Exposition Metro Line Construction Authority

Exposition Corridor Transit Project Phase 2

Final Environmental Impact Report

Technical Background Report

FINAL

Energy Resources

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Prepared for:

Exposition Metro Line Construction Authority

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The Exposition Metro Line Construction Authority (Expo Authority) has determined that the bike path and Second Street Santa Monica Terminus are no longer under consideration as part of the Expo Phase 2 Light-Rail Transit project. This Technical Background Report was drafted prior to the final definition of the LRT Alternatives that was presented in the Draft Environmental Impact Report (DEIR). Accordingly, discussion of the bike path and Second Street Santa Monica Terminus still remain in this report but no longer apply and should be disregarded.

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1. INTRODUCTION

1.1 Overview

The purpose of this report is to characterize existing and future energy resources and usage associated with the proposed Exposition Corridor Transit Project Phase 2 (Expo Phase 2). During construction and operation of the proposed project, energy would be required to operate construction equipment, stations, and transit vehicles (light-rail trains and buses). As a result, energy resources would be consumed directly for transit operations as well as indirectly off site. At the same time, the diversion of motorists to transit would reduce energy consumption by automobiles. Accordingly, this report identifies the net energy demand associated with changes to the transportation network with development of the Expo Phase 2 project.

1.2 Project Summary

The proposed Exposition Corridor Transit Project Phase 2 (referred to as either the Expo Phase 2 project or proposed project) would involve the implementation of new or upgraded corridor transit solutions within a western portion of Los Angeles County in the cities of Los Angeles, Culver City, and Santa Monica. Six alternatives are analyzed. The alternatives include the No-Build Alternative, Transportation System Management (TSM) Alternative, and four Light-Rail Transit (LRT) Alternatives. A brief description of these alternatives is provided below.

1.2.1 No-Build Alternative

The No-Build Alternative includes only Metro service features that currently exist or have been explicitly committed for project buildout in the year 2030. As such, the No-Build Alternative includes existing fixed guideway Metro Rail and Metro Liner bus rapid transit (BRT) systems currently under operation, the full implementation of the Metro Rapid Bus program, represented as twenty-eight routes across Los Angeles County, and planned peak-only rapid bus lanes along Wilshire Boulevard between Western Avenue and Bundy Drive. The rest of the bus network is based on June 2007 service patterns for Metro, Los Angeles Department of Transportation (LADOT), Culver City, and Santa Monica Big Blue Bus, as well as committed enhancements to those services anticipated by 2030. Based on direction from Metro, their bus fleet will be assumed to include a mix of articulated and higher-capacity 45-foot buses in 2030.

1.2.2 Transportation Systems Management (TSM) Alternative

The TSM Alternative seeks to address the corridor transit needs without major capital investments and includes the improvements outlined in the No-Build Alternative plus three additional components. These three components include (1) addition of a rapid bus route connecting downtown Culver City with downtown Santa Monica; (2) associated service improvements on selected north/south routes to feed stations along the new rapid bus route; and (3) service improvements on selected routes, connecting Westside communities to the Phase 1 Terminus.

1.2.3 Light-Rail Transit (LRT) Alternatives

LRT is defined as a metropolitan electric railway system characterized by its ability to operate single cars or short trains along exclusive rights-of-way at ground level, on aerial structures, in subways, or, occasionally, in streets, and to board and discharge passengers at track or car-floor level. Light-rail vehicles are driven electrically with power drawn from an overhead electric line. LRT provides a cleaner, more energy-efficient form of transportation than automobiles and is quieter than conventional rail systems.

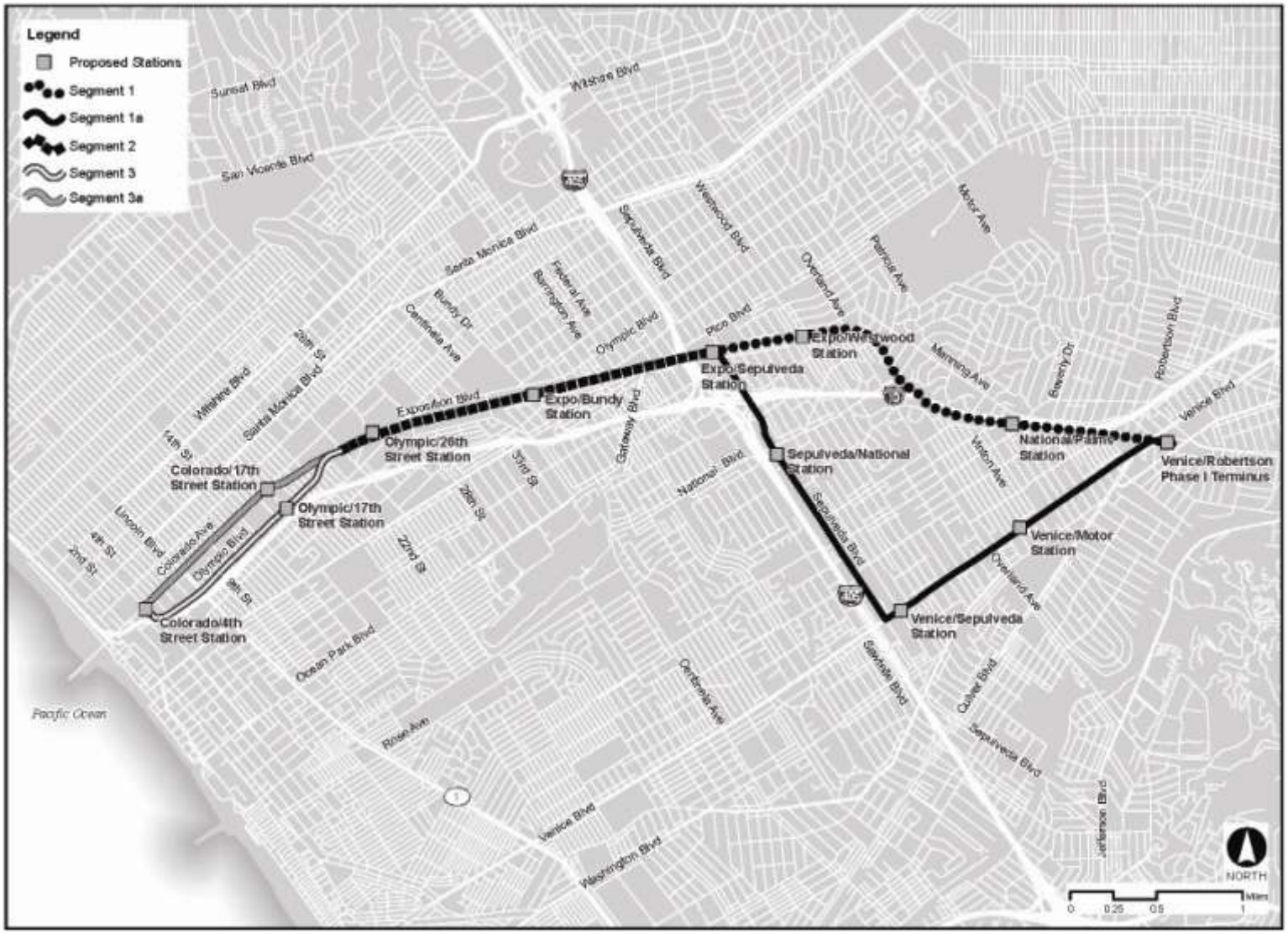
The LRT alignment would extend rail from the current Phase 1 terminus station at Venice/Robertson to a terminus station in Santa Monica at 4th Street and Colorado Avenue. The LRT Alternatives are as follows:

- LRT 1 (Expo ROW–Olympic Alternative) would utilize approximately 5 miles of the existing Expo ROW from the Expo Phase 1 terminus until reaching the intersection with Olympic Boulevard in Santa Monica. From that point, the alignment would follow Olympic Boulevard to the proposed terminus station.
- LRT 2 (Expo ROW–Colorado Alternative) would also utilize the existing Expo ROW from the Expo Phase 1 terminus until reaching the intersection with Olympic Boulevard in Santa Monica. From that point, the alignment would continue within the Expo ROW to west of 19th Street, then diverge from the Expo ROW and enter onto Colorado Avenue east of 17th Street and follow the center of Colorado Avenue to the proposed terminus.
- LRT 3 (Venice/Sepulveda–Olympic Alternative) would divert from the Expo ROW at the Expo Phase 1 terminus and follow Venice Boulevard and Sepulveda Boulevard until reaching the intersection with the Expo ROW. The alignment would then continue westward along the Expo ROW and Olympic Boulevard identical to the LRT 1 Expo ROW–Olympic Alternative.
- LRT 4 (Venice/Sepulveda–Colorado Alternative) would divert from the Expo ROW at the Expo Phase 1 terminus and follow Venice Boulevard and Sepulveda Boulevard until reaching the intersection with the Expo ROW. The alignment would then continue westward along the Expo ROW and Colorado Avenue identical to the LRT 2 Expo ROW–Colorado Alternative.

Geographic Segments

The proposed project traverses several jurisdictions, including the cities of Los Angeles, Culver City, and Santa Monica, and spans distinct communities within each jurisdiction. In order to account for these differences, the proposed project is described and examined at two different scales, from broad to specific—Westside of Los Angeles County and geographic segments with special consideration of proposed station areas—to identify potential impacts.

For purposes of this discussion, the LRT Alternatives have been divided into geographic segments for ease of analysis (Figure 1-1 [Project Location]). For the area between the Phase 1 terminus and the Exposition/Sepulveda intersection, there are two alternative alignments: Segment 1 (Expo ROW) and Segment 1a (Venice/Sepulveda). Segment 2 (Sepulveda to Cloverfield) is common to all LRT Alternatives. For the area between the Cloverfield/Olympic intersection and a terminus in Santa Monica, there are also two alternative alignments: Segment 3 (Olympic) and Segment 3a (Colorado). Thus, the segments are as follows:



Source: PBS&J, ESRI 2009

Figure 1-1 Project Location

- Segment 1: Follows the Expo ROW from the Expo Phase 1 terminus station in Culver City to the Expo ROW/Sepulveda Boulevard intersection, approximately 2.8 miles in length
- Segment 1a: Follows westerly in the median of Venice Boulevard from the Expo Phase 1 terminus station in Culver City to the Venice Boulevard/Sepulveda Boulevard intersection, then follows northerly in the center of Sepulveda Boulevard to the Expo ROW/Sepulveda Boulevard intersection, approximately 3.7 miles in length
- Segment 2: Follows the Expo ROW from the Expo ROW/Sepulveda Boulevard intersection to the Expo ROW/Olympic Boulevard intersection, approximately 2.3 miles in length
- Segment 3: Follows the median of Olympic Boulevard from the Expo ROW/Olympic Boulevard intersection to the Phase 2 terminus option at 4th Street and Colorado Avenue in Santa Monica, approximately 1.5 miles in length
- Segment 3a: Follows the Expo ROW from the Expo ROW/Olympic Boulevard intersection to west of 19th Street in Santa Monica. The alignment then diverges onto Colorado Avenue east of 17th Street and continues along the center of Colorado Avenue terminating between 4th Street and 5th Street, approximately 1.5 miles in length.

In response to comments received on the DEIR and after further analysis and coordination with various stakeholders, five design options have been added in the FEIR for the LRT Alternatives:

- Sepulveda Grade Separation Design Option
- Expo/Westwood Station No Parking Design Option
- Maintenance Facility Buffer Design Option
- Colorado Parking Retention Design Option
- Colorado/4th Parallel Platform and South Side Parking Design Option

Stations

Table 1-1 (Station Locations) provides a description of each station within the various segments, including the approximate location, the type of proposed station (i.e., at grade or aerial), and the amount of parking to be provided.

Table 1-1 Station Locations

Name	Location	LRT: EXPO ROW Alignment	LRT: Venice/ Sepulveda Alignment	Parking
Segment 1: Expo ROW				
National/Palms	Expo ROW just west of the aerial structure over National Boulevard/Palms Boulevard	On Embankment	N/A	0
Expo/Westwood	Within Expo ROW, ~~E~~east of Westwood Boulevard ~~on Exposition Boulevard~~	At grade	N/A	170

Table 1-1 Station Locations

Name	Location	LRT: EXPO ROW Alignment	LRT: Venice/ Sepulveda Alignment	Parking
Segment 1a: Venice/Sepulveda				
Venice/Motor	Venice Boulevard, east of Motor Avenue	N/A	At grade	0
Venice/Sepulveda	On Venice Boulevard, east of Sepulveda Boulevard	N/A	Aerial	0
Sepulveda/National	South of National Boulevard above the center of Sepulveda Boulevard	N/A	Aerial	250
Segment 2: Sepulveda to Cloverfield				
Expo/Sepulveda	West of Sepulveda Boulevard and Exposition Boulevard	At grade (aerial design option)	At grade (aerial design option)	~~270~~260
Expo/Bundy	Bundy Drive and Exposition Boulevard	Aerial	Aerial	250
Olympic/26th Street	East of 26th Street on Olympic	At grade	At grade	0
Segment 3: Olympic				
Olympic/17th Street	East and west side of 17th Street within the median of Olympic Boulevard	At grade	At grade	0
Colorado/4th	~~4th Street, east of Colorado Avenue~~On the existing commercial block bounded by 4th Street, 5th Street, and Colorado Avenue	Aerial	Aerial	~~250~~0
Segment 3a: Colorado				
Colorado/17th Street	Center of Colorado Avenue west of 17th Street	At grade	At grade	70
Colorado/4th	~~Center of Colorado Avenue between 2nd Street and 4th Street or o~~On the existing commercial block bounded by 4th Street, 5th Street, and Colorado Avenue	At grade	At grade	~~225~~0

SOURCE: DMJM Harris, 2008, updated 2009.

Maintenance Facilities

A Maintenance Facility is proposed to be constructed as a part of the Expo Phase 2 project. The Maintenance Facility site would be located on a parcel or parcels within the City of Santa Monica immediately south of the Expo ROW, north of Exposition Boulevard, and east of Stewart Street. The site is currently occupied by a surface parking lot and light-industrial facility. The maintenance facility is to be designed and built to meet the maintenance needs of the LRT vehicles required to operate Phase 2 through the year 2030. It could operate 24 hours a day in

three shifts. The maintenance facility would consist of outdoor storage for ~~20 to 36~~approximately 43 to 45 LRT vehicles and associated storage track; trackway to connect to the main line and allow the movement of LRT vehicles from the main line track to and within the maintenance facility area; main yard shop building with office and vehicle repair areas; vehicle wash facility; traction power substation; and parking for 65 ~~to 70~~ employees. The main yard shop structure would be approximately ~~300~~ 350 feet long and ~~166~~ 189 feet wide, two stories in height, and with a total area of approximately 125,000 square feet. The structure would be built of concrete block or corrugated metal or a combination thereof.

Since the release of the DEIR and in response to comments, the Expo Authority has worked with the City of Santa Monica, Metro, and the community to identify alternative layouts for the Maintenance Facility. As a result of these collaborative efforts, a Maintenance Facility Buffer Design Option has been developed for evaluation in the FEIR. This design option would occupy only a portion of the Verizon site, with an extension of the facility into the existing Santa Monica College parking lot to the west. Utilization of the adjacent parking lot on the west side of the Verizon site would create an approximate 100- to 110-foot buffer between the Maintenance Facility and the residential area on the south side of Exposition Boulevard. The Maintenance Facility Buffer Design Option would include much of the same facilities as the original Maintenance Facility concept.

2. AFFECTED ENVIRONMENT

2.1 Statewide Transportation Energy Demand and Supply

California is the tenth largest consumer of energy in the world (California Energy Commission [CEC] 2007). It is also the most populous state in the nation and its total energy demand is second only to Texas (Energy Information Administration [EIA] 2007). Although California is a leader in the energy-intensive chemical, forest products, glass, and petroleum industries, the State has one of the lowest per capita energy consumption rates in the country (ranked 48th), in part due to mild weather that reduces energy demand for heating and cooling. The California government's energy-efficiency programs have also contributed to low per capita energy consumption (EIA 2007).

Driven by high demand from California's many motorists, major airports, and military bases, the transportation sector is the State's largest energy-consumer. More motor vehicles are registered in California than any other state, and worker commute times are among the longest in the country (EIA 2007). Table 2-1 (Energy Consumption in California by Source) shows California's total energy consumption by source of energy and reflects the most recent information available from the Energy Information Administration. As shown in the table, motor gasoline and jet fuel account for nearly 30 percent of the nation's total consumption of petroleum in 2005.

Table 2-1 Energy Consumption in California by Source

Source	Amount	Share of U.S.
Total Petroleum	706 million barrels (2005)	9.3%
Motor Gasoline	381million barrels (2005)	11.4%
Distillate Fuel	97 million barrels (2005)	6.4%
Liquid Petroleum Gases	12 million barrels (2005)	1.7%
Jet Fuel	105 million barrels (2005)	17.1%
Natural Gas	2,242,136 million cu ft (2006)	10.3%
Coal	3 million short tons (2005)	0.3%
Total Energy Consumed (by Source)	**8,364,592 billion Btu (2004)**	**8.3%**
Total Energy Consumed (per Capita)	**233 million Btu (2004)**	**U.S. Rank: 48**

SOURCE: http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA November 16, 2007

Table 2-2 (Energy Consumption in California by Sector, 2004) shows the percentage of energy used by the transportation, industrial, commercial, and residential sectors. Again, it is evident that transportation energy consumption far exceeds the other sectors in California.

Table 2-2 Energy Consumption in California by Sector, 2004

Source	Amount	Share of U.S.
Transportation	3,199,591 billion Btu	11.5%
Industrial	2,052,670 billion Btu	6.1%
Commercial	1,556,272 billion Btu	8.8%
Residential	1,556,056 billion Btu	7.3%

SOURCE: http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA November 16, 2007
Btu = British thermal unit

2.1.1 Petroleum

The primary transportation fuel consumed in this country is petroleum-based gasoline and diesel. In 2005, California's nearly 28 million vehicles consume more than 16 billion gallons of gasoline and nearly 3 billion gallons of diesel (Energy Information Administration [EIA] 2007). California is the second largest consumer of gasoline in the world, behind the entire United States and just ahead of Japan. California obtains petroleum fuels from both in-state and out-of-state sources. In 2005, approximately 37.2 percent of the petroleum consumed in California was produced in-state. An additional 20.9 percent was produced in Alaska, while the remaining 41.8 percent was imported from foreign markets (CEC 2007). As California’s population continues to grow, it is anticipated that the state’s dependence on foreign oil will also increase unless measures are taken to reduce demand for petroleum fuels.

To reduce dependence on petroleum products, particularly from out-of-state or international sources, California has been working to improve the availability of alternative-fueled vehicles and public transit. In ~~2006~~2007, there were approximately 117,199~~105,594~~ alternative-fueled vehicles in use in California.[1] This number has increased over the last few years due to the conversion of many transit vehicles to clean air vehicles, and federal and state tax incentives for zero emission vehicles.

2.1.2 Natural Gas

California consumed 2,242,136 million cubic feet of natural gas in 2006, with 77,225 million cu ft used for electricity production (EIA 2007). Of the natural gas used within the state, 15 percent is produced in-state, while the remaining natural gas is imported from the southwest, Rockies region, or Canada. The transportation sector represents less than 1 percent of the total statewide natural gas demand. There are currently only 185 compressed natural gas (CNG) filling stations in California (used for fueling CNG vehicles), compared to 9,857 standard gasoline stations (EIA 2007).

2.1.3 Electricity

Due to high electricity demand, California imports more electricity than any other state. California generates approximately 78 percent of the electricity consumed within the state, with 22 percent of the electricity imported from the Pacific Northwest or the southwest. According to the CEC, of the electricity generated in the state, approximately 42 percent was generated from natural gas, 19 percent from hydroelectric sources, 16 percent from coal, 13 percent from nuclear sources and the remaining 10 percent was generated from renewable energy sources (CEC 2007). Table 2-3 (Sources of California Electricity, 2006) shows the variety of sources used to produce California's electricity.

Table 2-3 Sources of California Electricity, 2006

Source	Percentage
In-State	78.03%
Natural Gas	41.5%
Nuclear	12.9%
Large Hydro	19.0%
Coal	15.7%
Renewable	10.9%
Imports	21.97%
Pacific Northwest	6.72%
Southwest	15.25%

SOURCE: http://www.energy.ca.gov/html/energysources.html October 23, 2007

[1] ~~Based on the most recent data available at http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA~~ Energy Information Administration. *California Quick Facts.* http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA October 14, 2009.

In 2003, California consumed 272,385 million kilowatt-hours (kWh) of electricity. While California's consumption of energy is one of the highest in the nation, it ranks as the lowest per capita energy usage among all fifty states, as mentioned above, approximately 7,032 kWh per capita (CEC 2007). Electricity consumption is expected to increase over the next few years, due mainly to the anticipated increase in population. The highest overall use of electricity in California is air conditioning, which peaks at approximately 35 percent of all electricity uses during the summer months (CEC 2007). The two major issues associated with increasing electricity use are uncertainty in the peak demand during the summer when air conditioning use is driven by high temperatures, which vary year to year; and the ability of aging transmission infrastructure to handle high electricity demands. These are important issues to consider in light of the energy crisis that the State experienced in 2000 and 2001 caused by a supply and demand imbalance. Following the energy crisis, the California State government created an Energy Action Plan designed to eliminate outages and excessive price spikes. To achieve these goals, the plan calls for optimizing energy conservation, building sufficient new generation facilities, upgrading and expanding the electricity transmission and distribution infrastructure, and ensuring that generation facilities can quickly come online when needed.

Electricity is used in the transportation sector to power electric vehicles and trains, and to power stations and ancillary equipment for public transportation system. The transportation sector accounts for less than 1 percent of total electricity use in California.

2.1.4 Transportation Sector

The primary source of energy for transportation is gasoline and diesel. In 2003, 3,199,591 billion British thermal units (Btu) were consumed for transportation (EIA 2007). Over the last 20 years, fuel consumption for transportation needs have increased by almost 50 percent. Because of California's size and its reliance on the automobile, the transportation sector accounted for approximately 40 percent of all energy consumed in the state. California's nearly 28 million vehicles consume more than 16 billion gallons of gasoline and nearly 3 billion gallons of diesel (EIA 2007). California is the second largest consumer of gasoline in the world, behind the entire United States and just ahead of Japan. To reduce dependence on petroleum products, particularly from out-of-state sources, California has been working to improve the availability of alternative-fueled vehicles. In 200~~3~~7, there were approximately ~~77,761~~117,199 alternative-fueled vehicles in use in California.[2] This number has increased over the last few years due to the conversion of many city transit vehicles to clean air vehicles and the incentives for zero emission vehicles.

2.2 Current Fuel Consumption in Southern California

As stated above, transportation is the states largest consumer of energy. Due to the large number of vehicles used within Los Angeles County, and more specifically the Westside, much of the areas' energy is consumed for transportation-related uses. The Southern California Association of Governments (SCAG) released a draft regional transportation plan in January of 2008 that found motor vehicles in Southern California consumed 8,534,639 thousand gallons of gasoline and diesel in 2005 (SCAG 2008.)

[2] ~~Based on the most recent data available at www.energy.ca.gov/html/energysources.html~~Energy Information Administration. *California Quick Facts*. http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA October 14, 2009.

2.2.1 Metro Fuel Consumption

Metro's current operations include a bus fleet of 129 diesel-fueled buses, and 2,506 CNG buses, as well as five electricity-powered fixed rail lines: the Gold, Blue, Green, Red, and Purple lines (Metro 2008). Metro purchases electricity and petroleum fuels from commercial suppliers. Southern California Edison (SCE) and the Los Angeles Department of Water and Power (LADWP) supply Metro with electricity for operation of stations and LRT. Electricity is a "reactive" utility, meaning it is provided on an as-needed basis to customers within existing structures in the City. Metro is an existing customer of SCE and LADWP, and as such, the current service would be expanded to include operation of the proposed project. Petroleum fuels are purchased from a variety of commercial sources. CNG is provided by the Southern California Gas Company, and as with electricity, current service would be expanded to provide for increased demand in order to achieve Metro's goal of running 100 percent of their buses with CNG.

According to current Metro records, operation of Metro's existing rail lines consumes approximately 172,319 megawatt-hours (MWh) annually (588 billion British thermal units [Btu]).[3] As Metro currently operates 73.1 miles of rail lines, it consumes 8 billion Btu of energy per rail mile on an annual basis.

3. REGULATORY FRAMEWORK

3.1 Federal

3.1.1 Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects. The *Energy Policy Act of 2005* gave FERC additional responsibilities. Some of these responsibilities include the following:

- Regulates the transmission and sale of natural gas for resale in interstate commerce
- Regulates the transmission of oil by pipeline in interstate commerce
- Regulates the transmission and wholesale sales of electricity in interstate commerce
- Licenses and inspects private, municipal, and State hydroelectric projects
- Approves the siting of and abandonment of interstate natural gas facilities, including pipelines, storage and liquefied natural gas
- Ensures the reliability of high voltage interstate transmission system
- Monitors and investigates energy markets
- Oversees environmental matters related to natural gas and hydroelectricity projects and major electricity policy initiatives

[3] Metro Accounting, January 2007.

3.1.2 Corporate Average Fuel Economy Standards

Vehicle energy usage is dependent on the fuel economy of the vehicle. At the Federal level, the Energy Policy and Conservation Act of 1975 helped establish a program to regulate fuel economy of passenger automobiles and light-duty trucks. The result was the Corporate Average Fuel Economy Standards (CAFE), which requires that manufacturers maintain a fleet average fuel economy standard for their passenger automobiles and light-duty trucks. CAFE originally included only automobiles with a gross vehicle weight rating (GVWR) of less than 6,000 pounds (lb). According to the current CAFE standards, manufacturers must maintain a fleet average of 27.5 miles per gallon (mpg) for their passenger automobiles.

The standard for light-duty trucks has gradually increased from 20.7 mpg for model year 2000 to 22.2 mpg for model year 2007. After model year 2007, new CAFE rules would change how manufacturers must meet the standards for light-duty trucks. After a transition period for model year 2008 through 2010, light-duty truck fuel economy standards would be based on a mathematical function that relates required fuel economy to the footprint of the truck (wheelbase multiplied by track width). The new standards would also include trucks with GVWR of up to 10,000 lbs.

3.1.3 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

The *Intermodal Surface Transportation Efficiency Act* (ISTEA) of 1991 established an integrated and systematic approach to develop a transportation system that considered mobility, local economy, and the environment. The *Transportation Equity Act for the 21st Century* (TEA-21) was signed into law in 1998 and builds on the ISTEA, providing transportation funding from 1998 to 2003. More recently, after several extensions of the TEA-21, the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) was signed into law in August 2005. SAFETEA-LU represents the largest surface transportation investment in US history. SAFETEA-LU was passed to address issues such as safety, reducing traffic congestion, improve efficiency in freight movement, increase intermodal connectivity, and to protect the environment. SAFETEA-LU further promotes efficient and effective federal surface transportation programs by focusing on transportation issues of national significance. Some of the key programs targeted by SAFETEA-LU include safety, equity, innovative finance, congestion relief, mobility and productivity, efficiency, environmental stewardship, and environmental streamlining. SAFETEA-LU gives states more flexibility to use road pricing to manage congestion, and promotes real-time traffic management in all states to help improve transportation security (Federal Highway Administration 2005).

3.2 State

3.2.1 California Energy Planning and Efficiency Standards

At the state level, the California Energy Commission (CEC), created in 1974, is the primary agency for developing energy policy. The five major responsibilities of the agency include:

- Forecasting future energy needs and maintaining historical energy data
- Licensing thermal power plants that are 50 megawatts or larger

- Promoting energy efficiency through appliance and building standards
- Developing energy technologies and supporting renewable energy
- Planning for and directing state response to any energy emergency (California Energy Commission 2007)

As an example of how the CEC has discharged some of the above responsibilities, the CEC promulgated the Building Energy Efficiency standards in 1978 (Title 24, Part 6 of the *California Code of Regulations*) to help reduce the state's energy consumption. The CEC updated the Building Energy Efficiency standards in 2003. These regulations set standards for residential and nonresidential buildings and include requirements for indoor and outdoor lighting, ventilation systems, and roofing.

The CEC established The Renewable Energy Transmission Initiative (RETI), which is a statewide initiative to help identify the transmission projects needed to accommodate the state's renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting.

3.2.2 Executive Order S-01-07: Low Carbon Fuel Standard

In January 2007, California Governor Schwarzenegger asserted California's leadership in clean energy and environmental policy by establishing a Low-Carbon Fuel Standard (LCFS) by Executive Order. This first-in-the-world greenhouse gas standard for transportation fuels would spark research in alternatives to oil and reduce greenhouse gas emissions (CEC 2007). Additionally, AB 32 (*Global Warming Solutions Act of 2006*) codifies the state's goal to reduce global warming emissions to 2000 levels by 2010, to 1990 levels by 2020, and 80 percent below 1990 levels by 2050.This reduction would be accomplished through an enforceable statewide cap on global warming emissions that would be phased in starting in 2012. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (ARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.

The Governor's Executive Order directs the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop the protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis would become part of the State Implementation Plan for alternative fuels as required by AB 1007 and would be submitted to ARB for consideration as an "early action" item under AB 32. The ARB would complete its review of the LCFS protocols for adoption as an early action no later than June 2007. Upon adoption as an "early action" by the ARB, the regulatory process at ARB would begin to put the new standard into effect. It is expected that the regulatory process at ARB to implement the new standard would be completed no later than December 2008 (CEC 2007).

3.3 Regional

3.3.1 Metro Energy and Sustainability Policy

As a provider of public transportation, Metro is a large user of energy, both fossil fuels and electricity. As a result, the Metro Energy and Sustainability Policy was passed in June of 2007 to

discuss ways in which Metro could reduce energy consumption and subsequently improve sustainability. Metro is in the process of completing numerous energy efficiency projects, such as lighting upgrades, escalator power controllers, heating, ventilation and air conditioning (HVAC) replacements, and solar projects. The Metro Energy and Sustainability Policy codified an agency commitment to responsible energy management, renewable energy sources, energy efficiency, and general sustainability in Metro's operations.

The immediate goals of the policy are to gain more control over Metro's energy consumption and reduce costs by aggressively pursuing renewable energy sources and energy conservation projects, and to construct all new facilities using energy efficiency and conservation strategies. The policy's long-term objectives are as follows:

- Reduce, whenever possible, Metro's use of fossil fuels through the use of ambient and renewable energy sources.
- Buy fuels and electricity at the most economic cost.
- Use fuels and electricity as efficiently as possible.
- Reduce the amount of emissions, especially carbon dioxide (CO_2), caused by Metro's required consumption.

Additionally, the policy's immediate objectives include the following:

- Gain more control over Metro's energy consumption by aggressively pursuing renewable energy sources, take advantages of rebates and subsidies for energy and water conservation wherever feasible, conduct energy audits of Metro divisions and facilities, and implement energy conservation measures where they are feasible and fiscally prudent.
- Construct all new facilities and projects, including new transit corridor projects, using energy efficiency and conservation strategies. For buildings or structures over 10,000 sf, projects must be constructed to achieve Leadership in Energy and Environmental Design (LEED) Silver certification, at minimum.

3.4 Local

3.4.1 City of Culver City

Culver City's "Think Green" campaign offers residents numerous environmentally friendly tips to reducing one's impact on the environment. One section refers to energy saving tip recommendations to City residents. While most of these tips refer to energy savings through the changing of light bulbs and purchasing energy efficient appliances, other recommendations of the program look to improving the planning of the City to improve the walkability of neighborhoods. As a result, Culver City looks to improve the City's sustainability through a reduction of environmental resources.

3.4.2 City of Los Angeles

The City of Los Angeles, in conjunction with the LADWP has many established guidelines related to energy resources. The City and LADWP have established a number of program and

savings plans to educate the public as well as save energy. Programs include rebate programs that encourage residents to use environmentally sustainable energy and resources. These and other similar programs both foster a sense of resourcefulness and efficiency in residents and businesses within the City, as well as work to reduce the City's overall energy requirement.

3.4.3 City of Santa Monica

The City of Santa Monica established the Sustainable City Program to address ways in which the City can meet existing and future needs without compromising the ability of future generations to meet their own needs. The City-wide program was established to look at specific areas in which sustainability could be improved. One such area includes resource conservation. Within this section, policies related to energy consumption are identified. For energy, the program discusses the affects of energy production on the environment, and notes that using energy sustainably means "not wasting it. Simple energy efficiency measures can greatly help to reduce the impacts associated with energy production and can provide significant cost savings" (Santa Monica Sustainable City Program 2001). Since the program began, Santa Monica has reached a "stable" energy usage with minimal annual increases despite continued population increases.

4. ENVIRONMENTAL CONSEQUENCES

4.1 Analytic Method

Data used to prepare this section were taken from various sources, including the *Transportation Energy Data Book* (USDOT 2008), information from the CEC, the *Transportation/Traffic Technical Background Report* prepared for the proposed project, and previous environmental studies prepared for the proposed project.

Direct energy consumption would result from the operation of vehicles (trains or buses) within the corridor. Proposed light-rail vehicles and transit stations would be powered by electricity. For the No-Build and TSM Alternatives, which involve the use of buses, fuels consumed would include CNG fuels as Metro anticipates 100 percent of its bus fleet to run on CNG as of project buildout.

To assess the net change in energy consumption from the No-Build and TSM Alternatives, the total passenger vehicle and bus-transit vehicle miles traveled (VMT) of these alternatives were derived from the *Transportation/Traffic Technical Background Report*. The vehicle fleet mix was derived from the URBEMIS 2007[4] Model outputs generated for operational emissions of each alternative. According to the URBEMIS 2007 model, passenger vehicles account for 52.5 percent of total vehicles and transit buses account for 0.2 percent of the total vehicles; therefore, 52.5 percent of total daily VMT for passenger vehicles and 0.2 percent of total daily VMTs for buses for each alternative was assumed. The change in the weekly Btus consumed for the TSM Alternative within the Expo Phase 2 study area was then compared to the No-Build Alternative, as the No-Build Alternative would represent the baseline.

[4] URBEMIS 2007 is a model developed for ARB. The model incorporates mobile source emissions from the EMFAC 2007 computer model as well as the Institute of Transportation Engineers (ITE) trip generation rates for vehicle emission projections.

To estimate the net change in energy consumption associated with implementation of the LRT Alternatives, weekly VMT were assessed for light-rail vehicles and were multiplied by energy consumption factors specific to light-rail transport. The estimated Btu per VMT for light-rail vehicles is 62,797 Btu/mile, according to the U.S. Department of Transportation's *Transportation Energy Data Book: Edition 27* (2008). The estimated Btu per VMT for light-rail vehicles was then compared to the estimated Btu for passenger vehicle VMT and bus VMT within the Expo Phase 2 study area for each LRT Alternative.

4.2 Environmental Criteria

The FTA and the Expo Authority have identified the following CEQA criteria, taken, or adapted, from Appendix F of the 2008 CEQA Guidelines, as appropriate for this project. The FTA does not have specific criteria for evaluating effects associated with energy resources under NEPA; therefore, the FTA and the Expo Authority have determined that an assessment based on CEQA criteria provides a reasonable means for determining environmental effects. The project would have significant impacts on energy resources, for the purposes of CEQA and NEPA, if the project would result in any of the following:

- Wasteful, inefficient, or unnecessary usage of fuel or energy
- A substantial increase in demand upon existing energy sources such that the capacity to provide the energy is approached or exceeded

In addition, in recognition of Executive Order S-01-07, the Low Carbon Fuel Standard established by California Governor Arnold Schwarzenegger, this report would identify potential effects related to "greenhouse gases." The statewide goal is to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

4.3 Analysis

Criterion	**Would the project lead to a wasteful, inefficient, or unnecessary usage of fuel or energy?**

Impact ENG-1 The proposed project would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy. Therefore, the proposed project would create *no adverse effect*.

No-Build Alternative

There would be roadway and transit service improvements associated with the No-Build Alternative. As part of the No-Build Alternative, the I-405 Widening project would propose the installation of high occupancy vehicle (HOV) lanes which would improve traffic flow thereby reducing energy consumption along the I-405. In addition, the No-Build Alternative would modify the bus fleet to increase the percentage of CNG buses. As a result, the No-Build Alternative would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy. Therefore, ***no effect*** would occur with respect to energy consumption.

Transportation Systems Management (TSM) Alternative

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. The TSM Alternative results in a reduction of VMT ~~and VHT~~ in the ~~County~~Expo Phase 2 study area, and thus would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy. Therefore, ***no effect*** would occur with respect to energy consumption.

LRT Alternatives

Construction

Construction activities related to the proposed project would require construction equipment that utilizes fossil fuel (mainly diesel) for equipment operation. However, equipment would only be used on an as-needed basis. *Metro Design Criteria* (January 2007) identify the use of energy resources as a necessary requirement during the construction of the proposed project. The guidelines note that "during construction, every internal combustion engine hour saved is a positive contribution to the environment." By turning construction equipment off when not directly in use, fossil fuel and other energy would be conserved. Unnecessary idling of internal combustion engines is regulated by the South Coast Air Quality Management District to minimize harmful emissions (refer *Air Quality Technical Background Report*).

In accordance with Metro's Energy and Sustainability Policy, the Expo Authority would require the construction contractor to implement energy conserving Best Management Practices (BMPs). Such measures include, but are not limited to, implementing a construction energy conservation plan, using energy-efficient equipment, consolidating material delivery to ensure efficient vehicle utilization, scheduling delivery of materials during non-rush hours to maximize vehicle fuel efficiency, encouraging construction workers to carpool, and maintaining equipment and machinery, especially those using gasoline and diesel, in good working condition. With implementation of these measures, the proposed project would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy; hence, ***no adverse effect*** would result.

Operation

During operation of the LRT Alternatives, energy would be consumed as the result of LRT services and station operations as well as the operation of the trains themselves. The LRT stations would be equipped with security lighting, intercom and closed-circuit television systems, fare collecting machines, and, for aerial stations, elevators. Although LRT services and station operations would consume energy, Metro's Energy and Sustainability Policy would be followed, which would serve to reduce Metro's use of fossil fuels through the use of ambient and renewable energy sources. The energy consumed for station operations would be essentially the same regardless of the LRT Alternative chosen.

Once operational, energy consumption can be measured as a result of LRV miles traveled, which can then be compared to the estimated reduction in Btus due to automobiles that would be taken off the streets as a result of the proposed project. As shown in Table 4-1 (Annual Operational Energy Consumption for Project Alternatives [Regional and Study Area]), all of the LRT Alternatives within the Expo Phase 2 study area would result in an annual reduction of energy consumed due to the reduction in VMT for both single-occupancy vehicles and buses.

Table 4-1 Annual Operational Energy Consumption for Project Alternatives (Regional and Study Area)

Measure/Alternative	No-Build (baseline)	TSM	LRT 1: Expo ROW–Olympic	LRT 2: Expo ROW–Colorado	LRT 3: Venice/ Sepulveda–Olympic	LRT 4: Venice/ Sepulveda–Colorado
Regional Area VMT	454,216,941	454,283,158	454,141,039	454,249,551	454,190,217	454,259,139
Study Area VMT	2,695,854	2,693,804	2,684,231	2,685,511	2,686,360	2,685,540
Energy Consumed (Million Btu)						
Regional Single-Occupancy Vehicle	506,481,811	506,555,647	506,397,175	506,518,173	506,452,012	506,528,864
Study Area Single-Occupancy Vehicle	3,006,055	3,003,769	2,993,094	2,994,522	2,995,468	2,994,554
Regional Buses	5,384,667	5,385,452	5,383,767	5,385,053	5,384,350	5,385,167
Study Area Buses	31,959	31,935	31,821	31,836	31,846	31,837
Reduction in Energy Consumption from No-Build (Million Btu)						
Regional Single-Occupancy Vehicle	N/A	-73,836	-84,636	36,362	-29,799	47,054
Study Area Single-Occupancy Vehicle	N/A	-2,286	-12,960	-11,533	-10,586	-11,500
Regional Buses	N/A	785	-900	387	-317	500
Study Area Buses	N/A	-24	-138	-123	-113	-122

SOURCE: Data from URBEMIS2007; based on VMT in the *Transportation/Traffic Technical Background Report*.

a. VMTs for the No-Build and TSM Alternatives were taken from the URBEMIS outputs generated for operational emissions of each alternative. To derive energy consumptions, 52.5 percent of total daily VMTs were assumed for passenger vehicles and 0.2 percent of total daily VMTs were assumed for buses for each alternative, based on percent fleet mix identified in URBEMIS (URBEMIS, Version 9.2.4).

The greatest reduction in both single-occupancy vehicle energy consumption and bus energy consumption would result from implementation of LRT Alternative 1, with an estimated annual reduction of 12,960 million Btu from single-occupancy vehicles and an estimated annual reduction of 138 million Btu from buses.

When the focus is expanded to include all of Los Angeles County, LRT Alternative 1 and LRT Alternative 3 would cause an annual reduction in energy consumption for single-occupancy vehicles and buses and LRT Alternative 2 and LRT Alternative 4 would cause an increase in energy consumption in both transportation modes. The greatest regional reduction would result from implementation of LRT Alternative 1, with an estimated annual reduction of 8,436 million Btu from single-occupancy vehicles and an estimated annual reduction of 900 million Btu from buses. The greatest regional increase would result from implementation of LRT Alternative 4, with an estimated annual increase of 47,054 million Btu from single-occupancy vehicles and an estimated annual increase of 500 million Btu from buses.

Relative to the total energy consumed in the transportation sector, the difference in energy use between the two alternatives is slight. California's annual transportation-related energy use was 3,199,591 billion Btu (Table 2-2 [Energy Consumption in California by Sector, 2004]) in 2004. The LRT Alternatives would consume between 40 billion and 44 billion Btu annually, and would require less than one thousandth (0.001) of a percent of the State's current transportation-related energy consumption. The Metro's existing rail lines, which include the Gold, Blue, and Green light-rail lines as well as the Red and Purple subways, required 587,951 million Btu for operation throughout 2007, or 11,307 million Btu of energy each week. Operation of the LRT Alternatives would increase Metro's energy consumption by ~~6.6~~5.6 to 7.~~5~~ 4 percent, depending on the alternative selected.

As shown in Table 4-1 (Annual Operational Energy Consumption for Project Alternatives [Regional and Expo Phase 2 Study Area]), implementation of the LRT Alternatives would result in an overall reduction in total single-passenger vehicle and bus energy consumption within the study area. The LRT Alternatives would result in less energy consumption than baseline conditions and, as such, would result in a beneficial energy impact. In any event, energy usage under the LRT Alternatives would not be considered wasteful or inefficient as more people would be moved through the transportation system. This would be a ***beneficial*** impact that would occur with implementation of any of the LRT Alternatives.

FEIR Design Options

Development of the Sepulveda Grade Separation, Colorado Parking Retention, Colorado/4th Parallel Platform and South Side Parking, Maintenance Facility Buffer, or Expo/Westwood Station No Parking design options would not be anticipated to affect the daily operations of the proposed alignment, nor increase/decrease traffic volumes. As such, no change in energy consumption beyond that discussed above for the LRT Alternatives is anticipated, and impacts would remain ***beneficial***.

CEQA Determination

No Impact. There would be roadway and transit service improvements associated with the No-Build Alternative. As part of the No-Build Alternative, the I-405 Widening project would propose the installation of HOV lanes which would improve traffic flow thereby reducing energy consumption along the I-405. In addition, the No-Build Alternative would modify the bus fleet to

increase the percentage of CNG buses. As a result, the No-Build Alternative would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy. Therefore, ***no impact*** would occur with respect to energy consumption.

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. The TSM Alternative results in a reduction of VMT and VHT in the County, and thus would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy. Therefore, ***no impact*** would occur with respect to energy consumption.

Beneficial Impact. Implementation of the LRT Alternatives would result in an overall reduction in total single-occupancy vehicle and bus energy consumption within the study area. The LRT Alternatives would result in less energy consumption than baseline conditions and, as such, would result in a beneficial energy impact. In any event, energy usage under the LRT Alternatives would not be considered wasteful or inefficient as more people would be moved through the transportation system. This would be a ***beneficial*** impact that would occur with implementation of any of the LRT Alternatives.

Criterion	**Would the project result in a substantial increase in demand upon existing energy sources such that the capacity to provide the energy is approached or exceeded and or require substantial additional capacity or the development of new energy sources?**

Impact ENG-2 **The proposed project would not result in a substantial increase in demand upon existing energy sources such that the capacity to provide the energy is approached or exceeded and/or require substantial additional capacity or the development of new energy sources; therefore, the proposed project would result in *no adverse effect*.**

No-Build Alternative

There would be roadway and transit service improvements associated with the No-Build Alternative. These improvements include HOV lanes along the I-405 and improvements to the various bus fleet operations and expansion of rail service throughout the Los Angeles basin to reduce overall energy consumption. As a result, there would be a ***no adverse effect*** on the demand for existing energy sources.

Transportation System Management

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. These improvements would reduce overall energy consumption. As a result, there would be a ***no adverse effect*** on the demand for existing energy sources.

LRT Alternatives

Electricity is a “reactive” utility, meaning it is provided on an as-needed basis to customers within existing structures in the City. Operation of the LRVs, stations, maintenance facility, and

other supporting elements would be powered by electricity commercially available through LADWP and SCE. Metro is an existing customer of SCE and LADWP and the current service would be expanded to include the proposed project. Will-serve letters from both LADWP and SCE are included in Appendix A (Will Serve Letters SCE and LADWP). Construction-related energy consumption would occur during demolition of existing tracks and structures, as well as the subsequent construction of alignment and stations (at-grade and aerial), and operational structures. Construction is assumed to begin in 2010. Due to the size of the proposed project, construction could potentially create a substantial demand on fossil fuel, specifically diesel. In accordance with Metro's Energy and Sustainability Policy, the Expo Authority would require the construction contractor to implement energy conserving Best Management Practices (BMPs). In addition, *Metro Design Criteria* (January 2007) identify the use of energy resources as a necessary requirement during the construction of the proposed project. Unnecessary idling of internal combustion engines is regulated by the South Coast Air Quality Management District to minimize harmful emissions (refer *Air Quality Technical Background Report*).

Implementation of the LRT Alternatives would increase Metro's energy consumption by ~~6~~5.6 to 7.~~5~~ 4 percent, depending on the alternative selected. Although LRT services and station operations would consume energy, Metro's Energy and Sustainability Policy would be followed, which would serve to reduce Metro's use of fossil fuels through the use of ambient and renewable energy sources. As shown in Table 4-2 (LRT Alternatives Annual Operational Energy Consumption), the smallest increase of energy consumption associated with implementation of any of the LRT Alternatives would occur under LRT Alternative 1 and LRT Alternative 2. The LRT Alternatives with Segment 1 (LRT Alternative 1 and LRT Alternative 2) would have less energy demand largely because of the shorter length of the line (6.6 miles), as compared to the LRT Alternatives with Segment 1a (LRT Alternative 3 and LRT Alternative 4) at 7.5 miles. With a higher proportion of street running which travels at slower speeds and thus takes longer, the Colorado Alternatives (LRT Alternative 2 and LRT Alternative 4) require an additional train set and thus have higher operating energy needs when compared to the alternatives using Olympic. In addition, the variations in the feeder bus services also contribute to some of the energy demand differential between the alternatives.

Table 4-2 LRT Alternatives Annual Operational Energy Consumption

LRT Alternative	Annual Trips	Trip Length (miles)	Annual LRV VMT (miles)	Energy Consumed (Million Btu)
LRT 1: Expo ROW–Olympic	92,768	6.6	612,269	38,449
LRT 2: Expo ROW–Colorado	92,768	6.6	612,269	38,449
LRT 3: Venice/Sepulveda–Olympic	92,768	7.5	695,760	43,692
LRT 4: Venice/Sepulveda–Colorado	92,768	7.5	695,760	43,692

SOURCE: PBS&J 2008.

Energy consumption was derived by calculating overall VMT for the LRT Alternatives based on the overall length of the Alternative and converting the VMT into Btu. Light-rail vehicles (LRVs) operate at an average energy consumption rate of 62,797 Btu per vehicle mile in this case, the V of VMT refers to a train, without qualifiers to the number of cars..

As shown in Table 4-1 (Annual Operational Energy Consumption for Project Alternatives [Regional and Expo Phase 2 Study Area]), implementation of the LRT Alternatives would result in an overall reduction in total single-occupancy vehicle and bus energy consumption within the

study area. The increased electricity energy demand of the LRT Alternatives would be met by LADWP and SCE, as they would be able to provide the electricity required to operate the proposed alternatives while still providing adequate service to current customers. As a result, there would be ***no adverse effect***.

FEIR Design Options

Development of the Sepulveda Grade Separation, Colorado Parking Retention, Colorado/4th Parallel Platform and South Side Parking, Maintenance Facility Buffer, or Expo/Westwood Station No Parking design options would not result in an increase in energy consumption. Further, as the proposed design improvements would not be anticipated to affect the daily operations of the proposed alignment, nor increase/decrease traffic volumes. As such, no change in energy consumption beyond that discussed above for the LRT Alternatives is anticipated, and impacts would remain ***less than significant***.

CEQA Determination

Less-Than-Significant Impact. There would be roadway and transit service improvements associated with the No-Build Alternative. These improvements include HOV lanes along the I-405 and improvements to the various bus fleet operations and expansion of rail service throughout the Los Angeles basin to reduce overall energy consumption. As a result, there would be a ***less-than-significant*** impact on the demand for existing energy sources.

The TSM Alternative would include all of the improvements under the No-Build Alternative and new on-street bus services to directly serve the Expo Phase 2 community transit needs. Those additional improvements would include minor physical modifications such as upgraded bus stops and additional buses. These improvements would reduce overall energy consumption. As a result, there would be a ***less-than-significant*** impact on the demand for existing energy sources.

Implementation of the LRT Alternatives would result in an overall reduction in total single-occupancy vehicle and bus energy consumption within the study area. The increased electricity energy demand of the LRT Alternatives would be met by LADWP and SCE, as they would be able to provide the electricity required to operate the proposed alternatives while still providing adequate service to current customers. This would be a ***less-than-significant*** impact.

4.4 Cumulative Impacts

The LRT Alternatives would not lead to a wasteful, inefficient, or unnecessary usage of fuel or energy, and would not result in a substantial increase in demand upon existing energy sources such that substantial additional capacity or the development of new energy sources is required.

The LRT Alternatives would augment the existing public transit system, would provide additional public transit mobility options, and would help to offset increased demand for energy from single-occupancy vehicles. While the LRT Alternatives would increase Metro's energy needs by no more than 7.~~3~~ 4 percent, on a regional basis, this increase would be offset by reduction of energy consumed by single-passenger vehicles and buses. Energy usage under the LRT Alternatives would not be considered wasteful or inefficient as more people would be moved through the transportation system. In addition, the LRT Alternatives incorporate numerous energy-conserving elements from Metro's Energy and Sustainability Policy. Other existing,

proposed, and reasonably foreseeable development projects are subject to Title 24 and approval by local jurisdictions, which have the authority to impose energy conservation measures.

Existing, proposed, and reasonably foreseeable development could combine with the proposed LRT Alternatives to result in an increase in demand upon existing energy sources. As a result, the capacity to provide the energy could be approached or exceeded and/or substantial additional capacity, or the development of new energy sources, may be required. However, fuels consumed during operational phases for development projects are widely available in commercial markets. The LRT Alternatives would consume between 40 billion and 44 billion Btu annually, while California's annual transportation-related energy use was 3,199,591 billion Btu in 2004. Therefore, operation of the LRT Alternatives would require a small fraction of the state's current transportation-related energy consumption. Given this and the reduction in single-occupancy vehicle and bus VMT, the contribution of the LRT Alternatives to cumulative energy demand would be less than cumulatively considerable and the cumulative impact would be ***no adverse cumulative effect***.

5. REFERENCES

California Energy Commission (CEC). 2007. http://www.energy.ca.gov/ (accessed on September 25, 2007.)

———. 2007. *California Energy Demand 2008-2018. Staff Revised Forecast*: CEC-200-2007-015-SF. Pg. 13, October.

Energy Information Administration (EIA). 2007. http://www.eia.doe.gov/ (accessed in September, 2007.)

Federal Highway Administration. 2005. *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*. Office of Legislation and Intergovernmental Affairs, August 25.

Santa Monica, City of. 2001. Santa Monica Sustainable City Program. http://www.smgov.net/epd/ (accessed January 28, 2008).

Southern California Association of Governments (SCAG). 2008. Draft 2008 Regional Transportation Plan Program Environmental Impact Report. Section 3.5, Page 16, January.