ATTACHMENT D

ENERGY ASSESSMENT

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ENERGY ASSESSMENT

South Coast Technology Center Project

Santa Ana, California

Prepared By:

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June 13, 2024

JN 199799

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INTERNATIONAL

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We Make a Difference

MEMORANDUM

To: Jeffrey M. Reese, C.J. Segerstrom & Sons

From: Dennis Dinh, Michael Baker International

Date: June 13, 2024

Subject: South Coast Technology Center Project – Energy Assessment

PURPOSE

The purpose of this technical memorandum is to evaluate potential short-term construction and long-term operational energy consumption impacts that would result from the implementation of the proposed South Coast Technology Center Project (project) located in the City of Santa Ana (City), California. As the project is within the scope of buildout defined in the City's General Plan Land Use Plan, which was analyzed in the General Plan Update Program Environmental Impact Report (GPU PEIR), this memorandum compares the project's impacts with the impacts identified in the GPU PEIR.

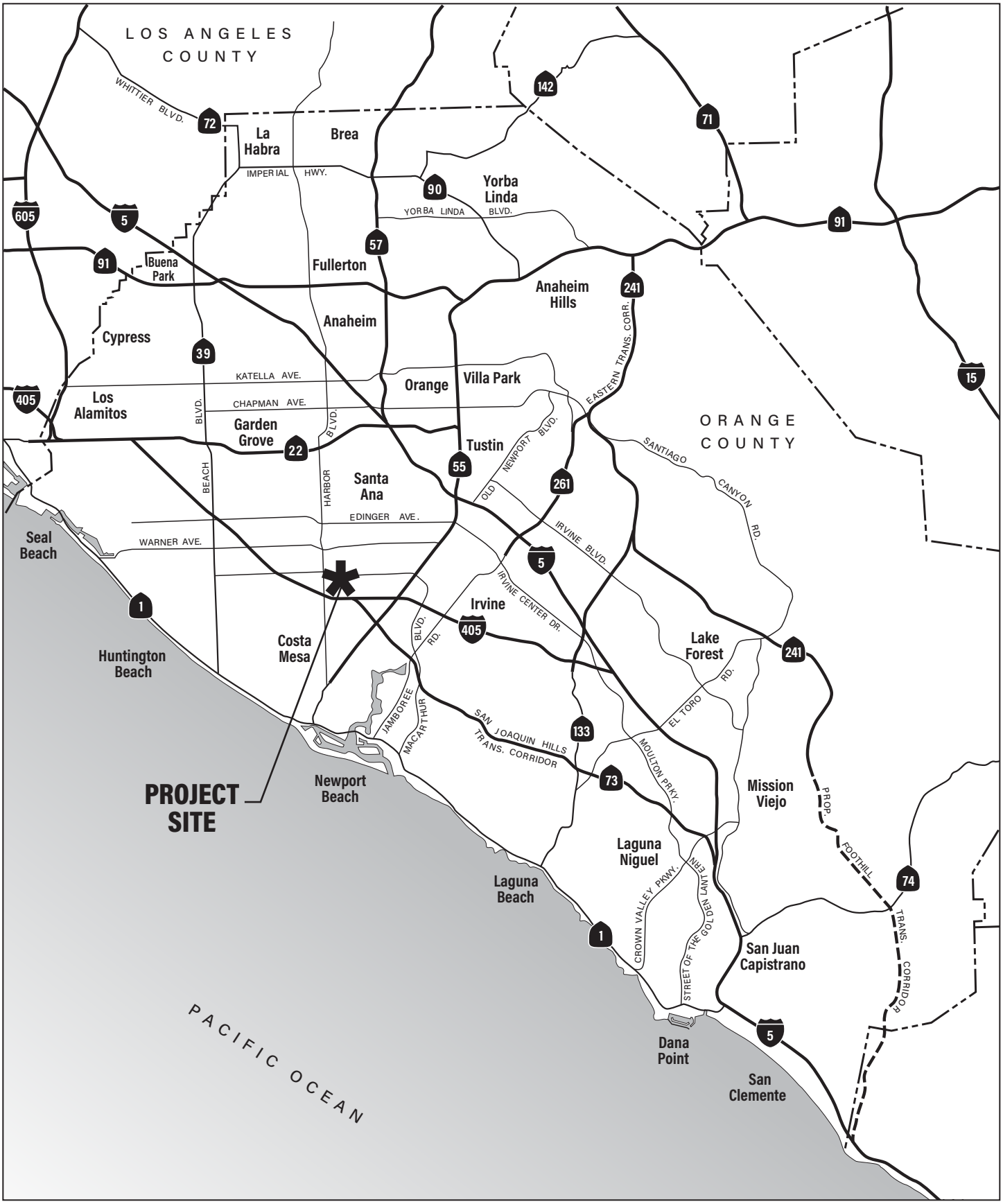
PROJECT LOCATION

The City is in central Orange County (County), generally north of the San Diego Freeway (Interstate 405 [I-405]), south of the Garden Grove Freeway (State Route 22 [SR-22]), and west of the Costa Mesa Freeway (SR-55) and Interstate 5 (I-5). The City is approximately 30 miles southeast of downtown Los Angeles; refer to Exhibit 1, *Regional Vicinity*.

The approximately 15.8-acre project site is located at 3100, 3110, and 3120 Lake Center Drive within the southwestern portion of the City. Regional access to the project site is provided via I-405. Local access to the site is provided via West Lake Center Drive and South Susan Street; refer to Exhibit 2, *Site Vicinity*.

EXISTING SITE CONDITIONS

The project site is in a highly developed and urbanized area of the City. The project site comprises an existing 10.2-acre office park, Lake Center Office Park, and includes an approximately 5.6-acre vacant field west of the existing buildings. The project site is bifurcated by the north-south South Susan Street. The Lake Center Office Park contains three buildings that surround a manmade pond with fountain features, surface parking, a parking structure, a grass lawn, and landscaping. Existing on-site energy consumption consists of natural gas and electricity consumption from the Lake Center Office Park including three existing buildings, a parking structure, and associated surface parking lots.



SOUTH COAST TECHNOLOGY CENTER PROJECT
ENERGY ASSESSMENT TECHNICAL MEMORANDUM

Regional Vicinity

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Exhibit 1

Source: Google Earth Pro, April 2024

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SOUTH COAST TECHNOLOGY CENTER PROJECT
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Site Vicinity

Exhibit 2

According to the General Plan Update Land Use Element Figure LU-1*, Land Use Map*, the project site is designated Industrial (IND).[1] The Industrial designation provides space for activities such as light and heavy manufacturing, warehousing, processing, and distribution as well as commercial uses ancillary to industrial activities. Based on the *City of Santa Ana Zoning Map* (Zoning Map), the site is zoned Specific Development No. 58 (SD-58).[2] According to Ordinance No. NS-2089, permitted uses in the SD-58 District are professional and business offices providing personal and professional services including employment agencies, medical insurance, real estate, travel, trade contractors, architects, engineers, finance, research and development, and other similar use.

Surrounding uses adjacent to the project site include office, commercial, and recreational uses. To the north of the project site, across from West Lake Center Drive, is the Calvary Chapel Private School Program support facility and athletic fields. Surface parking and a parking structure bound the project site to the east. To the south of the project site are office buildings, surface parking lots, and a United States Postal Service facility. Freight rail tracks bound the project site to the west.

PROJECT DESCRIPTION

The project proposes to demolish the Lake Center Office Park, including three existing buildings, a parking structure, and parking lots to construct three new Class A industrial buildings for office, manufacturing, and/or warehouse use. The three existing buildings that would be demolished are located on the eastern portion of the project site and total 178,026 square feet. The total site area of 689,310 square feet (15.8 net acres) would be divided into two lot areas containing three buildings. Two new buildings (Buildings 2 and 3) would be constructed to replace the Lake Center Office Park and one new building (Building 1) would be constructed on the undeveloped field located to the west of Susan Street; refer to Exhibit 3, *Conceptual Site Plan*. The three proposed Class A buildings would result in a total building square footage of 313,044 square feet.[3] Each building would have a truck dock and a potential mezzanine located opposite the truck dock. A total of 497 parking stalls would be provided for the project. The characteristics of each building are further detailed below.

Located on the parcel west of Susan Street, Building 1 would have a total lot area of 243,212 square feet (5.6 net acres) and would consist of a 58,615-square-foot tenant space and a 53,615-square-foot tenant space, for a total building square footage of 112,230 square feet. A truck loading dock with nine dock high doors and two grade doors would be located on the western side of the building, facing the existing railroad. Building 1 would have a maximum exterior height of 48 feet and 4 inches.

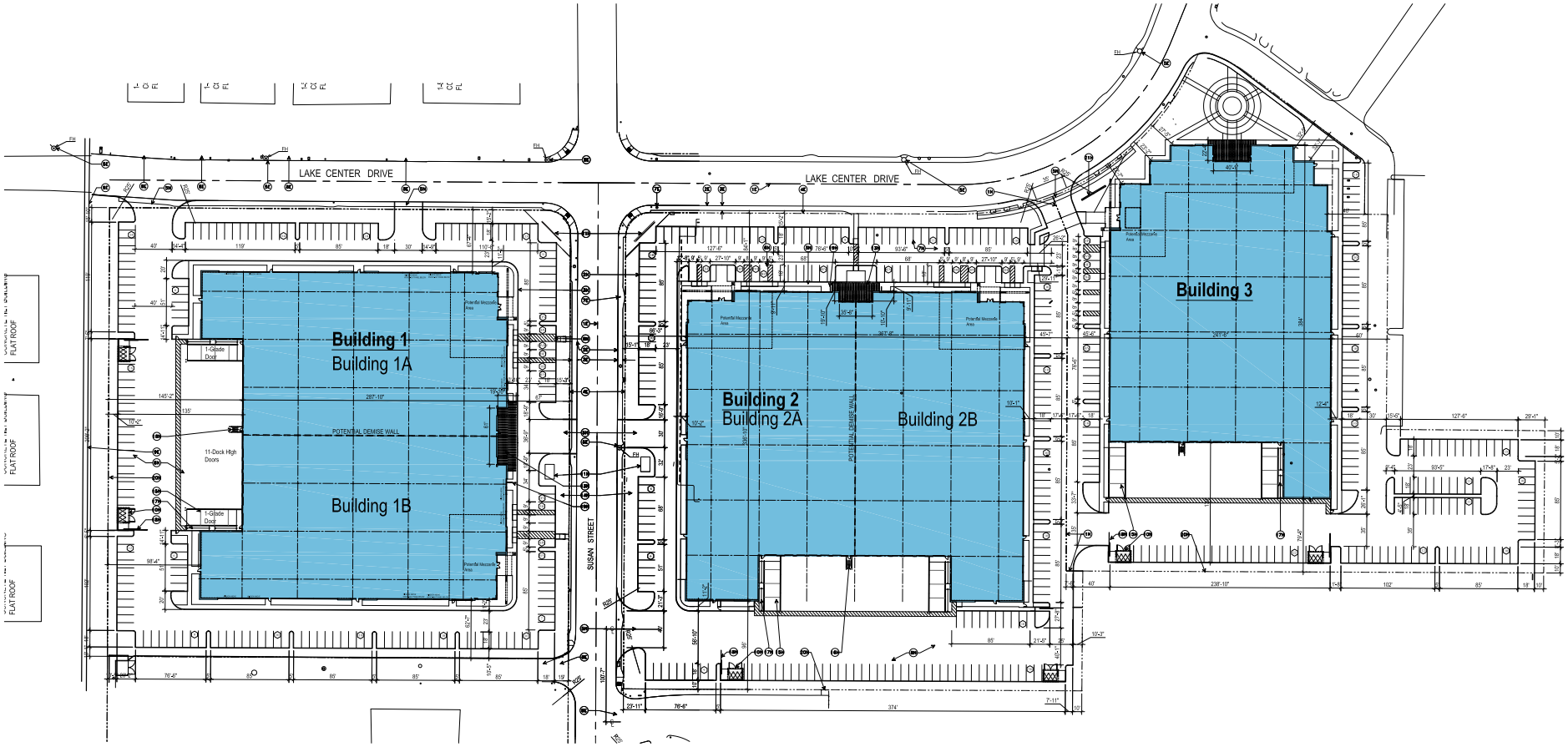
Building 2 would be centrally located on the project site on a 446,098-square-foot lot area (10.2 net acres) shared with Building 3. Building 2 would consist of two approximately 60,823-square-foot tenant spaces, for a total building square footage of 121,645 square feet. A truck loading dock with 11 dock high doors and two grade doors would be located on the southern side of the building. Building 2 would have a maximum exterior height of 48 feet and 4 inches.

Building 3 would be located on the eastern portion of the project site on a 446,098-square-foot lot area (10.2 net acres) shared with Building 2. Building 3 would be 79,369 square feet. A truck loading dock with

1 City of Santa Ana, *Golden City Beyond, Santa Ana General Plan Land Use Element, Figure LU-1, Land Use Map*, April 2022.

2 City of Santa Ana, *City of Santa Ana Zoning Map,* February 16, 2023.

3 The following analysis was conducted for a larger project with three industrial buildings totaling 325,044 square feet and is conservative since the total building square footage for the proposed project has been reduced to 313,244 square feet.



Source: DRA Architects, April 2024

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SOUTH COAST TECHNOLOGY CENTER PROJECT
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Conceptual Site Plan

Exhibit 3

seven dock high doors and one grade door would be located on the southern side of the building. Building 3 would have a maximum exterior height of 44 feet and 5 inches.

Of the 497 parking stalls proposed, 164 parking stalls would be located around Building 1, 178 parking stalls would be located around Building 2, and 155 parking stalls would be located east, south, and west of Building 3. Additionally, the project would include a total of 2,815 square feet of outdoor covered patio area (1,210 square feet for Building 1, 707 square feet for Building 2, and 895 square feet for Building 3).

Ancillary improvements to the project site would include landscaping, monument signage, lighting, and fencing. The proposed project would also include 27 short-term bike parking and 27 long-term bike parking near the building entrances. Similar to existing conditions, the project site would be accessible from Lake Center Drive and South Susan Street. The northern frontage of Building 3 would feature a prominent landscaped entrance to the South Coast Technology Center. Internal drive aisles would provide access to the proposed buildings.

Construction of the proposed project is anticipated to take approximately 16 months to complete, commencing in August 2024 and concluding in December 2025. Construction would occur in a single phase and would consist of the following activities:

- Demolition – 2 months
- Grading – 1+ months
- Building construction – 12 months
- Paving – 0.5 months
- Architectural coating – 1 month

ENVIRONMENTAL SETTING

Electricity

Southern California Edison (SCE) provides electricity services, billing, customer service and power line maintenance and repair in the City of Santa Ana. Over the past 15 years, electricity generation in California has undergone a transition. Historically, California has relied heavily on oil- and gas-fired plants to generate electricity. Spurred by regulatory measures and tax incentives, California's electrical system has become more reliant on renewable energy sources, including cogeneration, wind energy, solar energy, geothermal energy, biomass conversion, transformation plants, and small hydroelectric plants. Unlike petroleum production, electricity generation is usually not tied to the location of the fuel source and can be delivered great distances via the electrical grid. The generating capacity of a unit of electricity is expressed in megawatts (MW). Net generation refers to the gross amount of energy produced by a unit, minus the amount of energy the unit consumes. Generation is typically measured in kilowatt-hours (kWh), megawatt-hours (MWh), or gigawatt-hours (GWh).

Natural Gas

Southern California Gas (SoCalGas) provides natural gas service to the City. SoCalGas provides natural gas to approximately 21.8 million customers across a 24,000-square-mile territory, including parts of the following counties: Riverside, Orange, San Bernardino, Los Angeles, Ventura, Santa Barbara, Kern, Inyo, Tulare, and Mono. Natural gas generation is expressed in therms, where one therm is equivalent to 100,000 British Thermal Unit (BTU). In 2022, the total natural gas consumption in the SoCalGas service

area was 5,026 million therms, with the greatest consumption occurring in the residential and industrial sectors, which consumed 2,230 million therms and 1,606 million therms, respectively.[4]

Automotive Fuel

In California, gasoline consumed primarily by light-duty cars, pickup trucks, and sport utility vehicles is the most used transportation fuel. Diesel, the second most-used transportation fuel, is primarily consumed by heavy-duty trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles. Both gasoline and diesel are primarily petroleum-based, and their consumption releases greenhouse gas (GHG) emissions. The transportation sector is the single largest source of GHG emissions in California and accounts for the largest share of California's energy consumption. Approximately 40 percent of all inventoried GHG emissions in California in 2019 was generated by the transportation sector. California's transportation sector accounts for one-third of California's total energy consumption in 2020. To reduce statewide vehicle emissions, California requires that all motorists use California Reformulated Gasoline, which is sourced almost exclusively from California refineries.

Energy Usage

Total energy usage in California was 7,359 trillion BTU in 2021, which equates to an average of 189 million BTU per capita.[5] Of California's total energy usage, the breakdown by sector is approximately 37.8 percent transportation, 23.2 percent industrial, 19 percent commercial, and 20 percent residential.[6] Electricity in California are generally consumed by stationary users such as residences and commercial and industrial facilities, whereas petroleum consumption is generally accounted for by transportation-related energy use. In 2022, taxable gasoline sales (including aviation gasoline) in California accounted for 13,584,697,639 gallons of gasoline.[7]

The electricity and natural gas consumption attributable to County of Orange (County) from 2012 to 2022 is shown in Table 1, *Electricity and Natural Gas Consumption in Orange County 2012-2022*. The year 2022 is the most recent year for which data is available.

[4] California Energy Commission, *Gas Consumption by Entity*, http://www.ecdms.energy.ca.gov/, accessed March 1, 2024.

[5] U.S. Energy Information Administration, *California State Energy Profile*, April 20, 2023, https://www.eia.gov/state/print.php?sid=CA, accessed March 1, 2024.

[6] Ibid.

[7] California Department of Tax and Fee Administration, *Net Taxable Gasoline Gallons*, available at: https://www.cdtfa.ca.gov/taxes-and-fees/spftrpts.htm, accessed March 1, 2024.

Table 1
Electricity Consumption in Orange County 2012-2022

Year	Electricity Consumption (in millions of kilowatt hours)	Natural Gas Consumption (in millions of therms)
2012	20,372.57	612.55
2013	20,732.06	636.15
2014	20,732.06	544.76
2015	20,724.59	544.47
2016	20,234.20	569.94
2017	20,127.01	575.51
2018	19,993.46	575.10
2019	19,818.93	623.15
2020	19,691.16	594.60
2021	19,213.66	580.21
2022	20,243.72	572.45

Source:
California Energy Commission, *Electricity Consumption by County*, http://www.ecdms.energy.ca.gov/, accessed March 1, 2024.
California Energy Commission, *Gas Consumption by County*, http://www.ecdms.energy.ca.gov/, accessed March 1, 2024.

Automotive fuel consumption in Orange County from 2012 to 2024 is shown in Table 2, *Automotive Fuel Consumption in Orange County 2012-2024*.

Table 2
Automotive Fuel Consumption in Orange County 2012-2024

Year	On-Road Automotive Fuel Consumption (gallons)	Heavy-Duty Vehicle/Diesel Fuel Consumption (Construction Equipment) (gallons)
2012	1,221,716,120	13,940,473
2013	1,230,613,217	14,476,860
2014	1,253,185,765	14,996,951
2015	1,282,550,476	15,516,610
2016	1,323,468,153	16,025,543
2017	1,329,315,533	16,532,460
2018	1,318,354,853	17,029,945
2019	1,340,613,628	17,524,978
2020	1,180,338,192	14,231,301
2021	1,322,606,339	14,237,783
2022	1,314,210,083	14,236,973
2023	1,299,066,009	14,238,647
2024(Projected)	1,277,762,122	14,182,623

Source:
California Air Resources Board, *EMFAC2021, https://arb.ca.gov/emfac/emissions-inventory/*, accessed March 1, 2024.
California Air Resources Board, *EMFAC2021 Off-Road Web Platform, https://arb.ca.gov/emfac/offroad/emissions-inventory/*, accessed March 1, 2024.

REGULATORY SETTING

State

Senate Bill 100

Senate Bill (SB) 100 (Chapter 312, Statutes of 2018) requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt-hours (kWh) of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; 60 percent by December 31, 2030; and 100 percent by December 31, 2045. SB 100 requires the California Public Utilities Commission (CPUC), California Energy Commission (CEC), state board, and all other state agencies incorporate this policy into all relevant planning. In addition, SB 100 requires the CPUC, CEC, and state board to utilize programs authorized under existing statutes to achieve such renewable energy goals.

California Building Energy Efficiency Standards (Title 24)

The 2022 California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6), commonly referred to as "Title 24," became effective on January 1, 2023. In general, Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2022 Title 24 standards encourage efficient electric heat pumps, establish electric-ready requirements for new homes, expand solar photovoltaic and battery storage standards, strengthen ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Title 24 standards.

California Green Building Standards (CALGreen)

The 2022 California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as CALGreen, went into effect on January 1, 2023. CALGreen is the first-in-the-nation mandatory green buildings standards code. The California Building Standards Commission developed the green building standards in an effort to meet the goals of California's landmark initiative Assembly Bill (AB) 32, which established a comprehensive program of cost-effective reductions of GHGs to 1990 levels by 2020. CALGreen was developed to (1) reduce GHGs from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the environmental directives of the administration. CALGreen requires that new buildings employ water efficiency and conservation, increase building system efficiencies (e.g., lighting, heating/ventilation and air conditioning [HVAC], and plumbing fixtures), divert construction waste from landfills, and incorporate electric vehicles charging infrastructure. There is growing recognition among developers and retailers that sustainable construction is not prohibitively expensive, and that there is a significant cost-savings potential in green building practices and materials.[8]

[8] U.S. Green Building Council, *Green Building Costs and Savings*, https://www.usgbc.org/articles/green-building-costs-and-savings, accessed March 1, 2024.

California Public Utilities Commission Energy Efficiency Strategic Plan

The CPUC prepared an *Energy Efficiency Strategic Plan* (Strategic Plan) in September 2008 with the goal of promoting energy efficiency and GHG reductions. In January 2011, a lighting chapter was adopted and added to the Strategic Plan. The Strategic Plan is California's single roadmap to achieving maximum energy savings in the State from 2009 to 2020 and beyond. The Strategic Plan contains the practical strategies and actions to attain significant statewide energy savings, because of a year-long collaboration by energy experts, utilities, businesses, consumer groups, and governmental organizations in California, throughout the West, nationally and internationally. The plan includes the following four strategies:

1. All new residential construction in California will be zero net energy by 2020;
2. All new commercial construction in California will be zero net energy by 2030;
3. HVAC will be transformed to ensure that its energy performance is optimal for California's climate; and
4. All eligible low-income customers will be given the opportunity to participate in the low-income energy efficiency program by 2020.

California Public Utilities Commission Community Choice Aggregation

Community Choice Aggregation (CCA) was enacted by Assembly Bill 117 (AB 117) in 2002. Under AB 117, "all electrical corporations must cooperate fully with community choice aggregators investigating, pursuing, or implementing community choice aggregator programs."

The investor-owned utility (IOU) continues to provide transmission and distribution, metering, billing, collection, and customer service to retail customers participating in CCAs. AB 117 also provided guidance on how communities may create a CCA program. AB 117 requires that the city or county pass an ordinance to implement a CCA program within its jurisdiction. Two or more cities or counties may participate in a CCA program as a group through a Joint Powers agency. Potential customers within a community's service area are automatically enrolled in a CCA program unless they opt out, provided that they are notified in writing of their right to opt out. In the event that a customer opts out of CCA service, the IOU will continue to serve them as bundled customers.

CCAs are responsible to meet regulatory compliance requirements established in Resource Adequacy (RA), Integrated Resource Planning (IRP), and Renewable Portfolio Standards (RPS). CCAs are responsible for tracking and compliance with CPUC regulations.

California Energy Commission Integrated Energy Policy Report

In 2002, the California State legislature adopted Senate Bill (SB) 1389, which requires the CEC to develop an Integrated Energy Policy Report (IEPR) every two years. SB 1389 requires the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices, and use 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 CEC adopted the 2023 Integrated Energy Policy Report (2023 IEPR) on February 14, 2024. The 2023 IEPR provides the results of the CEC's assessments of a variety of energy issues facing California, many of which will require action if the State is to meet its climate, energy, air quality, and other environmental

goals while maintaining reliability and controlling costs. The 2023 IEPR discusses speeding connection of clean resources to the electricity grid, the potential use of clean and renewable hydrogen, and the California Energy Demand Forecast to 2040.

Executive Order N-79-20

Executive Order N-79-20, issued September 23, 2020, directs the State to require all new cars and passenger trucks sold in the State to be zero-emission vehicles by 2035. Executive Order N-79-20 further states that all medium- and heavy-duty vehicles sold in the State will be zero-emission by 2045.

Local

City of Santa Ana General Plan

The Santa Ana General Plan includes the following goals and policies related to energy consumption that would be applicable to the proposed project:[9]

Conservation Element

- **Goal CN-1 Air Quality and Climate:** Protect air resources, improve regional and local air quality, and minimize the impacts of climate change.
  - **Policy CN-1.4 Development Standards:** Support new development that meets or exceeds standards for energy-efficient building design and site planning.
  - **Policy CN-1.8 Promote Alternative Transportation:** Promote use of alternate modes of transportation in the City of Santa Ana, including pedestrian, bicycling, public transportation, car sharing programs, and emerging technologies.
  - **Policy CN-1.12 Sustainable Infrastructure:** Encourage the use of low or zero emission vehicles, bicycles, nonmotorized vehicles, and car-sharing programs by supporting new and existing development that includes sustainable infrastructure and strategies such as vehicle charging stations, drop-off areas for ride-sharing services, secure bicycle parking, and transportation demand management programs.
  - **Policy CN-1.14 Transportation Demand Management:** Require and incentivize projects to incorporate transportation demand management techniques.
- **Goal CN-3 Energy Resources:** Reduce consumption of and reliance on nonrenewable energy, and support the development and use of renewable energy sources.
  - **Policy CN-3.3 Development Patterns:** Promote energy-efficient development patterns by clustering mixed use developments and compatible uses adjacent to public transportation.
  - **Policy CN-3.5 Landscaping:** Promote and encourage the planting of native and diverse tree species to improve air quality, reduce heat island effect, reduce energy consumption, and contribute to carbon mitigation with special focus in environmental justice areas.
  - **Policy CN-3.7 Energy Conservation Design and Construction:** Incorporate energy conservation features in the design of new construction and rehabilitation projects.

[9] City of Santa Ana, Santa Ana General Plan, April 2022.

Land Use Element

- **Goal LU-4 Complete Communities:** Support a sustainable Santa Ana through improvements to the built environment and a culture of collaboration.
    - **Policy LU-4.3 Sustainable Land Use Strategies:** Encourage land uses and strategies that reduce energy and water consumption, waste and noise generation, soil contamination, air quality impacts, and light pollution.
    - **Policy LU-4.4 Natural Resource Capture:** Encourage the use of natural processes to capture rainwater runoff, sustainable electric power, and passive climate control.

Urban Design Element

- **Goal UD-2 Sustainable Environment:** Improve the built environment through sustainable development that is proportional and aesthetically related to its setting.
    - **Policy UD-2.10 Greening the Built Environment:** Promote planting of shade trees and require, where feasible, preservation and site design that uses appropriate tree species to shade parking lots, streets, and other facilities with the goal of reducing the heat island effect.
    - **Policy UD-2.11 Sustainable Practices:** Encourage sustainable development through the use of drought-tolerant landscaping, permeable hardscape surfaces, and energy-efficient building design and construction.

GPU PEIR Regulatory Requirements

The project is required to comply with the following GPU PEIR regulatory requirements related to energy:

- *RR E-1*: Construction activities will be conducted in compliance with California Code of Regulations Section 2485, which requires that nonessential idling of construction equipment be restricted to five minutes or less.
- *RR E-2*: At least 65 percent of all nonhazardous construction and demolition waste from nonresidential construction associated with future development in the plan area shall be recycled and/or salvaged for reuse in line with the 2016 California Green Building Standards Code Section 5.408 (California Code of Regulations, Title 24, Part 11).
- *RR E-3*: New buildings implemented as part of the General Plan Update are required to achieve the current California Building Energy and Efficiency Standards (California Code of Regulations, Title 24, Part 6) and California Green Building Standards Code (California Code of Regulations, Title 24, Part 11).
- *RR E-4*: Any appliances associated with development in the Plan Area shall meet the requirements of the 2012 Appliance Efficiency Regulations.
- *RR E-5*: Development under the General Plan Update shall support the goals of the renewables portfolio standard, SB 350, and SB 100 to achieve a tiered increase in the use of renewable energy to 60 percent by 2030, and 100 percent by 2045.
- *RR E-7*: Development under the General Plan Update shall be in compliance with state and local solid waste regulations including AB 939, AB 341, AB 1327, AB 1826, and Section 5.408 of 2016 California Green Building Standards Code (California Code of Regulations, Title 24, Part 11).

City of Santa Ana Municipal Code

Chapter 8, Article XVI of the Santa Ana Municipal Code, Green Building Standards Code, incorporates the California Green Building Standards Code by reference.

City of Santa Ana Climate Action Plan

The Santa Ana Climate Action Plan (CAP) was adopted in December 2015. The CAP outlines the City's efforts to reduce carbon pollution and energy use from City operations and the community as a whole. The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies and measures that will make it possible for the City to meet the recommended targets. The reduction strategies are organized in five sectors: transportation and land use, energy, solid waste, water, and wastewater. The energy reduction strategies focus primarily on energy efficiency, reduction in energy usage, and greater reliance on renewable energy as a source of electricity.

CALIFORNIA ENVIRONMENTAL QUALITY ACT THRESHOLDS

In accordance with the *California Environmental Quality Act Guidelines* (CEQA Guidelines), project impacts are evaluated to determine whether significant adverse environmental impacts would occur. This analysis will focus on the project's potential impacts and provide mitigation measures, if required, to reduce or avoid any potentially significant impacts that are identified. According to Appendix G of the CEQA Guidelines, the proposed project would have a significant impact related to energy if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (refer to Impact Statement EN-1); and/or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency (refer to Impact Statement EN-2).

SIGNIFICANCE CRITERIA AND METHODOLOGY

Appendix F of the CEQA Guidelines is an advisory document that assists environmental document preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. The analysis in Impact Statement EN-1 relies upon Appendix F of the CEQA Guidelines, which recommends the following topics that a lead agency may consider to determine whether the project would result in inefficient, wasteful, and unnecessary consumption of energy and whether the project would conflict with adopted energy conservation plans:

- **Topic 1**: The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
- **Topic 2**: The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- **Topic 3**: The effects of the project on peak and base period demands for electricity and other forms of energy.

- **Topic 4**: The degree to which the project complies with existing energy standards.
- **Topic 5**: The effects of the project on energy resources.
- **Topic 6**: The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

Quantification of the project's energy usage is presented and addresses **Topic 1**. The discussion on construction-related energy use focuses on **Topics 2, 4,** and **5**. The discussion on operational energy use is divided into transportation energy demand and building energy demand. The transportation energy demand analysis discusses **Topics 2, 4, 5,** and **6**, and the building energy demand analysis discusses **Topics 2, 3, 4,** and **5**.

Construction Methodology

Project construction would require temporary energy consumption primarily using fuel for construction equipment, construction worker vehicle trips to and from the project site, and the import and export of earth materials to and from the project site by heavy trucks. The estimated construction fuel consumption is based on the proposed project's construction equipment list, timing/phasing, and hours of duration for construction equipment, as well as vendor, hauling, and construction worker trips. The project would be constructed in one phase over a period of approximately 16 months. Construction is anticipated to begin during the third quarter of 2024 and conclude by the fourth quarter of 2025. The project would require approximately 7,235 cubic yards of soil to be exported. Energy consumption during construction, including gasoline and diesel fuel consumption from construction equipment, hauling trips, vendor trips, and worker trips, was estimated using the assumptions and factors from CalEEMod. The results of the CalEEMod modeling for construction estimates are included in Appendix A, *Energy Data*.

Operations Methodology

The proposed project would require energy use in the form of electricity and fuel consumption. The CalEEMod modeling included energy consumption data for the proposed project. It should be noted that the proposed project would not utilize natural gas. As such, natural gas consumption is not analyzed. The proposed project's electricity consumption would be compared against the existing conditions and the net change would be compared to the total consumption in Orange County in 2022, the latest year consumption data is available.

Based on the *Trip Generation Assessment for the Proposed South Coast Technology Center Project* (Traffic Assessment) prepared by Linscott, Law, and Greenspan Engineers (dated January 2, 2024), the proposed project results in an operational trip generation that would be less than the existing conditions. However, the project's trip generation would result in a fleet mix that utilizes more 2-, 3-, and 4-axle trucks than the existing conditions. These trucks use diesel with a lower miles per gallon efficiency rate and longer trip lengths, resulting in higher diesel fuel consumption. As such, gasoline and diesel fuel consumptions were modeled separately.

IMPACT ANALYSIS

EN-1 WOULD THE PROJECT RESULT IN POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACT DUE TO WASTEFUL, INEFFICIENT, OR UNNECESSARY CONSUMPTION OF ENERGY RESOURCES, DURING PROJECT CONSTRUCTION OR OPERATION? [GPU PEIR Impact 5.5-1]

Level of Significance: Less Than Significant Impact.

The GPU PEIR Impact 5.5-1 concludes that implementation of the GPU would result in temporary demands for electricity due to the development of projects under the GPU. The GPU PEIR also determined that construction equipment would not require the use of natural gas. Energy use from construction would also occur due to the transportation and use of construction equipment, delivery vehicles, haul trucks, and construction employee vehicle trips, all of which would use either diesel fuel or gasoline. However, the GPU PEIR determined that energy use from transportation would fluctuate depending on the phase of construction and would be temporary. Due to the temporary nature of construction, energy uses from these sources (construction equipment, haul trucks, construction employee vehicles, etc.) would cease upon the completion of a project. The GPU PEIR also states that compliance with Section 2449 of 13 California Code of Regulations (CCR) Article 4.8, Chapter 9 would minimize nonessential idling of construction equipment, minimizing excessive energy consumption. Additionally, construction activities and development proposed due to the GPU would be similar in nature to existing projects within the City.

The GPU PEIR also determined that the operation of new developments due to the implementation of the GPU would result in additional demands for electricity and natural gas compared to existing conditions. Usage of electricity and natural gas would come from a variety of sources (i.e., heating cooling, ventilation, appliances, and lighting). Nevertheless, while the implementation of the GPU would result in additional demands for electricity and natural gas, future developments would be required to comply with the most recent Building Energy Efficiency Standards and CALGreen, which would reduce the overall energy demands. In additional to the Building Energy Efficiency Standards and CALGreen, the GPU PEIR also determined that compliance with goals and policies within the GPU would increase energy efficiency and reduce wasteful use of energy resources. In addition, implementation of the GPU would result in an overall decrease in VMT and fuel usage for gasoline-powered vehicles but would result in an increase of diesel-powered, natural gas-powered, and electric-powered vehicles. Overall, the GPU PEIR determined that the implementation of the GPU would not result in excessive and inefficient energy use upon implementation of GPU goals and policies and compliance with applicable regulations (i.e., Building Energy Efficiency Standards, CALGreen, and RPS). Thus, the GPU PEIR determined that impacts of energy use would be less than significant.

The following impact analysis focuses on the two sources of energy that are relevant to the proposed project: electricity and transportation fuel for vehicle trips associated with project operations as well as the fuel necessary for project construction. Table 3, *Net Change in Energy Consumption* displays the net change of the project's energy consumption compared to existing conditions. As displayed below, due to the different fleet mix (more medium- and heavy-duty trucks) compared to existing conditions, the project would result in higher fuel consumption. The results of the CalEEMod modeling for operational energy consumption estimates are included in Appendix A, *Energy Data*.[10]

[10] Modeling was performed for a project with three industrial buildings totaling 325,044 square feet. However, since the completion of the modeling, the total building square footage has been reduced to 313,244 square feet. Therefore, the analysis in this memorandum is conservative.

Table 3
Net Change in Energy Consumption

Energy Type[1]	Existing Energy Consumption	Project Energy Consumption	Project Net Change[2]
Electricity	3,691 MWh	5,703 MWh	2,012 MWh
Natural Gas[3]	45,123 therms	0 therms	-45,123 therms
Fuel			
Operational Fuel Consumption (Gasoline)	154,292 gallons (Gasoline)	132,393 gallons (Gasoline)	-21,900 gallons (Gasoline)
Operational Fuel Consumption (Diesel)	11,624 gallons (Diesel)	392,103 gallons (Diesel)	380,479 gallons (Diesel)
1. Construction was not analyzed in this table as the existing conditions does not include construction energy consumption. 2. Numbers may be slightly off due to rounding. 3. The project would not utilize natural gas and as such, the net change is negative.			
Source: Refer to Appendix A, *Energy Data* for CalEEMod outputs and assumptions used in this analysis.			

Table 4, *Project and Countywide Energy Consumption* compares the project's net change in estimated energy consumption with the County's annual energy consumption.

Table 4
Project and Countywide Energy Consumption,

Energy Type	Project Net Change Energy Consumption [1]	Orange County Annual Energy Consumption [2]	Percentage Increase Countywide
Electricity Consumption [3]	2,012 MWh	20,243,721 MWh	0.0099%
Fuel Consumption			
Construction Off-Road Fuel Consumption (Diesel)[4]	34,671 gallons	14,182,623 gallons	0.2445%
Construction On-Road Fuel Consumption (Gasoline)	91,239 gallons (Gasoline)	1,142,034,463 gallons (Gasoline)	0.0080%
Construction On-Road Fuel Consumption (Diesel)	14,159 gallons (Diesel)	135,727,658 gallons (Diesel)	0.0104%
Operational Fuel Consumption (Gasoline)	-21,900 gallons (Gasoline)	1,088,796,204 gallons (Gasoline)	-0.0020%
Operational Fuel Consumption (Diesel)	380,479 gallons (Diesel)	136,337,459 gallons (Diesel)	0.2791%
Notes: 1. Project electricity consumptions as modeled in California Emissions Estimator Model Version 2022.1 (CalEEMod) computer model. Project fuel consumption calculated based on CalEEMod results. Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021. 2. The project's increase in electricity consumption is compared to the total consumption in Orange County in 2022, the latest year with data available. The project increases in construction off-road and on-road fuel consumption are compared with the projected Orange Countywide off-road fuel consumption and Orange Countywide on-road fuel consumption in 2024, respectively. The project's operational automotive fuel consumption is compared with the projected Countywide on-road fuel consumption in 2026. 3. Orange County electricity consumption data source: California Energy Commission, *Electricity Consumption by County*, http://www.ecdms.energy.ca.gov/elecbycounty.aspx, accessed March 1, 2024. 4. Construction Off-Road Diesel Fuel Consumption is based on the County's Mining/Construction Sector's fuel consumption in 2024 from CARB EMFAC Off-Road.			
Source: Refer to Appendix A, *Energy Data* for CalEEMod outputs and assumptions used in this analysis.			

As shown in Table 4, the project's net change of operational electricity usage would constitute an approximate 0.0099 percent increase over the County's typical annual electricity consumption. The

project would not involve natural gas consumption and therefore would result in a net decrease of natural gas consumption. The project would consume nominal electricity and natural gas would not be consumed during construction. The project's off-road construction equipment would use diesel and would increase the County's mining/constructions sector's diesel fuel consumption by approximately 0.2445 percent. The project's on-road gasoline and diesel consumption during construction (hauling trips, vendor trips, and worker trips) would increase the County's gasoline and diesel consumption by 0.0080 percent and 0.0104 percent, respectively. Based on the Traffic Assessment, the project operations would generate approximately 386 fewer average daily trips compared to the existing conditions. However, as discussed, the project would generate more trips from medium- and heavy-duty trucks than existing conditions, which use diesel with a lower mile per gallon efficiency rate and longer trip lengths, resulting in higher diesel fuel consumption. The project's net change operational diesel fuel consumption would increase the County's diesel consumption by 0.2791 percent and the project's net change in operational gasoline would reduce the County's gasoline consumption by 0.0020 percent. Therefore, the project operation would not substantially increase Orange County's annual fuel consumption. As such, the project's construction and operational energy consumption would be nominal compared to the County's consumption (**Topic 1**).

Construction Energy Consumption

During construction, the project would consume energy in two general forms: (1) the fuel energy consumed by construction vehicles and equipment; and (2) bound energy in construction materials, such as asphalt, steel, concrete, pipes, and manufactured or processed materials such as lumber and glass.

Fossil fuels for construction vehicles and other energy-consuming equipment would be used during demolition, grading, building construction, paving, and architectural coating. As indicated in Table 4, the project's off-road fuel consumption (diesel) and on-road fuel consumption (diesel and gasoline) from construction would be approximately 34,671 gallons, 14,159 gallons, and 91,239 gallons, respectively. Consequently, the project's off-road construction equipment diesel fuel consumption and on-road construction fuel diesel and gasoline consumption would increase Orange County's consumption by 0.2445 percent, 0.0104 percent, 0.0080 percent, respectively.

During construction, the proposed project would demolish the existing structures on-site and construct a temporary staging ground for equipment and resources. The temporary staging ground may include mobile office trailers and equipment (computers, lighting, electrical outlets, etc.) that may consume electricity. However, the electricity consumption during construction would be nominal and temporary. Additionally, natural gas would not be consumed during construction. As such, project construction would have a minimal effect on the local and regional energy supplies (fuel or electricity) and would not require additional capacity (**Topic 2**).

Some incidental energy conservation would occur during construction through compliance with state requirements that equipment not in use for more than five minutes be turned off (i.e., Title 13, California Code of Regulations Section 2485). Project construction equipment would also be required to comply with the latest U.S. Environmental Protection Agency (EPA) and CARB engine emissions standards. These emissions standards require highly efficient combustion systems that maximize fuel efficiency and reduce unnecessary fuel consumption. Section 2449 of 13 CCR Article 4.8, Chapter 9 would minimize the idling of construction equipment used for the construction of the proposed project. In addition, because the cost of fuel and transportation is a significant aspect of construction budgets, contractors and owners have a

strong financial incentive to avoid wasteful, inefficient, and unnecessary consumption of energy during construction (**Topic 4**).

Substantial reductions in energy inputs for construction materials can be achieved by selecting building materials composed of recycled materials that require substantially less energy to produce than nonrecycled materials.[11] The integration of green building materials can help reduce environmental impacts associated with the extraction, transport, processing, fabrication, installation, reuse, recycling, and disposal of these building industry source material. The project-related incremental increase in the use of energy bound in construction materials such as asphalt, steel, concrete, pipes and manufactured or processed materials (e.g., lumber and gas) would not substantially increase demand for energy compared to overall local and regional demand for construction materials. Further, it is noted that construction fuel use is temporary and would cease upon completion of construction activities. There are no unusual project characteristics that would necessitate the use of construction equipment, or building materials, or methods that would be less energy efficient than at comparable construction sites in the region or State. Therefore, fuel energy and construction materials consumed during construction would not represent a significant demand on energy resources (**Topic 5**) and a less than significant impact would occur in this regard.

Operational Energy Consumption

Transportation Energy Demand

Pursuant to the Federal Energy Policy and Conservation Act of 1975, the National Highway Traffic and Safety Administration is responsible for establishing additional vehicle standards and for revising existing standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model. Rather, compliance is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. According to the Traffic Assessment, the proposed project would generate approximately 1,544 total gross daily trips and would result in approximately 386 fewer average daily trips compared to the existing conditions. However, as discussed above, the project would result in a fleet mix that would include more medium- and heavy-duty trucks that use diesel with a lower mile per gallon efficiency rate and longer trip lengths, which would result in higher diesel fuel consumption. As indicated in Table 4, the project would increase operational diesel fuel consumption by 380,479 gallons, but would result in a net reduction in gasoline consumption of approximately 21,900 gallons compared to existing conditions. The project's net change in operational diesel fuel consumption would increase the County's diesel consumption by 0.2791 percent. The project's net change in operational gasoline consumption would reduce the County's gasoline consumption by 0.0020 percent. The project would not substantially increase the County's existing diesel and gasoline consumption. Additionally, the project does not propose any unusual features that would result in excessive long-term operational fuel consumption (**Topic 2**).

The key drivers of transportation-related fuel consumption for the proposed project are heavy-duty trucks traveling to and from the project site. Additionally, passenger vehicle and light- and medium-duty trucks trips also account for a portion of the transportation-related fuel consumption. At the time of this analysis, it has not been determined if the ultimate tenant would operate its own fleet and most warehouse operators have no control over the trucks entering and exiting their facilities. Consequently, it is infeasible to require trucks with particular emission profiles (e.g., zero-emission [ZE], near-zero-emission [NZE], or

[11] California Department of Resources Recycling and Recovery, *Green Building Materials*, https://www.calrecycle.ca.gov/greenbuilding/materials, accessed March 1, 2024.

2010 or beyond model year trucks) to visit the project site. It should be noted that the project would be required to comply with SCAQMD Rule 2305 for warehouse uses.

The project would also consume fuel in the form of employees driving to and from the project site. Additionally, employee commuting factors are outside of the scope of the design of the proposed project. Notwithstanding, the project would include approximately 39 electric vehicle (EV) parking spaces with electrical charging station installed; the project would also include 27 short- and long-term bicycle parking spaces, all of which would be in compliance with CALGreen standards. This requirement would encourage and support alternative modes of travel and thus reduce the petroleum fuel consumption (**Topic 4, Topic 5,** and **Topic 6**). Therefore, fuel consumption associated with vehicle trips generated by the project would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. A less than significant impact would occur in this regard.

Building Energy Demand

The CEC developed 2024 to 2040 forecasts for energy consumption and peak demand in support of the 2023 IEPR for each of the major electricity and natural gas planning areas and the State based on the economic and demographic growth projections. CEC forecasted baseline electricity consumption grows at a rate of about 1.7 percent annually through 2040.[12] The natural gas consumption grows at a rate of about 0.2 percent annually through 2035.[13]

As shown in Table 4, operational energy (electricity) consumption of the project would represent approximately 0.0099 percent increase over the 2022 Countywide electricity consumption, which would be significantly below CEC's forecast. According to the project applicant, the buildings would be fully powered by electricity and no natural gas would be used. As such, only electricity consumption was accounted for in the CalEEMod modeling. Therefore, the project would be consistent with the CEC's energy consumption forecasts and would not require additional energy capacity or supplies (**Topic 2**). Additionally, the project would consume energy during the same time periods as other commercial and light industrial developments and would consume energy evenly throughout the day. As a result, the project would not result in unique or more intensive peak or base period electricity demand (**Topic 3**).

According to the project applicant, the proposed project would exceed the most current Title 24 (i.e., 2022 Title 24) by approximately 10 percent. The 2022 Title 24 provides minimum efficiency standards related to various building features, including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting. Specifically, the project would install energy efficient appliances, and high efficiency lighting that would exceed the 2022 Title 24 standards by 10 percent. Title 24 Building Energy Efficiency Standards are updated every 3-year and become more stringent between each update, as such, complying with the most current Title 24 standards would make the proposed project more energy efficient than existing buildings built under the earlier versions of the Title 24 standards (**Topic 4**).

The electricity provider for the City, SCE, is subject to California's RPS reflected in SB 100. The RPS requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 44 percent by the end of 2024, 52 percent by

[12] California Energy Commission, *2023 Integrated Energy Policy Report, page 130*, February 14, 2024.

[13] Based on *2023 Integrated Energy Policy Report*, the gas forecast is updated every two years, in odd years. As such, the natural gas consumption shown here is based on the California Energy Commission, *Final 2022 Integrated Energy Policy Report Update, page 140*, May 10, 2023.

the end of 2027, 60 percent of total procurement by 2030, and 100 percent of total procurement by 2045. Renewable energy is generally defined as energy that comes from resources which are naturally replenished within a human timescale such as sunlight, wind, tides, waves, and geothermal heat. The increase in reliance of such energy resources further ensures that new development projects will not result in the waste of the finite energy resources (**Topic 5**).

In conclusion, the project's impact related to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation would be less than significant. Project construction and operation would not result in new significant impacts or substantial increase in the severity of previously identified impacts disclosed in the GPU PEIR, which were determined to be less than significant. Likewise, there are no changed circumstances involving new or more severe impacts and no new information of substantial importance requiring new analysis or mitigation measures.

Mitigation Measures: Impacts related to Impact EN-1 would be less than significant. Therefore, no mitigation measures are required.

Level of Significance After Mitigation: Impacts related to Impact EN-1 were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

EN-2 WOULD THE PROJECT CONFLICT WITH OR OBSTRUCT A STATE OR LOCAL PLAN FOR RENEWABLE ENERGY OR ENERGY EFFICIENCY? [GPU PEIR Impact 5.5-2]

Level of Significance: Less Than Significant Impact.

The GPU PEIR determined that the implementation of the GPU would comply with the California RPS program and the City's CAP. Compliance with these regulatory documents ensure that the GPU would not conflict or obstruct a state or local plan for renewable energy or energy efficiency. Thus, the GPU PEIR determined that impact in this regard is less than significant.

The project would comply with state and local plans for renewable energy and energy efficiency, which include the CEC's IEPR, Title 24 standards and CalGreen Code, California's RPS, and the City's CAP. As discussed above, the project's net change of operational electricity consumption would represent approximately 0.0099 percent increase in electricity consumption over the current Countywide usage, which would be significantly below CEC's forecasts in the 2023 IEPR (i.e., forecasted baseline electricity consumption grows at a rate of about 1.7 percent annually through 2040); refer to Table 4. Therefore, the project would be consistent with the CEC's 2023 IEPR. Further, the proposed project would exceed the most current Title 24 (2022 Title 24) by approximately 10 percent. The 2022 Title 24 provides minimum efficiency standards related to various building features, including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting. The project would also comply with the CALGreen Code which requires that new buildings employ water efficiency and conservation, increase building system efficiencies (e.g., lighting, HVAC, and plumbing fixtures), divert construction waste from landfills, and incorporate electric vehicles charging infrastructure. Specifically, the project would install energy efficient appliances and high efficiency appliances. Implementation of the most current Title 24 standards significantly reduces energy usage. Additionally, per the RPS, the project would utilize electricity that would achieve 60 percent of total procurement by 2030, and 100 percent renewable energy by 2045. As such, the project would comply with state energy plans including the 2023 IEPR, the most current Title 24 as well as CalGreen standards, and California's RPS. In addition, the project's proposed industrial use

is consistent with the project site's Industrial land use designation in the City's General Plan. Therefore, the project would be consistent with the City's General Plan, including the goals and policies listed above related to energy and energy efficiency. As discussed above, the GPU PEIR determined that City's General Plan is consistent with California's RPS and the City's CAP for reducing energy usage and implementing energy efficiency, and impacts would be less than significant. Moreover, the project would be required to comply with regulatory requirements RR E-1 through RR E-1 identified in the GPU PEIR. Therefore, since the proposed project is consistent with the General Plan, the project would also be consistent with California's RPS and the City's CAP.

In conclusion, based on the above, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and impacts would be less than significant. As such, the project would not result in new significant impacts and no substantial increase in the severity of previously identified impacts disclosed in the GPU PEIR would occur. Likewise, there are no changed circumstances involving new or more severe impacts and no new information of substantial importance requiring new analysis, verification, or mitigation measures.

Mitigation Measures: Impacts related to Impact EN-2 would be less than significant. Therefore, no mitigation measures are required.

Level of Significance After Mitigation: Impacts related to Impact EN-2 were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

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9. City of Santa Ana, *City of Santa Ana Zoning Map,* February 16, 2023.

10. City of Santa Ana, *Climate Action Plan*, December 2015.

11. City of Santa Ana, Santa Ana General Plan, April 2022.

12. City of Santa Ana, *Golden City Beyond, Santa Ana General Plan Land Use Element, Figure LU-1, Land Use Map*, April 2022.

13. Linscott, Law, and Greenspan Engineers, *Trip Generation Assessment for the Proposed South Coast Technology Center Project*, January 2, 2024.

14. U.S. Energy Information Administration, *California State Energy Profile*, April 20, 2023, https://www.eia.gov/state/print.php?sid=CA, accessed March 1, 2024.

15. U.S. Green Building Council, *Green Building Costs and Savings*, https://www.usgbc.org/articles/green-building-costs-and-savings, accessed March 1, 2024.

Programs

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2. California Air Pollution Control Officers Association, California Emissions Estimator Model (CalEEMod), version 2022.1.

Appendix A
Energy Data

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Orange
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Mile Per Gallons Calculation (Total VMT/Fuel Consumption)			MPG Calc
Row 12 and 13	Passanger Fuel	1410736	30.0438
Row 14-26 and 29-33	Light Trucks Fuel	1907131	21.76475
Row 10-11 and 27-28	Heavy/Medium Trucks Fuel	417698.8	6.749807

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Con	Fuel Consumption
Orange	2024	HHDT	Aggregate	Aggregate	Gasoline	7.623312	590.1042	590.1042	0	152.5272	0	0.140378
Orange	2024	HHDT	Aggregate	Aggregate	Diesel	11093.51	1265161	1265161	0	156385.2	0	211.2875
Orange	2024	LDA	Aggregate	Aggregate	Gasoline	1065892	42285386	42285386	0	4977599	0	1408.434
Orange	2024	LDA	Aggregate	Aggregate	Diesel	3266.417	98494.14	98494.14	0	13787.62	0	2.302448
Orange	2024	LDT1	Aggregate	Aggregate	Gasoline	97776.14	3495530	3495530	0	434581.9	0	138.9785
Orange	2024	LDT1	Aggregate	Aggregate	Diesel	31.55516	483.8937	483.8937	0	89.92549	0	0.020274
Orange	2024	LDT2	Aggregate	Aggregate	Gasoline	523220.8	21321177	21321177	0	2459651	0	872.8634
Orange	2024	LDT2	Aggregate	Aggregate	Diesel	2063.415	86972.74	86972.74	0	9872.064	0	2.705696
Orange	2024	LHDT1	Aggregate	Aggregate	Gasoline	41326.42	1661882	1661882	0	615702.1	0	118.3083
Orange	2024	LHDT1	Aggregate	Aggregate	Diesel	21602.57	922158.8	922158.8	0	271733.2	0	44.51642
Orange	2024	LHDT2	Aggregate	Aggregate	Gasoline	6721.103	253091.6	253091.6	0	100134.4	0	20.60061
Orange	2024	LHDT2	Aggregate	Aggregate	Diesel	9173.234	391527.7	391527.7	0	115387.7	0	22.43146
Orange	2024	MCY	Aggregate	Aggregate	Gasoline	50239	321576.6	321576.6	0	100478	0	7.622889
Orange	2024	MDV	Aggregate	Aggregate	Gasoline	324536.5	12620485	12620485	0	1506316	0	635.3871
Orange	2024	MDV	Aggregate	Aggregate	Diesel	4623.453	183419.8	183419.8	0	21700.57	0	7.625166
Orange	2024	MH	Aggregate	Aggregate	Gasoline	6023.474	58495.56	58495.56	0	602.5884	0	11.96604
Orange	2024	MH	Aggregate	Aggregate	Diesel	2969.064	29761.95	29761.95	0	296.9064	0	2.928855
Orange	2024	MHDT	Aggregate	Aggregate	Gasoline	7429.609	397726.4	397726.4	0	148651.6	0	77.00341
Orange	2024	MHDT	Aggregate	Aggregate	Diesel	27477.47	1155909	1155909	0	346710.1	0	129.2675
Orange	2024	OBUS	Aggregate	Aggregate	Gasoline	859.2546	35950.24	35950.24	0	17191.97	0	6.944891
Orange	2024	OBUS	Aggregate	Aggregate	Diesel	470.1283	36479.13	36479.13	0	5871.221	0	5.101184
Orange	2024	SBUS	Aggregate	Aggregate	Gasoline	669.63	30256.66	30256.66	0	2678.52	0	3.39847
Orange	2024	SBUS	Aggregate	Aggregate	Diesel	821.2477	16793.02	16793.02	0	11891.67	0	2.276612
Orange	2024	UBUS	Aggregate	Aggregate	Gasoline	255.8304	42204.05	42204.05	0	1023.322	0	3.455588

South Coast Technology Center Project
Energy Calculations

Proposed Project

Land Use	Natural Gas Use		Electricity Use	
	(kBTU/yr)	(Therms)	(kWh/yr)	(MWh/yr)
Industrial Park	0	0	5,413,105	5413.105
Parking Lot	0	0	290,005	290.005
Other Asphalt Surfaces	0	0	0	0
Other Asphalt Surfaces	0	0	0	0
Totals	**0**	**0**	**5,703,110**	**5,703**

South Coast Technology Center Project
Energy Calculations

Existing

Land Use	Natural Gas Use		Electricity Use	
	(kBTU/yr)	(Therms)	(kWh/yr)	(MWh/yr)
Office Park	4,512,330	45123.3	3,172,474	3172.474
Unenclosed Parking Structure	0	0	408,523	408.523
Parking Lot	0	0	110,288	110.288
Other Asphalt Surfaces	0	0	0	0
Totals	**4,512,330**	**45,123**	**3,691,285**	**3,691**

South Coast Technology Center Project
Energy Calculations

Net Change (Proposed-Existing)	
Natural Gas	-45,123
Electricity	2,012

1 kBTU = 0.01 therms

Energy Type	Net Change Annual Energy Consumption	Orange County Annual Energy Consumption	Percentage Increase Countywide
Electricity (MWh)	2,012	20,243,722	0.0099%
Natural Gas (Therms)	-45,123	572,454,744	-0.0079%

South Coast Technology Center Project
Energy Calculations

Existing

Vehicle Type	Percent of Vehicle Trips[1]	Daily Trips[2]	Annual Vehicle Miles Traveled	Average Fuel Economy (miles per gallon)[3]	Total Annual Fuel Consumption (gallons)[4]
Passenger Cars	0.50	964	1,989,766	30.0438	66,229
Light/Medium Trucks	0.48	928	1,916,683	21.76475	88,064
Heavy Trucks/Other	0.02	38	78,463	6.749807	11,624
TOTAL [6]	***1.00***	**1,930**	***3,984,912***	**--**	***165,917***

Notes:

1. Percent of Vehicle Trip distribution based on trip characteristics within the CalEEMod model.
2. Daily Trips taken from ITE manual.
3. Average fuel economy derived from the EMFAC calculations
4. Total Daily Fuel Consumption calculated by dividing the daily VMT by the average fuel economy (i.e., VMT/Average Fuel Economy).
5. Values may be slightly off due to rounding.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

	Existing
Gasoline (Passanger)	154,292
Diesel (Light/Medium plus Heavy)	11,624

Existing Conditions

South Coast Technology Center Project
Energy Calculations

Vehicle Type	Percent of Vehicle Trips[1]	Daily Trips[2]	Annual Vehicle Miles Traveled	Average Fuel Economy (miles per gallon)[3]	Total Annual Fuel Consumption (gallons)[4]
Passenger Cars	0.64	781	2,256,903	30.0438	75,120
Light/Medium Trucks	0.36	431	1,246,516	21.76475	57,272
Heavy Trucks/Other	0.00	0	0	6.749807	0
TOTAL [6]	***1.00***	**1,212**	***3,503,419***	**--**	***132,393***

Gasoline

Notes:

1. Percent of Vehicle Trip distribution based on trip characteristics within the CalEEMod model.

2. Daily Trips taken from ITE manual.

3. Average fuel economy derived from the EMFAC calculations

4. Total Daily Fuel Consumption calculated by dividing the daily VMT by the average fuel economy (i.e., VMT/Average Fuel Economy).

5. Values may be slightly off due to rounding.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

South Coast Technology Center Project
Energy Calculations

Proposed User defined industrial

Vehicle Type	Percent of Vehicle Trips[1]	Daily Trips[2]	Annual Vehicle Miles Traveled	Average Fuel Economy (miles per gallon)[3]	Total Annual Fuel Consumption (gallons)[4]
Passenger Cars	0.00	0	0	30.0438	0
Light/Medium Trucks	0.00	0	0	21.76475	0
Heavy Trucks/Other	1.00	146	2,126,271	6.749807	315,012
TOTAL [6]	***1.00***	**146**	***2,126,271***	**--**	***315,012***

Diesel 315,012

Notes:

1. Percent of Vehicle Trip distribution based on trip characteristics within the CalEEMod model.
2. Daily Trips taken from ITE manual.
3. Average fuel economy derived from the EMFAC calculations
4. Total Daily Fuel Consumption calculated by dividing the daily VMT by the average fuel economy (i.e., VMT/Average Fuel Economy).
5. Values may be slightly off due to rounding.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

User Defined represents 4 axle trucks (diesel)

South Coast Technology Center Project
Energy Calculations

User defined industrial (2)

Vehicle Type	Percent of Vehicle Trips[1]	Daily Trips[2]	Annual Vehicle Miles Traveled	Average Fuel Economy (miles per gallon)[3]	Total Annual Fuel Consumption (gallons)[4]
Passenger Cars	0.00	0	0	30.0438	0
Light/Medium Trucks	0.67	124	642,724	21.76475	29,531
Heavy Trucks/Other	0.33	62	321,025	6.749807	47,561
TOTAL [6]	***1.00***	**186**	***964,038***	**--**	***77,091***

Diesel 77,091

Notes:

1. Percent of Vehicle Trip distribution based on trip characteristics within the CalEEMod model.
2. Daily Trips taken from ITE manual.
3. Average fuel economy derived from the EMFAC calculations
4. Total Daily Fuel Consumption calculated by dividing the daily VMT by the average fuel economy (i.e., VMT/Average Fuel Economy).
5. Values may be slightly off due to rounding.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

User Defined 2 represents 2 and 3 axle trucks (diesel)

South Coast Technology Center Project
Energy Calculations

	Gasoline	Diesel
Existing Conditions	154,292	11624
Proposed Indsutrial Park	132393	0
Proposed User Defined 1	0	315012
Proposed User Defined 2	0	77091
Total	132393	392103

Net Change	
Existing Conditions	
Diesel	11,624
Gasoline	154,292
Proposed	
Diesel	392,103
Gasoline	132,393
Net Change	
Diesel	380,479
Gasoline	-21,899

County Consumption Projection (2026)	
Diesel	136,337,459
Gasoline	1,088,796,204
Percent Change (Net Change)	
Diesel	0.2791%
Gasoline	-0.00201%

Legend
Gasoline
Diesel

South Coast Technology Center Project
Energy Calculations

WORKER TRIPS						
Phase	**Phase Length (# days)**	**# Worker Trips**	**Worker Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption**
Demolition	44	30	18.5	24,420		980.61
Grading	33	40	18.5	24,420		980.61
Building Construction	264	274	18.5	1,338,216	**24.90284233**	53,737.48
Paving	11	30	18.5	6,105		245.15
Architectural Coating	22	54.6	18.5	22,222		892.36
						56,836.21

VENDOR TRIPS						
Phase	**Phase Length (# days)**	**# Vendor Trips**	**Vendor Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption**
Demolition	44	0	10.2	0		0.00
Grading	33	0	10.2	0		0.00
Building Construction	264	106.6	10.2	287,052	**8.343886151**	34,402.73
Paving	11	0	10.2	0		0.00
Architectural Coating	22	0	10.2	0		0.00
						34,402.73

HAULING TRIPS						
Phase	**Phase Length (# days)**	**# Hauling Trips**	**Hauling Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)[1]**	**Total Fuel Consumption**
Demolition	44	93	20	81,840		9,808.38
Grading	33	55	20	36,300	**8.343886151**	4,350.49
						14,158.87

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

TOTAL OFF-SITE MOBILE GALLONS (Diesel) CONSUMED DURING CONSTRUCTION	**14,158.87**
TOTAL OFF-SITE MOBILE GALLONS (Gasoline) CONSUMED DURING CONSTRUCTION	**91,238.94**
County On-road Gallons (gasoline)	1,142,034,463
Percentage Increase from Project	0.0080%

South Coast Technology Center Project
Energy Calculations

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Fuel Consumption Rate (gallons per hour)	Duration (total hours/day)	# days	Total Fuel Consumption (gallons)
Demolition	Rubber Tired Dozers	2	8	367	0.40	5.872	16	44	4133.89
Demolition	Excavators	3	8	36	0.38	0.5472	24	44	577.84
Demolition	Concrete/Industrial Saws	1	8	33	0.73	0.9636	8	44	339.19
Grading	Graders	1	8	148	0.41	2.4272	8	33	640.78
Grading	Excavators	2	8	36	0.38	0.5472	16	33	288.92
Grading	Tractors/Loaders/Backhoes	2	8	84	0.37	1.2432	16	33	656.41
Grading	Scrapers	2	8	423	0.48	8.1216	16	33	4288.20
Grading	Rubber Tired Dozers	1	8	367	0.40	5.872	8	33	1550.21
Building Construction	Forklifts	3	8	82	0.20	0.656	24	264	4156.42
Building Construction	Generator Sets	1	8	14	0.74	0.4144	8	264	875.21
Building Construction	Cranes	1	7	367	0.29	4.2572	7	264	7867.31
Building Construction	Welders	1	8	46	0.45	0.828	8	264	1748.74
Building Construction	Tractor/Loaders/Backhoes	3	7	84	0.37	1.2432	21	264	6892.30
Paving	Pavers	2	8	81	0.42	1.3608	16	11	239.50
Paving	Paving Equipment	2	8	89	0.36	1.2816	16	11	225.56
Paving	Rollers	2	8	36	0.38	0.5472	16	11	96.31
Architectural Coating	Air Compressors	1	6	37	0.48	0.7104	6	22	93.77
								Total:	**34,670.56**

Notes:

Fuel Consumption Rate = Horsepower x Load Factor x Fuel Consumption Factor

Where:

Fuel Consumption Factor for a diesel engine is 0.04 gallons per horsepower per hour (gal/hp/hr) and a gasoline engine is 0.06 gal/hp/hr.

Countywide operational fuel consumption, off-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB EMFAC2021.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

Fleet Mix

	HHD	LDA	LDT1	LDT2	LHD1	LHD2	MCY	MDV	MH	MHD	OBUS	SBUS	UBUS	SUM
Industrial Park	0.00	64.42	5.27	30.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Passenger Cars	64.42	0.64
Light/Medium Trucks	35.58	0.36
Heavy Trucks/Other	-	-
	100.00	

	HHD	LDA	LDT1	LDT2	LHD1	LHD2	MCY	MDV	MH	MHD	OBUS	SBUS	UBUS	SUM
User defined industrial	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Passenger Cars	-	-
Light/Medium Trucks	-	-
Heavy Trucks/Other	100.00	1.00
	100.00	

	HHD	LDA	LDT1	LDT2	LHD1	LHD2	MCY	MDV	MH	MHD	OBUS	SBUS	UBUS	SUM
User defined industrial (2)	0.00	0.00	0.00	0.00	0.00	66.67	0.00	0.00	0.00	33.33	0.00	0.00	0.00	100.00

Passenger Cars	-	-
Light/Medium Trucks	66.67	0.67
Heavy Trucks/Other	33.33	0.33
	100.00	