Appendix D

Energy Impact Assessment

ENERGY IMPACT ASSESSMENT

FOR THE PROPOSED

FRESNO CITY COLLEGE SOFTBALL FIELD IMPROVEMENT PROJECT

STATE CENTER COMMUNITY COLLEGE DISTRICT

FRESNO, CA

JULY 2022

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF COMMON TERMS & ACRONYMS

AFV	Alternative Fuel Vehicles
CalEEMod	California Emissions Estimator Model
CARB	California Air Resource Board
CEQA	California Environmental Quality ACt
CHP	Combined Heat and Power
DSG	Department of General Services
EMFAC	Emissions Factor
EO	Executive Order
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
kBTU	Kilo British Thermal Units
kW	Kilowatt
kWh	Kilowatt Hour
LEED	Leadership in Energy and Environmental Design
MW	Megawatt
PG&E	Pacific Gas and Electric
PV	Photovoltaic
SCAQMD	South Coast Air Quality Management District
SJVAPCD	San Joaquin Valley Air Pollution Control District
USDOT	U.S. Department of Transportation
VMT	Vehicle Mile Travelled

INTRODUCTION

This report provides an analysis of potential energy impacts associated with the proposed Fresno City College Softball Field Improvement Project. This report also provides a summary of existing conditions in the project area and the applicable regulatory framework pertaining to energy.

PROPOSED PROJECT SUMMARY

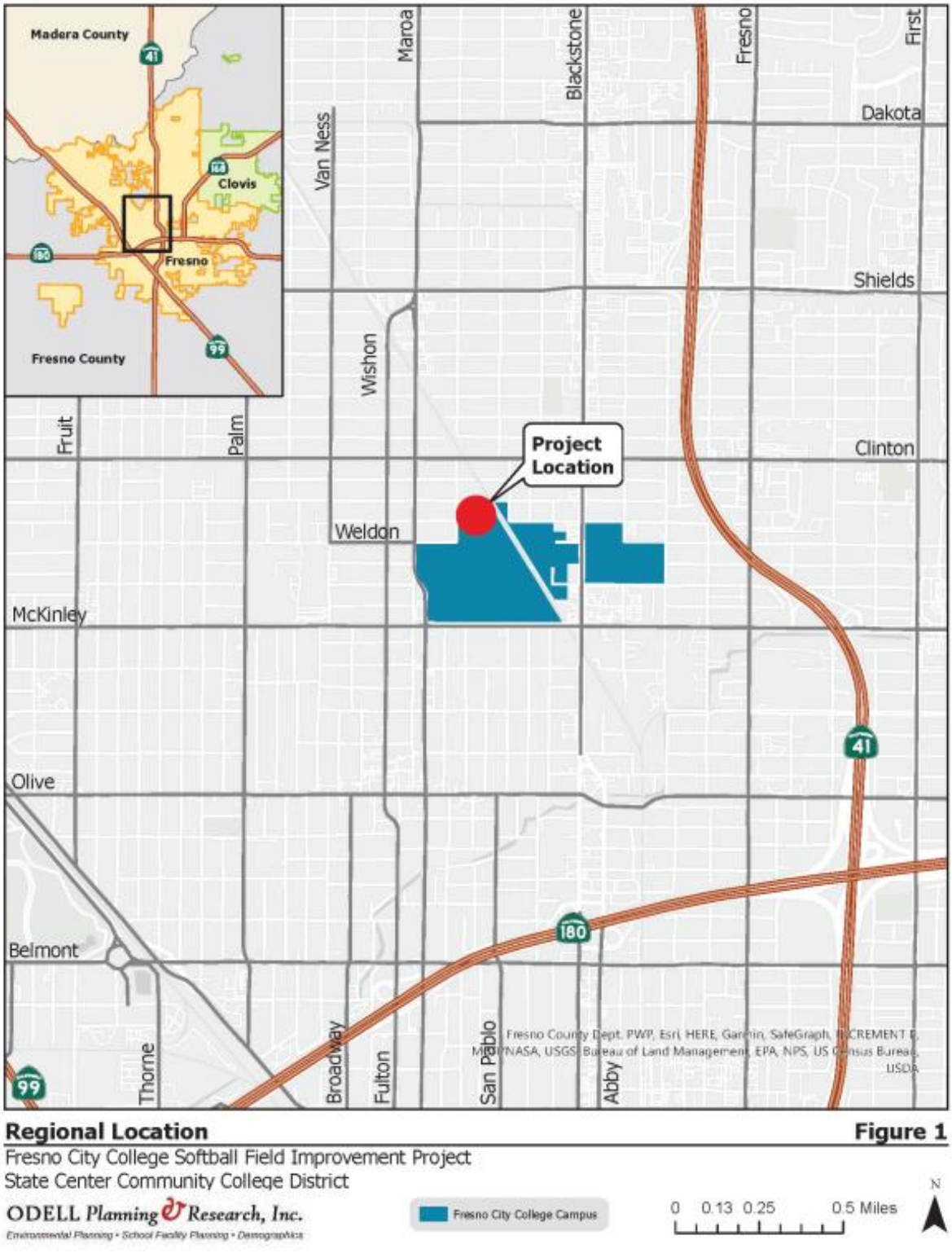
The proposed project includes improvement to existing softball facilities at Fresno City College. The project location is depicted in Figures 1 and 2. The following facilities and activities are planned as part of the project. Development of the facilities would occur over the next year.

- Demolition of existing dugout, bullpen, and announcer booth, approximately 2,050 square feet.
- Replacement of the existing bleacher seating with a new 200 person seating capacity.
- Construction of an announcer's booth, in-ground dugout enclosure, batting cage area, two pitching warm-up areas, back stop fencing, and field lighting.
- Construction of a field house that contains a team room, coach's office, restrooms, snack bar. And storage areas.
- The addition of 3 ADA parking spaces along an existing access road.

ENERGY FUNDAMENTALS

Energy use is typically associated with transportation, construction, and the operation of land uses. Transportation energy use is generally categorized by direct and indirect energy. Direct energy relates to energy consumption by vehicle propulsion. Indirect energy relates to the long-term indirect energy consumption of equipment, such as maintenance activities. Energy is also consumed by construction and routine operation and maintenance of land use. Construction energy relates to a direct one-time energy expenditure primarily associated with the consumption of fuel use to operate construction equipment. Energy-related to land use is normally associated with direct energy consumption for heating, ventilation, and air conditioning of buildings.

Figure 1. Project Location

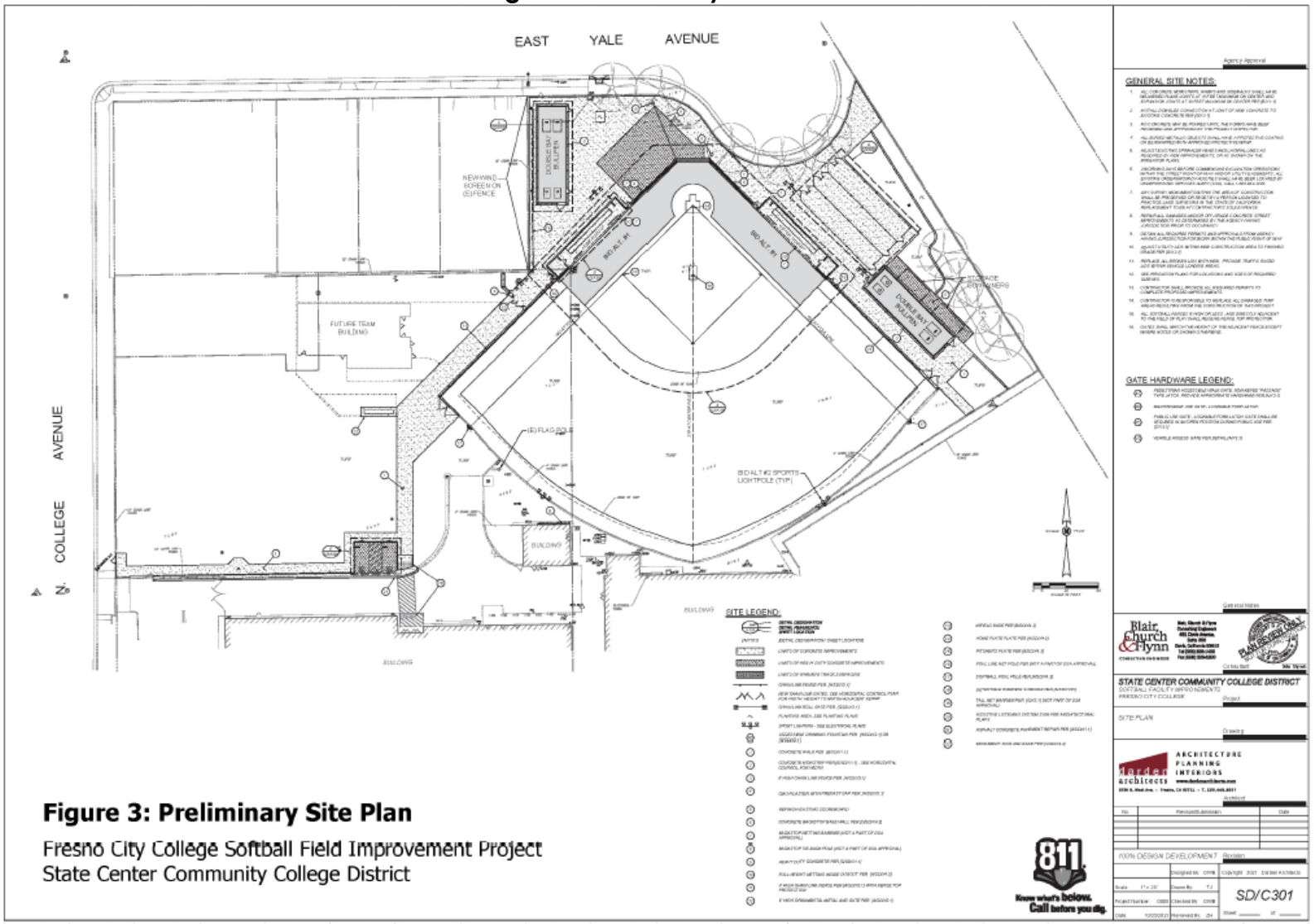


Source: OPR 2022

Figure 2. Project Site Boundaries and Proposed Facilities

Source: OPR 2021

Figure 3. Preliminary Site Plan



Source: Darden Architects 2021

EXISTING SETTING

PHYSICAL SETTING

The project is located in the City of Fresno. The City is served primarily by Pacific Gas & Electric (PG&E). The climate in the project area is semi-arid, with an annual normal precipitation of approximately 11 inches. Temperatures in the project area range from an average minimum of approximately 38 degrees Fahrenheit (°F), in January, to an average maximum of 98°F, in July (WRCC 2018).

State Center Community College District is dedicated to the responsible management of natural resources to continue efficient operations on campus. Electricity, natural gas, water, and other resources are managed using sustainability as a driving force in campus planning and operations. In 2018, the District embarked on solar installation projects at Fresno City College, Reedley College, Clovis Community College, and Madera Community College Center. The installed systems provide approximately 11,668,000 kilowatt hours (kWh). The systems are designed to produce a maximum of 83 percent of the campuses' energy needs (SCCCD 2018).

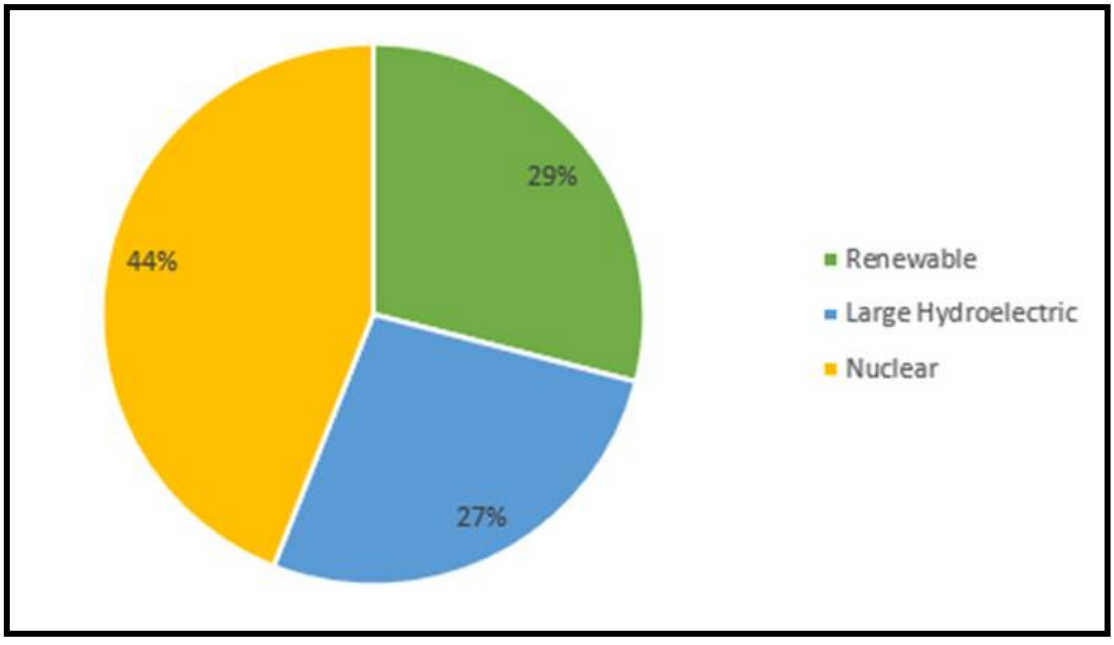
ENERGY RESOURCES

Energy sources for the City of Fresno are served primarily by Pacific Gas & Electric (PG&E). Energy resources consist largely of natural gas, nuclear, fossil fuels, hydropower, solar, and wind. The primary use of energy sources is for electricity to operate campus facilities.

ELECTRICITY

Electric services at Fresno City College are purchased from regulated electric utility, Pacific Gas and Electric Company (PG&E). The breakdown of PG&E's power mix is shown in Figure 4. As shown, 100 percent of PG&E's 2019 total electric power mix came from greenhouse gas (GHG)-free sources that include nuclear, large hydro and renewable energy sources (PG&E 2020).

Figure 4. PG&E 2019 Power Mix



Source: PG&E 2020

NATURAL GAS

PG&E's natural gas system encompasses approximately 70,000 square miles in Northern and Central California. Approximately 90 percent of the natural gas supply for PG&E is from out-of-state imports. In 2017, natural gas throughput provided by PG&E totaled 800,923 million cubic feet (MMcf). Natural gas throughput has decreased over by past few years. In comparison to year 2015 throughput, natural gas throughput has decreased by 103,599 MMcf, an approximate 11.5 percent reduction (PG&E 2019).

REGULATORY FRAMEWORK

FEDERAL

REGULATIONS FOR GREENHOUSE GAS EMISSIONS FROM PASSENGER CARS AND TRUCKS AND CORPORATE AVERAGE FUEL ECONOMY STANDARDS

In October 2012, the U.S. Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHSTA), on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond. NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of carbon dioxide (CO2) per mile for the fleet of cars and light-duty trucks by the model year 2025.

In January 2017, EPA Administrator Gina McCarthy signed a Final Determination to maintain the current GHG emissions standards for the model year 2022-2025 vehicles. However, on March 15, 2017, EPA Administrator Scott Pruitt and Department of Transportation Secretary Elaine Chao announced that EPA intends to reconsider the Final Determination. On April 2, 2018, EPA Administrator Scott Pruitt officially withdrew the January 2017 Final Determination, citing information that suggests that these current standards may be too stringent due to changes in key assumptions since the January 2017 Determination. According to the EPA, these key assumptions include gasoline prices and overly optimistic consumer acceptance of advanced technology vehicles. The April 2nd notice is not EPA's final agency action. The EPA intends to initiate rulemaking to adopt new standards. Until that rulemaking has been completed, the current standards remain in effect. (EPA 2017, EPA 2018).

ENERGY POLICY AND CONSERVATION ACT

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon (mpg). Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The CAFE program, administered by EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

ENERGY POLICY ACT OF 1992

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of

alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

ENERGY POLICY ACT OF 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

STATE

WARREN-ALQUIST ACT

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The Act established a state policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission (CPUC) regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

ASSEMBLY BILL 32: CLIMATE CHANGE SCOPING PLAN AND UPDATE

In October 2008, ARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order to achieve the target emission levels identified in AB 32. The Scoping Plan included ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The initial Scoping Plan was first approved by ARB on December 11, 2008, and is updated every five years. The first update of the Scoping Plan was approved by the ARB on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reach the 2050 goals (ARB 2014). The most recent update released by ARB is the 2017 Climate Change Scoping Plan, which was released in November 2017. The measures identified in the 2017 Climate Change Scoping Plan have the co-benefit of increasing energy efficiency and reducing California's dependency on fossil fuels.

ASSEMBLY BILL 1007: STATE ALTERNATIVE FUELS PLAN

AB 1007 (Chapter 371, Statues of 2005) required CEC to prepare a state plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels (SAF) Plan in partnership with ARB and in consultation with other state, federal, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce GHG emissions, and increase in-state production of biofuels without causing significant degradation of public health and environmental quality.

ASSEMBLY BILL 2076: REDUCING DEPENDENCE ON PETROLEUM

Pursuant to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), CEC and the California Air Resource Board (ARB) prepared and adopted a joint agency report in 2003, Reducing California's Petroleum Dependence. 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) (ARB 2003). Further, in response to the CEC's 2003 and 2005 Integrated Energy Policy Reports, Governor Davis directed CEC to take the lead in developing a long-term plan to increase alternative fuel use. A performance-based goal of AB 2076 was to reduce petroleum demand to 15 percent below 2003 demand by 2020.

SENATE BILL 350: CLEAN ENERGY AND POLLUTION PREVENTION REDUCTION ACT OF 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources to be increased to 50 percent by December 31, 2030. This act also requires a doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.

SENATE BILL 375

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan (RTP). ARB, in consultation with MPOs, establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld.

SENATE BILL 1078: CALIFORNIA RENEWABLES PORTFOLIO STANDARD PROGRAM

Senate Bill (SB) 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum of 20 percent of their supply from renewable sources by 2017. This SB will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order (EO) S-14-08, which set the Renewables Portfolio Standard (RPS) target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. EO S-14-08 was later superseded by EO S-21-09 on September 15, 2009. EO S-21-09 directed the ARB to adopt regulations requiring 33 percent of electricity sold in the State to come from renewable energy by 2020. Statute SB X1-2 superseded this EO in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

SENATE BILL 32 AND ASSEMBLY BILL 197 OF 2016

SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from year 2020 to year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG reductions in support of the State's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs the ARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target. Achievement of these goals will have the co-benefit of increasing energy efficiency and reducing California's dependency on fossil fuels.

EXECUTIVE ORDER S-06-06

EO S-06-06, signed on April 25, 2006, establishes targets for the use and production of biofuels and biopower, and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The EO establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The EO also calls for the State to meet a target for use of biomass electricity. The 2011

Bioenergy Action Plan identifies those barriers and recommends actions to address them so that the State can meet its clean energy, waste reduction, and climate protection goals. The 2012 Bioenergy Action Plan updates the 2011 plan and provides a more detailed action plan to achieve the following goals:

- increase environmentally- and economically-sustainable energy production from organic waste;
- encourage the development of diverse bioenergy technologies that increase local electricity generation, combined heat and power facilities, renewable natural gas, and renewable liquid fuels for transportation and fuel cell applications;
- create jobs and stimulate economic development, especially in rural regions of the state; and
- reduce fire danger, improve air and water quality, and reduce waste.

In 2019, 2.87 percent of the total electrical system power in California was derived from biomass (CEC 2020).

Executive Order B-48-18: Zero Emission Vehicles

In January 2018, Governor Brown signed EO B-48-18 which required all State entities to work with the private sector to put at least 5-million zero-emission vehicles on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 zero-emissions chargers by 2025. In addition, State entities are also required to continue to partner with local and regional governments to streamline the installation of zero-emission vehicle infrastructure. Additionally, all State entities are to support and recommend policies and actions to expand infrastructure in homes, through the Low-Carbon Fuel Standard.

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California's energy markets. The State's three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California's electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California's future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 EAP II, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues, and research and development activities. The CEC adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State's ongoing actions in the context of global climate change.

California Building Code

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The CBC is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the California Building Code and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020.

The 2019 Building Energy Efficiency Standards focused on four key areas: smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to the exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements. The ventilation measures improve indoor air quality, protecting homeowners from air pollution originating from outdoor and indoor sources. Under the newly adopted standards, nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades. The recently updated 2019 Building Energy Efficiency Standards also require new homes built after January 1, 2020 to be equipped with solar photovoltaic (PV) systems. The solar PV systems are to be sized based on the buildings annual electricity demand, the building square footage, and the climate zone within which the home is located. However, under the 2019 Building Energy Efficiency Standards, homes may still rely on other energy sources, such as natural gas. Compliance with the 2019 Building Energy Efficiency Standards, including the solar PV system mandate, residential dwellings will use approximately 50 to 53 percent less energy than those under the 2016 standards. Actual reduction will vary depending on various factors (e.g., building orientation, sun exposure). Non-residential buildings will use about 30 percent less energy due mainly to lighting upgrades (CEC 2019).

The recently updated 2022 Building Energy Efficiency Standards (2022 Standards), which were approved in December 2021, encourages efficient electric heat pumps, establishes electric-ready requirements when natural gas is installed and to support the future installation of battery storage, and further expands solar photovoltaic and battery storage standards. The 2022 Standards extend solar PV system requirements, as well as battery storage capabilities for select land uses, including high-rise multi-family and non-residential land uses, such as office buildings, schools, restaurants, warehouses, theaters, grocery stores, and more. Depending on the land use and other factors, solar systems should be sized to meet targets of up to 60 percent of the structure's loads. These new solar requirements will become effective January 1, 2023 and contribute to California's goal of reaching net-zero carbon footprint by 2045 (CEC 2022).

ADVANCED CLEAN CARS PROGRAM

In January 2012, ARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. The new rules strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires a battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (ARB 2016).

IMPACT ANALYSIS

THRESHOLDS OF SIGNIFICANCE

Based on Appendix F and G of the State CEQA Guidelines, the proposed project would result in a potentially significant impact on energy use if it would:

1. Result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The CEQA Guidelines, Appendix F, requires environmental analyses to include a discussion of potential energy impacts associated with a proposed project. Where necessary, CEQA requires that mitigation measures be incorporated to reduce the inefficient, wasteful or unnecessary consumption of energy. The State CEQA Guidelines, however, do not establish criteria that define inefficient, wasteful or unnecessary consumption. Compliance with the State's building standards for energy efficiency would result in decreased energy consumption for proposed buildings. However, compliance with building codes may not adequately address all potential energy impacts associated with project construction and operation. As a result, this analysis includes an evaluation of electricity and natural gas usage requirements associated with future development, as well as, energy requirements associated with the use of on-road and off-road vehicles. The degree to which the proposed project would comply with existing energy standards, as well as, applicable regulatory requirements and policies related to energy conservation was also taken into consideration for the evaluation of project-related energy impacts.

METHODOLOGY

CONSTRUCTION

Regarding energy use (e.g., fuel use) during construction, it is assumed that only diesel fuel would be used in construction equipment. On-road vehicles for hauling materials and worker commute trips assumed a mix of diesel and gasoline fuel use. Construction schedules, equipment numbers, horsepower ratings, and load factors were used to calculate construction-related fuel use, based on default assumptions contained in the California Emissions Estimator Model (CalEEMod). Diesel fuel use was estimated based on a factor of 0.05 gallons of diesel fuel per horsepower-hour derived from the South Coast Air Quality Management District's (SCAQMD) *CEQA Air Quality Handbook* (SCAQMD 1993).

OPERATIONS

The long-term operation of proposed the land uses would require electricity usage for lighting, space and water heating, appliances, water conveyance, and landscaping maintenance equipment. Indirect energy use would include wastewater treatment and solid waste removal. Project operation would not increase the consumption of diesel or gasoline fuel from existing conditions and so those emissions have not been included.

Energy use was estimated using CalEEMod, version 2020.4.0. Energy use included electricity and including electricity associated with the use, conveyance, and treatment of water. To be conservative, estimated energy use was based on year 2024 operational conditions. With continued improvements in energy efficiencies, energy use in future years would be less.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact E-1:	***Would the project result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?***

Implementation of the proposed project would increase electricity, diesel, gasoline, and natural gas consumption associated with construction activities, as well as long-term operational activities. Energy consumption associated with short-term construction and long-term operational activities are discussed in greater detail, as follows:

CONSTRUCTION-RELATED ENERGY CONSUMPTION

Energy consumption would occur during construction of the proposed facilities, including fuel use associated with the on-site operation of off-road equipment and vehicles traveling to and from the construction site. Table 1 summarizes the levels of energy consumption associated with project construction. As depicted, operation of off-road construction equipment would use an estimated total of

22,809 gallons of diesel fuel. On-road vehicles would use approximately 3,899 gallons of gasoline and 2,151 gallons of diesel fuel. In total, fuel use would equate to approximately 3,898 million British thermal units per year (MMBU) over the life of the construction project. Construction equipment use and associated energy consumption would be typical of that commonly associated with the construction of new land uses. As a result, project construction would not be anticipated to require the use of construction equipment that would be less energy efficient than those commonly used for the construction of similar facilities. Idling of on-site equipment during construction would be limited to no more than five minutes in accordance with San Joaquin Valley Air Pollution Control District (SJVAPCD) requirements. Furthermore, on-site construction equipment may include alternatively-fueled vehicles (e.g., natural gas) where feasible. Energy use associated with construction of the proposed facilities would be temporary and would not be anticipated to result in the need for additional capacity, nor would construction be anticipated to result in increased peak-period demands for electricity. As a result, the construction of proposed facilities and improvements would not result in an inefficient, wasteful, or unnecessary consumption of energy. As a result, impacts are considered **less-than-significant**.

Table 1. Construction Energy Consumption

Source	Total Fuel Use (gallons)	Total MMBTU
Off-Road Equipment Use (Diesel)	22,809	3,134
On-Road Vehicles (Gasoline)	3,899	469
On-Road Vehicles (Diesel)	2,151	296
	Total:	3,898
Fuel use was calculated based, in part, on default construction schedules, equipment use, and vehicle trips identified for the construction of similar land uses contained in the CalEEMod output files prepared for the air quality analysis conducted for this project. Refer to Appendix A for modeling assumptions and results.		

OPERATIONAL MOBILE-SOURCE ENERGY CONSUMPTION

Operational mobile-source energy consumption would be primarily associated with trips to and from the softball field for practice and games. While the project will be installing new seating it will not increase the capacity of the existing facility. As a result, increases in mobile-source energy consumption attributable to the proposed project would be negligible and would not result in increased fuel usage that would be considered unnecessary, inefficient, or wasteful. This impact would be considered **less-than-significant.**

OPERATIONAL BUILDING-USE ENERGY CONSUMPTION

The proposed project would result in increased electricity and natural gas associated with the long-term operation of the proposed facilities. It is important to note that the proposed buildings would be required to comply with Title 24 standards for energy-efficiency, which would include increased building insulation and energy-efficiency requirements, including the use of energy-efficient lighting, energy-efficient appliances, and use of low-flow water fixtures.

Estimated electricity consumption associated with proposed facilities to be constructed as part of the proposed project are summarized in Table 2. As depicted, new facilities at build-out would result in the consumption of approximately 2,592 kilowatt hours per year (kWh/Yr) of electricity and 1,787,090 kilo British thermal units per year (kBTU/Yr) of natural gas. In total, the proposed facilities would use consume a total of approximately 4,379 MMBTU/year. The proposed project would comply with the most current building energy-efficient standards (i.e., Title 24). For this reason, implementation of the proposed project would not be anticipated to result in wasteful, inefficient, and unnecessary consumption of energy. As a result, this impact would be considered **less than significant**.

Table 2. Operational Electricity & Natural Gas Consumption

Source	Energy Use	MMBTU/Year
Electricity Consumption	748,460 kWh/year	2,554
Water Use, Treatment & Conveyance	11,112 kWh/Year	38
Natural Gas Use	1,787,090 kBTU/Year	1,787
	Total:	4,379
Fuel use was calculated based, in part, on default construction schedules, equipment use, and vehicle trips identified for the construction of similar land uses contained in the CalEEMod output files prepared for the air quality analysis conducted for this project. Refer to Appendix A for modeling assumptions and results.		

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

As discussed earlier in this report, the proposed land uses would not be anticipated to result in increased vehicle trips. As a result, the proposed project would not result in increased fuel usage that would be anticipated to conflict with applicable plans, policies, or regulations adopted for the purpose of reducing future fuel consumption rates.

The State of California's Energy Efficiency Strategic Plan establishes a goal for the development of building with net zero energy consumption. This plan includes goals pertaining to the construction of new residential, commercial, and governmental buildings. Adherence to current and future Title 24 energy requirements would help to reduce the project's building-use energy consumption. Additional measures would, nonetheless, likely be required to achieve a goal of meeting net-zero energy usage. As a result, this impact would be considered **potentially significant.**

Mitigation Measures

Implement Mitigation Measure GHG-1.

E-1: The following measures shall be implemented to further reduce energy use associated with the development of proposed facilities:

- New buildings shall be designed to meet or exceed Title 24 building energy-efficiency standards with a goal of achieving net-zero energy use.
- Utilize high efficiency exterior lighting in parking lots and other public areas.
- Incorporate measures and building design features that reduce energy use, water use, and waste generation (e.g., light-colored roofing materials, installation of automatic lighting controls, planting of trees to provide shade).
- Install energy-efficient appliances and building components sufficient to achieve overall reductions in interior energy use beyond those required at the time of development by CalGreen standards.
- Plant drought-tolerate landscaping and incorporate water-efficient irrigation systems where necessary.

Significance After Mitigation

Mitigation measures have been included to reduce overall operational energy consumption, including those associated with long-term operational building energy use. With mitigation, operational energy consumption would be substantially reduced, beyond those required by Title 24 building energy-efficiency requirements. With mitigation, this impact would be considered **less-than-significant**

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APPENDIX A

Energy Modeling

Energy Use Summary Operational Year 2024 Mitigated

Construction Energy Use

	Gallons	Annual MMBTU
Off-Road Equipment Fuel (Diesel)	22,809	3,134
On-Road Vehicle Fuel (Gasoline)	3,899	469
On-Road Vehicle Fuel (Diesel)	2,151	296
Total:		3,898

Operational Fuel Use

	Gallons	Annual MMBTU
Mobile Fuel (Diesel)	0	0
Mobile Fuel (Gasoline)	0	0
Total:		0

Operational Electricity & Natural Gas Use

	Annual Energy	Annual MMBTU
Electricity (kWh/yr, MMBTU)	748,460	2,554
Water Use, Treatment & Conveyance (kWh/Yr, MMBTU)	11,112	38
Natural Gas (kBTU/yr, MMBTU)	1,787,090	1,787
Total:		4,379

Construction Equipment Fuel Use

OFF-ROAD EQUIPMENT FUEL USE

Primary Construction Activity	Activity Duration (Days)	Equipment Type	Size (hp)	Number of Pieces	Hours of Daily Use/Piece of Equipment	Total Days of Use	Load Factor	Fuel Usage Rate (g/bhph)	Total Fuel Diesel (Gallons)
Demolition	20	Concrete Saw	81	1	8	20	0.73	0.05	473
		Rubber Tired Dozers	247	1	8	20	0.4	0.05	790
		Tractors/Loaders/Backhoes	97	3	8	20	0.37	0.05	861
Site Prep	3	Graders	187	1	8	3	0.41	0.05	92
		Scrapers	367	1	8	3	0.48	0.05	211
		Tractors/Loaders/Backhoes	97	1	7	3	0.37	0.05	38
Grading	6	Graders	187	1	8	6	0.41	0.05	184
		Rubber Tired Dozers	247	1	8	6	0.4	0.05	237
		Tractors/Loaders/Backhoes	97	2	7	6	0.37	0.05	151
Construction	220	Cranes	231	1	8	220	0.29	0.05	5895
		Forklifts	89	2	7	220	0.2	0.05	2741
		Generator Sets	0.74	1	8	220	0.74	0.05	48
		Tractors/Loaders/Backhoes	97	1	6	220	0.37	0.05	2369
		Welders	46	3	8	220	0.45	0.05	5465
Paving	10	Cement Mixers	9	1	8	10	0.58	0.05	21
		Pavers	130	1	8	10	0.42	0.05	218
		Paving Equipment	132	1	8	10	0.36	0.05	190
		Rollers	80	2	8	10	0.38	0.05	243
		Tractors/Loaders/Backhoes	97	1	8	10	0.37	0.05	144
Arch Coating	217	Air Compressor	78	1	6	217	0.48	0.05	2437

Equipment usage assumptions based on default assumptions contained in CalEEMod.

Total Diesel Fuel Use (Gallons):	22809
Number of Construction Years:	3.21
Average Diesel Fuel Use/Year:	7106
BTU/Gallon:	137381
BTU:	3133558852
MMBTU:	3134

Construction Fuel Use - On-Road Vehicles

Activity	Demolition	Sire Prep	Grading	Construction	Paving	Arch Coating	Total	LDA	LDT1	LDT2	MDV
Days	20	3	6	220	10	217					
Worker Trips	13	8	10	36	15	7					
Miles/Trip	10.8	10.8	10.8	10.8	10.8	10.8					
Total VMT	2808	259.2	648	85536	1620	16405.2	107276.4	35758.8	35758.8	35758.8	0
Vendor Trips	0	0	0	14	0	0					
Miles/Trip	7.3	7.3	7.3	7.3	7.3	7.3					
Total VMT	0	0	0	22484	0	0	22484	0	0	0	22484
Haul Trips	0	200	0	0	0	0					
Miles/Trip	20	12	20	20	20	20					
Total VMT	0	7200	0	0	0	0	7200	0	0	0	0

	Annual VMT	Gallons/Mile*	Gallons	BTU/gallon**		BTU	MMBTU
HDT	7200	0.18609383	1340	137381		184073442	184.07
LDA	35759	0.03141995	1124	120333		135198894	135.20
LDT1	35759	0.03642770	1303	120333		156747086	156.75
LDT2	35759	0.04118580	1473	120333		177221023	177.22
MDV	22484	0.03609284	812	137381		111486247	111.49

**Gallons per mile based on year 2022 conditions for Fresno County. Derived from Emfac2017 (v1.0.2) Emissions Inventory.*

***Energy coefficient derived from US EIA.*

https://www.eia.gov/energyexplained/index.php?page=about_energy_units

EMFAC2017 Fuel Rate Calculation	Fuel Consumption (1000 Gallons/Day)*		VMT (Miles/Day)**			
	Diesel	Gasoline	Diesel	Gasoline		TOTAL
LDA	1.56732996	173.7986273	77744.39644	5531474.113		
LDT1	0.014388292	21.12623283	353.7104788	579949.616		
LDT2	0.470804534	93.398813	17222.23218	2267742.808		
MDV	1.574519892	83.6468936	43624.16292	1679831.445		
HDT***	3.461395295	0.046230813	18600.26949	181.9970735		
Total	7.088437973	372.0167975	157544.7715	10059179.98		10216724.75
Percent of Total			1.54%	98.46%		
LDA-Miles/Gallon	49.60308194	31.82691486				
LDA-Gallons/Mile	0.020160038	0.031419948				
LDT1-Miles/Gallon	24.58321503	27.45163422				
LDT1-Gallons/Mile	0.040678162	0.036427704				
LDT2-Miles/Gallon	36.58042977	24.28021016				
LDT2-Gallons/Mile	0.027337022	0.041185805				
MDV-Miles/Gallon	27.70632694	20.08241278				
MDV-Gallons/Mile	0.036092839	0.049794814				
HDT-Miles/Gallon	5.373633435	0.00025402				
HDT-Gallons/Mile	0.186093825	3936.704985				

**Fuel consumptions derived from EMFAC2017 (v1.0.2) for year 2022 conditIons.*

***VMT derived from EMFAC2017 (v1.0.2) for year 2022 conditons.*

****HDT diesel engine T7 CAIRP construction, T7 single construction, T7 tractor construction. HDT gasoline engine T7IS.*

Fuel consumption and VMT based on the Fresno County.

Operational Fuel Use - Proposed Project Year 2024 Mitigated

LAND USE	Total Annual VMT
FCC Sorftball Field	0

No additional VMT expected under project

	VMT	Gallons/Mile*	Gallons	BTU/gallon**	BTU	MMBTU
Diesel	0	0.09490507	0	137381	0	0.00
Gasoline	0	0.03973770	0	120333	0	0.00

**Gallons per mile based on year 2022 conditions for Fresno County. Derived from Emfac2017 (v1.0.2) Emissions Inventory.*

**Energy coefficient derived from US EIA.

https://www.eia.gov/energyexplained/index.php?page=about_energy_units

EMFAC2017 Fuel Rate Calculation	Fuel Consumption (1000 Gallons/Day)*		VMT (Miles/Day)**		
	Diesel	Gasoline	Diesel	Gasoline	
All Other Buses	0.867335178		7776.863771		
LDA	1.56732996	173.7986273	77744.39644	5531474.113	
LDT1	0.014388292	21.12623283	353.7104788	579949.616	
LDT2	0.470804534	93.398813	17222.23218	2267742.808	
LHD1	9.285773294	22.42518545	163550.7779	184175.1397	
LHD2	3.550951109	4.058488433	55872.97732	29093.12936	
MDV	1.574519892	83.6468936	43624.16292	1679831.445	
MH	0.352637963	2.042942269	3431.680088	9632.980042	
Motor Coach	0.611808985		3826.774324		
PTO	1.299409748		6203.975214		
SBUS	3.510187816	1.975172786	27697.54633	17703.79474	
T6 Ag	0.030276215		270.9722381		
T6 CAIRP heavy	0.229826347		2549.361508		
T6 CAIRP small	0.026547462		273.2333029		
T6 instate construction heavy	0.582971165		4684.868081		
T6 instate construction small	2.280528907		18448.35917		
T6 instate heavy	8.577050676		81039.97184		
T6 instate small	8.928245705		82783.70252		
T6 OOS heavy	0.125564895		1390.215619		
T6 OOS small	0.016368793		168.8975115		
T6 Public	0.537519732		3767.635741		
T6 utility	0.102680485		924.472509		
T7 Ag	0.016527475		96.30604549		
T7 CAIRP	4.499150832		29967.50503		
T7 CAIRP construction	0.58505176		3365.181439		
T7 NNOOS	5.282126436		36547.34106		
T7 NOOS	1.808634408		11770.34978		
T7 other port	1.390576446		7604.006869		
T7 Public	1.088142899		5573.309938		
T7 Single	5.24773337		31244.45925		
T7 single construction	1.571012727		8348.396191		
T7 SWCV	0.933567507		2070.872771		
T7 tractor	5.861926601		41815.39701		
T7 tractor construction	1.305330809		6886.691858		
T7 utility	0.050186883		294.9429209		
UBUS	1.817481152	0.583117712	11610.51436	3020.045788	
MCY		2.2697166		88002.73404	
OBUS		2.069316625		9679.525292	
T6TS		7.189248515		33685.64616	
T7IS		0.046230813		181.9970735	
Total	76.00017646	414.6299859	800802.0616	10434172.97	11234975.04
Percent of Total			7.13%	92.87%	
Miles/Gallon	10.53684477	25.16502262			
Gallons/Mile	0.094905071	0.039737695			

*Fuel consumptions derived from EMFAC2017 (v1.0.2) for year 2022 conditons.

**VMT derived from EMFAC2017 (v1.0.2) for year 2022 conditons.

Fuel consumption and VMT based on the Fresno County.

Operational Electricity & Natural Gas Use Year 2024 Mitigated

	kWh/yr	MWh/Yr	BTU/kWh*	BTU	MMBTU
Electricity	748460	748	3412	2553745520	2554

*Energy coefficient derived from US EIA.
https://www.eia.gov/energyexplained/index.php?page=about_energy_units

	kBTU/yr			BTU	MMBTU
Natural Gas	1787090			1787090000	1787

*Energy coefficient derived from US EIA.
https://www.eia.gov/energyexplained/index.php?page=about_energy_units

Water Energy Use Year 2024 Mitigated

	WATER USE*	ELECTRIC INTENSITY FACTORS		ANNUAL ELECTRIC USE (kWh/Yr)		
	MGAL/YR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	TOTAL
ANNUAL INDOOR WATER USE	3.17	3500		11112		11,112
ANNUAL OUTDOOR WATER USE	0.62		0		0	

*Based on estimated water use derived from CalEEMod.

**Energy coefficient derived from US EIA.

https://www.eia.gov/energyexplained/index.php?page=about_energy_units

BTU/kWh**	3412
BTU:	37914656
MMBTU:	37.91