2.2.8 Energy

This section evaluates potential energy impacts that could result from operation of the Tier I Corridor Alternatives and Tier II Auxiliary Lane Alternative. Energy impacts that could occur during project construction are discussed in Section 2.4, and cumulative impacts are discussed in Section 2.5.

Regulatory Setting

The National Environmental Policy Act (42 United States Code Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act Guidelines, Appendix F, Energy Conservation, state that an Environmental Impact Report is required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Affected Environment

The information in this section is derived from the proposed project's *Technical Memorandum on Energy Impacts* (2011).

Route 1, within the Tier I and Tier II project limits, is heavily traveled and congested in the northbound direction in the morning and southbound direction during the evening commute. The level of service in both directions during these peak periods is Level of Service F, reflecting congested, stop-and-go conditions. Recurrent congestion contributes to inefficient energy consumption as vehicles use extra fuel while idling and accelerating in stop-and-go traffic or moving at slow speeds.

Environmental Consequences

Tier I Corridor Alternatives

Because the effect of the proposed project in the context of the countywide travel model is too small to demonstrate energy impacts, in accordance with Caltrans' Standard Environmental Reference Guidelines, a qualitative energy analysis was conducted for the Tier I Corridor Alternatives and is reported in the *Technical Memorandum on Energy Impacts* (2011).

Tier I Corridor HOV Lane Alternative

The Tier I Corridor HOV Lane Alternative would improve average travel speeds and reduce average travel times during both morning and evening peak hours compared to the No Build Alternative. When compared to the No Build Alternative, the Tier I Corridor HOV Lane Alternative would reduce delay by 89 percent (northbound) and 88 percent (southbound)

during the morning peak hour, and it would reduce delay by 84 percent (northbound) and 82 percent (southbound) during the afternoon peak hour (Traffic Operations Report, 2012). Freeway operational improvements also would reduce the number of vehicles taking circuitous routes using local streets to avoid freeway bottlenecks. Improved operations are likely to reduce vehicle energy use, whether in the form of petroleum fuels or alternative energy sources. For these reasons, the HOV Lane Alternative is anticipated to have a beneficial effect on energy use compared to the No Build Alternative.

The Tier I Corridor HOV Lane Alternative would offer dedicated peak-hour capacity and nearly free-flow conditions to transit and carpool vehicles compared to stop-and-go conditions under the No Build Alternative. Transit travel times would be reduced, and transit schedule reliability would be improved. A transit market study conducted for this project shows that these improvements would act as incentives for commuters to take advantage of restored or increased local and express bus services. Shifting single-occupant automobile commuters into carpools and transit also would mean energy savings. This information is based on the Traffic Market Analysis prepared for this project (2008).

In sum, improvements in traffic operations under the Tier I Corridor HOV Lane Alternative would reduce operating energy use, whether in the form of petroleum fuels or alternative sources, compared to higher fuel consumption under the No Build Alternative. Construction of proposed pedestrian and bicycle overcrossings would also reduce some vehicle trips, although this trip reduction would not have measurable energy effects.

When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the Tier I Corridor HOV Lane Alternative is anticipated to have a slightly beneficial effect on direct energy use compared to the No Build Alternative.

Tier I Corridor TSM Alternative

The Tier I Corridor TSM Alternative would have a minimal effect in reducing energy consumption. Auxiliary lanes and ramp metering alone would improve operational conditions, but the overall travel benefits would be much less than under the Tier I Corridor HOV Lane Alternative, which also includes auxiliary lanes and ramp metering. When compared to the No Build Alternative, the Tier I Corridor TSM Lane Alternative would reduce delay by 54 percent (northbound) and 89 percent (southbound) during the morning peak hour, and it would reduce delay by 24 percent (northbound) and would increase delay by 2 percent (southbound) direction during the afternoon peak hour (Traffic Operations Report, 2012). Construction of proposed pedestrian and bicycle overcrossings would also reduce some vehicle trips, although this trip reduction would not have measurable energy effects. The transit market study conducted for this project shows that while the TSM Alternative would improve conditions for transit, transit ridership would not increase enough

over the No Build Alternative to affect energy consumption. When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the TSM Alternative would not have substantial energy impacts or substantially affect energy consumption.

Tier II Auxiliary Lane Alternative

The Tier II Auxiliary Lane Alternative would have a minimal effect in reducing energy consumption because improvements proposed under this alternative would not entirely relieve traffic congestion. Construction of the Chanticleer Avenue pedestrian/bicycle overcrossing may also reduce some vehicle trips, although this trip reduction would not have measurable energy effects. When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the Tier II Auxiliary Lane Alternative would not have substantial energy impacts or substantially affect energy consumption.

No Build Alternative

The No Build Alternative under the Tier I and Tier II alternatives would not offer any energy benefits.

Avoidance, Minimization, and/or Mitigation Measures

Tier I Corridor Alternatives and Tier II Auxiliary Lane Alternative

Because the effect of the project alternatives on energy consumption would be either neutral or beneficial compared to the No Build Alternative, no minimization or mitigation measures are proposed for the Tier II Auxiliary Lane Alternative or are anticipated under either of the Tier I Corridor Alternatives.

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