

3.19 UTILITIES

3.19.1 Studies and Coordination

3.19.1.1 Approach to Analyses

Major utility installations, such as City of Seattle water transmission lines from the Tolt and Cedar River watersheds and Puget Sound Energy (PSE) and Seattle City Light power transmission towers, are factors in the evaluation of the corridor alternatives. Existing major utilities have been identified throughout the study area from agency GIS information. This information was compared to maps of improvements proposed under each alternative, and areas of potential conflict were identified.

Consideration was given to the type of work proposed, particularly on the arterials, to distinguish between improvements requiring excavation, such as pavement widening and lane additions, and TDM measures restricted to restriping and/or new traffic control devices.

The utilities analyses in this section are based on the *I-405 Corridor Program Draft Utilities Expertise Report* (HNTB, 2001), herein incorporated by reference.

3.19.1.2 Coordination with Agencies and Jurisdictions

The primary data source on existing utilities located within the I-405 right-of-way is the WSDOT database of utility franchises and permits. Utility operators are required to secure either a franchise or a permit prior to locating an overhead cable or underground cable, pipe, or line inside the public right-of-way. These applications are reflected in the WSDOT listing.

Because of the limitations of using the WSDOT listings alone, GIS information in either electronic files or hard copy was collected from individual utilities to show exact facility locations and sizes, where these data were not shown with sufficient details in the WSDOT database.

Future planning is documented in municipal comprehensive plans generated under the state's Growth Management Act (GMA) and in some internal utility plans.

3.19.2 Methodology

3.19.2.1 Water and Sewer

Most of the water and sewer systems along the I-405 corridor are managed by municipalities. The cities with utility jurisdiction along the corridor include Tukwila, Renton, Seattle, Bellevue, Kirkland, Redmond, Woodinville, and Bothell. In each case, the public works departments have provided as-built and/or GIS information in electronic or hard copy. King County has a major sewer trunk line through the corridor, and GIS information and as-built information on it was collected.

For projections to the 2020 design year, each city's planning section was contacted to obtain available information on future infrastructure expansions.

3.19.2.2 Electric Power

PSE prepared hard copy maps showing locations of power lines 115 kilovolts and larger along the I-405 corridor. This information was converted to GIS. PSE maintains an internal planning document outlining future development.

The Snohomish Public Utility District provided a CAD drawing showing existing transmission and distribution line locations. The current 7-year plan and 20-year plan were reviewed for utility projects affected by I-405 corridor improvements.

3.19.2.3 Fuel Pipelines

Olympic Pipeline Company (OPLC) provided as-built plans and GIS of their fuel distribution facilities. Natural gas line locations were provided by PSE showing locations of high-pressure gas lines and smaller gas lines. The high-pressure gas lines along the I-405 corridor were entered into GIS.

3.19.3 Affected Environment

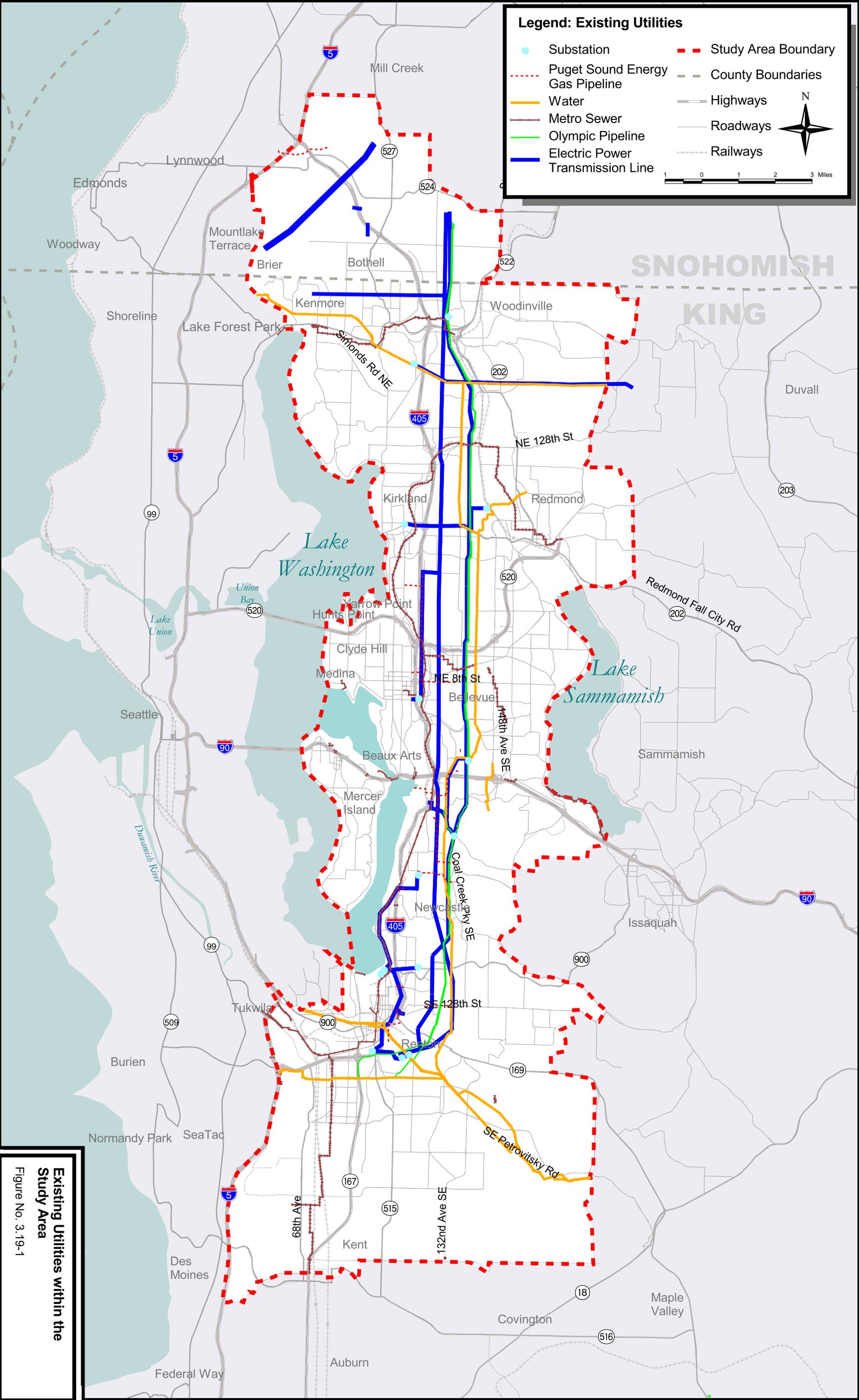
Major water, sanitary sewer, electric power, and fuel utilities are shown on Figure 3.19-1. A detailed identification of the utility segments that cross or are adjacent to portions of the study area where alternatives are being analyzed is included in the *I-405 Corridor Program Draft Utilities Expertise Report* (HNTB, 2001).

3.19.4 Impacts

The potential impacts of each alternative on utilities are summarized below for water pipelines of 36” and larger diameter, sewer lines of 48” and greater diameter, heavy electrical transmission lines (115 kv), and fuel pipelines (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4, respectively).

Table 3.19-1: Number of Major Water Pipelines Affected by Alternative

| Type of Improvement | No Action Alternative | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Preferred Alternative |
|--|-----------------------|------------------|--------------------------------------|---------------------|---------------------------|-----------------------|
| | | HCT/TDM Emphasis | Mixed Mode with HCT/Transit Emphasis | Mixed Mode Emphasis | General Capacity Emphasis | |
| Arterial Committed Projects | 3 | 3 | 3 | 3 | 3 | <u>3</u> |
| Arterial Interchange Improvements | 1 | 1 | 3 | 3 | 2 | <u>2</u> |
| Basic I-405 Improvements | <u>0</u> | 4 | 4 | 1 | 4 | <u>1</u> |
| High-Capacity Transit (Fixed-Guideway) | <u>0</u> | 3 | 3 | <u>0</u> | <u>0</u> | <u>0</u> |
| Park-and-Rides | <u>0</u> | 2 | 2 | 2 | 2 | <u>2</u> |
| Transit Centers | <u>0</u> | 1 | 1 | 1 | <u>0</u> | <u>1</u> |
| I-405 General Purpose Lanes | <u>0</u> | <u>0</u> | 3 | 3 | 3 | <u>3</u> |
| I-405 Express Lanes | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | 3 | <u>0</u> |
| Connecting Freeway Improvements | <u>0</u> | <u>0</u> | 2 | 3 | 3 | <u>3</u> |
| Arterial Capacity and Improvements | <u>0</u> | <u>0</u> | 5 | 6 | 7 | <u>6</u> |
| Pedestrian and Bicycle | <u>0</u> | 3 | 3 | 3 | 2 | <u>3</u> |
| Total | 4 | 17 | 29 | 25 | 29 | <u>24</u> |



Legend: Existing Utilities

- Substation
- - - Study Area Boundary
- - - Puget Sound Energy Gas Pipeline
- - - County Boundaries
- Water
- Highways
- Metro Sewer
- Roadways
- Olympic Pipeline
- - - Railways
- Electric Power Transmission Line



Existing Utilities within the Study Area
Figure No. 3.19-1

This page intentionally left blank.

Table 3.19-2: Number of Major Sewer Lines Affected by Alternative

| <u>Type of Improvement</u> | <u>No Action Alternative</u> | <u>Alternative 1 HCT/TDM Emphasis</u> | <u>Alternative 2 Mixed Mode with HCT/Transit Emphasis</u> | <u>Alternative 3 Mixed Mode Emphasis</u> | <u>Alternative 4 General Capacity Emphasis</u> | <u>Preferred Alternative</u> |
|--|------------------------------|---|---|--|--|----------------------------------|
| <u>Arterial Committed Projects</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> |
| <u>HOV Committed Projects</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> |
| <u>Arterial Interchange Improvements</u> | <u>1</u> | <u>1</u> | <u>4</u> | <u>4</u> | <u>4</u> | <u>4</u> |
| <u>HOV Improvements</u> | <u>0</u> | <u>8</u> | <u>12</u> | <u>12</u> | <u>3</u> | <u>10</u> |
| <u>Basic I-405 Improvements</u> | <u>0</u> | <u>6</u> | <u>6</u> | <u>1</u> | <u>6</u> | <u>1</u> |
| <u>High-Capacity Transit (Fixed- Guideway)</u> | <u>0</u> | <u>7</u> | <u>7</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| <u>Park-and-Rides</u> | <u>0</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> |
| <u>Transit Centers</u> | <u>0</u> | <u>3</u> | <u>3</u> | <u>3</u> | | <u>3</u> |
| <u>I-405 General Purpose Lanes</u> | <u>0</u> | <u>0</u> | <u>6</u> | <u>6</u> | <u>6</u> | <u>5</u> |
| <u>I-405 Express Lanes</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>8</u> | <u>0</u> |
| <u>Connecting Freeway Improvements</u> | <u>0</u> | <u>0</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> |
| <u>Arterial Capacity and Improvements</u> | <u>0</u> | <u>0</u> | <u>5</u> | <u>6</u> | <u>7</u> | <u>4</u> |
| <u>Pedestrian and Bicycle</u> | <u>0</u> | <u>5</u> | <u>5</u> | <u>5</u> | <u>3</u> | <u>4</u> |
| <u>Total</u> | <u>4</u> | <u>32</u> | <u>55</u> | <u>44</u> | <u>44</u> | <u>38</u> |

Table 3.19-3: Number of Major Fuel Pipelines Affected by Alternative

| <u>Type of Improvement</u> | <u>No Action Alternative</u> | <u>Alternative 1 HCT/TDM Emphasis</u> | <u>Alternative 2 Mixed Mode with HCT/Transit Emphasis</u> | <u>Alternative 3 Mixed Mode Emphasis</u> | <u>Alternative 4 General Capacity Emphasis</u> | <u>Preferred Alternative</u> |
|--|------------------------------|---|---|--|--|----------------------------------|
| <u>HOV Committed Projects</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> |
| <u>Arterial Interchange Improvements</u> | <u>1</u> | <u>1</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> |
| <u>HOV Improvements</u> | <u>0</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>5</u> |
| <u>Basic I-405 Improvements</u> | <u>0</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>1</u> |
| <u>High-Capacity Transit (Fixed- Guideway)</u> | <u>0</u> | <u>6</u> | <u>6</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| <u>Transit Centers</u> | <u>0</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>0</u> |
| <u>I-405 General Purpose Lanes</u> | <u>0</u> | <u>0</u> | <u>5</u> | <u>5</u> | <u>5</u> | <u>4</u> |
| <u>I-405 Express Lanes</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>8</u> | <u>0</u> |
| <u>Connecting Freeway Improvements</u> | <u>0</u> | <u>0</u> | <u>1</u> | <u>2</u> | <u>2</u> | <u>2</u> |
| <u>Arterial Capacity and Improvements</u> | <u>0</u> | <u>0</u> | <u>5</u> | <u>7</u> | <u>7</u> | <u>6</u> |
| <u>Pedestrian and Bicycle</u> | <u>0</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>0</u> | <u>2</u> |
| <u>Total</u> | <u>2</u> | <u>16</u> | <u>28</u> | <u>25</u> | <u>30</u> | <u>23</u> |

Table 3.19-4: Number of Electrical Transmission Lines Affected by Alternative

| <u>Type of Improvement</u> | <u>No Action Alternative</u> | <u>Alternative 1 HCT/TDM Emphasis</u> | <u>Alternative 2 Mixed Mode with HCT/Transit Emphasis</u> | <u>Alternative 3 Mixed Mode Emphasis</u> | <u>Alternative 4 General Capacity Emphasis</u> | <u>Preferred Alternative</u> |
|--|------------------------------|---|---|--|--|----------------------------------|
| <u>Arterial Committed Projects</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> |
| <u>HOV Committed Projects</u> | <u>4</u> | <u>4</u> | <u>4</u> | <u>4</u> | <u>4</u> | <u>4</u> |
| <u>Arterial Interchange Improvements</u> | <u>1</u> | <u>1</u> | <u>3</u> | <u>4</u> | <u>4</u> | <u>5</u> |
| <u>HOV Improvements</u> | <u>0</u> | <u>5</u> | <u>5</u> | <u>5</u> | <u>0</u> | <u>3</u> |
| <u>Basic I-405 Improvements</u> | <u>0</u> | <u>6</u> | <u>6</u> | <u>1</u> | <u>6</u> | <u>2</u> |
| <u>High-Capacity Transit (Fixed- Guideway)</u> | <u>0</u> | <u>7</u> | <u>7</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| <u>I-405 General Purpose Lanes</u> | <u>0</u> | <u>0</u> | <u>6</u> | <u>6</u> | <u>6</u> | <u>5</u> |
| <u>I-405 Express Lanes</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>6</u> | <u>0</u> |
| <u>Connecting Freeway Improvements</u> | <u>0</u> | <u>0</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>2</u> |
| <u>Arterial Capacity and Improvements</u> | <u>0</u> | <u>0</u> | <u>3</u> | <u>3</u> | <u>4</u> | <u>4</u> |
| <u>Pedestrian and Bicycle</u> | <u>0</u> | <u>2</u> | <u>2</u> | <u>2</u> | <u>0</u> | <u>2</u> |
| <u>Total</u> | <u>8</u> | <u>27</u> | <u>40</u> | <u>30</u> | <u>36</u> | <u>30</u> |

3.19.4.1 No Action Alternative

Construction Impacts

Utility issues considered in analyses of these potential impacts include the relocation of existing utilities; coordination with cities, utility districts, and public utilities to prevent interruptions of service; and the mitigation of unavoidable service interruptions because of lack of alternate means of supply during the downtime required to relocate lines.

As shown in Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4, the No Action Alternative would affect the fewest utilities of any alternative.

Operational Impacts

Operation of the No Action Alternative is not anticipated to have any direct effect on the major utilities described in this section.

3.19.4.2 Alternative 1: HCT/TDM Emphasis

Construction Impacts

Alternative 1 would affect the fewest utilities of any action alternative (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4).

Operational Impacts

Operation of Alternative 1 is not anticipated to have any direct effect on the major utilities described in this section.

3.19.4.3 *Alternative 2: Mixed Mode with HCT/Transit Emphasis*

Construction Impacts

Alternative 2 would affect the greatest number of water pipelines, sewer lines, and electrical transmission lines (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4).

Operational Impacts

Operation of Alternative 2 is not anticipated to have any direct effect on the major utilities described in this section.

3.19.4.4 *Alternative 3: Mixed Mode Emphasis*

Construction Impacts

Alternative 3 would affect more utilities than Alternative 1 but fewer than Alternatives 2 and 4 (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4).

Operational Impacts

Operation of Alternative 3 is not anticipated to have any direct effect on the major utilities described in this section.

3.19.4.5 *Alternative 4: General Capacity Emphasis*

Construction Impacts

Alternative 4 would affect the second highest number of utilities of any alternative (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4). It would affect the highest number of fuel pipelines.

Operational Impacts

Operation of Alternative 4 is not anticipated to have any direct effect on the major utilities described in this section.

3.19.4.6 *Preferred Alternative*

Construction Impacts

The Preferred Alternative would affect more major utilities than Alternative 1, and fewer than Alternatives 2, 3, and 4 (Tables 3.19-1, 3.19-2, 3.19-3, and 3.19-4).

Operational Impacts

Operation of the Preferred Alternative is not anticipated to have any direct effect on the major utilities described in this section.

3.19.5 **Mitigation Measures**

Mitigation for the No Action Alternative improvements is, or will be, addressed through the environmental analysis, documentation, and review completed for those improvements.

For the action alternatives, conflicts with utilities would be avoided through project design where feasible. Where avoidance is not feasible, typical utility impact mitigation would include relocation of the above-ground utilities.

This page left intentionally blank.