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4.15 Energy

Energy resources would be affected by the proposed Valley Highway Project in several ways. The primary energy consideration is the use of petroleum and other fuels to power vehicles using and maintaining the corridor's transportation facilities. Other energy considerations include increases in electrical energy use associated with project operational features, such as traffic signals and lights, as well as increased energy use associated with construction activities under each of the system alternatives, which include System Alternative 1, 2, 3, and the Preferred Alternative.

4.15.1 Current Conditions

The project corridor is an existing major transportation facility. Current conditions consist of major limited access highways, the connections of these highways to local streets, and portions of local streets. These facilities are already heavily used and consequently represent a substantial consumer of energy. However, the transportation facilities considered in this EIS represent only a very small portion of the Metro Denver transportation system.

During peak traffic hours, traffic congestion leads to inefficient consumption of energy by vehicles within the project area. In addition, traffic at the Santa Fe Drive/Kalamath Street railroad crossing is idled several times each day by local and through-train traffic, increasing fuel consumption. In contrast, periods when traffic is not congested lead to more efficient energy consumption by vehicles. Transit facilities operated by RTD in the project area provide an alternative transportation mode, reducing commuter's reliance on private vehicles, providing a more efficient use of energy consumption.

The project area includes a number of traffic signals and streetlights. These features represent a relatively minor consumption of electricity in the Denver region and are not a burden on the electrical infrastructure.

4.15.2 Consequences of the Alternatives

4.15.2.1 No Action Alternative

Impacts to energy resources under the No Action Alternative would be similar to impacts occurring under current conditions (see **Section 4.15.1**). The same basic transportation facilities would be available in the corridor. Vehicle miles of travel in the corridor would increase over time, leading to increased traffic congestion. This, in turn, would result in even less efficient fuel use by all vehicles in the project corridor during peak periods. Some planned improvements to corridor roads would be made in the future, but none is expected to significantly reduce traffic congestion during peak periods.

Under the No Action Alternative, traffic at the Santa Fe Drive/Kalamath Street railroad crossing would continue to be delayed several times each day by local and through-train rail traffic.

Because of the lack of changes under this alternative, signal and streetlight requirements are not expected to differ greatly from existing conditions. Since no new construction would occur under this alternative, there would be no construction-related energy impacts.

4.15.2.2 SYSTEM ALTERNATIVE 1

The alignment of many corridor roads under System Alternative 1 would resemble existing roadway conditions, but future traffic congestion would be reduced relative to the No Action Alternative. The number of through lanes on I-25 would be increased and travel time by vehicles in the corridor would be reduced. More vehicles could use the project highways in a given period, but each vehicle would use less fuel than under the No Action Alternative.

Santa Fe Drive and Kalamath Street would pass under the railroad, which would eliminate idling associated with rail traffic. This would represent an improvement in energy use over the No Action Alternative. Other energy use by vehicles on the project streets is not likely to differ greatly from the No Action Alternative.

System Alternative 1 would not produce major changes in signal and streetlight features in the project area. Some features might be removed or added, but in the aggregate, these features and their energy use should be similar to the No Action Alternative. Construction associated with System Alternative 1 would increase energy consumption over the short-term when compared with the No Action Alternative, but this would be balanced by the long-term per-vehicle energy savings in the corridor associated with improved traffic flow under this alternative.

4.15.2.3 SYSTEM ALTERNATIVE 2

In comparison with the No Action Alternative, overall per-vehicle energy consumption during peak traffic periods would be reduced under System Alternative 2 via improved traffic flow. Energy resource impacts under this alternative would be similar to impacts under System Alternative 1. A number of improvements overlap between the system alternatives, so the differences would not be great. For most project highways and streets, System Alternative 2 also would provide similar benefits to those under System Alternative 1.

As under System Alternatives 1 (and 3), Santa Fe Drive and Kalamath Street would pass under the railroad, which would eliminate idling vehicles at the current railroad crossing, resulting in more efficient energy use than compared with the No Action Alternative. In comparison to both System Alternative 1 and the No Action Alternative, this alternative would also reduce energy use at the Alameda Avenue/Santa Fe Drive intersection through construction of an overpass that would eliminate a point of traffic congestion in the area. Other energy use by vehicles on project streets is not likely to differ greatly from that under the No Action Alternative or System Alternative 1, since streets would not be improved under this alternative.

System Alternative 2 would not produce major changes in signal and streetlight features in the project area. Some features might be removed or added, but in the aggregate, these features and their energy use should be similar to those under the No Action Alternative and System Alternative 1. Short-term indirect energy consumption from construction associated with System Alternative 2 would be greater than under System Alternative 1, due to construction of the Alameda Avenue/Santa Fe Drive overpass; however, this consumption would be offset by the long-term per-vehicle energy savings in the corridor from improved traffic flow associated with this improvement.

4.15.2.4 SYSTEM ALTERNATIVE 3

Energy resource impacts from System Alternative 3 would be similar to System Alternatives 1 and 2. A number of the improvements overlap between the system alternatives, so the differences would not be great. Overall per-vehicle energy consumption during peak traffic periods would be reduced with System Alternative 3 in comparison to the No Action Alternative, due to improved traffic flow. For most project highways and streets, System Alternative 3 would provide benefits similar to those under System Alternatives 1 and 2.

As under the other system alternatives, Santa Fe Drive and Kalamath Street would pass under the railroad, which would eliminate idling vehicles at the current railroad crossing, representing an energy improvement when compared to the No Action Alternative. In comparison to System Alternative 1, System Alternative 3 would reduce energy use at the Alameda Avenue/Santa Fe Drive intersection through construction of an underpass that would eliminate a point of traffic congestion. Other energy use by vehicles on project streets is not likely to differ greatly from the No Action Alternative or the other system alternatives because the streets would not be improved by System Alternative 3.

System Alternative 3 would not produce major changes in the signal and streetlight features. Some features may be removed or added, but in the aggregate, these features and their energy use should be similar to the No Action Alternative and other system alternatives. Indirect energy consumption due to construction of System Alternative 3 would be greater than System Alternatives 1 and 2 because of the Alameda Avenue/Santa Fe Drive underpass, but this would be offset relative to System Alternative 1 by the per-vehicle energy savings in the corridor if System Alternative 3 is built.

4.15.2.5 PREFERRED ALTERNATIVE

Energy resource impacts from the Preferred Alternative would be similar to System Alternatives 1, 2, and 3. The alignment of many corridor roads under the Preferred Alternative would resemble existing roadway conditions, but future traffic congestion would be reduced relative to the No Action Alternative. The number of through lanes on I-25 would be increased and travel time by vehicles in the corridor would be reduced. More vehicles could use the project highways in a given period, but each vehicle would use less fuel than under the No Action Alternative.

Santa Fe Drive and Kalamath Street would pass under the railroad, which would eliminate idling associated with rail traffic. This would represent an improvement in energy use over the No Action Alternative. Other energy use by vehicles on the project streets is not likely to differ greatly from the No Action Alternative.

The Preferred Alternative would not produce major changes in signal and streetlight features in the project area. Some features might be removed or added, but in the aggregate, these features and their energy use should be similar to the No Action Alternative. Construction associated with the Preferred Alternative would increase energy consumption over the short-term when compared with the No Action Alternative, but this would be balanced by the long-term per-vehicle energy savings in the corridor associated with improved traffic flow under this alternative.

4.15.3 Mitigation Measures

The system alternatives, including the Preferred Alternative, would not control the number of drivers accessing a public highway like I-25, but all would be likely to reduce the per-vehicle energy use relative to the No Action Alternative. No significant impacts to energy resources are anticipated under any of the system alternatives; therefore, no mitigation measures are necessary.

A variety of energy-saving measures may be available to minimize energy use under any alternative. During final design, measures will be considered to reduce long-term energy use within the corridor by planning for energy efficiency. These measures may include:

- energy-efficient light bulbs in signals and lights
- more durable pavement to minimize the frequency of maintenance-induced traffic delays and material consumption
- use of recycled materials, wherever practicable, to increase energy efficiency

Additional mitigation measures may be developed during final design, as appropriate. Additional discussion on sustainable construction and designs is provided in **Section 4.17** *Irreversible and Irretrievable Commitments of Resources*.