG emissions generated within the city and to develop strategies to reduce emissions in the future. The CAP includes three specific energy measures to improve energy efficiency and reduce energy waste in the city. One of the measures includes installing more efficient public street and area lighting and another measure is to replace traffic lights with light-emitting diode traffic lights. The last measure encourages the City to establish onsite renewable energy systems through the installation of solar photovoltaic systems (City of Santa Clarita 2012).

City of Santa Clarita Green Building Standards Code

Santa Clarita Municipal Code Section 25.01.010, *Adoption of the City Green Building Standards Code*, regulates the planning, design, operation, construction, use and occupancy of every new building or structure to ensure buildings have a more positive environmental impact and encourage sustainable construction practices.

City of Santa Clarita Energy Conservation Code

Santa Clarita Municipal Code Section 24.01.010, *Adoption of the City Energy Conservation Code,* regulates the design, construction, alteration, installation, or repair of building envelopes, space-conditioning systems, water-heating systems, indoor lighting systems of buildings, outdoor lighting and signage, and certain equipment to enhance the efficiency and reduce energy use of buildings.

3 Impact Analysis

3.1 Methodology

This impact analysis evaluates the potential for the project to result in a substantial increase in energy demand and/or wasteful use of energy during the construction, operation and maintenance, and decommissioning of the solar facility. The analysis includes the estimated energy consumption from project construction and operation, and it is informed by Appendix G of the CEQA Guidelines. The potential impacts are analyzed based on an evaluation of whether construction, operation and maintenance, and decommissioning energy use estimates for the solar facility would be considered Wasteful, inefficient, or unnecessary.

Construction energy demand accounts for anticipated energy consumption during project construction, such as fuel consumed by construction equipment and construction workers' vehicles traveling to and from the project site. Operational energy demand accounts for the anticipated energy consumption during project operation, such as electricity and natural gas consumed from building activity and fuel consumed by vehicle trips to and from the project site. The analysis in this section utilizes the assumptions identified in the Shadowbox Studios Air Quality and Greenhouse Gas Technical Study prepared by Rincon Consultants, Inc. (2022). Specifically, the inputs and outputs from the California Emissions Estimator Model (CalEEMod), Version 2020.4.0 were used in this analysis. Table 5 lists the type and size of buildings that would be constructed as part of the project and the comparable CalEEMod land use.

Table 5 Summary of Project Land Uses

Building # Building Use	CalEEMod Land use	Unit Size	Unit
Sound Stages	Industrial Park	476,000	sf
Catering & Specialty Services[1]	Office Park	33,700	sf
Parking Structure (Covered)	Enclosed Parking with Elevator	822	spaces
		389,163	sf
Production & Admin Office	General Office Building	210,000	sf
Wash/Detail	Automobile Care Center	3,800	sf
Production Support	Industrial Park	571,000	sf
Parking Structure (Uncovered)	Unenclosed Parking with Elevator	247	spaces
Onsite Ground Level Parking	Parking Lot	2,366	spaces
		821,548	sf
Paving	Other Asphalt Surfaces	1,042,894	sf

sf = square feet; N/A = not applicable

[1] Wash/detail is part of the overall 38,000 square feet of "Catering and Specialty Services" identified in the Project description.

Construction

Construction of the proposed project would require temporary energy use in the form of fuel consumption primarily from the operation of construction equipment onsite and vehicle trips from the transport of construction workers to and from the project site and from the import and export of earth materials on- and off-site by heavy trucks. Energy consumption during construction, including gasoline and diesel fuel consumption from construction equipment, hauling trips, vendor tips and worker trips, was estimated using the assumptions and factors from CalEEMod.

The fuel demand rate for construction equipment was derived from the total hours of operation, the equipment's horsepower, the equipment's load factor, and the equipment's fuel usage per horsepower per hour of operation, which are all taken from CalEEMod outputs (see Appendix A), and from compression-ignition engine brake-specific fuel consumptions factors for engines between zero to 100 horsepower and greater than 100 horsepower (USEPA 2021). The fuel demand rate for hauling and vendor trips (cut material imports) was derived from hauling and vendor trip number, hauling and vendor trip length, and hauling and vendor vehicle class from "Trips and VMT" Table contained in Section 3.0, *Construction Detail*, of the CalEEMod results (see Appendix A). The fuel economy for hauling and vendor trip vehicles was derived from DOT. Based on the 2020 average miles traveled per gallon for single-unit 2-axle 6-tire or more truck, the fuel consumed for all vendor and hauling trucks was assumed to be diesel fuel with a 7.5 mile per gallon (mpg) rate of (DOT 2022a). The fuel economy for worker trip vehicles was derived from DOT National Transportation Statistics and was assumed to be 24 mpg (DOT 2022), and all trucks would be powered by gasoline fuel.

The project proposes a bridge across Placerita Creek to access a graded employee parking area on the north side of Placerita Creek. The EIR also evaluates the adjacent 11.4 acre Metropolitan Water District (MWD) right of way parcel, which may potentially be utilized for excess parking, subject to agreement with MWD. These features were included as part of the overall parking construction and are not analyzed separately in the analysis.

Operation

The proposed project would require energy use in the form of electricity, natural gas, and fuel consumption.

Energy Sources

The annual electricity and natural gas consumption were approximated using energy consumption data for the Shadowbox Studios based in Atlanta, Georgia. The peak month electricity (khW) and natural gas (kilo-British Thermal Units [kBtu]) consumption were selected and used to estimate the approximate annual energy consumption. The annual electricity and natural gas values from the Shadowbox Studios in Atlanta were then increased based on the square footage difference (52 percent increase) between the Shadowbox Studios in Atlanta and the proposed project. The annual electricity and natural gas consumed by the project would be approximately 8,460,355 kWh and 3,700,855 kBtu, which is conservatively high since the peak month usage were used to approximate an annual usage.

Mobile Sources

VMT was calculated in CalEEMod using the trip generation rates provided by Gibson Transportation Consulting, Inc. The assumed vehicle fleet mix provided in CalEEMod for the opening year of 2025

was used to determine the total annual fuel consumption of the proposed project. Note that vehicle classes provided in CalEEMod do not correspond exactly to vehicle classes in DOT fuel consumption data, except for motorcycles. Therefore, it was assumed that passenger cars correspond to the light-duty, short-base vehicle class, light/medium trucks correspond to the light-duty long-base vehicle class, and heavy trucks/other correspond to the single unit, 2-axle 6-tire or more class. Using the DOT 2020 rates for average miles traveled per gallon, passenger vehicles were assumed to have a 25.3 mpg; light-medium duty trucks were assumed to have a 18.2 mpg; heavy trucks/others were assumed to have a 7.6 mpg; and motorcycles were assumed to have a 44 mpg. Except for heavy trucks/others, which were assumed to be fueled by diesel, all other vehicle types were assumed to be gasoline fueled vehicles (DOT 2022a, 2022b, and 2022c).

3.2 Significance Thresholds

According to Appendix G of the CEQA Guidelines, an energy-related impact would be considered significant if the project would result in one or more of the following conditions:

- Wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation;
- Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

3.3 Energy Impact Analysis

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, operation, or decommissioning?

Impact E-1 THE PROJECT WOULD NOT RESULT IN WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION DURING CONSTRUCTION NOR OPERATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Wasteful, Inefficient, and Unnecessary Consumption of Energy

CEQA Guidelines Appendix F is an advisory document that assists in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. This relies upon Appendix F of the CEQA Guidelines, which includes the following criteria to determine whether this threshold of significance is met:

- **Criterion 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 maybe discussed.
- **Criterion 2**: The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- **Criterion 3**: The effects of the project on peak and base period demands for electricity and other forms of energy.
- **Criterion 4**: The degree to which the project complies with existing energy standards.
- **Criterion 5**: The effects of the project on energy resources.
- **Criterion 6:** The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives

These six criteria are addressed in the construction and operational analysis below.

Construction

The project's energy requirements and its energy use efficiencies by amount and fuel type for construction is quantified within this section (Criterion 1). Project construction would require energy resources primarily in the form of fuel consumption to operate heavy equipment and vehicles. Construction of the project would also result in fuel consumption from the use of construction tools and equipment, haul truck trips, and vehicle trips generated from construction workers traveling to and from the site. Table 6 summarizes the anticipated energy consumption from construction equipment and vehicles, including construction worker trips to and from the project site. As shown therein, construction activities would result in the consumption of 608,836 gallons of diesel fuel from construction equipment and vendor, hauling, and water truck trips, and approximately 353,662 gallons of gasoline from construction worker vehicle trips.

Table 6 Project Construction Energy Usage – Fuel Consumption

	Fuel Consumption (gallons)	
Source	**Gasoline**	**Diesel**
Construction Equipment & Hauling Trips	N/A	608,836
Construction Worker Vehicle Trips	353,662	N/A

See Appendix A for energy calculation sheets.

Construction activities and corresponding fuel energy consumption would be temporary and localized, as the use of diesel fuel and heavy-duty equipment would not be a typical condition of the project. In addition, construction contractors would be required to comply with the provisions of California Code of Regulations Title 13 Sections 2449 and 2485, which prohibit diesel-fueled commercial motor vehicles and off-road diesel vehicles from idling for more than five minutes and would minimize unnecessary fuel consumption. Construction equipment would be subject to the USEPA Construction Equipment Fuel Efficiency Standard, which would also minimize inefficient, wasteful, or unnecessary fuel consumption. Furthermore, per applicable regulatory requirements such as 2019 CALGreen, the project would comply with construction waste management practices to divert a minimum of 65 percent of construction debris. These practices would result in efficient use of energy necessary to construct the project. In the interest of cost-efficiency, construction contractors also would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, the project would not involve the inefficient, wasteful, and unnecessary use of energy during construction.

Operation

The project's energy requirements and its energy use efficiencies by amount and fuel type for operation is quantified within this section (Criterion 1). Operation of the project would result in the consumption of electricity, and gasoline and diesel fuels. Natural gas and electricity would be used for heating and cooling systems, lighting, appliances, and water and wastewater conveyance at the proposed buildings onsite. Gasoline and diesel consumption would be associated with vehicle trips generated by employees and guests.

Table 7 summarizes estimated operational energy consumption for the proposed project. As shown therein, operation would require approximately 1,088,710 gallons of gasoline and 192,858 gallons of diesel for transportation fuels, 8,460,355 kWh of electricity, and 37,009 therms of natural gas. The transportation fuel consumption represents the highest amount used from project operation.

Criterion 2 asks for the effects of the project on local and regional energy supplies and on requirements for additional capacity, Criterion 3 asks for the effects of the project on peak and base period demands for electricity and other forms of energy, and Criterion 5 asks for the effects of the project on energy resources. Operational fuel consumption associated with the project would account for less than one percent of Los Angeles County's gasoline and diesel use. Project electricity demand would represent less than one percent of SCE electricity demand and project natural gas use would represent less than one percent of SoCalGas natural gas demand. SCE and SCG have not provided any indication that it cannot serve the project. Therefore, there would be sufficient petroleum fuel in Los Angeles County for the project and SCE and SCG would have sufficient supplies for peak and base period demand for the project.

Table 7 Estimated Project Annual Operational Energy Consumption

Source	Energy Consumption[1]	
Transportation Fuels		
Gasoline	1,088,710 gallons	130,957 MMBtu
Diesel	192,858 gallons	26,495 MMBtu
Electricity	8,460,355 kWh	28,867 MMBtu
Natural Gas	37,009 therms	3,701 MMBtu

MMBtu = million metric British thermal units; kWh = kilowatt-hours

[1] Energy consumption is converted to MMBtu for each source

See Appendix A for energy calculation sheets

Criterion 4 asks the degree to which the project complies with existing energy standards. The project would be required to comply with all standards set in the latest iteration of the California Building Standards Code (CCR Title 24), which would minimize the wasteful, inefficient, or unnecessary consumption of energy resources by the built environment during operation. California's CALGreen standards (CCR Title 24, Part 11) require implementation of energy-efficient light fixtures and building materials into the design of new construction projects. Furthermore, the 2019 Building Energy Efficiency Standards (CCR Title 24, Part 6) require newly constructed buildings to meet energy performance standards set by the CEC. These standards are specifically crafted for new buildings to result in energy efficient performance so that the buildings do not result in wasteful, inefficient, or unnecessary consumption of energy. Pursuant with CALGreen, all plumbing fixtures used for the proposed project would be high-efficiency fixtures, which would minimize the potential the inefficient or wasteful consumption of energy related to water and wastewater. In addition, the project would utilize electricity from SCE, which is required to procure a certain percentage of electricity from renewable resources.

Criterion 6 asks for the project's projected transportation energy use requirements and its overall use of efficient transportation alternatives. The proposed project would reduce anticipated transportation fuel use through provision of 246 electric vehicle charging spaces and 170 onsite bicycle parking spaces. The electric vehicle charging stations would represent an increase in electricity use onsite, but the use of more electric vehicles would offset fuel consumption for diesel or gasoline fueled vehicles. In addition, the project site would be accessible via public transit. Santa Clarita Transit and Antelope Valley Transit provide bus routes with bus stops along Railroad Avenue adjacent to the project site. Specifically, the bus stops are served by routes 12 and 757 from Santa Clarita Transit and route 790 from Antelope Valley Transit Authority. These lines also have stops at the Newhall Metrolink Station, which is half a mile south of the project site or an approximately ten-

minute walk. At the Newhall Metrolink Station (25663 Avenue Stanford), there are additional Santa Clarita Transit bus routes (796, 797, and 799). The Amtrak Thruway Bus route 1 also has a stop at the station. Lastly, the Antelope Valley commuter rail line provided by Metrolink stops at the station. This commuter rail provides stops from Lancaster to the Los Angeles Union Station. Given the number of public transit options and the proximity of the campus to the Newhall Metrolink Station, these factors would encourage future employees to travel to the site via public transit. These factors would minimize the potential of the project to result in the wasteful, inefficient, or unnecessary consumption of vehicle fuels. Therefore, project operation would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy.

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

Impact E-2 THE PROJECT WOULD NOT CONFLICT WITH OR OBSTRUCT THE CITY OF SANTA CLARITA CAP NOR THE GENERAL PLAN. NO IMPACTS WOULD OCCUR.

The City Santa Clarita currently does not have a plan pertaining to renewable energy or energy efficiency. Instead, the project's consistency with State regulations and the City of Santa Clarita's CAP and General Plan are used.

State Energy Regulations

The proposed project would be required to comply with the nonresidential mandatory measures in the 2019 CALGreen, which would reduce energy consumption compared to standard building practices. The proposed project would also be required to comply with the energy standards in the California Building Energy Efficiency Standards. Measures included in this energy standards include low-flow plumbing fixtures, water-efficient irrigation systems, and energy-efficient lighting and HVAC. Compliance with these regulations would minimize potential conflicts with adopted energy conservation plans. As the project would be required to comply with these prescriptive measures, the project would not conflict with or obstruct state plans.

City of Santa Clarita CAP and General Plan

The City of Santa Clarita CAP includes measures aimed at reducing energy and water use, encouraging installation of renewable energy systems, integrating land use and transportation planning to reduce VMT, and increasing the number of urban trees and amount of vegetated open space. The measure that are relevant to energy use are identified in Table 8.

The City's General Plan also includes Goal CO 8, which is directed at improving energy efficiency, reducing energy and natural resource consumption, and reducing GHG emissions associated with development. Table 8 summarizes the project's consistency with applicable CAP measures and General Plan Goal CO 8. As summarized therein, the project would be consistent with the applicable measures of the City's CAP and General Plan.

Table 8 Project Consistency with City of Santa Clarita CAP and General Plan

Reduction Strategy	Project Consistency
Climate Action Plan	
Establish On-site Renewable Energy Systems – Solar Power. Includes installation of photovoltaic systems in residential or commercial buildings.	**Consistent.** Pursuant with Section 110.10 of the 2019 Building Energy Efficiency Stands, the project, as a nonresidential building with buildings less than three stories would need to be solar ready. The project is considering the installation of solar canopies in the Metropolitan Water District Parking Lot along the eastern section of the site.
Overall Land Use Transportation Measure. Includes increased density of in-City development, increased diversity of urban and suburban developments, increased location efficiency, destination and transit accessibility, integration of affordable and below market rate housing, implementation of trip reduction programs, improvements to the transit system, and improvements to the flow of traffic.	**Consistent**. The project would repurpose a vacant parcel that is half a mile north of the Newhall Metrolink Station and within walking distance of bus stops served by Santa Clarita Transit, Antelope Valley Transit Authority, and the Amtrak Thruway Bus. Additionally, the project would provide catering, specialty services (e.g., car washing and detailing service), and a gym to encourage a "park once" strategy for employees and guests of the campus to reduce daily trips generated by the project. Electric golf carts would also be provided for onsite traveling.
Provide Pedestrian Network Improvements. Includes improving pedestrian access to off-site areas. Enhancements can range from improving interconnectivity by expanding the pedestrian network to minimizing barriers to pedestrian access such as walls, landscaping, slopes, or anything that impedes circulation.	**Consistent**. The project would include roadway modifications at the intersection of Railroad Avenue and 13th Street. A bike path and trail would be developed on the north side of the crossing. There would also be internal roadways and sidewalks constructed onsite for employees and guests traveling within the campus.
Use Reclaimed Water. Includes meeting City's demand for landscape water.	**Consistent**. The project would utilize reclaimed water for landscaping pursuant with CALGreen Section 5.305.1.1.
Low-Flow Water Fixtures. Includes installation of low-flow or high efficiency water fixtures such as low-flow toilets, urinals, showerheads, or faucets, or high-efficiency clothes-washers and dishwashers in residential and commercial buildings	**Consistent**. The project would be required to comply with Section 5.303.3, *Water conserving plumbing fixtures and fittings*, from the 2019 CALGreen nonresidential standards.
Landscape Irrigation Systems. Includes use of efficient irrigation techniques, such as "smart" irrigation technology.	**Consistent**. The project would include installation of water-efficient irrigation systems in accordance with CALGreen Section 4.304.
Urban Tree Planting. Includes planting trees through the City's Urban Forestry Division.	**Consistent**. The project would include planting of trees and shrubbery throughout the project site.
General Plan	
Conservation and Open Space Goal 8. Development designed to improve energy efficiency, reduce energy and natural resource consumption, and reduce emissions of greenhouse gases.	**Consistent.** As discussed above, the project would be consistent with the City's CAP. The project would also be required to comply with the California Green Building Standards Code, the 2019 Building Energy Efficiency Standards, the City's Green Building Standards Code, and the City's Energy Conservation Code. The project would be constructed in compliance with CALGreen and the 2019 Title 24 standards and would be located within walking distance to the Newhall Metrolink Station. In addition, the project would include onsite amenities (catering, gym, and car wash services) and electrical golf carts, thereby reducing vehicle trips. The project would also plant trees throughout the project site.

Source: City of Santa Clarita 2012

4 Conclusions

The project would not result in the wasteful, inefficient, or unnecessary use of energy, nor would it conflict with or obstruct a state or local plan for renewable energy or energy efficiency. No mitigation measures are recommended.

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Appendix A

Energy Calculation Sheets

Shadowbox Studios - Santa Clarita

Last Updated: 8/16/22

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Rubber Tired Dozers	3	8	247	0.4	Site Preparation	12,409
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Preparation	6,681
Excavators	2	8	158	0.38	Grading	19,245
Graders	1	8	187	0.41	Grading	12,288
Rubber Tired Dozers	1	8	247	0.4	Grading	15,835
Scrapers	2	8	367	0.48	Grading	56,466
Tractors/Loaders/Backhoes	2	8	97	0.37	Grading	12,789
Cranes	1	7	231	0.29	Building Construction	4,710
Forklifts	3	8	89	0.2	Building Construction	4,770
Generator Sets	1	8	84	0.74	Building Construction	5,552
Tractors/Loaders/Backhoes	3	7	97	0.37	Building Construction	8,415
Welders	1	8	46	0.45	Building Construction	1,849
Air Compressors	1	6	78	0.48	Architectural Coating Phase	0
Pavers	2	8	130	0.42	Paving	4,387
Paving Equipment	2	8	132	0.36	Paving	3,818
Rollers	2	8	80	0.38	Paving	2,715
					Total Fuel Used	**171,928**
						(Gallons)

Construction Phase	Days of Operation
Site Preparation	77
Grading	99
Building Construction	379
Architectural Coating	190
Paving	95
Total Days	840

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Site Preparation	25.3	18	14.7	805.30
Grading	25.3	20	14.7	1,150.43
Building Construction	25.3	1448	14.7	318,863.34
Architectural Coating	25.3	290	14.7	32,014.62
Paving	25.3	15	14.7	827.96
			Fuel	**353,661.66**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Site Preparation	7.6	0	20.0	0.00
Grading	7.6	0	20.0	0.00
Building Construction	7.6	0	20.0	0.00
Architectural Coating	7.6	0	20.0	0.00
Paving	7.6	0	20.0	0.00
Architectural Coating Phase	7.6	0	20.0	0.00
			Fuel	**-**
VENDOR TRIPS				
Site Preparation	7.6	0	14.7	0.00
Grading	7.6	0	14.7	0.00
Building Construction	7.6	596	14.7	436,907.21
Architectural Coating	7.6	0	14.7	0.00
Paving	7.6	0	14.7	0.00
Architectural Coating Phase	7.6	0	14.7	0.00
			Fuel	**436,907.21**

Total Gasoline Consumption (gallons)	**353,662**
Total Diesel Consumption (gallons)	**608,836**

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2* . September. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1013KWQ.pdf

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics* . Available at: https://www.bts.gov/topics/national-transportation-statistics.

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Populate one of the following tables (Leave the other blank):

Annual VMT		OR	Daily Vehicle Trips	
Annual VMT:	25,530,765		Daily Vehicle Trips:	
			Average Trip Distance:	

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.541709
Light Duty Truck 1 (LDT1)	0.062136
Light Duty Truck 2 (LDT2)	0.185590
Medium Duty Vehicle (MDV)	0.128486
Light Heavy Duty 1 (LHD1)	0.023783
Light Heavy Duty 2 (LHD2)	0.006533
Medium Heavy Duty (MHD)	0.012157
Heavy Heavy Duty (HHD)	0.009216
Other Bus (OBUS)	0.000814
Urban Bus (UBUS)	0.000497
Motorcycle (MCY)	0.024669
School Bus (SBUS)	0.000753
Motorhome (MH)	0.003657

Fuel Economy (MPG) [1]	
Passenger Vehicles	25.3
Light-Med Duty Trucks	18.2
Heavy Trucks/Other	7.6
Motorcycles	44

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*54.17%*	*Gasoline*	13,830,245	0.00	546,650
Light-Medium Duty Trucks	*37.62%*	*Gasoline*	9,604,980	0.00	527,746
Heavy Trucks/Other	*5.74%*	*Diesel*	1,465,721	0.00	192,858
Motorcycle	*2.47%*	*Gasoline*	629,818	0.00	14,314

Total Gasoline Consumption (gallons)	**1,088,710**
Total Diesel Consumption (gallons)	**192,858**

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2021. National Transportation Statistics. Available at: https://www.bts.gov/topics/national-transportation-statistics.