

## 4.16 ENERGY

As part of the Placer Parkway Tier 1 Environmental Impact Statement/Environmental Impact Report (EIS/EIR), an evaluation of potential energy impacts was performed. This evaluation considered the potential changes in energy use associated with changes in traffic patterns in the study area resulting from the Parkway. The primary energy demand associated with the Parkway will be vehicle fuel. Vehicle fuel efficiency standards are controlled by the federal and state governments (see below).

### 4.16.1 REGULATORY SETTING

Energy consumption is regulated through federal and state government agencies via a number of policies and programs. At the federal level, the U.S. Environmental Protection Agency (U.S. EPA), the U.S. Department of Energy (USDOE), and the U.S. Department of Transportation (USDOT) all have roles and responsibilities in the regulation of energy consumption.

At the state level, the three key energy agencies responsible for energy in California—the California Energy Commission (CEC), the California Power Authority (CPA), and the California Public Utilities Commission (CPUC)—have adopted an Energy Action Plan (EAP) (CEC and PUC, 2005), which lists joint goals for California's energy future and sets forth a commitment to achieve those goals through specific actions.

Both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require consideration of impacts associated with energy use. A general discussion of NEPA and CEQA requirements is provided in Chapter 1 of this Tier 1 EIS/EIR.

### 4.16.2 AFFECTED ENVIRONMENT

Existing energy consumption in the study area is associated primarily with residential and commercial use, transportation, and construction of new development.

### 4.16.3 IMPACT ANALYSIS

#### 4.16.3.1 Methodology for Impact Evaluation

##### Construction of Placer Parkway

Energy is consumed both directly and indirectly during project construction. Direct energy consumption includes the energy used to operate construction machinery, provide construction lighting, and produce and transport materials. Most of this energy is in the form of petroleum. Indirect energy consumption includes activities such as manufacturing and maintaining construction equipment and the energy consumed by workers commuting to the project site. At the Tier 1 level of analysis when no Parkway alignment has been selected, there is not sufficient detail available on the construction schedule or equipment to calculate construction energy use at this time. Therefore, for this Tier 1 EIS/EIR an estimate of energy use during construction is not provided.

##### Operation of Placer Parkway

Operational energy consumption impacts were evaluated by quantitatively comparing vehicle energy consumption among alternatives. Energy consumption rates for vehicles operating a roadway can be differentiated by comparing changes in traffic operations measured by vehicle miles traveled (VMT) and changes in traffic speed throughout the study area. Fuel consumption is proportional to distance traveled and decreases as speed increases up to about 40 miles (60 kilometers) per hour. Fuel consumption increases as speed increases above that point (U.S. Department of Transportation, 1980). Energy consumption estimates for roadway

traffic within the study area are based on the Transportation Technical Report (DKS Associates, 2007). Net changes in overall energy use by roadway vehicles are assessed by using daily VMT and average speed values calculated from the transportation forecasting model for each alternative. Energy consumption was calculated by multiplying daily VMT by the appropriate fuel consumption rate for the average speed. Ongoing roadway maintenance consumes energy. The California Department of Transportation (Caltrans) estimates that maintenance activities for urban freeways consume approximately 170 million British thermal units per lane mile per year (Caltrans, 1983). Because this value is less than 1 percent of the energy consumption of vehicles traveling over the roadway, it is not included in the comparison of alternatives in this study.

#### **4.16.3.2 Evaluation Criteria**

For the proposed project, potential impacts related to energy use have been evaluated on a preliminary basis, using the evaluation criteria listed below:

- Potential energy impacts that may be associated with a proposed project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy
- Potential effects of the project on local and regional energy supplies and on requirements for additional capacity
- The project's projected transportation energy use requirements (fuel consumption)

#### **4.16.3.3 Direct Impacts**

##### **Existing Plus Project Conditions (2004)**

The Parkway transportation analysis includes a qualitative evaluation of existing conditions with the Parkway. This analysis concludes that under Existing Plus Project conditions, the Parkway build alternatives would result in similar but smaller changes in travel patterns in the Transportation Analysis Study Area (TASA) (see Transportation Technical Report [DKS Associates, 2007] for definition) than under 2020 conditions (described in the following section). These would include increased traffic volumes on some roadway segments near proposed interchanges, although these increases probably would be less than those under 2020 conditions. Traffic volumes would decrease on a larger number of local roadway segments in south Sutter County and southwestern Placer County. These decreases probably would be less than those under 2020 conditions.

If the project were added to existing conditions, energy use as a function of VMT would increase slightly. This increase would be at least partially offset by the reduction in travel under congested conditions. As the existing study area does not include any of the planned/proposed developments expected to be constructed in the future, under Existing Plus conditions the magnitude of reduction in congested travel will be lower than in 2020 and 2040.

##### **Future Analysis (2020) Conditions**

###### **No-Build Alternative**

Under the No-Build Alternative, Placer Parkway would not be constructed or operated and would not incur construction costs or result in the expenditure of any energy (see Section 2.3-1). There would not be any impacts associated with the use of energy under the No-Build Alternative.

### Parkway Build Alternatives – Construction

Construction costs for the Parkway build alternatives would vary slightly depending on the length of the alternative and the number of proposed interchanges included (Table 4.16-1).

**Table 4.16-1  
Length and Number of Interchanges Associated with  
Parkway Alternatives**

Alternative	Length in Miles	No. of Interchanges
No-Build	N/A	0
1	16.2	6
2	15.4	6
3	15.6	6
4	14.3	5
5	14.2	5

Energy would be consumed on a one-time basis during construction of any of the build alternatives to manufacture materials, transport materials, and operate construction equipment. All build alternatives would incur substantial energy consumption during consumption in comparison to the No-Build Alternative. Alternative 1, which has six interchanges and is 16.2 miles in length, would be expected to consume the greatest amount of energy during construction compared with other build alternatives. Alternative 5, which has five interchanges and is 14.2 miles in length, would consume the least.

With respect to the length of new roadway and associated transportation benefits in the study area, the Parkway will require a relatively short-term temporary investment of energy that will result in an overall benefit for energy consumption efficiency due to the reduced congestion that the project will afford. These values would not put substantial additional demand on energy sources or fuel availability in the region.

### Parkway Build Alternatives – Operation

Traffic is predicted to increase by the year 2020, independent of the Parkway. Vehicle fuel consumption dominates the total energy use for each alternative. Energy consumption resulting from daily vehicle operations in the affected area is presented for the No-Build Alternative and build alternatives for 2020 in Table 4.16-2.

In order to calculate the average gas mileage for all new vehicles sold within a calendar year, the National Highway Traffic Safety Administration (NHTSA) uses a calculation called Corporate Average Fuel Economy (CAFE). This essentially takes the U.S. EPA estimated gas mileage for each make and model sold and weights that estimated gas mileage against the total number of vehicles sold during that year.

According to NHTSA, the average gas mileage for new vehicles sold in the United States was 24.7 miles per gallon (mpg) in 2004. This represents an increase in fuel efficiency of slightly less than 7 percent since 1980, when average gas mileage was 23.1 mpg. Table 4.16-2 shows estimated average fuel consumption for Parkway alternatives using this gas mileage estimate.

The relative energy efficiency of a transportation network is dependent, among other factors, on the speed of traffic and any congestion. Faster, uniform vehicle speeds are generally more fuel-efficient than

**Table 4.16-2  
Estimated Energy Consumption Associated with VMT  
for the Build Alternatives in Transportation Analysis Study Area (2020)**

<b>Alternative</b>	<b>Daily VMT in TASA (Freeways and Arterials)</b>	<b>Estimated Fuel Consumption (Gallons) (2020)</b>
No-Build	17,725,900	717,647
1	17,846,974	722,457
2	17,875,272	723,695
3	17,888,226	724,219
4	17,871,573	723,545
5	17,874,270	723,591

Source: DKS Associates, 2007

All VMT data excludes the effect of a potential future interchange with a Watt Avenue Extension as the effect on daily VMT of this interchange is similar for all build alternatives and adds less than 0.5 percent total VMT.

The analysis does not differentiate between trucks and passenger vehicles, numbers of which are not assumed to differ substantially between alternatives

Calculations do not reflect changes in average mpg by 2020, which are not expected to differ substantially between alternatives.

Calculations do not reflect potential congestion that would be expected under the No-Build Alternative, which would result in decreased fuel efficiency if VMT were at slower speeds.

slower, stop-and-go congestion. An uncongested roadway operating at a high Level of Service (LOS) will conserve energy use per vehicle using the system in comparison to a congested facility. Analysis of energy consumption in the form of gasoline use and traffic flow efficiency in terms of passenger miles traveled for the build alternatives in comparison to the No-Build Alternative therefore reflects the operating efficiency of the transportation system. As the Parkway would be expected to reduce overall congestion in the study area, it would result in more efficient traffic flow on a more energy-efficient roadway in comparison to the No-Build Alternative, as the VMT traveled under the No-Build Alternative would be on more congested roadways than would occur under the build alternatives. This is demonstrated in the Transportation Technical Report (DKS Associates, 2007), which shows that, compared with the No-Build Alternative, the Parkway build alternatives would decrease traffic on many arterial/collector roadway segments in the study area.

During roadway operation, lighting and traffic signals consume energy in the form of electricity. This would not be expected to differ substantially between any of the Parkway build alternatives. The existing electricity grid is expected to have sufficient capacity to service the project's operational electricity demand.

#### **4.16.3.4 Comparison of Alternatives**

Table 4.16-2 illustrates that estimated fuel consumption does not differ substantially between build alternatives or between the No-Build Alternative and the build alternatives. The operational fuel consumption of Alternative 3, which has the greatest VMT of all build alternatives and therefore the greatest fuel consumption, is only 0.9 percent greater than that of the No-Build Alternative. This is because VMT does not increase substantially for any of the Parkway build alternatives in comparison to the No-Build Alternative. Furthermore, this Tier 1 analysis does not take into account the reduction in fuel use due to substantial reduction in congestion associated with all build alternatives; energy use under the build alternatives probably is overstated compared with the No-Build Alternative.

#### 4.16.3.5 Secondary and Indirect Impacts

The Parkway is not expected to result in any secondary and indirect energy-related impacts. Although the manufacturing and maintenance of vehicles consume energy, the construction and operation of any of the Parkway build alternatives are not anticipated to affect vehicle purchasing or maintenance decisions made by drivers and/or residents or business in the study area. Potential secondary and indirect impacts associated with growth are discussed in Section 6.1, Growth.

#### 4.16.3.6 Cumulative Impacts

Under the No-Build Alternative (see Section 2.3-1), Placer Parkway would not be constructed or operated and would not incur construction costs or result in the expenditure of any energy. There would not be any cumulative impacts associated with the use of energy under the No-Build Alternative.

Energy consumption associated with the construction of any of the Parkway build alternatives is not expected to make cumulatively considerable contribution to energy consumption. The Parkway will require a relatively short-term temporary investment of energy that will result in an overall benefit for energy consumption efficiency due to the reduced congestion that the project will afford. The construction of the Parkway is not expected to overlap with most of the proposed and planned development in the study area, as the majority of such projects either will be constructed before 2020 or will be constructed between 2020 and 2040, so that the number of projects under construction at the same time is not expected to have an adverse effect on energy sources or fuel availability in the region.

Table 4.16-3 illustrates that estimated fuel consumption does not differ substantially between build alternatives or between the No-Build Alternative and the build alternatives in 2040. The operational fuel consumption of Alternative 3, which has the greatest VMT of all build alternatives and therefore the greatest fuel consumption, is only approximately 1.9 percent greater than that of the No-Build Alternative. This is because VMT does not increase substantially for any of the Parkway build alternatives in comparison to the No-Build Alternative.

**Table 4.16-3**  
**Estimated Energy Consumption Associated with VMT**  
**for the Build Alternatives in Transportation Analysis Study Area (2040)**

Alternative	Daily VMT in TASA (Freeways and Arterials)	Estimated Fuel Consumption (Gallons) (2020)
No-Build	25,983,131	1,051,948
1	26,424,662	1,069,824
2	26,477,729	1,071,972
3	26,488,169	1,072,395
4	26,482,450	1,072,163
5	26,461,066	1,071,298

Source: DKS Associates, 2007

All VMT data excludes the effect of a potential future interchange with a Watt Avenue Extension as the effect on daily VMT of this interchange is similar for all build alternatives and adds less than 0.5 percent total VMT.

The analysis does not differentiate between trucks and passenger vehicles, numbers of which are not assumed to differ substantially between alternatives.

Calculations do not reflect changes in average mpg by 2040, which are not expected to differ substantially between alternatives.

Calculations do not reflect potential congestion that would be expected under the No-Build Alternative, which would result in decreased fuel efficiency if VMT were at slower speeds.

As the Parkway would be expected to reduce overall congestion in the study area, it would result in more efficient traffic flow on a more energy-efficient roadway in comparison to the No-Build Alternative, assuming that the VMT traveled under the No-Build Alternative is on more congested roadways than would occur under the build alternatives. Therefore, the Parkway would not make any contribution to cumulative energy impacts during operation.

#### **4.16.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

Measures to reduce energy consumption during construction could include limiting the idling of construction equipment and employee vehicles, encouraging carpooling or van pools among construction workers, and locating construction staging areas as close as possible to work sites. Any transportation control measures to reduce traffic volumes and congestion also would decrease energy consumption.

#### **4.16.5 TIER 2 STUDIES**

Additional analysis will be undertaken to evaluate potential energy impacts at the Tier 2 level. These would include:

- Detailed evaluation of energy consumption based on vehicle use of the Parkway by vehicle type (trucks and cars).
- An evaluation of potential measures that could be implemented in the design, construction, operation, and maintenance of the Parkway in order to reduce wasteful, inefficient, and unnecessary consumption of energy, including an explanation of why measures are incorporated in the project and which measures were dismissed.
- An evaluation of ways to utilize new energy-efficient technologies, including alternative fuels, in the maintenance of the Parkway.