

**APPENDIX C**

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Energy Consumption Analysis

# Vans Building Expansion Project

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## Energy Consumption Analysis

Costa Mesa, California

Prepared For:  
**City of Costa Mesa**  
**Development Services**  
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ECORP Consulting, Inc. has assisted public and private land owners with environmental regulation compliance since 1987. We offer full service capability, from initial baseline environmental studies through environmental planning review, permitting negotiation, liaison to obtain legal agreements, mitigation design, construction monitoring, and compliance reporting.

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Attachment A – Project Automotive Fuel Consumption

**LIST OF ACRONYMS AND ABBREVIATIONS**

CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
ECDMS	Energy Consumption Data Management System
ECORP	ECORP Consulting, Inc.
EPS	emissions performance standard
I-405	Interstate 405
ISO	Independent System Operator
kWh	kilowatt hours
Project	Vans Building Expansion Project
RPS	Renewables Portfolio Standard
SB	Senate Bill
SCE	Southern California Edison
SoCalGas	Southern California Gas Company

## 1.0 INTRODUCTION

Energy consumption is analyzed due to the potential direct and indirect environmental impacts associated with the Vans Building Expansion Project (Project). Such impacts include the depletion of nonrenewable resources (oil, natural gas, coal, etc.) and emissions of pollutants during both the construction and long-term operational phases.

### 1.1 Project Description and Location

The Project site is in the City of Costa Mesa. Located at 1588 South Coast Drive in the central portion of Costa Mesa adjacent to and north of the Interstate 405 (I-405) freeway between Harbor Boulevard and Hyland Avenue, the site spans 15 acres and is currently operating as a Van’s headquarters facility. The facility currently includes one 170,328-square foot office building and three surface parking lots. Surrounding lands include nonresidential land uses to the west, north, and east. The I-405 freeway traverses the Project site to the south, with residential land uses beyond.

The site is designated as “Industrial Park” in the City of Costa Mesa 2015–2035 General Plan. The Industrial Park designation is intended to apply to large districts that contain a variety of industrial and compatible office and support commercial uses. Industrial parks are characterized by large parcels and landscaped setbacks that create a campus-like environment, in close proximity to freeways and other major transportation routes. Industrial parks have major physical separations from areas designated for other uses to maintain their distinctiveness and avoid potential land use incompatibilities. Appropriate uses include industrial, commercial, commercial-recreational provided that the use is determined to be complementary to the industrial area, and institutional provided that land use compatibility and traffic issues have been addressed.

The Project proposes to construct a three-story, 91,023-square foot office building approximately 40 feet north of the existing Vans headquarters building, and a four-level parking structure reaching three stories and accommodating 354 parking spaces at the northeast portion of the campus. The Project would also include the installation of a half-pipe skate ramp just west of the proposed office building, as well as an amphitheater just east of the proposed office building and just south of the proposed parking garage.

The Project proposes a 16-month construction time frame starting in November 2019. Prior to construction, the Project would need to remove over an acre of solar panels currently on the site and re-install them at existing surface parking lots on the Vans campus. Additionally, approximately two acres of asphalt, in addition to a concrete fountain feature, would be demolished and hauled offsite.

## 2.0 ENERGY CONSUMPTION

To better integrate the energy analysis with the rest of the California Environmental Quality Act (CEQA), the Governor’s Office of Planning Research has added relevant questions regarding potential energy impacts currently contained in CEQA Guidelines Appendix F to the sample environmental checklist in Appendix G, holding that CEQA-related environmental analysis must quantify energy use during

construction and operations, including energy associated with transportation related to the Project, and also consider the availability of measures to reduce reliance on fossil fuels.

## 2.1 Existing Setting

### 2.1.1 Electricity/Natural Gas Services

Southern California Edison (SCE) provides electrical services to Costa Mesa through State-regulated public utility contracts. SCE, the largest subsidiary of Edison International, is the primary electricity supply company for much of Southern California. It provides 14 million people with electricity across a service territory of approximately 50,000 square miles. SCE has met or exceeded all Renewable Portfolio Standard requirements to date, procuring renewable energy from diverse sources, including biomass, biowaste, geothermal, hydroelectric, solar, and wind. This Standard requires all California utilities to generate 33 percent of their electricity from renewables by 2020, 50 percent by 2030, and 100 percent by 2045.

The Southern California Gas Company (SoCalGas) provides natural gas services to the Project area. As the nation's largest natural gas distribution utility, SoCalGas delivers natural gas energy to 21.6 million consumers through 5.9 million meters in more than 500 communities. SoCalGas' service territory encompasses approximately 20,000 square miles throughout Central and Southern California, from Visalia to the Mexican border.

### 2.1.2 Energy Consumption

Electricity use is measured in kilowatt hours (kWh), and natural gas use is measured in therms. Vehicle fuel use is typically measured in gallons (e.g., of gasoline or diesel fuel), although energy use for electric vehicles is measured in kWh.

The electricity consumption attributable to non-residential land uses (commercial and industrial) in Orange County from 2014 to 2018 is shown in Table 2-1. As indicated, the demand has decreased since 2014.

<b>Table 2-1. Non-Residential Electricity Consumption in Orange county 2014-2018</b>	
<b>Year</b>	<b>Non-Residential Electricity Consumption (kWh)</b>
2018	13,044,070,989
2017	13,303,152,020
2016	13,479,185,717
2015	13,799,566,708
2014	13,807,333,656

Source: California Energy Consumption Data Management System (ECDMS) 2019

The natural gas consumption attributable to non-residential land uses in Orange County from 2014 to 2018 is shown in Table2-2. As shown, natural gas demand has increased since 2014.

<b>Year</b>	<b>Non-Residential Natural Gas Consumption (therms)</b>
2018	236,102,647
2017	232,285,127
2016	232,223,485
2015	227,551,930
2014	225,550,853

Source: California ECDMS 2019

Automotive fuel consumption in Orange County from 2014 to 2019 is shown in Table 2-3. As shown, on-road fuel consumption has decreased and off-road fuel consumption has increased since 2004.

<b>Year</b>	<b>On-Road Automotive Fuel Consumption (gallons)</b>	<b>Off-Road Equipment Fuel Consumption (gallons)</b>
2019	1,362,039,800	16,317,320
2018	1,384,981,472	15,785,664
2017	1,412,971,800	15,361,356
2016	1,425,043,591	14,946,222
2015	1,427,024,567	14,394,448
2014	1,430,174,246	13,840,257

Source: California Air Resources Board (CARB) 2014

## **2.2 Regulatory Framework**

### **2.2.1 California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24)**

Title 24, California’s energy efficiency standards for residential and nonresidential buildings, were established by the California Energy Commission (CEC) in 1978 in response to a legislative mandate to create uniform building codes to reduce California’s energy consumption and provide energy efficiency standards for residential and nonresidential buildings. California’s energy efficiency standards are updated on an approximate three-year cycle. In 2016, the CEC updated Nonresidential Title 24 standards with more stringent requirements. The 2016 standards, which went into effect on January 1, 2017, have substantially reduced the growth in electricity and natural gas use.

## **California Green Building Standards**

The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also has voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code was adopted in 2016 and went into effect January 1, 2017.

## **Senate Bill (SB) 1368**

On September 29, 2006, Governor Arnold Schwarzenegger signed into law SB 1368 (Perata, Chapter 598, Statutes of 2006). The law limits long-term investments in baseload generation by the State's utilities to those power plants that meet an emissions performance standard (EPS) jointly established by the CEC and the California Public Utilities Commission (CPUC).

The CEC has designed regulations that:

- Establish a standard for baseload generation owned by or under long-term contract to publicly owned utilities, of 1,100 pounds carbon dioxide per megawatt hour. This would encourage the development of power plants that meet California's growing energy needs while minimizing their emissions of greenhouse gas.
- Require posting of notices of public deliberations by publicly owned utilities on long-term investments on the CEC website. This would facilitate public awareness of utility efforts to meet customer needs for energy over the long term while meeting the State's standards for environmental impact.
- Establish a public process for determining the compliance of proposed investments with the EPS (Perata, Chapter 598, Statutes of 2006).

## **Renewable Energy Sources (Renewables Portfolio Standard [RPS])**

Established in 2002 under SB 1078, and accelerated by SB 107 (2006) and SB 2 (2011), California's RPS obligates investor-owned utilities, energy service providers, and community choice aggregators to procure 33 percent of their electricity from renewable energy sources by 2020. Eligible renewable resources are defined in the 2013 RPS to include biodiesel; biomass; hydroelectric and small hydro (30 megawatts or less); Los Angeles Aqueduct hydro power plants; digester gas; fuel cells; geothermal; landfill gas; municipal solid waste; ocean thermal, ocean wave, and tidal current technologies; renewable derived biogas; multi-fuel facilities using renewable fuels; solar photovoltaic; solar thermal electric; wind; and other renewables that may be defined later. Governor Jerry Brown signed SB 350 on October 7, 2015, which expands the RPS by establishing a goal of 60 percent of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 includes the goal to double the energy

efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses upon which an energy efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal. SB 350 also provides for the transformation of the California Independent System Operator (ISO) into a regional organization to promote the development of regional electricity transmission markets in the western states and to improve the access of consumers served by the California ISO to those markets, pursuant to a specified process.

## **2.3 Energy Consumption Impact Assessment**

### **2.3.1 Thresholds of Significance**

The impact analysis focuses on the four sources of energy that are relevant to the proposed Project: electricity, natural gas, the equipment fuel necessary for Project construction, and the automotive fuel necessary for Project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, and unnecessary consumption of energy for a proposed manufacturing land use. For the purposes of this analysis, the amount of electricity, natural gas, construction fuel, and fuel use from operations are quantified and compared to that consumed by non-residential land uses (commercial and industrial) in Orange County.

### **2.3.2 Methodology**

The analysis of electricity/natural gas usage is based on California Emissions Estimator Model modeling conducted by ECORP Consulting, Inc. (ECORP 2019), which quantifies energy use for Project operations. The amount of operational automotive fuel use was estimated using CARB's EMFAC2014 computer program, which provides projections for typical daily fuel usage in Orange County. The amount of total construction-related fuel use was estimated using ratios provided in the Climate Registry's General Reporting Protocol for the Voluntary Reporting Program, Version 2.1.

### **2.3.3 Energy Consumption**

Energy consumption associated with the proposed Project is summarized in Table 2-4.

<b>Energy Type</b>	<b>Annual Energy Consumption</b>	<b>Percentage Increase Countywide</b>
Electricity Consumption <sup>1</sup>	673 kilowatt-hours	0.000005%
Natural Gas Consumption <sup>1</sup>	0.45 therms	0.00%
Automotive Fuel Consumption		
• Project Construction <sup>2</sup>	91,626 gallons	0.6%
• Project Operations <sup>3</sup>	328,145 gallons	0.02%

Source: <sup>1</sup>ECORP 2019; <sup>2</sup>Climate Registry 2016; <sup>3</sup>EMFAC2014 (CARB 2014)

Notes: The Project increases in electricity and natural gas consumption are compared with all of the non-residential buildings in Orange County in 2018, the latest data available. The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2019, the most recent full year of data.

As shown in Table 2-4, the increase in electricity usage as a result of the Project would constitute an approximate 0.000005 percent increase in the typical annual electricity consumption attributable to non-residential uses in Orange County. Project increases in natural gas usage across Orange County would also be unnoticeable. The Project would adhere to all federal, State, and local requirements for energy efficiency, including the Title 24 standards. The Project would be required to comply with Title 24 building energy efficiency standards, which establish minimum efficiency standards related to various building features including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting. Implementation of the Title 24 standards significantly reduces energy usage.

As further indicated in Table 2-4, the Project's gasoline fuel consumption during the one-time construction period is estimated to be 91,626 gallons of fuel, which would increase the annual construction-related gasoline fuel use in the county, by 0.6 percent. As such, Project construction would have a nominal effect on local and regional energy supplies. No unusual Project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would conserve the use of their supplies to minimize costs to their profits. Additionally, construction equipment fleet turnover and increasingly stringent State and federal regulations on engine efficiency combined with State regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during Project construction. For these reasons, it is expected that construction fuel consumption associated with the Project would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature.

As indicated in Table 2-4, Project operation is estimated to consume approximately 328,145 gallons of automotive fuel per year, which would increase the annual countywide automotive fuel consumption by 0.02 percent. The amount of operational fuel use was estimated using CARB's EMFAC2014 computer program, which provides projections for typical daily fuel usage in Orange County. This analysis conservatively assumes that all of the automobile trips projected to arrive at the Project during operations would be new to Orange County. The Project would not result in any unusual characteristics that would result in excessive long-term operational automotive fuel consumption. 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.

For these reasons, this impact would be less than significant.

### 3.0 REFERENCES

California ECDMS. 2019. Website: Electricity and Natural Gas Consumption by County.

<http://www.ecdms.energy.ca.gov/>.

CARB. 2014. EMFAC2014 Emissions Model.

Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program, Version 2.1*.

ECORP 2019. *Vans Building Expansion Project Air Quality and Greenhouse Gas Assessment*.

## **ATTACHMENT A**

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Project Automotive Fuel Consumption

**Proposed Project  
Total Construction-Related Operational  
Gasoline Usage**

<b>Action</b>	<b>Carbon Dioxide Equivalents (CO<sub>2</sub>e) in Metric Tons<sup>1</sup></b>	<b>Conversion of Metric Tons to Kilograms<sup>2</sup></b>	<b>Construction Equipment Emission Factor<sup>2</sup></b>	<b>Total Gallons of Fuel Consumed</b>
<b>Project Construction</b>	<b>930</b>	<b>930000</b>	<b>10.15</b>	<b>91,626</b>
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

**Total Gallons Consumed During Project Construction: 91,626**

**Notes:**

Fuel used by all construction equipment, including vehicle hauling trucks, assumed to be diesel.

**Sources:**

ECORP Consulting. 2019. Vans Expansion Project Air Quality & Greenhouse Gas Emissions Assessment

Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1*. January 2016.  
<http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf>

**Total Gallons During Project Operations**

Area	Sub-Area	Cal. Year	Season	Veh_tech	EMFAC AC2007 Category	Fuel_GAS	Fuel_DSL	Daily Total	<b>ANNUAL TOTAL</b>
Sub-Areas	Orange County	2021	Annual	All Vehicles	All Vehicles	872.3310942	26.69817274	899.0292669	<b>328145.6824</b>

**Sources:**

Californai Air Resource Board. 2014. EMFAC2014 Mobile Emissions Model.