Technical Report
LAX Master Plan EIS/EIR

# 8. Energy Supply Technical Report

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Prepared for:

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# 1. INTRODUCTION

This Technical Report presents detailed information on baseline conditions related to energy consumption associated with implementation of the Los Angeles Airport (LAX) Master Plan. This report supports the Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the LAX Master Plan Project prepared pursuant to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

This Technical Report provides factors and equations used to develop projected electricity, natural gas, and transportation-related fuel consumption and contains information pertaining to energy consumption within the Master Plan boundaries that is supplemental to the material presented in Section 4.17.1, *Energy Supply*, of the EIS/EIR. Impacts associated with the information contained in this Technical Report are addressed in Section 4.17.1, *Energy Supply*, of the EIS/EIR.

# 2. GENERAL APPROACH AND METHODOLOGY

This analysis compares energy consumption projected for the No Action/No Project Alternative and three build alternatives to baseline energy consumption, including electricity and natural gas, as well as transportation-related fuels, such as Jet A, gasoline, diesel, liquefied natural gas (LNG), compressed natural gas (CNG), and liquefied propane gas (LPG), or propane. The analysis characterizes existing energy supply sources as well as infrastructure and methods of transmission. The analysis also estimates baseline on-airport electricity and natural gas consumption, as well as that associated with areas proposed to be acquired as part of the LAX Master Plan and other airport programs--collectively referred to as the Master Plan boundaries, as described below. Fuel consumption associated with airport operations is also estimated.

The acreage and location of land required for the proposed LAX Master Plan improvements are unique to each of the three build alternatives. Consequently, each alternative would result in a different footprint for LAX. In order for baseline conditions, the No Action/No Project Alternative, and the three build alternatives to be compared side by side, a single energy supply study area was used. This composite study area is referred to as the "Master Plan boundaries." Total energy consumption within the Master Plan boundaries was then calculated (as described below) for baseline conditions as well as all alternatives at both the 2005 and 2015 planning horizons.

The energy supply study area encompasses all of the land within the Master Plan boundaries. The Master Plan boundaries include the existing airport, as well as the total (composite) area considered for acquisition under the three build alternatives, the Aircraft Noise Mitigation Program (ANMP) acquisition areas (Manchester Square and Belford) and the LAX Expressway alignments. Under baseline conditions, land within the ANMP acquisition areas is assumed to be in its existing land use; under the No Action/No Project Alternative, it is assumed to be vacant. For each of the build alternatives, it is assumed that all proposed acquisition has been completed and existing land uses demolished. Each alternative proposes a different configuration of land acquisition; thus, not all land within the Master Plan boundaries would be acquired by any one alternative. Land uses within areas not acquired would be unaffected by the Master Plan. The Alternative B off-site fuel farm sites are discussed separately from the Master Plan boundaries.

In order to determine whether the increase in energy consumption associated with the LAX Master Plan would be significant, the total energy consumption associated with each of the three build alternatives and the No Action/No Project alternative was projected. Projected energy demands were compared to the projected supply from local and regional suppliers. For the electricity and natural gas analyses, total energy consumption within the Master Plan boundaries was considered; for transportation-related fuels, fuel consumption associated with airport operations was considered.

The methodologies and factors used to estimate energy consumption for baseline conditions, the No Action/No Project Alternative, and the three build alternatives are presented and discussed below. Supporting information for each category of energy consumption is presented. Where appropriate, example calculations are provided.

## 2.1 Electricity

Electricity is used for many purposes at LAX, including lighting, air conditioning, operation of airport equipment, and ground transportation-related uses. The methods used to estimate electricity consumption reflect these various uses. The total estimate of electricity consumption for baseline conditions, the No Action/No Project Alternative, and the three build alternatives were obtained by adding the amount of electricity consumed for each of the identified sources of electricity consumption: buildings and facilities and airport operations, including the Central Utility Plant (CUP), Automated People Mover (APM), gate electrification, ground support equipment, and on-airport vehicles. The methods employed for estimating electricity consumption are described below.

## 2.1.1 Electricity Consumption for Buildings and Facilities

Electricity is consumed at airport terminals, buildings, and other facilities for heating, cooling, lighting, and other miscellaneous uses. Electricity consumption for these uses is dependent primarily on building area. Electricity consumption for airport land uses under baseline conditions, the No Action/No Project Alternative, and the three build alternatives was calculated using factors derived from square footage obtained from Psomas and Associates' *Utilities Consumption and Generation at LAX Technical Addendum.*[1] These factors are presented in **Table 1**, Airport Land Use Electricity Consumption Factors. For non-airport land uses, including current and proposed uses within LAX Northside/Westchester Southside, energy consumption factors based on square footage were obtained from the South Coast Air Quality Management District's (SCAQMD) *CEQA Air Quality Handbook*.[2] These factors are presented in **Table 2**, Non-Airport Land Use Electricity Consumption Factors.

Electricity consumption was projected by multiplying the factor (in kilowatt-hours per square foot per year) by the area of the facility or building (in square feet), as follows:

Equation 1

Annual Facility Electricity Consumption$_i$ = $E_i$ x $A_i$

Where

$E_i$ = Electricity consumption factor for facility (i), kilowatt-hour per square foot year

$A_i$ = Area of facility or building (i), square feet

**Table 1**

**Airport Land Use Electricity Consumption Factors**

| Airport Land Use Category | Electricity Consumption Factor (KWH/S.F./Yr) |
|---|---|
| Terminal[1] | 19.05 |
| Cargo | 13.40 |
| Maintenance | 24.22 |
| Ancillary | 14.17 |

1 The consumption factor for terminal areas does not include energy consumed by the CUP to service the terminals.

Source: Psomas & Associates, 1996.

1 Psomas and Associates, Utilities Consumption and Generation at LAX Technical Addendum, October 1996.

2 SCAQMD, CEQA Air Quality Handbook, April 1993.

**Table 2**

**Non-Airport Land Use Electricity Consumption Factors**

| Non-Airport Land Use Category | Units | Electricity Consumption Factor (KWH/S.F./Yr) |
|---|---|---|
| Residential (Single Family) | DU | 5,626.50[1] |
| Residential (Multi Family) | DU | 5,626.50[1] |
| Hotel | Sq Ft | 9.95 |
| Office | Sq Ft | 12.95 |
| Retail | Sq Ft | 13.55 |
| Light Industrial | Sq Ft | 10.50 |
| Institutional | Sq Ft | 9.31 |
| Restaurant | Sq Ft | 47.45 |

[1] KWH/dwelling/unit/Yr

Source: SCAQMD, CEQA Air Quality Handbook, April 1993.

## 2.1.2 Electricity Consumption for Airport Operations

Sources of electricity demand associated with airport operations include the CUP, gate electrification, APM, ground support equipment (GSE), and on-airport electric vehicles. Each of the sources of electricity demand considered under airport operations was estimated using a different method. Because the sources of electricity demand associated with airport operations are not the same under all alternatives, specific assumptions for baseline conditions, the No Action/No Project Alternative, and the three build alternatives were identified. For example, the APM would only be constructed under the three build alternatives and is not present under baseline conditions or under the No Action/No Project Alternative. The following discussion details the methods used to estimate electricity consumption for each source of electricity demand.

### 2.1.2.1 Electricity Consumption for the Central Utility Plant

The existing CUP is located within the Central Terminal Area (CTA) and consumes electricity in the generation of steam to provide general heating, ventilation, and air conditioning (HVAC) to the terminals. While the CUP consumes electricity for these purposes, the CUP also generates electricity through co-generation. Electricity produced by the CUP under baseline conditions is transferred to the electrical power grid. Los Angeles World Airports (LAWA) receives a credit from the Los Angeles Department of Water and Power (DWP) for electricity transferred from the CUP to the electrical power grid. Under the three build alternatives, a new west CUP would be constructed to serve the West Terminal/Concourses. The west CUP would not be designed to generate electricity; it would only provide HVAC.

Electricity consumption under baseline conditions was obtained from Psomas and Associates' *Utilities Consumption and Generation at LAX Technical Addendum*. Under the No Action/No Project Alternative, electricity consumption for the CUP was assumed to be identical to baseline conditions because the terminal building areas would not change. Because the terminals would be different under each of the three build alternatives for 2005 and 2015, electricity consumption for the CUP was calculated based on terminal area square footage, using the energy consumption factor determined for baseline conditions of 6.70 kilowatt-hour per square foot per year.

### 2.1.2.2 Electricity Consumption for Gate Electrification

Gate electrification refers to the electricity, and if necessary conditioned air, provided to airplanes while they are parked at gates between arrival and departure. Under baseline conditions, while most gates have electrical hook-ups, approximately 40 percent of the aircraft operations were provided electrical service/conditioned air.[3] When airplanes are not provided electricity and conditioned air at gates, an

[3] Los Angeles World Airports, Engineering Division.

onboard Jet A-powered Auxiliary Power Unit (APU), or stationary ground power unit (GPU) and/or air conditioning unit (ACU) are generally operated to provide electricity and conditioned air for aircraft use.

For the No Action/No Project Alternative and the three build alternatives, it was assumed that all passenger gates (100 percent) would provide electrical power to aircraft. The power required for gate electrification was estimated by identifying the numbers and types of APUs on aircraft in use at these gates. Electricity consumption for gate electrification was calculated using the estimated electricity generated by APUs when gate electrification is not provided. The time at a gate requiring power/AC hookup was assumed to be, on average, about 30 minutes for a small aircraft, 45 minutes for a large aircraft, and 60 minutes for a heavy aircraft.[4] Small aircraft that do not have APUs (e.g., very small aircraft) were not assumed to use gate power. The gate electrical power requirements were calculated based on the equivalent power derived from the APUs. An 80 percent APU load factor was assumed adequate to meet electrical power and air conditioning needs for parked aircraft.

The equation for estimating electricity generated by APUs if gate electrification was not provided is as follows:

Equation 2

Annual Gate Electricity $\text{Consumption}_i$ = %GE x $HP_i$ x $LF_i$ x $T_i$ x $F_i$ xC

Where

Annual Gate Electricity $\text{Consumption}_i$ = annual electricity consumption at gate by aircraft model (i), MWH

%GE = percent gate electrification, under baseline conditions only 40% of available gates are electrified. By 2005 100% of gates will be electrified.

$HP_i$ = Horsepower rating of APU associated with aircraft model (i), horsepower

$LF_i$ = Load factor associated with APU, dimensionless

$T_i$ = Time at gate in minutes for a aircraft model (i), minutes

$F_i$ = Annual number of flight operations by aircraft model (i)

C = Constant to convert HP-minutes units to MWH, $1.24 \times 10^{-5}$ MWH per HP-minute

Information and data regarding airplane models, APU horsepower, load factor, time at gate, and annual number of flight operations are provided in the tables in Section 4, *Environmental Consequences*.

## 2.1.2.3 Electricity Consumption for the Automated People Mover

Under the three build alternatives, a APM would be constructed to transport passengers between the new West Terminal and the CTA. The addition of the APM would improve airport operations by reducing the reliance on other vehicles, especially gasoline and diesel powered vehicles, to transport passengers around the airport. Under the three build alternatives, the APM was assumed to be fully constructed and operational by 2015. While the selection of energy form to power the APM has not been selected, the most likely form of energy to power the APM will be electricity. The length of the APM would vary slightly among the three build alternatives. Because for each alternative, the APM would serve the same length of track and make a similar amount of trips regardless of passenger traffic, the intensification of use by increasing numbers of passengers would not increase the amount of electricity consumption by the APM. Estimated annual electricity consumption for the APM was provided by Lea + Elliott, Inc.[5]

## 2.1.2.4 Electricity Consumption for GSE

GSE can be powered by a variety of fuels, including gasoline, diesel, liquefied natural gas (LNG), compressed natural gas (CNG), propane, and electricity. GSE perform a wide variety of airside operations from providing short-term power to aircraft to loading and unloading passenger baggage and cargo, including food service for passenger flights. The types and number of GSE in use depends on the number of flight operations and the types of aircraft in service. The GSE types and numbers used in this analysis are provided in the *Technical Report 4, Air Quality*. For each GSE type, annual hours of usage

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4 Horonjeff, Robert, and Francis X. McKelvey, Planning and Design of Airports, 4th Ed., 1994.

5 Lea + Elliot, Inc., Electrical Power Consumption Estimate for PeopleMover Concepts, February 1998.

were estimated by considering the number of flight operations, types of aircraft, service requirements specific to that aircraft, and anticipated service time for each flight operation. Under baseline conditions, the amount of electrical-powered GSE was not substantial because very few electrical-powered vehicles were in use; therefore, it was assumed that little to no electricity was consumed by GSE under baseline conditions.

For 2005 and 2015, under the No Action/No Project Alternative and the three build alternatives, it was assumed that electrical-powered GSE would be used, in addition to gasoline, diesel, LNG, CNG, and propane. Information and data regarding the types of GSE, the GSE base horsepower, GSE load factor, and the hours of operation, are provided in the tables in Section 4, *Environmental Consequences*.

The energy estimates were calculated as follows:

Equation 3

$$\text{Energy Consumed by GSE Vehicle}_i = \text{BHP}_i \times \text{LF}_i \times \text{Hours}_i \times \frac{1}{[\text{Efficiency}]} \times C$$

Where

$\text{BHP}_i$ = Base horsepower rating of GSE vehicle (i), horsepower

$\text{LF}_i$ = Load factor rating of GSE vehicle (i), dimensionless

$\text{Hours}_i$ = Annual hours of operation of vehicle (i), hours

Efficiency = Motor efficiency for internal combustion engine, 25%

C = Conversion factor from horsepower-hour to million BTUs,[6] 0.002545 million BTUs per horsepower-hour.

Motor efficiencies for standard gasoline and diesel internal combustion engines are typically 25 percent or less.[7] A motor efficiency of 25 percent was used for gasoline, diesel, LNG, CNG, and propane internal combustion engines. Fuel conversion factors for various hydrocarbon based fuels were as follows: 114,000 BTUs per gallon for gasoline; 130,000 BTUs per gallon for diesel; 82,450 BTUs per gallon for liquefied petroleum (propane); and 1,050 BTUs per cubic foot of natural gas.[8, 9] For electric vehicles, the estimate of energy consumed was first converted to gasoline assuming 114,000 BTUs per gallon, then a fuel conversion factor of 12 kilowatt-hour (KWH) of electricity per gallon of gasoline was used to estimate electricity consumed.[10, 11]

## 2.1.2.5 On-Airport Vehicles

On-airport vehicles use a variety of fuels, including gasoline, diesel, LNG, CNG, propane, and electricity. On-airport vehicles are curbside vehicles, rather than airside equipment such as GSE. These curbside activities include transporting passengers, cargo, and airport employees around the airport. Electricity consumed by on-airport vehicles was estimated using on-airport vehicle miles traveled (VMT) and fleet mix assumptions provided by JKH Mobility Services and Barton-Aschman. **Table 3**, On-Airport Vehicle Fleet Mix Assumptions, provides the assumed fleet breakdown for on-airport vehicles under baseline conditions, the No Action/No Project Alternative, and the three build alternatives for 2005 and 2015. **Table 4**, Annual Vehicles Miles Traveled by On-Airport Vehicles, provides the annual miles per year

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6 A British Thermal Unit (BTU) is equivalent to the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit at 60 degrees Fahrenheit.

7 Daniel Sperling, The Case for Electric Vehicles, Scientific American, Available: http://www.sciam.com/1196issue/1196sperling.htm [June 24, 2000]

8 Consumers Corner, Natural Gas Vehicle Quick Reference Fuel Guide, Natural Fuels Company, Available: http://www.naturalfuels.com/quick_ref_fuel_guide.htm. [June 5, 2000]

9 U.S. Department of Energy (DOE), Alternative Energy Sources for Non-Highway Transportation, DOE/CS/05438-T1 Volume 3 of 3, June 1980

10 California Energy Commission, Transportation Technology Status Report, I. Alternative Fuel Vehicles, II. Automotive Fuel Economy, December 1997

11 This is approximately equal to 1.072 KWH per horsepower-hour or a combined electric charger, battery, and motor efficiency of 69.6%.

traveled by each on-airport vehicle type used in the energy consumption calculations. Energy demand was estimated assuming an equivalent of 18.92 miles per gallon of gasoline for the fleet mix.[12] Conversion to other energy forms was accomplished using conversion factors. For the purpose of estimating electricity consumption, the energy consumed by electric vehicles has been estimated by assuming conversion of gasoline to electric vehicles. For the conversion of gasoline into an equivalent consumption of electricity, a conversion factor of 12 KWH of electricity per gallon of gasoline was used.[13] The equation for calculating electricity consumption by on-airport vehicles is as follows:

Equation 4

$$\text{On-Airport Vehicle Energy Consumption}_i = \text{VMT}_i \,/\, \text{MPGi} \times \text{Conversion Factor}_i$$

Where

$\text{VMT}_i$ = Annual vehicle miles traveled by vehicle (i), miles

MPGi = Estimated miles per gallon of gasoline (18.92 miles per gallon assumed), miles per gallon

$\text{Conversion Factor}_i$ = 12 KWH per gallon of gasoline for electric $\text{vehicle}_i$

[12] California Department of Transportation (Caltrans), California Motor Vehicle Stock, Travel and Fuel Forecast, Transportation System Information Program, November, 1998

[13] California Energy Commission, Transportation Technology Status Report, I. Alternative Fuel Vehicles; II. Automotive Fuel Economy, December, 1997

**Table 3**

**On-Airport Vehicle Fleet Mix Assumptions**

| | Percentage of Fleet | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline Conditions | | | | | | | | No Action/No Project Alternative 2005 | | | | | | | | No Action/No Project Alternative 2015 | | | | | | | |
| Vehicle Type | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid |
| **Cargo** | | | | | | | | | | | | | | | | | | | | | | | | |
| Light Duty Auto | | 100.0 | | | | | | | | 99.0 | 1.0 | | | | | | | 95.0 | 5.0 | | | | | |
| Pickup | 18.0 | 81.0 | | | 1.0 | | | | 9.0 | 90.0 | 1.0 | | | | | | 9.0 | 81.0 | 1.0 | | | 2.0 | 2.5 | 4.5 |
| Van | 6.0 | 94.0 | | | | | | | 22.0 | 76.0 | 1.0 | | | 1.0 | | | 18.5 | 65.5 | 1.0 | | | 3.0 | 4.0 | 8.0 |
| Step Van | 22.0 | 78.0 | | | | | | | 21.0 | 78.0 | 1.0 | | | | | | 14.0 | 70.0 | 1.0 | 1.0 | | | 5.0 | 9.0 |
| Cube Van | 84.0 | 16.0 | | | | | | | 83.0 | 16.0 | 1.0 | | | | | | 70.5 | 16.0 | 1.0 | 1.0 | | | 4.0 | 7.5 |
| 3-Axle | 95.0 | 5.0 | | | | | | | 95.0 | 4.0 | | 1.0 | | | | | 89.0 | 1.0 | | 1.0 | | | 3.0 | 6.0 |
| 4/5-Axle | 100.0 | | | | | | | | 100.0 | | | | | | | | 95.0 | | | | | | 2.0 | 3.0 |
| **LAWA** | | | | | | | | | | | | | | | | | | | | | | | | |
| Van | | | 33.0 | | | 67.0 | | | | | 33.0 | | | 67.0 | | | | | 33.0 | | | 67.0 | | |
| Pickup | 11.0 | 61.0 | 26.0 | | | 2.0 | | | 11.0 | 62.0 | 26.0 | | | 1.0 | | | 11.0 | 62.0 | 26.0 | | | 1.0 | | |
| Sedan | | 80.0 | 19.0 | | | 1.0 | | | | 80.0 | 19.0 | | | 1.0 | | | | 80.0 | 19.0 | | | 1.0 | | |
| Parking Lot Bus | 55.0 | | 5.0 | 40.0 | | | | | 8.0 | | | 92.0 | | | | | | | | 100.0 | | | | |
| Airfield Bus | 100.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | | | | | | |
| Flyaway Bus | 100.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | | | | | | |
| Construction | 100.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | | | | | | |
| Sweeper | 75.0 | | 25.0 | | | | | | 75.0 | | 25.0 | | | | | | 80.0 | | 20.0 | | | | | |
| Forklift | | | | | | 100.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | |
| Truck | 89.0 | | | | | 11.0 | | | 91.0 | | | | | 9.0 | | | 90.0 | | | | | 10.0 | | |
| Rideshare Van | | 100.0 | | | | | | | | | | | 100.0 | | | | | 100.0 | | | | | | |
| **On-Road GSE** | | | | | | | | | | | | | | | | | | | | | | | | |
| Van | 1.0 | 98.0 | | | 1.0 | | | | 1.0 | 97.0 | | | 2.0 | | | | 1.0 | 95.0 | | | 3.0 | 1.0 | | |
| Pickup | 81.0 | 18.0 | | | 1.0 | | | | 81.0 | 17.0 | | | 2.0 | | | | 81.0 | 15.0 | | | 3.0 | 1.0 | | |
| Car | | 99.0 | | | | 1.0 | | | | 98.0 | | | | 2.0 | | | | 96.0 | | | | 4.0 | | |
| Truck | 53.0 | 32.0 | | | 15.0 | | | | 53.0 | 31.0 | | | 16.0 | | | | 53.0 | 29.0 | | | 17.0 | 1.0 | | |
| Bus | 90.0 | 6.0 | 4.0 | | | | | | 90.0 | 5.0 | 5.0 | | | | | | 90.0 | 3.0 | 6.0 | | | 1.0 | | |
| SUV | | 100.0 | | | | | | | | 99.0 | 1.0 | | | | | | | 97.0 | 2.0 | | | 1.0 | | |
| Step Van | | 78.0 | | | 22.0 | | | | | 77.0 | | | 23.0 | | | | | 75.0 | | | 24.0 | 1.0 | | |

| | Percentage of Fleet | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline Conditions | | | | | | | | Alternatives A, B, C - 2005 | | | | | | | | Alternatives A, B, C - 2015 | | | | | | | |
| Vehicle Type | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid | Diesel | Gasoline | CNG | LNG | Propane | Battery | Fuel Cell | Hybrid |
| **Cargo** | | | | | | | | | | | | | | | | | | | | | | | | |
| Light Duty Auto | | 100.0 | | | | | | | | 49.0 | 51.0 | | | | | | | 49.0 | 29.0 | | | | 8.0 | 14.0 |
| Pickup | 18.0 | 81.0 | | | 1.0 | | | | 9.0 | 41.0 | 49.0 | | | | | 1.0 | 9.0 | 41.0 | 29.0 | | | | 8.0 | 13.0 |
| Van | 6.0 | 94.0 | | | | | | | 3.0 | 47.0 | 49.0 | | | | | 1.0 | 3.0 | 47.0 | 30.5 | | | | 8.0 | 11.5 |
| Step Van | 22.0 | 78.0 | | | | | | | 17.0 | 40.0 | 43.0 | | | | | | 11.0 | 39.0 | 35.5 | | | | 5.5 | 9.0 |
| Cube Van | 84.0 | 16.0 | | | | | | | 48.0 | 9.0 | 43.0 | | | | | | 42.0 | 8.0 | 34.0 | | | | 6.0 | 10.0 |
| 3-Axle | 95.0 | 5.0 | | | | | | | 64.0 | 3.0 | | 33.0 | | | | | 47.0 | 2.0 | | 38.0 | | | 5.0 | 8.0 |
| 4/5-Axle | 100.0 | | | | | | | | 67.0 | | | 33.0 | | | | | 50.0 | | | 38.0 | | | 5.0 | 7.0 |
| **LAWA** | | | | | | | | | | | | | | | | | | | | | | | | |
| Van | | | 33.0 | | | 67.0 | | | | | 33.0 | | | 67.0 | | | | | | | | 33.3 | 33.3 | 33.3 |
| Pickup | 11.0 | 61.0 | 26.0 | | | 2.0 | | | | | 80.0 | | | 19.0 | 1.0 | | | | 51.0 | | | 10.0 | 15.0 | 24.0 |
| Sedan | | 80.0 | 19.0 | | | 1.0 | | | | | 81.0 | | | 18.0 | 1.0 | | | | 46.0 | | | 10.0 | 17.5 | 26.5 |
| Parking Lot Bus | 55.0 | | 5.0 | 40.0 | | | | | | | | 100.0 | | | | | | | | 60.0 | | | 17.0 | 23.0 |
| Airfield Bus | 100.0 | | | | | | | | | | | 100.0 | | | | | | | | 59.0 | | | 18.0 | 23.0 |
| Flyaway Bus | 100.0 | | | | | | | | | | | 100.0 | | | | | | | | 62.0 | | | 15.0 | 23.0 |
| Construction | 100.0 | | | | | | | | | | 100.0 | | | | | | | | 100.0 | | | | | |
| Sweeper | 75.0 | | 25.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | | | | |
| Forklift | | | | | | 100.0 | | | | | | | | 100.0 | | | | | | | | 100.0 | | |
| Truck | 89.0 | | | | | 11.0 | | | | | | 84.0 | | 16.0 | | | | | | 80.0 | | 20.0 | | |
| Rideshare Van | | 100.0 | | | | | | | | | 98.0 | | | | | 2.0 | | | 37.5 | | | | 25.0 | 37.5 |
| **On-Road GSE** | | | | | | | | | | | | | | | | | | | | | | | | |
| Van | 1.0 | 98.0 | | | 1.0 | | | | | 75.0 | 15.0 | | | 10.0 | | | | 45.0 | 35.0 | | | 10.0 | | 10.0 |
| Pickup | 81.0 | 18.0 | | | 1.0 | | | | 55.0 | 20.0 | 15.0 | | | 10.0 | | | 15.0 | 50.0 | 15.0 | | | 10.0 | | 10.0 |
| Car | | 99.0 | | | | 1.0 | | | | 75.0 | 15.0 | | | 10.0 | | | | 65.0 | 15.0 | | | 10.0 | | 10.0 |
| Truck | 53.0 | 32.0 | | | 15.0 | | | | 30.0 | 25.0 | 35.0 | | | 10.0 | | | | 45.0 | 35.0 | | | 10.0 | | 10.0 |
| Bus | 90.0 | 6.0 | 4.0 | | | | | | 15.0 | | 75.0 | | | 10.0 | | | | | 80.0 | | | 10.0 | | 10.0 |
| SUV | | 100.0 | | | | | | | | 75.0 | 15.0 | | | 10.0 | | | | 65.0 | 15.0 | | | 10.0 | | 10.0 |
| Step Van | | 78.0 | | | 22.0 | | | | | 50.0 | 25.0 | | | 25.0 | | | | 30.0 | 35.0 | | | 25.0 | | 10.0 |

Source: JKH Mobility Services and Barton-Aschman, 2000.

**Table 4**

**Annual Vehicle Miles Traveled by On-Airport Vehicles**

| | | Miles Traveled Per Year | | | | |
|---|---|---|---|---|---|---|
| | | Baseline | No Action/No Project | | Alternatives A, B, C | |
| **Class** | **Vehicle Type** | **Conditions[1]** | **2005** | **2015** | **2005** | **2015** |
| **Cargo** | Light Duty Auto | 1,954,656 | 3,215,227 | 3,990,359 | 2,016,347 | 2,666,761 |
| | Pickup | 291,304 | 479,168 | 594,687 | 300,498 | 397,430 |
| | Van | 673,404 | 1,107,687 | 1,374,730 | 694,657 | 918,733 |
| | Step Van | 246,536 | 405,530 | 503,295 | 254,317 | 336,353 |
| | Cube Van | 1,967,248 | 3,235,939 | 4,016,065 | 2,029,336 | 2,683,940 |
| | 3-Axle | 250,319 | 411,752 | 511,019 | 258,220 | 341,514 |
| | 4/5-Axle | 539,732 | 887,809 | 1,101,843 | 556,766 | 736,363 |
| **LAWA** | Van | 21,840 | 25,986 | 31,522 | 25,986 | 36,656 |
| | Pickup | 1,303,120 | 1,550,492 | 1,880,796 | 1,550,492 | 2,187,122 |
| | Sedan | 1,645,280 | 1,957,604 | 2,374,637 | 1,957,604 | 2,761,394 |
| | Parking Lot Bus | 1,055,765 | 1,256,181 | 1,523,788 | 1,256,181 | 1,771,968 |
| | Airfield Bus | 174,720 | 207,887 | 252,174 | 207,887 | 293,245 |
| | Flyaway Bus | 54,990 | 65,429 | 79,367 | 65,429 | 92,294 |
| | Construction | 40,040 | 47,641 | 57,790 | 47,641 | 67,202 |
| | Sweeper | 7,280 | 8,662 | 10,507 | 8,662 | 12,219 |
| | Forklift | 1,820 | 2,165 | 2,627 | 2,165 | 3,055 |
| | Truck | 203,840 | 242,535 | 294,203 | 242,535 | 342,120 |
| **On-Road GSE** | Van | 8,594,550 | 8,687,818 | 8,792,637 | 8,687,818 | 10,906,039 |
| | Pickup | 4,337,150 | 4,424,651 | 4,478,034 | 4,424,651 | 5,554,377 |
| | Car | 4,366,500 | 4,413,885 | 4,467,139 | 4,413,885 | 5,540,862 |
| | Truck | 4,057,650 | 4,101,684 | 4,151,170 | 4,101,684 | 5,148,948 |
| | Bus | 511,200 | 516,748 | 522,982 | 516,748 | 648,686 |
| | SUV | 276,900 | 279,905 | 283,282 | 279,905 | 351,372 |
| | Step Van | 244,950 | 247,608 | 250,596 | 247,608 | 310,829 |

1 Cargo VMT under baseline conditions was estimated using the anticipated ratio of cargo tonnage and VMT presented for the 2005 No Action/No Project Alternative.

Source: Calstart, 1999.

# 2.2 Natural Gas

Natural gas is consumed at airport terminals, buildings, and other facilities for heating, cooking, and other miscellaneous uses. Natural gas consumption for these uses is dependent primarily on building area. Natural gas consumption under baseline conditions, the No Action/No Project Alternative, and the three build alternatives was calculated using factors derived from square footage obtained from Psomas and Associates' *Utilities Consumption and Generation at LAX Technical Addendum*.[14] These factors are presented in **Table 5**, Airport Land Use Natural Gas Consumption Factors. For non-airport land uses, including current and proposed uses within LAX Northside/Westchester Southside, natural gas consumption factors based on square footage were obtained from the South Coast Air Quality Management District's (SCAQMD) *CEQA Air Quality Handbook*.[15] These factors are presented in **Table 6**, Non-Airport Land Use Natural Gas Consumption Factors.

Natural gas consumption was projected by multiplying the factor (in cubic feet per square foot per year) by the area of the facility or building (in square feet), as follows:

Equation 5

$$\text{Annual Natural Gas Consumption}_i = NG_i \times A_i$$

Where

$NG_i$ = Natural gas consumption factor for facility (i), cubic feet per square foot per year

14 Psomas and Associates, Utilities Consumption and Generation at LAX Technical Addendum, October 1996.

15 SCAQMD, CEQA Air Quality Handbook, April 1993.

$A_i$ = Area of facility or building (i), square feet

**Table 5**

**Airport Land Use Natural Gas Consumption Factors**

| Airport Land Use Category | Natural Gas Consumption Factor (CF/S.F./Yr) |
|---|---|
| Terminal[1] | 15.18 |
| Cargo | 9.84 |
| Maintenance | 24.59 |
| Ancillary | 142.60 |

1 The consumption factor for terminal areas does not include energy consumed by the CUP to service the terminals.

Source: Camp Dresser & McKee Inc., 2000.

**Table 6**

**Non-Airport Land Use Natural Gas Consumption Factors**

| Non-Airport Land Use Category | Units | Natural Gas Use Factor (CF/S.F./Yr) |
|---|---|---|
| Residential (Single Family) | DU | 79,908[1] |
| Residential (Multi Family) | DU | 48,144[2] |
| Hotel | Sq. Ft. | 57.60 |
| Office | Sq. Ft. | 24.00 |
| Retail | Sq. Ft. | 34.80 |
| Light Industrial | Meter | 2,939,600[2] |
| Institutional | Sq. Ft. | 24.00 |
| Restaurant | Sq. Ft. | 38.40 |

1 CF/dwelling unit/Yr
2 CF/meter/Yr

Source: SCAQMD, CEQA Air Quality Handbook, April 1993.

In addition to the natural gas consumed at airport buildings and facilities, natural gas is consumed at the CUP to provide hot water and HVAC for the airport terminals,[16] and to generate electricity through co-generation with a gas turbine. The gas turbine is normally fueled by natural gas, but also has the capability to use distillate oil as a back-up fuel. Under the three build alternatives, additional CUP capacity would be added by constructing a second CUP near the West Terminal/Concourses. The west CUP would provide HVAC and hot water to the West Terminal/Concourses, but would not be used to generate electricity through co-generation. Under the three build alternatives, the natural gas consumption by the CUP was assumed to be proportional to the square footage of terminal area, with an adjustment for the west CUP that would not generate electricity through co-generation. Natural gas consumption for electricity generation by the existing CUP was estimated using data presented in Psomas and Associates' *Utilities Consumption and Generation at LAX Technical Addendum*[17] and the LAWA Green Power Agreement.[18] Using these data sources, a factor for natural gas consumption was developed based on terminal areas in square feet.

16 Steam generated by natural gas combustion by the CUP is used to power a steam turbine in one of the five CUP chillers, and is also used in the heat cycle of the two lithium bromide absorption coolers that are used to provide chilled water for air conditioning.

17 Psomas and Associates, Utilities Consumption and Generation at LAX Technical Addendum, October 1996.

18 LAWA, Resolution No. 20821, Board File No. LAA-7858, October 21, 1999.

# 2.3 LNG, CNG, and Propane

LNG, CNG, and propane are consumed by GSE and on-airport vehicles as an alternative fuel to gasoline and diesel. The methods used to estimate LNG, CNG, and propane are similar to those described for estimating electricity consumption discussed previously. The methods for estimating LNG, CNG, and propane consumption are provided below.

## 2.3.1 CNG and Propane Consumption for GSE

The consumption of CNG, and propane by GSE was estimated using the same approach as for electricity consumption for GSE. Energy consumption for GSE was calculated using the number of flight operations and the types of aircraft in service. The GSE types and numbers used in this analysis are provided in the *Technical Report 4, Air Quality*. For each GSE vehicle type, annual hours of usage were estimated by considering the number of flight operations, types of aircraft, service requirements specific to that aircraft, and anticipated service time for each flight operation. Data and information presented in Section 4, *Environmental Consequences*, provides the types of GSE vehicles, the GSE vehicle base horsepower, vehicle load factor, the annual hours of operation, and the CNG and propane consumed expressed in million BTUs. The calculation method for estimating the energy consumed by GSE is provided in Equation 3, above. Annual CNG and propane consumption was obtained by converting the consumption values expressed in million BTUs to Therms by multiplying the reported million BTUs by a conversion factor of 0.1 therm[19] per million BTUs.

## 2.3.2 LNG, CNG, and Propane Consumption for On-Airport Vehicles

LNG, CNG, and propane consumption for on-airport vehicles was estimated using on-airport VMT and fleet mix assumptions provided by JKH Mobility Services and Barton-Aschman.[20] **Table 3**, On-Airport Vehicle Fleet Mix Assumptions, provides the assumed fleet breakdown for on-airport vehicles under baseline conditions, the No Action/No Project Alternative, and the three build alternatives for 2005 and 2015. **Table 4**, Annual Vehicles Miles Traveled by On-Airport Vehicles, provides the annual miles per year traveled by each on-airport vehicle type. Energy consumption was estimated by assuming an equivalent of 18.92 miles per gallon of gasoline for the fleet mix. Conversion to other energy forms was accomplished using Equation 4 with the conversion factor adjusted to 1.14 Therms per gallon of gasoline.

# 2.4 Gasoline and Diesel

Gasoline and diesel fuels are used to power a variety of equipment including GSE, on-airport vehicles, off-airport vehicles, and stationary sources. The methods used to estimate gasoline and diesel consumption were based primarily on distance traveled by vehicles or time in operation. A discussion of the methods for estimating gasoline and diesel consumption for each application is provided below.

## 2.4.1 Gasoline and Diesel Consumption for GSE

The consumption of gasoline and diesel by GSE was estimated using the same approach as for consumption of electricity for GSE. Energy consumption for GSE was calculated using the number of flight operations and the types of aircraft in service. The GSE types and numbers used in this analysis are provided *Technical Report 4, Air Quality*. For each GSE vehicle type, annual hours of usage were estimated by considering the number of flight operations, types of aircraft, service requirements specific to that aircraft, and anticipated service time for each flight operation. Data and information presented in Section 4, *Environmental Consequences*, provides the types of GSE vehicles, the GSE vehicle base horsepower, vehicle load factor, the annual hours of operation and the gasoline and diesel consumption expressed in million BTUs. The calculation method for estimating the energy consumed by GSE is provided in Equation 3, above. Annual gasoline and diesel consumption was obtained by converting the consumption values expressed in million BTUs to gallons of gasoline and diesel by multiplying the

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19 A therm is defined as 100,000 BTUs.

20 Rod Swindler, et al, JKH, Personal Communication, 1999 - 2000; Larry Wessemann, et al, Barton-Aschman, Personal Communication, 1999 - 2000.

reported million BTUs by a conversion factor of 8.77 gallons per million BTUs for gasoline and 7.69 gallons per million BTUs for diesel.

### 2.4.2 Gasoline and Diesel Consumption for On-Airport Vehicles

Gasoline and diesel consumption for on-airport vehicles was estimated using on-airport VMT and fleet mix assumptions provided by JKH Mobility Services and Barton-Aschman. **Table 3**, On-Airport Vehicle Fleet Mix Assumptions, provides the breakdown of fleet mix for on-airport vehicles under baseline conditions, the No Action/No Project Alternative, and the three build alternatives for 2005 and 2015. **Table 4**, Annual Vehicles Miles Traveled by On-Airport Vehicles, provides the annual miles traveled by each on-airport vehicle type. Energy demand was estimated assuming an equivalent of 18.92 miles per gallon for combined gasoline and diesel vehicles.[21] The proportion assigned to gasoline or diesel consumption was estimated using fleet mix assumptions presented in **Table 3**, On-Airport Vehicle Fleet Mix Assumptions. Total gasoline and diesel consumption was estimated using Equation 4 with the conversion factor adjusted to one.

### 2.4.3 Gasoline and Diesel Consumption for Off-Airport Vehicles

Off-airport vehicles considered in this analysis include vehicles that arrive and depart from LAX to transport passengers, employees, and cargo to or from a ground destination within the Los Angeles region, and vehicles coming and going from non-airport areas within the Master Plan boundaries (e.g., acquisition area land uses under baseline conditions, LAX Northside and Continental City under the No Action/No Project Alternative, and Westchester Southside under the build alternatives) to destinations outside of the Master Plan boundaries. Gasoline and diesel consumption by off-airport vehicles was estimated using off-airport VMT similar to the approach used to estimate consumption for on-airport vehicles.

Off-airport VMT and estimated gasoline and diesel consumption is presented in the tables provided in Section 4, *Environmental Consequences*. Gasoline and diesel consumption were estimated assuming an equivalent of 18.92 miles per gallon of fuel.[22]

### 2.4.4 Gasoline and Diesel Consumption for Stationary Sources

Stationary sources that consume gasoline and diesel include ground power units (GPUs), air start units (ASUs), air conditioning units (ACUs), and emergency generators for lights and fire protection water pumps. Emergency power generators are typically tested periodically to assure functionality and operability of emergency back-up equipment. In 2005 and 2015 under the No Action/No Project Alternative and the three build alternatives, gasoline and diesel powered GPUs, ASUs, and ACUs would be phased out. However, use of gasoline or diesel powered emergency power back-up systems is anticipated to continue.

The consumption of gasoline and diesel fuels by stationary sources under baseline conditions was obtained from data collected for the Air Quality Baseline Inventory, provided in *Technical Report 4, Air Quality*.[23] Stationary source gasoline and diesel consumption in 2005 and 2015 was estimated by eliminating GPUs, ASUs, and ACUs while maintaining the other engine types detailed in the Air Quality Baseline Inventory.

### 2.4.5 Gasoline and Diesel Consumption for Construction-Related Activities

A construction energy consumption estimate for Alternative C was prepared by Bechtel Infrastructure Corporation.[24] Construction related VMT were estimated based on the information in the Bechtel report. These estimates were based on the likely construction equipment mix and associated manpower

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21 California Department of Transportation (Caltrans), California Motor Vehicle Stock, Travel and Fuel Forecast, Transportation System Information Program, November, 1998

22 California Department of Transportation (Caltrans), California Motor Vehicle Stock, Travel and Fuel Forecast, Transportation System Information Program, November, 1998

23 Camp Dresser & McKee Inc./Planning Consultants Research, Air Quality Baseline Inventory, March 6, 1998.

24 Bechtel Infrastructure Corporation, Interim Year Construction Inputs to Environmental Analysis for LAX Master Plan, 3rd Iteration Alternatives, February 4, 1998.

requirements, and include fuel consumption for construction equipment, haul vehicle travel, and construction worker travel. It was assumed that Alternatives A and B would consume energy in proportion to the amount of facility square footage demolished and constructed as compared to Alternative C. Therefore, using the estimates for gasoline and diesel consumption for Alternative C provided by the Bechtel Corporation, estimates for Alternatives A and B were developed based on the ratios of square feet of total square footage demolished and new construction. As there would be very limited construction activity associated with the No Action/No Project Alternative, it was assumed that construction-related fuel consumption would be negligible. The area of facilities demolished and constructed in 2005 and 2015 that were used to estimate construction-related fuel consumption for the three build alternatives is provided in the data tables presented in Section 4, *Environmental Consequences*.

# 3. AFFECTED ENVIORNMENT/ENVIRONMENTAL BASELINE

## 3.1 Electricity

Electric power within the City of Los Angeles is supplied by Los Angeles Department of Water and Power (DWP) to over 1.3 million customers. DWP maintains facilities for both generation and distribution. Electricity provided by DWP is generated by DWP and other utilities with power generating facilities located both within the Los Angeles Basin and in outlying areas. These sources include natural gas-fired, coal-fired, and hydroelectric plants. Approximately 23 percent of the electricity is generated within DWP's service area by four generating stations: Haynes Generating Station near Seal Beach; Scattergood Generating Station, located approximately one mile south of LAX; Valley Generating Station in the San Fernando Valley, and Harbor Generating Station at Los Angeles Harbor. All four stations are steam-generating, and are fired by either natural gas or fuel oil, with natural gas being the primary fuel. The remainder of the electricity is generated outside of DWP's service area. Approximately 57 percent is generated by coal-fired plants, including Navajo Generating Station in Arizona, Mojave Generating Station in Nevada, and Intermountain Generating Station in Utah. Approximately 7.5 percent is generated at the Palo Verde Nuclear Generating Station in Arizona. Less than five percent is provided by hydroelectric plants located at Hoover Dam, Owens Gorge, Castaic Lake, and along the Los Angeles Aqueduct. The remainder of the power transmitted by the DWP (approximately 8.5 percent) is purchased from other generating sources.[25] The current DWP electric capacity has been developed to provide for a reasonable reserve. DWP's extensive transmission system allows the city to access surplus electricity generated throughout the Pacific Northwest and Southwest to meet all of the city's needs through the year 2015.[26, 27, 28]

LAX is located in DWP's Receiving Station N (RS-N) service area. RS-N is located in the community of Westchester, near Manchester Avenue and Interstate 405 (I-405). The capacity of RS-N is 300,000 kVA. It is served by four 138-kilovolt (kV) underground transmission lines: two from Fairfax Receiving Station to the north, and two from Scattergood Generating Station to the south. A 230-kV underground transmission line runs north from Scattergood, traveling along Pershing Drive in the vicinity of LAX, and serves Receiving Station K in the City of Santa Monica.[29] The location of RS-N, and other distribution facilities, is illustrated in **Figure 1**, Location of Electrical Power Lines and Distribution Facilities at LAX.

From RS-N, power is stepped down to 34.5 kV and distributed to six Distribution Stations (DS) in the airport area. The locations and capacities of the distributing stations are summarized in **Table 7**, Location and Capacity of Distribution Stations Serving LAX. Each station has 34.5 kV and 4.8 kV circuit switching facilities and transformers for stepping down the incoming 34.5 kV voltage to 4.8 kV for further distribution.[30] In addition to these facilities, 12 customer stations, referred to as Industrial Stations (IS), serve LAX. An industrial station is similar to a distribution station with circuit switching and a transformer

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25 City of Los Angeles, Department of Water and Power, Statistics, Fiscal Year 1993-1994, 1994.

26 City of Los Angeles, Department of Water and Power.

27 California Energy Commission, Electricity Report, November 1997.

28 City of Los Angeles, Department of Water and Power, 2000 Integrated Resource Plan, August 15, 2000.

29 City of Los Angeles, Department of Water and Power, Power System Diagram, August, 1994.

30 City of Los Angeles, Department of Water and Power.

and is fed by 34.5 kV lines. The purpose of the IS is to step down the electricity coming from the distribution facility so the end user can access it. **Table 8**, Location and Capacity of Industrial Stations Serving LAX, summarizes the location and capacities of the 12 customer stations located at LAX.

**Table 7**

**Location and Capacity of Distribution Stations Serving LAX**

| Distribution Station | Capacity (kVA) | Location |
|---|---|---|
| DS-47 | 20,000 | West Imperial Highway |
| DS-58 | 30,000 | La Tijera Boulevard |
| DS-111 | 20,000 | South Vicksburg Avenue |
| DS-137 | 48,000 | Talbert Street |
| DS-139 | 11,250 | West Imperial Highway |
| DS-225 | N/A | World Way West |

Source: DWP, 1995.

**Table 8**

**Location and Capacity of Industrial Stations Serving LAX**

| Industrial Station | Capacity (kVA) | Location |
|---|---|---|
| IS-71 | 1,500 | Administration Bldg. / Control Tower |
| IS-686 | 10,000 | Central Complex West |
| IS-695 | 1,500 | Central Complex East |
| IS-696 | 5,000 | Terminal 2 |
| IS-697 | 3,000 | Terminal 3 |
| IS-698 | 3,000 | Terminal 4 |
| IS-699 | 5,000 | Terminal 5 |
| IS-700 | 3,000 | Terminal 6 |
| IS-701 | 5,000 | Terminal 7 |
| IS-702 | 5,000 | Terminal 8 |
| IS-2248 | 11,500 | Tom Bradley International Terminal |
| IS-2260 | 15,000 | Terminal 1 |

Source: DWP, 1995.

# 3.2 Natural Gas

The Southern California Gas Company (The Gas Company) supplies natural gas to nearly all of Southern and Central California, including the City of Los Angeles. In 1996, approximately 2,443 million cubic feet of gas a day was supplied to the Los Angeles region.[31] The Gas Company obtains the majority of its natural gas from out-of-state sources. The Gas Company's sources include interstate suppliers (36 percent), natural gas transportation companies (56 percent), California producers (7 percent), and offshore supplies (0.3 percent).[32]

The gas is transported from suppliers to The Gas Company's transmission facilities for distribution to their service areas by a network of high-pressure transmission lines. Interconnected with the transmission facilities are five underground storage fields in the Los Angeles region. The storage fields act as reservoirs to hold gas which is used to supplement in-line gas storage, primarily to meet peak demands during the winter season. From the transmission facilities, gas is distributed on a local level to customers

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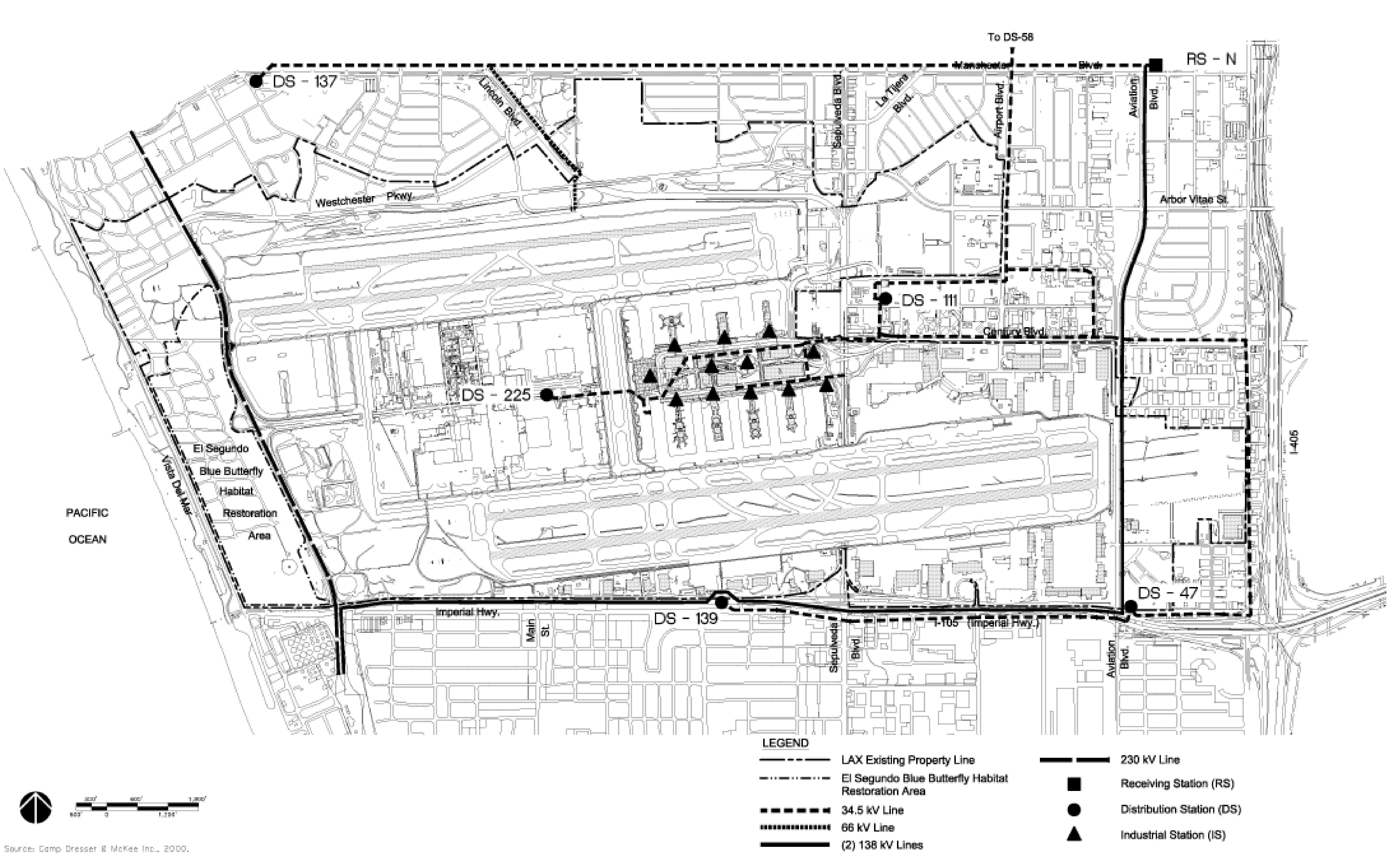
[31] The California Gas and Electric Utilities, The California Gas Report, 1997 Supplement, 1997.

[32] Envicom Corporation, et al., Draft Environmental Impact Report for the Los Angeles Citywide General Plan Framework, January, 1995.




Source: Camp Dresser & McKee Inc., 2000.

Los Angeles International Airport Master Plan

**Location of Electrical Power Lines and Distribution Facilities at LAX**

Figure 1

through an extensive pipeline network of underground high-pressure (greater than 60 psi), standard pressure (less than 60 psi), and neighborhood (less than 6-inch diameter) gas mains.[33]

Natural gas is supplied to LAX by several natural gas distribution lines. Service to individual tenants is provided through connections to these distribution lines. The distribution lines are illustrated in **Figure 2**, Natural Gas Distribution Lines Serving LAX, and include the following:

- Airport tenants located in the southern portion of LAX are served by a gas line in Imperial Highway that varies from 2- to 8-inches in diameter.
- The Central Terminal Area is served by two gas lines: a 4-inch line along World Way North, and a 2-inch line along World Way South. Both of these lines connect to a larger 6-inch distribution line in Century Boulevard.
- Airline facilities along Century Boulevard, east of Sepulveda Boulevard, are served by a 3-inch line in Avion Drive, which is connected to the 6-inch distribution line on Century Boulevard.
- Facilities located along Aviation Boulevard are served by a either a 6- or 12-inch diameter line. Also located along Aviation Boulevard are two 30-inch high-pressure lines.
- Maintenance facilities located on World Way West are served by a 6-inch diameter line. This line winds through the airport to 96th Street, and then to Sepulveda Boulevard, where it connects to a 6-inch distribution line.[34]

# 3.3 Baseline Energy Consumption

**Table 9**, Electricity Consumption Based on Facility Areas Under Baseline Conditions, through **Table 11**, Baseline Conditions Energy Consumption Estimate for GSE, provide the electricity, natural gas, and fuel consumption factors, facility areas, and other information used to estimate energy consumption for baseline conditions. Baseline energy consumption for the CUP, gate electrification, and transportation is incorporated into in subsequent tables addressing future conditions.

[33] Sal Zamora, Southern California Gas Company, Personal Communication, July 13, August 7, 1995

[34] Sal Zamora, Southern California Gas Company, Personal Communication, July 13, August 7, 1995

**Table 9**

**Electricity Consumption Based on Facility Areas Under Baseline Conditions**

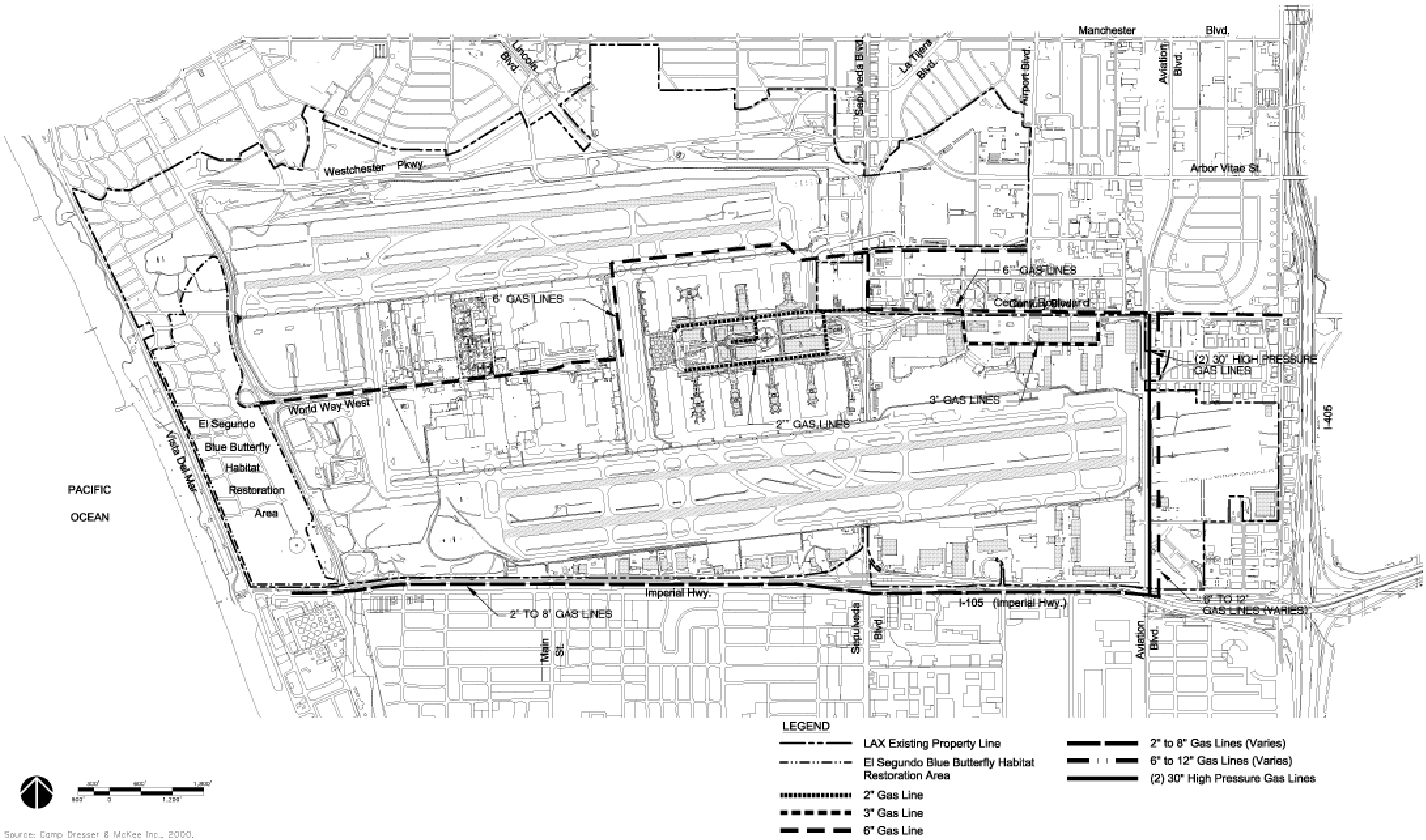
| Land Use | Usage Factor | Unit Type | Building S.F. or Units | Total Consumption (MWH/Yr) |
|---|---|---|---|---|
| **LAX**[1] | | | | |
| **Airport Land Uses** | | | | |
| Terminal (S.F.) | 19.05 | KWH/S.F./Yr | 3,997,000 | 76,143 |
| Cargo (S.F.) | 13.40 | KWH/S.F./Yr | 1,900,000 | 25,460 |
| Maintenance (S.F.) | 24.22 | KWH/S.F./Yr | 1,440,000 | 34,877 |
| Ancillary (S.F.) | 14.17 | KWH/S.F./Yr | 1,294,000 | 18,336 |
| **Subtotal Airport Uses** | | | | **154,816** |
| **Non-Airport Land Uses** | | | | |
| **Belford** | | | | |
| Residential (Multi Family DUs) | 5,626.50 | KWH/Unit/Yr | 583 | 3,280 |
| **Subtotal Belford** | | | | **3,280** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **158,096** |
| **Non-Project Uses Within Master Plan Boundaries**[2] | | | | |
| **Manchester Square** | | | | |
| Residential (Single Family DUs) | 5,626.50 | KWH/Unit/Yr | 280 | 1,575 |
| Residential (Multi Family DUs) | 5,626.50 | KWH/Unit/Yr | 1,706 | 9,599 |
| **Subtotal Manchester Square** | | | | **11,174** |
| **Land Within Acquisition Areas** | | | | |
| Residential (Single Family DUs) | 5,626.50 | KWH/Unit/Yr | 57 | 321 |
| Residential (Multi Family DUs) | 5,626.50 | KWH/Unit/Yr | 69 | 388 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 1,404,993 | 13,980 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 1,108,312 | 14,353 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 148,219 | 2,008 |
| Light Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 3,789,292 | 39,788 |
| Institutional[3] (S.F.) | 9.31 | KWH/S.F./Yr | 156,178 | 1,454 |
| **Subtotal Acquisition** | | | | **72,292** |
| **SUBTOTAL NON-PROJECT USES** | | | | **83,466** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **241,562** |

S.F. = Square Feet
MWH = megawatt-hour
KWH = kilowatt-hour

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport operations including CUP, gate electrification, and electric GSE and on-airport vehicles are not included.
2 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.
3 Based on office land use type from SCAQMD, CEQA Air Quality Handbook, 2000, Table A9-12-A.

Notes: Information in table may not always total, due to rounding.
There is no baseline electricity consumption associated with Continental City or LAX Northside.

Source: Camp Dresser & McKee Inc., 2000.




Source: Camp Dresser & McKee Inc., 2000.

Los Angeles International Airport Master Plan

**Natural Gas Distribution Lines Serving LAX**

Figure 2

**Table 10**

**Natural Gas Consumption Based on Facility Areas Under Baseline Conditions**

| Land Use | Usage Factor | Unit Type | Building S.F. or Units | Total Consumption (MCF/Yr) |
|---|---|---|---|---|
| **LAX**[1] | | | | |
| **Airport Land Uses** | | | | |
| Terminal (S.F.) | 15.18 | CF/S.F./Yr | 3,997,000 | 60,674 |
| Cargo (S.F.) | 9.84 | CF/S.F./Yr | 1,900,000 | 18,696 |
| Maintenance (S.F.) | 24.59 | CF/S.F./Yr | 1,440,000 | 35,410 |
| Ancillary (S.F.) | 142.60 | CF/S.F./Yr | 1,294,000 | 184,524 |
| **Subtotal Airport Uses** | | | | **299,304** |
| **Non-Airport Land Uses** | | | | |
| **Belford** | | | | |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 583 | 28,068 |
| **Subtotal Non-Airport Use** | | | | **28,068** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **327,372** |
| **Non-Project Uses Within Master Plan Boundaries**[2] | | | | |
| **Manchester Square** | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 280 | 22,394 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 1,706 | 82,134 |
| **Subtotal Non-Project Uses** | | | | **104,528** |
| **Land Within Acquisition Areas** | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 57 | 4,559 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 69 | 3,322 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 1,404,993 | 80,928 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 1,108,312 | 26,599 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 148,219 | 5,158 |
| Light Industrial (meters) | 2,939,600 | CF/Meter/Yr | 140 | 412,556 |
| Institutional[3] (S.F.) | 24.00 | CF/S.F./Yr | 156,178 | 3,748 |
| **Subtotal Acquisition Areas** | | | | **536,870** |
| **SUBTOTAL NON-PROJECT USES** | | | | **641,398** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **968,770** |

S.F. = Square Feet
MCF = thousand cubic feet of natural gas

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport operations including CUP, gate electrification, APM, and electric GSE and on-airport vehicles are not included.
2 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.
3 Based on office land use type from SCAQMD, CEQA Air Quality Handbook, 2000, Table A9-12-A.

Source: Camp Dresser & McKee Inc., 2000

**Table 11**

**Baseline Conditions Energy Consumption Estimate for GSE**

| | Equipment List[1] | Less Forklift & Cart | Net | Percent | Million BTUs |
|---|---|---|---|---|---|
| Electric | 222 | 154 | 68 | 3.6% | 26,116 |
| Diesel | 540 | 5 | 535 | 28.0% | 205,471 |
| Gasoline | 1134 | 36 | 1098 | 57.4% | 421,695 |
| LNG, CNG, and Propane | 292 | 81 | 211 | 11.0% | 81,036 |
| **Total** | | | | | **734,318[2]** |

1 Source: 1995 list from Aviation Systems, Inc.
2 The total million BTUs under baseline conditions was estimated using GSE energy consumption for 2005 under the No Action/No Project Alternative. The baseline GSE energy consumption was obtained by multiplying the GSE energy consumption for 2005 by a ratio of aircraft operations.

Source: Camp Dresser & McKee Inc., 2000.

# 4. ENVIRONMENTAL CONSEQUENCES

To determine projected energy consumption under each of the alternatives, the methodologies described in Section 2, *General Approach and Methodology*, were used. **Table 12**, Land Uses Included in the Alternatives, presents a comparison of the land use types included in the alternatives; **Table 13**, Electricity Consumption Based on Facility Areas Under the No Action/No Project Alternative, through **Table 26**, Construction Related Consumption of Gasoline and Diesel, present energy consumption information for all the alternatives. A discussion of the environmental consequences of the energy consumption projected for each alternative is included in Section 4.17.1, *Energy Supply*, of the EIS/EIR.

Under the build alternatives, the proposed APM would not be in operation by 2005. Therefore, electricity consumption by the APM has not been included within the electricity consumption by airport operations in 2005. By 2015, the proposed APM would be in operation under each of the build alternatives. Lea + Elliot, Inc. estimated the annual electricity consumption by the APM and ancillary facilities to be as follows:

- Under Alternative A[35] - 93,200 MWH/Yr.
- Under Alternative B[36] - 174,500 MWH/Yr.
- Under Alternative C[37] - 62,000 MWH/Yr.

**Table 27**, Electricity Consumption by Airport Operations, provides a summary of the contribution electricity consumption values added together to obtain the airport operations consumption estimate presented in Table 4.17.1-2, Energy Consumption within Master Plan boundaries.

35 Lea + Elliott, Inc., Electrical Power Consumption Estimate for People Mover Concepts, January 2000.

36 Lea + Elliott, Inc., Electrical Power Consumption Estimate for People Mover Concepts, January 2000.

37 Lea + Elliott, Inc., Electrical Power Consumption Estimate for LAX Alternative C APM Concepts, December 1999.

**Table 12**

**Land Uses Included in the Alternatives**

| | | Alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Baseline** | **No Action/No Project** | | **A** | | **B** | | **C** | |
| **Land Use** | **Conditions** | **2005** | **2015** | **2005** | **2015** | **2005** | **2015** | **2005** | **2015** |
| **<u>LAX</u>** | | | | | | | | | |
| **Airport Land Uses** | | | | | | | | | |
| Terminal (S.F.) | 3,997,000 | 3,997,000 | 3,997,000 | 8,311,000 | 10,419,000 | 8,333,000 | 9,712,000 | 6,654,000 | 7,319,000 |
| Cargo (S.F.) | 1,900,000 | 2,328,064 | 2,328,064 | 3,694,000 | 4,518,000 | 4,192,000 | 4,871,000 | 3,664,000 | 5,075,000 |
| Maintenance (S.F.) | 1,440,000 | 1,440,000 | 1,440,000 | 584,000 | 841,000 | 889,000 | 859,000 | 1,011,000 | 834,000 |
| Ancillary (S.F.) | 1,294,000 | 1,294,000 | 1,294,000 | 1,987,000 | 2,260,000 | 2,389,000 | 1,720,000 | 2,499,000 | 3,198,000 |
| **Belford** | | | | | | | | | |
| Residential (Multi Family DUs) | 583 | | | | | | | | |
| **Manchester Square**[1] | | | | | | | | | |
| Residential (Multi/Single Family DUs) | 1,986 | | | | | | | | |
| Office (S.F.) | | | | 50,000 | 50,000 | | | | |
| Hotel (S.F.) | | | | 250,000 | 500,000 | | | | |
| Industrial (S.F.) | | | | 860,000 | 1,720,000 | | | | |
| **LAX Northside** | | | | | | | | | |
| Office (S.F.) | | 632,000 | 1,580,000 | | | | | | |
| Hotel (S.F.) | | 390,000 | 870,000 | | | | | | |
| Retail (S.F.) | | 24,000 | 60,000 | | | | | | |
| Airport Related (S.F.) | | 300,000 | 750,000 | | | | | | |
| R/D Business Park (S.F.) | | 470,000 | 1,170,000 | | | | | | |
| Restaurant (S.F.) | | 28,000 | 70,000 | | | | | | |
| **Continental City** | | | | | | | | | |
| Office (S.F.) | | 1,200,000 | 3,000,000 | | | | | | |
| Retail (S.F.) | | 40,000 | 100,000 | | | | | | |
| **Westchester Southside** | | | | | | | | | |
| Hotel (S.F.) | | | | 340,000 | 850,000 | 340,000 | 850,000 | 340,000 | 850,000 |
| Office (S.F.) | | | | 260,000 | 650,000 | 260,000 | 650,000 | 260,000 | 650,000 |
| Retail (S.F.) | | | | 44,000 | 110,000 | 44,000 | 110,000 | 44,000 | 110,000 |
| R/D Business Park (S.F.) | | | | 388,000 | 970,000 | 388,000 | 970,000 | 388,000 | 970,000 |
| Restaurant (S.F.) | | | | 16,000 | 40,000 | 16,000 | 40,000 | 16,000 | 40,000 |
| **Land Within Acquisition Areas**[2] | | | | | | | | | |
| Residential (Single Family DUs) | 57 | 57 | 57 | | | | | | |
| Residential (Multi Family DUs) | 69 | 69 | 69 | 42 | 42 | 42 | 42 | | |
| Hotel (S.F.) | 1,404,993 | 1,404,993 | 1,404,993 | 63,595 | 63,595 | | | 1,030,340 | 1,030,340 |
| Office (S.F.) | 1,108,312 | 1,108,312 | 1,108,312 | 142,064 | 142,064 | | | 509,218 | 509,218 |
| Retail (S.F.) | 148,219 | 148,219 | 148,219 | 45,737 | 45,737 | 60,221 | 60,221 | 73,002 | 73,002 |
| Light Industrial (S.F.) | 3,789,292 | 3,789,292 | 3,789,292 | 1,196,544 | 1,196,544 | 83,329 | 83,329 | 1,958,314 | 1,958,314 |
| Light Industrial (S.F.) (Gas Meters)[3] | 140 | 140 | 140 | 44 | 44 | 3 | 3 | 73 | 73 |
| Institutional (S.F.)[4] | 156,178 | 156,178 | 156,178 | 85,902 | 85,902 | 85,902 | 85,902 | | |

1 Under the No Action/No Project Alternative, existing uses would be demolished. For purposes of this EIS/EIR, no development is assumed. Under Alternative A, Manchester Square would be redeveloped with commercial/light industrial uses independent of the Master Plan. Under Alternatives B and C, existing uses would be demolished, and the area would be incorporated into the overall Master Plan development.

2 Only a portion of the land within the acquisition areas would be acquired for each individual build alternative. No land within the acquisition areas would be acquired under the No Action/No Project Alternative. The land within the Master Plan boundaries that would not be acquired under a particular alternative would be unaffected by the Master Plan.

3 Conversion of Light Industrial areas from square feet to numbers of gas meters was based on approximately 27,000 square feet per gas meter derived from the baseline data collected by Psomas and Associates.

4 Includes college, high school, elementary school and library land use.

Source: Landrum & Brown, 2000.

**Table 13**

**Electricity Consumption Based on Facility Areas Under the No Action/No Project Alternative**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MWH/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MWH/Yr) |
|---|---|---|---|---|---|---|
| **LAX**[1] | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 19.05 | KWH/S.F./Yr | 3,997,000 | 76,143 | 3,997,000 | 76,143 |
| Cargo (S.F.) | 13.40 | KWH/S.F./Yr | 2,328,064 | 31,196 | 2,328,064 | 31,196 |
| Maintenance (S.F.) | 24.22 | KWH/S.F./Yr | 1,440,000 | 34,877 | 1,440,000 | 34,877 |
| Ancillary (S.F.) | 14.17 | KWH/S.F./Yr | 1,294,000 | 18,336 | 1,294,000 | 18,336 |
| **Subtotal Airport Uses** | | | | **160,552** | | **160,552** |
| **Non-Airport Land Uses** | | | | | | |
| **LAX Northside** | | | | | | |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 632,000 | 8,184 | 1,580,000 | 20,461 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 390,000 | 3,881 | 870,000 | 8,657 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 24,000 | 325 | 60,000 | 813 |
| Airport-Related[2] (S.F.) | 24.00 | KWH/S.F./Yr | 300,000 | 7,200 | 750,000 | 18,000 |
| R/D Business Park (S.F.) | 12.95 | KWH/S.F./Yr | 470,000 | 6,087 | 1,170,000 | 15,152 |
| Restaurant (S.F.) | 47.45 | KWH/S.F./Yr | 28,000 | 1,329 | 70,000 | 3,322 |
| **Subtotal LAX Northside** | | | | **27,006** | | **66,405** |
| **Continental City** | | | | | | |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 1,200,000 | 15,540 | 3,000,000 | 38,850 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 40,000 | 542 | 100,000 | 1,355 |
| **Subtotal Continental City** | | | | **16,082** | | **40,205** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **203,640** | | **267,162** |
| **Non-Project Uses Within Master Plan Boundaries**[3] | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Single Family DUs) | 5,626.50 | KWH/UNIT/Yr | 57 | 321 | 57 | 321 |
| Residential (Multi Family DUs) | 5,626.50 | KWH/UNIT/Yr | 69 | 388 | 69 | 388 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 1,404,993 | 13,980 | 1,404,993 | 13,980 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 1,108,312 | 14,353 | 1,108,312 | 14,353 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 148,219 | 2,016 | 148,219 | 2,016 |
| Light Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 3,789,292 | 39,788 | 3,789,292 | 39,788 |
| Institutional (S.F.) | 9.31 | KWH/S.F./Yr | 156,178 | 1,454 | 156,178 | 1,454 |
| **Subtotal Acquisition Areas** | | | | **72,300** | | **72,300** |
| **SUBTOTAL NON-PROJECT USES** | | | | **72,300** | | **72,300** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **275,940** | | **339,462** |

S.F. = Square Feet
MWH = megawatt- hour

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport facilities operations including CUP, gate electrification, and electric GSE and on-airport vehicles are not included.
2 Usage rate averaged from SCAQMD, CEQA Air Quality Handbook, 2000, Table A9-11-A (Includes restaurant, office and miscellaneous land use)
3 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

Source: Camp Dresser & McKee Inc., 2000.

**Table 14**

**Electricity Consumption Based on Facility Areas Under Alternative A**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MWH/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MWH/Yr) |
|---|---|---|---|---|---|---|
| **LAX[1]** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 19.05 | KWH/S.F./Yr | 8,311,000 | 158,325 | 10,419,000 | 198,482 |
| Cargo (S.F.) | 13.40 | KWH/S.F./Yr | 3,694,000 | 49,500 | 4,518,000 | 60,541 |
| Maintenance (S.F.) | 24.22 | KWH/S.F./Yr | 584,000 | 14,144 | 841,000 | 20,369 |
| Ancillary (S.F.) | 14.17 | KWH/S.F./Yr | 1,987,000 | 28,156 | 2,260,000 | 32,024 |
| **Subtotal Airport Uses** | | | | **250,124** | | **311,416** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 340,000 | 3,383 | 850,000 | 8,458 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 260,000 | 3,367 | 650,000 | 8,418 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 44,000 | 596 | 110,000 | 1,491 |
| R/D Business Park (S.F.) | 12.95 | KWH/S.F./Yr | 388,000 | 5,025 | 970,000 | 12,562 |
| Restaurant (S.F.) | 47.45 | KWH/S.F./Yr | 16,000 | 759 | 40,000 | 1,898 |
| **Subtotal Westchester Southside** | | | | **13,130** | | **32,827** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **263,254** | | **344,243** |
| **Non-Project Uses Within Master Plan Boundaries[2]** | | | | | | |
| **Manchester Square** | | | | | | |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 50,000 | 648 | 50,000 | 648 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 250,000 | 2,488 | 500,000 | 4,975 |
| Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 860,000 | 9,030 | 1,720,000 | 18,060 |
| **Subtotal Manchester Square** | | | | **12,166** | | **23,683** |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Multi Family DUs) | 5,626.50 | KWH/UNIT/Yr | 42 | 236 | 42 | 236 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 63,595 | 633 | 63,595 | 633 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 142,064 | 1,840 | 142,064 | 1,840 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 45,737 | 620 | 45,737 | 620 |
| Light Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 1,196,544 | 12,564 | 1,196,544 | 12,564 |
| Institutional (S.F.) | 9.31 | KWH/S.F./Yr | 85,902 | 800 | 85,902 | 800 |
| **Subtotal Acquisition Areas** | | | | **16,693** | | **16,693** |
| **SUBTOTAL NON-PROJECT USES** | | | | **28,589** | | **40,376** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **292,113** | | **384,619** |

S.F. = Square Feet
MWH = megawatt-hour

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport facilities operations including CUP, gate electrification, and electric GSE and on-airport vehicles are not included.

2 For the purposes of this analysis, a single composite study area was established, referred to as the “Master Plan boundaries.” However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

Source: Camp Dresser & McKee Inc., 2000.

**Table 15**

**Electricity Consumption Based on Facility Areas Under Alternative B**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MWH/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MWH/Yr) |
|---|---|---|---|---|---|---|
| **LAX[1]** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 19.05 | KWH/S.F./Yr | 8,333,000 | 158,744 | 9,712,000 | 185,014 |
| Cargo (S.F.) | 13.40 | KWH/S.F./Yr | 4,192,000 | 56,173 | 4,871,000 | 65,271 |
| Maintenance (S.F.) | 24.22 | KWH/S.F./Yr | 889,000 | 21,532 | 859,000 | 20,805 |
| Ancillary (S.F.) | 14.17 | KWH/S.F./Yr | 2,389,000 | 33,852 | 1,720,000 | 24,372 |
| **Subtotal Airport Uses** | | | | **270,301** | | **295,462** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 340,000 | 3,383 | 850,000 | 8,458 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 260,000 | 3,367 | 650,000 | 8,418 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 44,000 | 596 | 110,000 | 1,491 |
| R/D Business Park, Educational Facilities (S.F.) | 12.95 | KWH/S.F./Yr | 388,000 | 5,025 | 970,000 | 12,562 |
| Restaurant (S.F.) | 47.45 | KWH/S.F./Yr | 16,000 | 759 | 40,000 | 1,898 |
| **Subtotal Westchester Southside** | | | | **13,130** | | **32,827** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **283,430** | | **328,289** |
| **Non-Project Uses Within Master Plan Boundaries[2]** | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Multi Family DUs) | 5,626.50 | KWH/Unit/Yr | 42 | 236 | 42 | 236 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 0 | 0 | 0 | 0 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 0 | 0 | 0 | 0 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 60,221 | 816 | 60,221 | 816 |
| Light Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 83,329 | 875 | 83,329 | 875 |
| Institutional (S.F.) | 9.31 | KWH/S.F./Yr | 85,902 | 800 | 85,902 | 800 |
| **Subtotal Acquisition Areas** | | | | **2,727** | | **2,727** |
| **SUBTOTAL NON-PROJECT USES** | | | | **2,727** | | **2,727** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **286,157** | | **331,016** |

S.F. = Square Feet
MWH = megawatt- hour

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport operations including CUP, gate electrification, and electric GSE and on-airport vehicles are not included.

2 For the purposes of this analysis, a single composite study area was established, referred to as the “Master Plan boundaries.” However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

Source: Camp Dresser & McKee Inc., 2000.

**Table 16**

**Electricity Consumption Based on Facility Areas Under Alternative C**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MWH/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MWH/Yr) |
|---|---|---|---|---|---|---|
| LAX[1] | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 19.05 | KWH/S.F./Yr | 6,654,000 | 126,759 | 7,319,000 | 139,427 |
| Cargo (S.F.) | 13.40 | KWH/S.F./Yr | 3,664,000 | 49,098 | 5,075,000 | 68,005 |
| Maintenance (S.F.) | 24.22 | KWH/S.F./Yr | 1,011,000 | 24,486 | 834,000 | 20,199 |
| Ancillary (S.F.) | 14.17 | KWH/S.F./Yr | 2,499,000 | 35,411 | 3,198,000 | 45,316 |
| **Subtotal Airport Uses** | | | | **235,754** | | **272,947** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 340,000 | 3,383 | 850,000 | 8,458 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 260,000 | 3,367 | 650,000 | 8,418 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 44,000 | 596 | 110,000 | 1,491 |
| R/D Business Park, Educational Facilities (S.F.) | 12.95 | KWH/S.F./Yr | 388,000 | 5,025 | 970,000 | 12,562 |
| Restaurant (S.F.) | 47.45 | KWH/S.F./Yr | 16,000 | 759 | 40,000 | 1,898 |
| **Subtotal Westchester Southside** | | | | **13,130** | | **32,827** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **248,884** | | **305,774** |
| Non-Project Uses Within Master Plan Boundaries[2] | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential | 5,626.50 | KWH/Unit/Yr | 0 | 0 | 0 | 0 |
| Hotel (S.F.) | 9.95 | KWH/S.F./Yr | 1,030,340 | 10,252 | 1,030,340 | 10,252 |
| Office (S.F.) | 12.95 | KWH/S.F./Yr | 509,218 | 6,594 | 509,218 | 6,594 |
| Retail (S.F.) | 13.55 | KWH/S.F./Yr | 73,002 | 989 | 73,002 | 989 |
| Light Industrial (S.F.) | 10.50 | KWH/S.F./Yr | 1,958,314 | 20,562 | 1,958,314 | 20,562 |
| Institutional (S.F.) | 9.31 | KWH/S.F./Yr | 0 | 0 | 0 | 0 |
| **Subtotal Acquisition Areas** | | | | **38,397** | | **38,397** |
| **SUBTOTAL NON-PROJECT USES** | | | | **38,397** | | **38,397** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **287,281** | | **344,171** |

S.F. = Square Feet
MWH = Megawatt-hour

1 Electricity consumption for airport facilities based on square footage only. Electricity consumed by airport operations including CUP, gate electrification, and electric GSE and on-airport vehicles are not included.

2 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

Source: Camp Dresser & McKee Inc., 2000.

**Table 17**

**Estimated Electricity Consumption at the Central Utility Plant**

| | Baseline Conditions | 2005 Alternative NA/NP[2] | 2005 Alternative A | 2005 Alternative B | 2005 Alternative C | 2015 Alternative NA/NP[2] | 2015 Alternative A | 2015 Alternative B | 2015 Alternative C |
|---|---|---|---|---|---|---|---|---|---|
| Terminal Area (S.F.) | 3,997,000 | 3,997,000 | 8,311,000 | 8,333,000 | 6,654,000 | 3,997,000 | 10,419,000 | 9,712,000 | 7,319,000 |
| Electrical Power Consumption[1] (MWH) | 26,780 | 26,780 | 55,684 | 55,831 | 44,582 | 26,780 | 69,807 | 65,070 | 49,037 |

1 Psomas and Associates, Utilities Consumption and Generation at LAX, October, 1996

2 No Action/No Project Alternative

Source: Camp Dresser & McKee Inc., 2000.

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**Table 18**

**Estimated Annual Power Consumption for Gate Electrification**

| Aircraft and APU Information | | | | | Annual Landings and Takeoffs | | | | | | | Annual Electrical Power Consumption (MWH) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2005 | | 2015 | | | | | 2005 | | 2015 | | | |
| Aircraft | APU | APU HP | Aircraft Size | Time at Gate (minutes) | Baseline | NA/NP | Alt A, B, C | NA/NP | Alt A | Alt B | Alt C | Baseline | NA/NP | Alt A, B, C | NA/NP | Alt A | Alt B | Alt C |
| EMB110KQ1 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 1,372 | 1,372 | 3,431 | 4,803 | 4,803 | 2,402 | - | 33 | 33 | 82 | 115 | 115 | 57 |
| Jetstream 31 | -NONE- | 0 | Light | 30 | 29,396 | 14,753 | 14,753 | 7,548 | 7,548 | 7,548 | 4,460 | - | - | - | - | - | - | - |
| Swearingen Metro 2 | APU GTCP 36 (80HP) | 80 | Light | 30 | 8,674 | 10,979 | 10,979 | 11,665 | 9,950 | 9,950 | 7,205 | 83 | 262 | 262 | 278 | 237 | 237 | 172 |
| BH-1900 | -NONE- | 0 | Light | 30 | 21,685 | 5,147 | 5,147 | 6,519 | 7,548 | 7,548 | 4,803 | - | - | - | - | - | - | - |
| BH-1900 Cargo | -NONE- | 0 | Light | 30 | 963 | 1,029 | 1,029 | 1,029 | 1,029 | 1,029 | 1,029 | - | - | - | - | - | - | - |
| GenAvProp | -NONE- | 0 | Light | 30 | 14,457 | 14,753 | 14,753 | 14,753 | 14,067 | 14,067 | 14,753 | - | - | - | - | - | - | - |
| GenAvProp Cargo | -NONE- | 0 | Light | 30 | 2,409 | 2,745 | 3,088 | 2,745 | 3,088 | 3,088 | 3,088 | - | - | - | - | - | - | - |
| SHORT 360 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 3,088 | 3,088 | 1,029 | 2,059 | 2,059 | 686 | - | 74 | 74 | 25 | 49 | 49 | 16 |
| SF-340A | APU GTCP 36 (80HP) | 80 | Light | 30 | 16,866 | 20,586 | 20,586 | 5,490 | 6,862 | 6,862 | 3,774 | 161 | 491 | 491 | 131 | 164 | 164 | 90 |
| EMB-120 | APU GTCP 36 (80HP) | 80 | Light | 30 | 4,819 | 14,067 | 14,067 | 3,431 | 5,490 | 5,490 | 3,088 | 46 | 336 | 336 | 82 | 131 | 131 | 74 |
| ATR42 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 1,716 | 1,716 | 7,548 | 9,950 | 9,950 | 5,833 | - | 41 | 41 | 180 | 237 | 237 | 139 |
| GenAvJet | -NONE- | 0 | Light | 30 | 2,891 | 3,088 | 3,088 | 3,088 | 4,803 | 4,803 | 3,088 | - | - | - | - | - | - | - |
| DASH-7 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 3,774 | 3,774 | 8,921 | 11,322 | 11,322 | 5,490 | - | 90 | 90 | 213 | 270 | 270 | 131 |
| ATR72-200 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 3,088 | 3,088 | 3,774 | 4,803 | 4803 | 2,059 | - | 74 | 74 | 90 | 115 | 115 | 49 |
| FOKKER 50 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 343 | 343 | 2,745 | 4,460 | 4,460 | 1,716 | - | 8 | 8 | 65 | 106 | 106 | 41 |
| Saab 2000 | APU GTCP 36 (80HP) | 80 | Light | 30 | 0 | 3431 | 3,431 | 8,921 | 12,352 | 12,352 | 6,176 | - | 82 | 82 | 213 | 295 | 295 | 147 |
| BAE146-300 | APU GTCP 36 (80HP) | 80 | Light | 30 | 2,891 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | - | - | - | - | - | - |
| Canadair RJ50 | APU GTCP 85 (200 HP) | 200 | Light | 30 | 0 | 3,774 | 3,774 | 61,76 | 10,636 | 10636 | 5147 | - | 225 | 225 | 368 | 635 | 635 | 307 |
| Canadair RJ70 | APU GTCP 85 (200 HP) | 200 | Light | 30 | 0 | 0 | 0 | 686 | 686 | 686 | 686 | - | - | - | 41 | 41 | 41 | 41 |
| MD-90-95 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 3,774 | 3,774 | 4,803 | 6,519 | 6,519 | 5,833 | - | 338 | 338 | 430 | 583 | 583 | 522 |
| F-28-4000 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 963 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | - | - | - | - | - | - |
| FOKKER 70 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 2,059 | 2,059 | 1,029 | 1,716 | 1,716 | 686 | - | 184 | 184 | 92 | 154 | 154 | 61 |
| B737-300 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 60,238 | 47,348 | 47,348 | 34,310 | 28,477 | 28,477 | 27,448 | 2,156 | 4,237 | 4,237 | 3,070 | 2,548 | 2,548 | 2,456 |
| B737-400 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 1,927 | 3,088 | 3,088 | 13,381 | 8,578 | 8,578 | 8,578 | 69 | 276 | 276 | 1,197 | 768 | 768 | 768 |
| B737-500 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 27,468 | 14,067 | 14,067 | 22,645 | 9,950 | 9,950 | 11,665 | 983 | 1,259 | 1,259 | 2,026 | 890 | 890 | 1,044 |
| FOKKER 100-100 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 1,372 | 1,372 | 1,029 | 1,029 | 1,029 | 1,029 | - | 123 | 123 | 92 | 92 | 92 | 92 |
| B737-200 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 1,445 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | - | - | - | - | - | - |
| A319 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 1,029 | 1,029 | 686 | 1,372 | 1,372 | 686 | - | 92 | 92 | 61 | 123 | 123 | 61 |
| MD-90-10 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 8,234 | 8,234 | 5,490 | 7,891 | 7,891 | 7,205 | - | 737 | 737 | 491 | 706 | 706 | 645 |
| A320 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 10,293 | 10,293 | 7,205 | 9,950 | 9,950 | 9,264 | - | 921 | 921 | 645 | 890 | 890 | 829 |
| B737-200C Cargo | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 0 | 2,745 | 2,059 | 2,745 | 3,431 | 3,431 | 3,431 | - | 246 | 184 | 246 | 307 | 307 | 307 |
| B727 Cargo | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 1,927 | 0 | 1,029 | 0 | 0 | 0 | 0 | 69 | - | 92 | - | - | - | - |
| B727-200 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 13,975 | 2,745 | 2,745 | 0 | 0 | 0 | 0 | 500 | 246 | 246 | - | - | - | - |
| DC9 Cargo | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 481 | 0 | 686 | 0 | 0 | 0 | 0 | 17 | - | 61 | - | - | - | - |
| DC9-50 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 31,806 | 343 | 343 | 0 | 0 | 0 | 0 | 1,138 | 31 | 31 | - | - | - | - |
| MD-80-87 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 2,891 | 1,372 | 1,372 | 343 | 1,029 | 1,029 | 1,029 | 103 | 123 | 123 | 31 | 92 | 92 | 92 |
| MD-80 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 29,396 | 23,331 | 23,331 | 16,469 | 16,469 | 16,469 | 17,155 | 1,052 | 2,088 | 2,088 | 1,474 | 1,474 | 1,474 | 1,535 |
| B757-200 | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 29,878 | 54,210 | 54,210 | 52,151 | 88,520 | 88,520 | 78,227 | 1,069 | 4,851 | 4,851 | 4,667 | 7,921 | 7,921 | 7,000 |
| B757-200 Cargo | APU GTCP 85 (200 HP) | 200 | Medium | 45 | 963 | 1,372 | 1,716 | 1,372 | 2,059 | 2,059 | 2,059 | 34 | 123 | 154 | 123 | 184 | 184 | 184 |
| DC8 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 3,373 | 0 | 0 | 0 | 0 | 0 | 0 | 241 | - | - | - | - | - | - |
| DC8-70 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - | - | - |
| A340-200 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 3,431 | 3,431 | 2,402 | 6,862 | 6,862 | 5,490 | - | 614 | 614 | 430 | 1,228 | 1,228 | 982 |
| IL-96 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 343 | 343 | 0 | 0 | 0 | 0 | - | 61 | 61 | - | - | - | - |
| B767-200 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 10,602 | 13,381 | 13,381 | 12,352 | 13,381 | 13,381 | 12,352 | 759 | 2,395 | 2,395 | 2,211 | 2,395 | 2,395 | 2,211 |
| B767-200 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 2,059 | 2,059 | 2,059 | 2,402 | 2,402 | 2,402 | - | 368 | 368 | 368 | 430 | 430 | 430 |
| B767-300 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 4,819 | 6,519 | 6,519 | 22,302 | 17,498 | 17,498 | 13,724 | 345 | 1,167 | 1,167 | 3,991 | 3,132 | 3,132 | 2,456 |
| A310-200 | APU GTCP 85 (200 HP) | 200 | Heavy | 60 | 0 | 2,402 | 2,402 | 2,745 | 2,745 | 2,745 | 3,088 | - | 287 | 287 | 327 | 327 | 327 | 368 |
| A310-200 Cargo | APU GTCP 85 (200 HP) | 200 | Heavy | 60 | 0 | 1,029 | 1,372 | 1,029 | 1,716 | 1,716 | 1,716 | - | 123 | 164 | 123 | 205 | 205 | 205 |
| L1011-500 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 7,228 | 2,745 | 2,745 | 0 | 0 | 0 | 0 | 517 | 491 | 491 | - | - | - | - |
| B747 Combination | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 2,059 | 2,059 | 2,402 | 3,431 | 3,431 | 3,088 | - | 368 | 368 | 430 | 614 | 614 | 553 |
| B747-400 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 9,156 | 15,783 | 15,783 | 17,841 | 22,302 | 22,302 | 21,615 | 655 | 2,825 | 2,825 | 3,193 | 3,991 | 3,991 | 3,868 |
| B747-400 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 2,059 | 1,716 | 2,059 | 3,088 | 3,088 | 3,088 | - | 368 | 307 | 368 | 553 | 553 | 553 |
| A300B | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 963 | 10,293 | 10,293 | 22,645 | 23,331 | 23,331 | 22,988 | 69 | 1,842 | 1,842 | 4,053 | 4,175 | 4,175 | 4,114 |
| B747-200 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 4,819 | 5,833 | 5,833 | 1,372 | 1,372 | 1,372 | 1,372 | 345 | 1,044 | 1,044 | 246 | 246 | 246 | 246 |
| B747-200 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 2,409 | 2,402 | 2,745 | 2,402 | 3,088 | 3,088 | 3,088 | 172 | 430 | 491 | 430 | 553 | 553 | 553 |
| A300-C4-200 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 1029 | 1029 | 1029 | 1716 | 1,716 | 1,716 | - | 184 | 184 | 184 | 307 | 307 | 307 |
| DC10-30 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 11,083 | 9,950 | 9,950 | 0 | 0 | 0 | 0 | 793 | 1,781 | 1,781 | - | - | - | - |
| DC10-30 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 1,927 | 2,059 | 3,088 | 2,059 | 2,745 | 2,745 | 2,745 | 138 | 368 | 553 | 368 | 491 | 491 | 491 |
| MD-11 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 2,891 | 10,979 | 10,979 | 19,557 | 23,331 | 23,331 | 21,615 | 207 | 1,965 | 1,965 | 3,500 | 4,175 | 4,175 | 3,868 |
| MD-11 Cargo | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 1,716 | 1,372 | 1,716 | 2,745 | 2,745 | 2,745 | - | 307 | 246 | 307 | 491 | 491 | 491 |
| A330 | APU GTCP 85 (200 HP) | 200 | Heavy | 60 | 0 | 2,745 | 2,745 | 2,402 | 5,833 | 5,833 | 5,833 | - | 327 | 327 | 287 | 696 | 696 | 696 |
| B747-X | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 0 | 0 | 0 | 4,803 | 5,147 | 5,147 | 5,147 | - | - | - | 860 | 921 | 921 | 921 |
| B777-200 | APU GTCP 660 (300 HP) | 300 | Heavy | 60 | 963 | 7,205 | 7,205 | 5,147 | 15,783 | 15,783 | 14,410 | 69 | 1,289 | 1,289 | 921 | 2,825 | 2,825 | 2,579 |
| **Total Annual Electrical Power (MWH)** | | | | | | | | | | | | **11,908** | **36,194** | **36,480** | **39,010** | **46,882** | **46,882** | **42,754** |

Source: Camp Dresser & McKee Inc., 2000.

**Table 19**

**GSE Energy Consumption**

| | | | Annual Hours of Operation | | | | | | Annual Energy Consumed (Million BTUs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2005 | | 2015 | | | | 2005 | | 2015 | | | |
| Energy Form/ GSE Vehicle Type | BHP | Load Factor | No Action/ No Project | Alternative C | No Action/ No Project | Alternative A | Alternative B | Alternative C | No Action/ No Project | Alternative C | No Action/ No Project | Alternative A | Alternative B | Alternative C |
| **Electric Powered GSE** | | | | | | | | | | | | | | |
| Electric Aircraft Tug Wide | 500 | 0.8 | 869 | 1,327 | 1,190 | 19,763 | 19,763 | 18,345 | 3,539 | 5,402 | 4,844 | 80,474 | 80,474 | 74,699 |
| Electric Airstart Unit Tra | 180 | 0.5 | | | 51 | | | | | | 47 | | | |
| Electric Cabin Service | 180 | 0.2 | | 20,844 | 858 | 35,596 | 35,854 | 30,021 | | 7,639 | 314 | 13,045 | 13,140 | 11,002 |
| Electric Water Truck | 150 | 0.2 | | 1,578 | 274 | 5,352 | 5,009 | 5,215 | | 482 | 84 | 1,635 | 1,530 | 1,593 |
| Electric Aircraft Tug Narrow | 130 | 0.8 | 2,230 | 2,779 | 2,550 | 30,159 | 29,781 | 24,257 | 2,361 | 2,942 | 2,700 | 31,930 | 31,530 | 25,682 |
| Electric Airstart Unit | 130 | 0.9 | | | 51 | | | | | | 61 | | | |
| Electric Food Truck | 130 | 0.25 | | 48,635 | 2,802 | 83,058 | 82,858 | 70,050 | | 16,091 | 927 | 27,480 | 27,414 | 23,176 |
| Electric Fuel Truck | 130 | 0.25 | | 600 | | 2,802 | | 600 | | 199 | | 927 | | 199 |
| Electric Hydrant Truck | 130 | 0.25 | 2,001 | 20,615 | 5,605 | 24,819 | 25,018 | 21,416 | 662 | 6,820 | 1,854 | 8,211 | 8,277 | 7,085 |
| Electric Lavatory Truck | 130 | 0.25 | | 11,780 | 1,144 | 28,477 | 28,592 | 24,474 | | 3,897 | 378 | 9,422 | 9,460 | 8,097 |
| Electric Baggage Tug | 100 | 0.55 | 92,354 | 94,784 | 114,224 | 287,260 | 292,607 | 243,514 | 51,709 | 53,069 | 63,954 | 160,837 | 163,831 | 136,343 |
| Electric Cargo Loader | 70 | 0.5 | | 2,104 | | 35,248 | 35,247 | 35,248 | | 750 | | 12,559 | 12,558 | 12,559 |
| Electric Container Loader | 70 | 0.5 | | 15,257 | 1,578 | 227,272 | 225,167 | 210,962 | | 5,436 | 562 | 80,977 | 80,227 | 75,166 |
| Electric Belt Loader | 60 | 0.5 | 40,074 | 40,350 | 51,328 | 162,218 | 162,218 | 137,514 | 12,239 | 12,323 | 15,676 | 49,541 | 49,541 | 41,997 |
| **Subtotal** | | | | | | | | | **70,510** | **115,050** | **91,402** | **477,038** | **477,981** | **417,598** |
| **Diesel Powered GSE** | | | | | | | | | | | | | | |
| Diesel Airstart Unit | 600 | 0.9 | 721 | | 686 | | | | 3,961 | | 3,772 | | | |
| Diesel Aircraft Tug Wide | 500 | 0.8 | 10,888 | 7,365 | 13,450 | | | | 44,336 | 29,991 | 54,768 | | | |
| Diesel Air Conditioning Unit | 300 | 0.75 | 20,243 | | 17,327 | | | | 46,367 | | 39,687 | | | |
| Diesel Bus | 180 | 0.25 | 44,946 | | 55,805 | | | | 20,590 | | 25,564 | | | |
| Diesel Fuel Truck | 180 | 0.25 | 10,407 | 8,606 | 10,007 | | | | 4,768 | 3,942 | 4,584 | | | |
| Diesel Aircraft Tug Narrow | 175 | 0.8 | 22,438 | 15,165 | 20,827 | | | | 31,979 | 21,613 | 29,682 | | | |
| Diesel Airstart Transporter | 170 | 0.5 | 721 | | 686 | | | | 624 | | 594 | | | |
| Diesel Cabin Service | 170 | 0.2 | | 172 | | | | | | 59 | | | | |
| Diesel Transporter | 170 | 0.5 | | | 858 | | | | | | 742 | | | |
| Diesel Water Truck | 150 | 0.2 | 14,342 | | 17,292 | 4,666 | 4,666 | 4,323 | 4,380 | | 5,281 | 1,425 | 1,425 | 1,320 |
| Diesel Hydrant Truck | 130 | 0.25 | 117,283 | 71,850 | 120,888 | | | | 38,803 | 23,772 | 39,996 | | | |
| Diesel Shuttle | 130 | 0.25 | 76,855 | | 74,340 | | | | 25,428 | | 24,595 | | | |
| Diesel GPU Transporter | 130 | 0.5 | 6,748 | | 5,776 | | | | 4,465 | | 3,822 | | | |
| Diesel Lavatory Truck | 130 | 0.25 | 95,838 | | 94,354 | 21,501 | 21,501 | 18,298 | 31,708 | | 31,217 | 7,114 | 7,114 | 6,054 |
| Diesel Baggage Tug | 78 | 0.55 | 91,861 | | 94,299 | | | | 40,118 | | 41,182 | | | |
| Diesel Cargo Loader | 76 | 0.5 | 19,995 | | 21,045 | | | | 7,735 | | 8,141 | | | |
| Diesel Container Loader | 76 | 0.5 | 129,947 | | 160,460 | | | | 50,269 | | 62,072 | | | |
| Diesel Belt Loader | 45 | 0.5 | 83,990 | 26,625 | 86,738 | | | | 19,238 | 6,098 | 19,867 | | | |
| **Subtotal** | | | | | | | | | **374,766** | **85,475** | **395,569** | **8,539** | **8,539** | **7,374** |
| **Gasoline Powered GSE** | | | | | | | | | | | | | | |
| Gasoline Aircraft Tug Wide | 500 | 0.8 | 915 | 1,372 | 869 | | | | 3,726 | 5,588 | 3,539 | | | |
| Gasoline Airstart Transporter | 180 | 0.5 | 103 | | 86 | | | | 94 | | 79 | | | |
| Gasoline Water Truck | 150 | 0.2 | 1,304 | 10,019 | 3,568 | 11,665 | 12,626 | 11,803 | 398 | 3,060 | 1,090 | 3,563 | 3,856 | 3,605 |
| Gasoline Hydrant Truck | 130 | 0.25 | 84,660 | 30,822 | 81,059 | 37,826 | 37,627 | 32,022 | 28,010 | 10,198 | 26,818 | 12,515 | 12,449 | 10,595 |
| Gasoline Aircraft Tug Narrow | 130 | 0.8 | 1,887 | 2,745 | 1,235 | | | | 1,998 | 2,906 | 1,308 | | | |
| Gasoline Airstart Unit | 130 | 0.9 | 103 | | 86 | | | | 123 | | 102 | | | |
| Gasoline Cabin Service | 130 | 0.2 | 64,159 | 41,429 | 63,475 | 30,364 | 30,450 | 25,904 | 16,982 | 10,965 | 16,801 | 8,037 | 8,060 | 6,856 |
| Gasoline Food Truck | 130 | 0.25 | 149,704 | 97,068 | 148,108 | 68,248 | 71,050 | 60,243 | 49,530 | 32,115 | 49,002 | 22,580 | 23,507 | 19,931 |
| Gasoline Fuel Truck | 130 | 0.25 | 3,002 | 3,002 | | 4,403 | 2,802 | 1,801 | 993 | 993 | | 1,457 | 927 | 596 |
| Gasoline Lavatory Truck | 130 | 0.25 | 19,900 | 64,503 | 17,842 | 73,538 | 71,479 | 61,186 | 6,584 | 21,341 | 5,903 | 24,330 | 23,649 | 20,243 |
| Gasoline Baggage Tug | 100 | 0.55 | 132,209 | 23,816 | 91,381 | 28,678 | 28,678 | 24,790 | 74,024 | 13,334 | 51,164 | 16,057 | 16,057 | 13,880 |
| Gasoline Cargo Loader | 70 | 0.5 | 3,682 | 17,357 | 2,631 | | | | 1,312 | 6,184 | 937 | | | |
| Gasoline Container Loader | 70 | 0.5 | 18,414 | 90,487 | 18,414 | | | | 6,561 | 32,240 | 6,561 | | | |
| Gasoline Belt Loader | 60 | 0.5 | 109,242 | 66,423 | 84,541 | 16,194 | 16,194 | 13,999 | 33,363 | 20,286 | 25,819 | 4,964 | 4,946 | 4,275 |
| **Subtotal** | | | | | | | | | **223,696** | **159,211** | **189,122** | **93,483** | **93,450** | **79,981** |
| **Propane and CNG Powered GSE** | | | | | | | | | | | | | | |
| Propane Wide Tug | 500 | 0.8 | 412 | | 778 | | | | 1,677 | | 3,166 | | | |
| Propane Cabin Service | 180 | 0.2 | 19,128 | | 20,501 | | | | 7,010 | | 7,513 | | | |
| Propane Water Truck | 150 | 0.2 | 2,058 | 2,608 | 1,029 | | | | 629 | 796 | 314 | | | |
| Propane Food Truck | 130 | 0.25 | 44,633 | | 47,034 | | | | 14,767 | | 15,561 | | | |
| Propane Fuel Truck | 130 | 0.25 | 600 | | 600 | | | | 199 | | 199 | | | |
| Propane Lavatory Truck | 130 | 0.25 | 1,601 | 17,611 | 3,546 | | | | 530 | 5,827 | 1,173 | | | |
| Propane Narrow Tug | 130 | 0.8 | 824 | | 858 | | | | 872 | | 908 | | | |

**Table 19**

**GSE Energy Consumption**

| | | | Annual Hours of Operation | | | | | | Annual Energy Consumed (Million BTUs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2005 | | 2015 | | | | 2005 | | 2015 | | | |
| **Energy Form/ GSE Vehicle Type** | **BHP** | **Load Factor** | **No Action/ No Project** | **Alternative C** | **No Action/ No Project** | **Alternative A** | **Alternative B** | **Alternative C** | **No Action/ No Project** | **Alternative C** | **No Action/ No Project** | **Alternative A** | **Alternative B** | **Alternative C** |
| Propane Transporter | 130 | 0.5 | 343 | | | | | | 227 | | | | | |
| Propane Baggage Tug | 100 | 0.55 | 150,678 | 141,443 | 180,818 | | | | 84,365 | 79,194 | 101,240 | | | |
| Propane Cargo Loader | 70 | 0.5 | 1,578 | 4,735 | 1,578 | | | | 562 | 1,687 | 562 | | | |
| Propane Container Loader | 70 | 0.5 | 4,735 | 23,147 | 6,840 | | | | 1,687 | 8,247 | 2,437 | | | |
| Propane Belt Loader | 60 | 0.5 | 33,213 | 26,350 | 48,859 | | | | 10,143 | 8,047 | 14,922 | | | |
| CNG Aircraft Tug Wide | 500 | 0.8 | | 3,339 | | | | | | 13,598 | | | | |
| CNG Bus | 180 | 0.25 | | 162,285 | | | | | | 74,343 | | | | |
| CNG Water Truck | 150 | 0.2 | | 3,500 | | 3,843 | 4,186 | 3,019 | | 1,069 | | 1,174 | 1,278 | 922 |
| CNG Aircraft Tug Narrow | 130 | 0.8 | | 6,862 | | | | | | 7,265 | | | | |
| CNG Food Truck | 130 | 0.25 | | 48,634 | | 82,861 | 82,860 | 70,249 | | 16,091 | | 27,414 | 27,414 | 23,242 |
| CNG Fuel Truck | 130 | 0.25 | | 1,801 | | 5,004 | 9,407 | 5,405 | | 596 | | 1,656 | 3,112 | 1,788 |
| CNG Hydrant Truck | 130 | 0.25 | | 82,056 | | 187,534 | 187,532 | 160,514 | | 27,148 | | 62,045 | 62,045 | 53,106 |
| CNG Lavatory Truck | 130 | 0.25 | | 11,723 | | 11,265 | 10,693 | 9,150 | | 3,878 | | 3,727 | 3,538 | 3,027 |
| CNG Shuttle | 130 | 0.25 | | 15,324 | | | | | | 5,070 | | | | |
| CNG Baggage Tug | 100 | 0.55 | 4,859 | 211,921 | | 259,072 | 259,072 | 218,726 | 2,721 | 118,654 | | 145,054 | 145,054 | 122,465 |
| CNG Cargo Loader | 70 | 0.5 | | 4,735 | | | | | | 1,687 | | | | |
| CNG Belt Loader | 60 | 0.5 | | 106,773 | | 146,299 | 146,299 | 123,516 | | 32,608 | | 44,680 | 44,680 | 37,722 |
| CNG Cabin Service | 50 | 0.2 | | 20,843 | | 35,512 | 35,512 | 30,021 | | 2,122 | | 3,615 | 3,615 | 3,056 |
| CNG Container Loader | 50 | 0.5 | | 25,777 | | | | | | 6,560 | | | | |
| **Subtotal** | | | | | | | | | **125,387** | **414,489** | **147,996** | **289,365** | **290,737** | **245,328** |
| **Total** | | | | | | | | | **794,360** | **774,225** | **824,089** | **868,425** | **870,706** | **750,281** |

Source: Camp Dresser & McKee Inc., 2000.

**Table 20**

**Natural Gas Consumption Based on Facility Areas Under No Action/No Project Alternative**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MCF/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MCF/Yr) |
|---|---|---|---|---|---|---|
| **LAX** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 15.18 | CF/S.F./Yr | 3,997,000 | 60,674 | 3,997,000 | 60,674 |
| Cargo (S.F.) | 9.84 | CF/S.F./Yr | 2,328,064 | 22,908 | 2,328,064 | 22,908 |
| Maintenance (S.F.) | 24.59 | CF/S.F./Yr | 1,440,000 | 35,410 | 1,440,000 | 35,410 |
| Ancillary (S.F.) | 142.60 | CF/S.F./Yr | 1,294,000 | 184,524 | 1,294,000 | 184,524 |
| **Subtotal Airport Uses** | | | | **303,517** | | **303,517** |
| **Non-Airport Land Uses** | | | | | | |
| **LAX Northside** | | | | | | |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 632,000 | 15,168 | 1,580,000 | 37,920 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 390,000 | 22,464 | 870,000 | 50,112 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 24,000 | 835 | 60,000 | 2,088 |
| Airport Related[1] (S.F.) | 23.63 | CF/S.F./Yr | 300,000 | 7,089 | 750,000 | 17,723 |
| R/D Business Park (S.F.) | 24.00 | CF/S.F./Yr | 470,000 | 11,280 | 1,170,000 | 28,080 |
| Restaurant (S.F.) | 38.40 | CF/S.F./Yr | 28,000 | 1,075 | 70,000 | 2,688 |
| **Subtotal LAX Northside** | | | | **57,911** | | **138,611** |
| **Continental City** | | | | | | |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 1,200,000 | 28,800 | 3,000,000 | 72,000 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 40,000 | 1,392 | 100,000 | 3,480 |
| **Subtotal Continental City** | | | | **30,192** | | **75,480** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **391,620** | | **517,608** |
| **Non-Project Uses Within Master Plan Boundaries** | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 57 | 4,559 | 57 | 4,559 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 69 | 3,322 | 69 | 3,322 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 1,404,993 | 80,928 | 1,404,993 | 80,928 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 1,108,312 | 26,599 | 1,108,312 | 26,599 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 148,219 | 5,158 | 148,219 | 5,158 |
| Light Industrial[3] (number of meters) | 2,939,600 | CF/Meter/Yr | 140 | 412,556 | 140 | 412,556 |
| Institutional (S.F.) | 24.00 | CF/S.F./Yr | 156,178 | 3,748 | 156,178 | 3,748 |
| **Subtotal Acquisition Areas** | | | | **536,870** | | **536,870** |
| **SUBTOTAL NON-PROJECT USES** | | | | **536,870** | | **536,870** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **928,490** | | **1,054,477** |

S.F. = Square Feet
MCF = thousand cubic feet of natural gas

1 Usage rate average from SCAQMD, CEQA Air Quality Handbook, Table A9-11-A (Includes restaurant, office, and miscellaneous land use).
2 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.
3 Data collected during the baseline survey (Psomas and Associates) indicated that each gas meter serviced approximately 27,000 square feet of light industrial areas on average.

Source: Camp Dresser & McKee Inc., 2000.

**Table 21**

**Natural Gas Consumption Based on Facility Areas Under Alternative A**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MCF/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MCF/Yr) |
|---|---|---|---|---|---|---|
| **LAX** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 15.18 | CF/S.F./Yr | 8,311,000 | 126,160 | 10,419,000 | 158,160 |
| Cargo (S.F.) | 9.84 | CF/S.F./Yr | 3,694,000 | 36,345 | 4,518,000 | 44,457 |
| Maintenance (S.F.) | 24.59 | CF/S.F./Yr | 584,000 | 14,361 | 841,000 | 20,680 |
| Ancillary (S.F.) | 142.60 | CF/S.F./Yr | 1,987,000 | 283,346 | 2,260,000 | 322,276 |
| **Subtotal Airport Uses** | | | | **460,216** | | **545,574** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 340,000 | 19,584 | 850,000 | 48,960 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 260,000 | 6,240 | 650,000 | 15,600 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 44,000 | 1,531 | 110,000 | 3,828 |
| R/D Business Park (S.F.) | 24.00 | CF/S.F./Yr | 388,000 | 9,312 | 970,000 | 23,280 |
| Restaurant (S.F.) | 38.40 | CF/S.F./Yr | 16,000 | 614 | 40,000 | 1,536 |
| **Subtotal Westchester Southside** | | | | **37,281** | | **93,204** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **497,497** | | **638,778** |
| **Non-Project Uses Within Master Plan Bondaries[1]** | | | | | | |
| **Manchester Square** | | | | | | |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 50,000 | 1,200 | 50,000 | 1,200 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 250,000 | 14,400 | 500,000 | 28,800 |
| Industrial (S.F.) | 2,939,600 | CF/Meter/Yr | 32 | 94,048 | 64 | 188,096 |
| **Subtotal Manchester Square** | | | | **109,648** | | **218,096** |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 0 | 0 | 0 | 0 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 42 | 2,022 | 42 | 2,022 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 63,595 | 3,663 | 63,595 | 3,663 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 142,064 | 3,410 | 142,064 | 3,410 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 45,737 | 1,592 | 45,737 | 1,592 |
| Light Industrial (number of meters)[2] | 2,939,600 | CF/Meter/Yr | 44 | 129,342 | 44 | 129,342 |
| Institutional (S.F.) | 24.00 | CF/S.F./Yr | 85,902 | 2,062 | 85,902 | 2,062 |
| **Subtotal Acquisition Areas** | | | | **142,091** | | **142,091** |
| **SUBTOTAL NON-PROJECT USES** | | | | **251,739** | | **360,187** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **749,236** | | **998,965** |

S.F. = Square Feet
MCF = thousand cubic feet of natural gas

1 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

2 Data collected during the baseline survey (Psomas and Associates) indicated that each gas meter serviced approximately 27,000 square feet of light industrial areas on average.

Source: Camp Dresser & McKee Inc., 2000.

**Table 22**

**Natural Gas Consumption Based on Facility Areas Under Alternative B**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MCF/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MCF/Yr) |
|---|---|---|---|---|---|---|
| **LAX** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 15.18 | CF/S.F./Yr | 8,333,000 | 126,495 | 9,712,000 | 147,428 |
| Cargo (S.F.) | 9.84 | CF/S.F./Yr | 4,192,000 | 41,249 | 4,871,000 | 47,931 |
| Maintenance (S.F.) | 24.59 | CF/S.F./Yr | 889,000 | 21,861 | 859,000 | 21,123 |
| Ancillary (S.F.) | 142.60 | CF/S.F./Yr | 2,389,000 | 340,671 | 1,720,000 | 245,272 |
| **Subtotal Airport Uses** | | | | **530,276** | | **461,754** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 340,000 | 19,584 | 850,000 | 48,960 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 260,000 | 6,240 | 650,000 | 15,600 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 44,000 | 1,531 | 110,000 | 3,828 |
| R/D Business Park (S.F.) | 24.00 | CF/S.F./Yr | 388,000 | 9,312 | 970,000 | 23,280 |
| Restaurant (S.F.) | 38.40 | CF/S.F./Yr | 16,000 | 614 | 40,000 | 1,536 |
| Conference Center (S.F.) | | CF/S.F./Yr | | | | |
| **Subtotal Westchester Southside** | | | | **37,281** | | **93,204** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **567,557** | | **554,958** |
| **Non-Project Uses Within Master Plan Boundaries[1]** | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 0 | 0 | 0 | 0 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 42 | 2,022 | 42 | 2,022 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 0 | 0 | 0 | 0 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 0 | 0 | 0 | 0 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 60,221 | 2,096 | 60,221 | 2,096 |
| Light Industrial (number of meters)[2] | 2,939,600 | CF/Meter/Yr | 3 | 8,819 | 3 | 8,819 |
| Institutional (S.F.) | 24.00 | CF/S.F./Yr | 85,902 | 2,062 | 85,902 | 2,062 |
| **Subtotal Acquisitions Areas** | | | | **14,999** | | **14,999** |
| **SUBTOTAL NON-PROJECT USES** | | | | **14,999** | | **14,999** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **582,556** | | **569,957** |

S.F. = Square Feet
MCF = thousand cubic feet of natural gas

1 For the purposes of this analysis, a single composite study area was established, referred to as the “Master Plan boundaries.” However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.
2 Data collected during the baseline survey (Psomas and Associates) indicated that each gas meter serviced approximately 27,000 square feet of light industrial areas on average.

Source: Camp Dresser & McKee Inc., 2000

**Table 23**

**Natural Gas Consumption Based on Facility Areas Under Alternative C**

| Land Use | Usage Factor | Unit Type | 2005 Building S.F. or Units | 2005 Total Consumption (MCF/Yr) | 2015 Building S.F. or Units | 2015 Total Consumption (MCF/Yr) |
|---|---|---|---|---|---|---|
| **LAX** | | | | | | |
| **Airport Land Uses** | | | | | | |
| Terminal (S.F.) | 15.18 | CF/S.F./Yr | 6,654,000 | 101,008 | 7,319,000 | 111,102 |
| Cargo (S.F.) | 9.84 | CF/S.F./Yr | 3,664,000 | 36,054 | 5,075,000 | 49,938 |
| Maintenance (S.F.) | 24.59 | CF/S.F./Yr | 1,011,000 | 24,860 | 834,000 | 20,508 |
| Ancillary (S.F.) | 142.60 | CF/S.F./Yr | 2,499,000 | 356,357 | 3,198,000 | 456,035 |
| **Subtotal Airport Uses** | | | | **518,279** | | **637,583** |
| **Non-Airport Land Uses** | | | | | | |
| **Westchester Southside** | | | | | | |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 340,000 | 19,584 | **850,000** | **48,960** |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 260,000 | 6,240 | 650,000 | 15,600 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 44,000 | 1,531 | 110,000 | 3,828 |
| R/D Business Park (S.F.) | 24.00 | CF/S.F./Yr | 388,000 | 9,312 | 970,000 | 23,280 |
| Restaurant (S.F.) | 38.40 | CF/S.F./Yr | 16,000 | 614 | 40,000 | 1,536 |
| **Subtotal Westchester Southside** | | | | **37,281** | | **93,204** |
| **SUBTOTAL AIRPORT AND NON-AIRPORT USES** | | | | **555,560** | | **730,787** |
| **Non-Project Uses Within Master Plan Boundaries[1]** | | | | | | |
| **Land Within Acquisition Areas** | | | | | | |
| Residential (Single Family DUs) | 79,980 | CF/Unit/Yr | 0 | 0 | 0 | 0 |
| Residential (Multi Family DUs) | 48,144 | CF/Unit/Yr | 0 | 0 | 0 | 0 |
| Hotel (S.F.) | 57.60 | CF/S.F./Yr | 1,030,340 | 59,348 | 1,030,340 | 59,348 |
| Office (S.F.) | 24.00 | CF/S.F./Yr | 509,218 | 12,221 | 509,218 | 12,221 |
| Retail (S.F.) | 34.80 | CF/S.F./Yr | 73,002 | 2,540 | 73,002 | 2,540 |
| Light Industrial (number of meters)[2] | 2,939,600 | CF/Meter/Yr | 73 | 214,591 | 73 | 214,591 |
| Institutional (S.F.) | 24.00 | CF/S.F./Yr | 0 | 0 | 0 | 0 |
| **Subtotal Acquisition Areas** | | | | **288,700** | | **288,700** |
| **SUBTOTAL NON-PROJECT USES** | | | | **288,700** | | **288,700** |
| **TOTAL MASTER PLAN BOUNDARIES** | | | | **844,260** | | **1,019,487** |

S.F. = Square Feet
MCF = thousand cubic feet of natural gas

1 For the purposes of this analysis, a single composite study area was established, referred to as the "Master Plan boundaries." However, for each alternative, a portion of the study area would not be incorporated into the Master Plan development.

2 Data collected during the baseline survey (Psomas and Associates) indicated that each gas meter serviced approximately 27,000 square feet of light industrial areas on average.

Source: Camp Dresser & McKee Inc., 2000.

**Table 24**

**Estimated Natural Gas Consumption at the Central Utility Plant**

| | Baseline Conditions | Planning Horizon 2005 | | | | Planning Horizon 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Alternative | | | | Alternative | | | |
| | | NA/NP[2] | A | B | C | NA/NP[2] | A | B | C |
| Terminal Area (S.F.) | 3,997,000 | 3,997,000 | 8,311,000 | 8,333,000 | 6,654,000 | 3,997,000 | 10,419,000 | 9,712,000 | 7,319,000 |
| Electrical Power Consumption[1] (MWH) | 820 | 820 | 1,281 | 1,283 | 1,104 | 820 | 1,506 | 1,430 | 1,175 |

[1] Natural gas consumption includes natural gas consumed to produce electrical power (derived from Psomas and Associates, Utilities Consumption and Generation at LAX, October, 1996):
106.81 CF/S.F./Yr - factor applied to terminal area
393 MMCF/Yr – used for electrical power generation

[2] No Action/No Project Alternative

Assumptions:

A. Credit from DWP to LAWA = $3,581,000 (1998 per Green Power Agreement)
B. Unit cost of Electricity = $0.0898 per kWH
C. Power generated = 39,862,864 kWH
D. Efficiency of Generation = 34% per GE description of single cycle gas turbine.
E. Natural Gas used per year to generate electricity = 393 MMCF

Source: Camp Dresser & McKee Inc., 2000. Psomas and Associates, Utilities Consumption and Generation at LAX, October, 1996

**Table 25**

**Daily Vehicle Miles Traveled and Gasoline and Diesel Consumption For Off-Airport Vehicles**

| | | Alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Baseline | No Action/No Project | | A | | B | | C | |
| Item | Conditions | 2005 | 2015 | 2005 | 2015 | 2005 | 2015 | 2005 | 2015 |
| **VMT Data[1] (miles per day)** | 8,522,324 | 10,780,115 | 12,061,915 | 10,981,934 | 14,716,721 | 11,040,923 | 13,457,963 | 10,755,921 | 12,833,543 |
| **Fuel Factor (Gallons per Total VMT by Fuel)[2]** | | | | | | | | | |
| Gasoline | 0.0432 | 0.0403 | 0.0389 | 0.0403 | 0.0389 | 0.0403 | 0.0389 | 0.0403 | 0.0389 |
| Diesel | 0.0074 | 0.0069 | 0.0070 | 0.0069 | 0.0070 | 0.0069 | 0.0070 | 0.0069 | 0.0070 |
| **Estimated Gasoline Consumption (millions of gallons per year)** | | 158.7 | 171.3 | 161.5 | 209.0 | 162.4 | 191.2 | 158.2 | 182.2 |
| **Estimated Diesel Consumption (millions of gallons per year)** | | 27.2 | 30.8 | 27.7 | 37.6 | 27.8 | 34.4 | 27.1 | 32.8 |

[1] Total Daily VMT data provided by PCR Services Corp., miles/day
[2] CARB, Predicted California Vehicle Emissions Ozone Planning Inventory, 1998 (July 28)
[3] Baseline estimated using No Action/No Project Alternative, 2005 ratioed by MAP (58/68.5)

Source: Camp Dresser & McKee Inc., 2000.

**Table 26**

**Construction Related Consumption of Gasoline and Diesel**

| | Total Through 2005 | | | Total Through 2015 | | |
|---|---|---|---|---|---|---|
| **Fuel Consumption (million gallons)** | **A** | **B** | **C** | **A** | **B** | **C** |
| Diesel[1] | 17.6 | 9.3 | 17.6 | 31.6 | 34.1 | 32.0 |
| Gasoline[2] | 0.4 | 0.4 | 0.4 | 3.1 | 3.1 | 3.1 |

[1] Derived from data provided by Bechtel Corporation presented in Table 4.20-3, Projected Brake Horsepower and Fuel Consumption, presented in Section 4.20, *Construction Impacts*, of the Draft EIS/EIR.

[2] Derived from data provided by PCR Services Corp. for Alternative C. Gasoline consumption associated with construction-related activities for Alternatives A and B assumed to be similar to Alternative C.

Source: Camp Dresser McKee Inc., 2000

**Table 27**

**Electricity Consumption by Airport Operations**

| | | | Total Through 2005 | | | | Total Through 2015 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Baseline Conditions** | **NA/NP** | **A** | **B** | **C** | **NA/NP** | **A** | **B** | **C** |
| **Airport Operations (MWH/Yr)** | | | | | | | | | |
| CUP | 26,780 | 26,780 | 55,684 | 55,831 | 44,582 | 26,780 | 69,807 | 65,070 | 49,037 |
| Gate Electrification | 11,908 | 36,194 | 36,480 | 36,480 | 36,480 | 39,010 | 46,882 | 46,882 | 42,754 |
| APM | 0 | 0 | 0 | 0 | 0 | 0 | 93,200 | 174,500 | 62,000 |
| GSE[1] | 7,647 | 7,422 | 12,111 | 12,111 | 12,111 | 9,621 | 50,215 | 50,314 | 43,958 |
| On Airport Vehicles | 0 | 112 | 1,937 | 1,937 | 1,937 | 858 | 6,808 | 6,808 | 6,808 |
| **Total Airport Operations** | 46,335 | 70,507 | 106,212 | 106,359 | 95,110 | 76,269 | 266,912 | 343,574 | 204,557 |

[1] As discussed in Section 2.1.24, *Electricity Consumption for GSE*, of the Draft EIS/EIR the estimates for electricity consumption were obtained by estimating energy consumed by gasoline, then converting to electricity assuming an equivalent electricity consumption of 12 kilowatt-hour (KWH) of electricity per gallon of gasoline. The estimated amount of energy consumed as gasoline by GSE is presented in Table 20, GSE Energy Consumption. A gallon of gasoline is equivalent to 114,000 BTUs.

Source: Camp Dresser & McKee Inc., 2000.