4.18 UTILITIES

Summary

Information regarding existing and planned utilities along the United States Highway 36 (US 36) corridor was obtained in 2003 and 2004 to support preliminary design of the packages and to identify conflicts, and for future coordination with utility companies during the project.

The Utility Notification Center of Colorado was contacted for initial identification of private utility companies and municipalities with facilities in the project area. The identified companies and departments were contacted, and maps or verbal descriptions of the facilities were obtained. Follow-up field reconnaissance and review of U.S. Geological Survey topographic maps confirmed the findings and provided additional information. This information is included in the *Existing Utilities Technical Memorandum* (Goodbee & Associates, Inc. 2004). Not all utility owners responded to requests for information, and information obtained from utility owners was assumed to be complete and accurate. This information will be updated and field-verified prior to final design.

Certain utilities were classified as "major utilities" based on their critical nature or the high cost and complexity of relocating them. These major utilities included electric transmission lines, irrigation ditches, water lines and sanitary/storm sewers with diameters greater than 24 inches, fiber optic lines, raw-water lines (municipal water supplies), and high-pressure gas lines. Only major utilities are addressed in this section; non-major utilities are identified in the *Existing Utilities Technical Memorandum* (Goodbee & Associates, Inc. 2004). These other utilities are to be taken into consideration during design and construction of any transportation improvements.

Seventy-four major utilities were identified within the footprint of the build packages. Of these, 15 would require relocation under each of the build packages, and 48 would require adjustments.

Affected Environment

All Segments

The major utilities in the project area include overhead fiber optic and electric transmission lines, an electric substation, buried fiber optic lines, buried water and gas lines, sanitary and storm sewers, and irrigation ditches. The following provides general information for each type of major utility.

Fiber Optic Transmission Lines

Colorado Department of Transportation (CDOT) and numerous private telecommunications companies, including Comcast, ICG Telecom, Level 3, MCI, McLeod USA, and Qwest have buried fiber optic that runs throughout the project area, primarily in cross streets. Buried fiber optic is usually contained in plastic conduit or ducts at a depth of approximately 4 feet. Comcast has some overhead fiber optic in the City and County of Boulder and the City of Louisville. Fiber optic is usually located in a public right-of-way (ROW).

Electric Transmission Lines

Xcel Energy (Xcel) provides electricity to the entire metropolitan Denver area through a network of power plants, substations, and transmission lines. One Xcel substation is located in the project area, north of US 36 between Wadsworth Boulevard and Wadsworth Parkway. The height of the 115-kilovolt (kV) and 230-kV transmission lines is a minimum of 25 feet and 30 feet, respectively. Xcel's electric transmission facilities are almost always located in private-exclusive easements.

Water Lines

The cities of Louisville, Northglenn, Thornton, and Westminster own water lines that cross US 36.

The cities of Louisville, Northglenn, Thornton, and Westminster own water lines that cross US 36. Of particular concern are the raw-water lines that carry municipal water supplies to treatment plants. The cities of Northglenn and Thornton share a 48-inch raw-water line that crosses the US 36 corridor near Big Dry Creek. Water lines usually range in depth from 5 to 8 feet and are located in the public ROW.

High-Pressure Gas Lines

Xcel has several high-pressure gas lines, ranging in diameter from 8 to 20 inches, that cross the US 36 corridor. The gas lines are at a minimum depth of 4 feet and are generally located in a private-exclusive easement.

Sanitary Sewers

The cities of Boulder and Westminster have large sanitary sewer pipes that cross the US 36 corridor. Depths of the sewers vary widely, ranging from 2 feet to more than 10 feet. Sanitary sewers are usually located in the public ROW.

Storm Sewers

The City of Boulder, Adams County, the City of Westminster, and CDOT have several storm sewers that cross the US 36 corridor. CDOT storm sewers parallel the existing US 36 roadway alignment in the US 36 ROW. Information from the City and County of Broomfield regarding their storm sewers is not available at this time.

Irrigation Ditches

Numerous irrigation ditches cross the US 36 corridor in pipe or concrete box culverts. Most of the ditches carry irrigation water from spring through fall, and some of the ditches also carry municipal water. Ditches are usually located in a private easement or owned by fee by the ditch company.

Findings

Approximately 150 utilities were identified in the US 36 corridor. Of these, approximately 70 utilities were considered major due to their critical nature or the high cost or complexity associated with relocation. Additional utilities may be added to the list as information is received from utility companies.

Tables 4.18-1 through 4.18-5 list the major utilities located in the Adams, Westminster, Broomfield, Superior/Louisville, and Boulder segments, respectively.

Table 4.18-1: Adams Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
Adams County	✓	p	24- to 36-inch storm sewer north of roadway from Pecos Street to Zuni Street
Adams County	✓	x	72-inch storm sewer on east side of Broadway
Allen Ditch Company	✓	x	Ditch in box culvert 1,700 feet east of Sheridan Boulevard bridge
Allen Ditch Company	✓	x	Ditch in box culvert 1,400 feet west of West 80th Avenue bridge
Allen Ditch Company	✓	x	Ditch in box culvert 1,000 feet east of West 80th Avenue bridge
City of Westminster	✓	x	30-inch storm sewer 1,100 feet west of Federal Boulevard
Colorado Agricultural Ditch Company	✓	x	Ditch in box culvert under US 36 westbound on-ramp from northbound I-25
CDOT	✓	x/p	Buried fiber optic in south ROW between Broadway and West 92nd Avenue, crosses under roadway at West 92nd Avenue; for VMS system
CDOT	✓	p	24- to 60-inch storm sewer south of roadway from 250 feet west of Zuni Street to west of Pecos Street
CDOT	✓	p	24- to 96-inch storm sewer north of roadway from 250 feet west of Zuni Street to west of Pecos Street (24-inch west of Zuni, 96-inch easternmost 300 feet of pipe)
CDOT	✓	x	48-inch storm sewer 2,200 feet west of Pecos Street
CDOT	✓	x	60-inch storm sewer 500 feet west of Pecos Street
CDOT	✓	x	30-inch storm sewer 300 feet west of Federal Boulevard
Lower Clear Creek Ditch Company	✓	x	Ditch in box culvert under US 36 westbound on-ramp from northbound I-25
MCI Worldcom	✓	x	Buried fiber optic on Federal Boulevard bridge
Pomponio Ditch	✓	x	Ditch in 18-inch pipe 100 feet east of Federal Boulevard
Qwest Communications	✓	x	Buried fiber optic in conduit in Zuni Street
Qwest Communications	✓	x	Buried fiber optic in conduit in Lowell Boulevard
Qwest Communications	✓	x	Buried fiber optic in conduit in Federal Boulevard
Qwest Communications	✓	x	Buried fiber optic in conduit in Pecos Street
Xcel Energy - electric	✓	x	Overhead 115-kV transmission line 1,000 feet west of Broadway

Source: US 36 Mobility Partnership, 2004.

Notes:

CDOT = Colorado Department of Transportation
I-25 = Interstate 25
kV = kilovolt
ROW = right-of-way
US 36 = United States Highway 36
VMS = variable message sign

Table 4.18-2: Westminster Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
City of Northglenn/Thornton	✓	x	48-inch raw water line 200 feet west of Big Dry Creek crossing, serves both cities
City of Westminster	✓	x	27-inch sanitary sewer 800 feet east of West 104th Avenue bridge
City of Westminster	✓	x	30-inch sanitary sewer 1,400 feet east of West 104th Avenue bridge
City of Westminster	✓	x	42-inch water line in 54-inch steel casing south of West 92nd Avenue
FRICO	✓	x	Farmers Highline Canal 2,500 feet west of West 92nd Avenue bridge
ICG Telecom	✓	x	Buried fiber optic under sidewalk on west side of bridge at Church Ranch Boulevard
ICG Telecom		x	Buried fiber optic on railroad ROW under highway 2,600 feet east of Wadsworth Boulevard bridge
Level 3		x	Buried fiber optic on railroad ROW under highway 2,600 feet east of Wadsworth Boulevard bridge
McLeod USA		x	Buried fiber optic on railroad ROW under highway 2,600 feet east of Wadsworth Boulevard bridge
Qwest Communications	✓	x	Buried fiber optic in conduit at Wadsworth Boulevard
Qwest Communications	✓	x	Buried fiber optic in conduit at West 104th Avenue
Qwest Communications	✓	x	Buried fiber optic in conduit at Sheridan Boulevard
Xcel Energy - electric	✓	x	Overhead 115-kV transmission line 300 feet east of West 104th Avenue

Source: US 36 Mobility Partnership, 2004.
Notes:
CDOT = Colorado Department of Transportation
FRICO = Farmers Reservoir & Irrigation Co.
kV = kilovolt
ROW = right-of-way

Table 4.18-3: Broomfield Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
Comcast Cable Communications Inc.	✓	x	Two buried fiber optics east of SH 121
Dry Creek Valley Ditch Company		p	Irrigation ditch in south ROW across SH 121 to Interlocken sign
FRICO	✓	x	Community Ditch west of SH 121
ICG Telecom		p	Buried fiber optic along BNSF Railway ROW under SH 121
Level 3		p	Buried fiber optic along BNSF Railway ROW under SH 121
McLeod USA		p	Buried fiber optic along BNSF Railway ROW under SH 121
Qwest Communications	✓	x	Buried fiber optic in conduit east of SH 121
Xcel Energy - electric	✓	x	Overhead 115-kV transmission line 4,500 feet west of Wadsworth Boulevard bridge
Xcel Energy - electric			Broomfield electric substation north of US 36
Xcel Energy - electric	✓	p	Overhead 115-kV transmission line in south ROW between East Flatiron Circle and Interlocken Loop
Xcel Energy - gas	✓	x	12-inch high-pressure gas main west of SH 121
Xcel Energy - gas	✓	x	20-inch high-pressure gas main west of SH 121
Comcast Cable Communications Inc.	✓	x	Two buried fiber optics east of SH 121

Source: US 36 Mobility Partnership, 2004.
Notes:
CDOT = Colorado Department of Transportation
FRICO = Farmers Reservoir & Irrigation Co.
kV = kilovolt
ROW = right-of-way
SH = State Highway
US 36 = United States Highway 36

Table 4.18-4: Superior/Louisville Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
Boulder County/City of Louisville	✓	x	Ditch laterals in four pipes over US 36 500 feet west of South 88th Street
Boulder County et al./City of Louisville	✓	x	Admor laterals 900 feet west of South 88th Street
Boulder County/City of Louisville	✓	x	Warembourg-Bowes lateral 3,600 feet west of South 88th Street (north of Superior Cemetery)
City of Louisville	✓	x	Louisville lateral in concrete box culvert 5,000 feet west of McCaslin Boulevard
City of Louisville	✓	x	36-inch steel water line 4,500 feet west of McCaslin Boulevard
Comcast Cable Communications Inc.	✓	x	Buried fiber optic at Interlocken Loop Street under eastbound off-ramp and mainline
Comcast Cable Communications Inc.	✓	x	Buried fiber optic 2,500 feet west of McCaslin Boulevard (north-south alignment)
ICG Telecom	✓	x	Fiber optic under sidewalk on west side of bridge at Interlocken Loop
Northern Colorado Water Conservancy District	✓	x	16-inch steel water line in 24-inch casing 1,000 feet west of South 88th Street – Superior's water supply
Qwest Communications	✓	x	Buried fiber optic in conduit at Interlocken Loop
Xcel Energy - electric	✓	x	Overhead 115-kV transmission line 1,000 feet west of Interlocken Loop
Xcel Energy - electric	✓	x	Overhead 230-kV transmission line 1 mile west of McCaslin Boulevard

Table 4.18-4: Superior/Louisville Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
Xcel Energy - electric	✓	x	Overhead 115-kV transmission line 5,500 feet west of McCaslin Boulevard
Xcel Energy - gas	✓	x	10-inch high-pressure gas main west side of South 96th Street; 300 feet west of Interlocken Loop bridge
Xcel Energy - gas	✓	x	10-inch high-pressure gas main 300 feet west of McCaslin Boulevard bridge

Source: US 36 Mobility Partnership, 2004.
Notes:
CDOT = Colorado Department of Transportation
kV = kilovolt

Table 4.18-5: Boulder Segment — Major Utilities in the US 36 Corridor

Operator/Owner	In CDOT Right-of-Way	Crossing (x)/ Parallel (p)	Description
Anderson Extension Ditch Company		p	Ditch in pipe and open channel along South Boulder Road under SH 157 bridge; on north side of road to east of SH 157, then on south side of road (mostly in pipe)
City of Boulder	✓	x	Shearer Ditch in pipe, 200 feet west of Cherryvale Road bridge
City of Boulder	✓	x	Dry Creek No. 2 Ditch in box culvert, 500 feet east of eastbound on-ramp from SH 157
City of Boulder	✓	x	27-inch sanitary sewer west of South Boulder Creek
City of Boulder	✓	x	Storm sewer (Viele Creek) 900 feet east of Foothills Parkway (diagonal crossing)
Davidson Ditch Company	✓	x	Ditch in box culvert 3,500 feet west of overlook
Goodhue Ditch Company	✓	x	Ditch in 24-inch pipe 5,300 feet west of overlook
Marshallville Ditch Company	✓	x	Ditch in box culvert 1,200 feet east of Cherryvale Road bridge
Qwest Communications	✓	x	Buried fiber optic in conduit at Foothills Parkway
Qwest Communications	✓	p	Buried fiber optic in conduit in south ROW between Foothills Parkway and McCaslin Boulevard
Qwest Communications	✓	x	Buried fiber optic in conduit 5,000 feet west of McCaslin Boulevard
Qwest Communications	✓	p	Buried fiber optic in conduit in Marshall Road ROW for 5,000 feet west of McCaslin Boulevard
South Boulder Canyon Ditch Company	✓	x	Ditch in pipe 200 feet east of South Boulder Creek, 2,500 feet west of Cherryvale Road bridge
McGinn Ditch Company	✓	x	Ditch crossing at South Boulder Road 1,030 feet west of Cherryvale Road

Source: US 36 Mobility Partnership, 2006.
Notes:
CDOT = Colorado Department of Transportation
No. = number
ROW = right-of-way
SH = State Highway

Impact Evaluation

Utilities were assumed to be affected by implementation of a proposed package if:

- They will be unable to function normally.
- They will be inaccessible.
- There will be insufficient clearance between the utility and proposed improvements.
- There is danger of rupture or disruption of service.

Impacts to utilities along the US 36 corridor would be nearly the same for all of the build packages and consist primarily of adjustments caused by wider pavement and the addition of separate lanes at interchanges.

All utility impacts will be short-term and addressed prior to or during construction by relocation or adjustment. There would be no long-term impacts from construction of the transportation improvements. New or expanded utility systems would need to be built to accommodate the additional demand for service in transit-oriented developments and planned development in the study area.

All utility impacts will be short-term and addressed prior to or during construction by relocation or adjustment.

Utilities would also be affected by Package 1, but relocations or adjustments would be evaluated and mitigated by the project that needed the relocation or adjustment.

Methodology

Potential utility conflicts were identified by comparing the footprint of each of the packages with the location of major utilities, shown in Figures 4.18-1 through 4.18-4. The likelihood of a conflict was evaluated by assessing the profile (grade) of the proposed US 36 corridor improvements, depth and elevation of the utility, its type of protection, and potential for the presence of manholes and valves in relation to the proposed improvements in that location.

This evaluation resulted in one of three determinations:

- **Relocation** — Utility would need to be moved horizontally and/or vertically to maintain adequate clearance and avoid conflict.
- **Adjustment** — Utility would be affected by the proposed improvement but no relocation would be required. Actions that are considered adjustments include:
  - lengthening a pipe or culvert
  - raising, lowering, or moving manholes or valves
  - moving inlets and associated piping
  - extending or adding protective casing
  - moving fire hydrants
- **No Impact** —Utility would not be affected by the proposed improvements.

Figure 4.18-1: Major Utility Impacts — Adams Segment

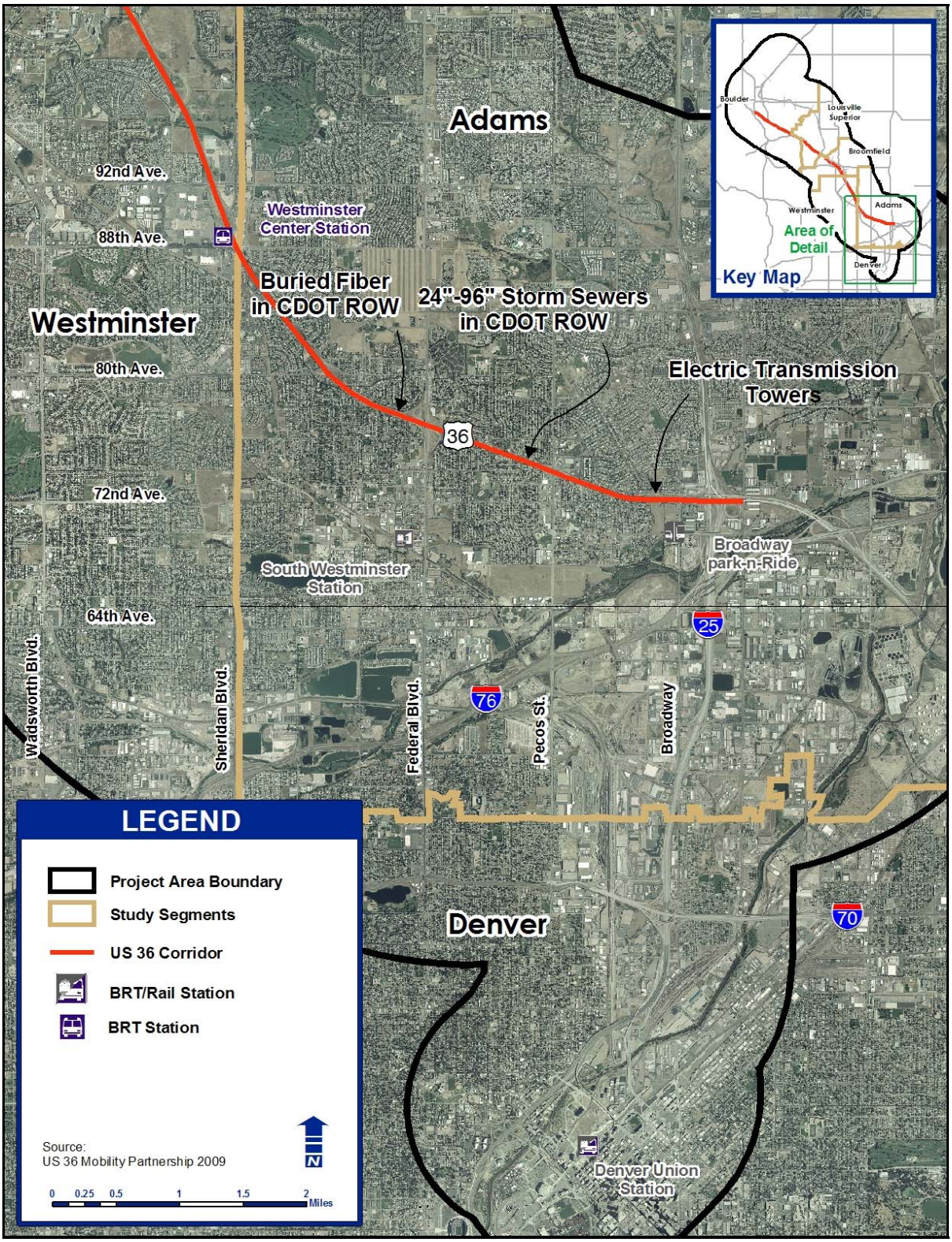
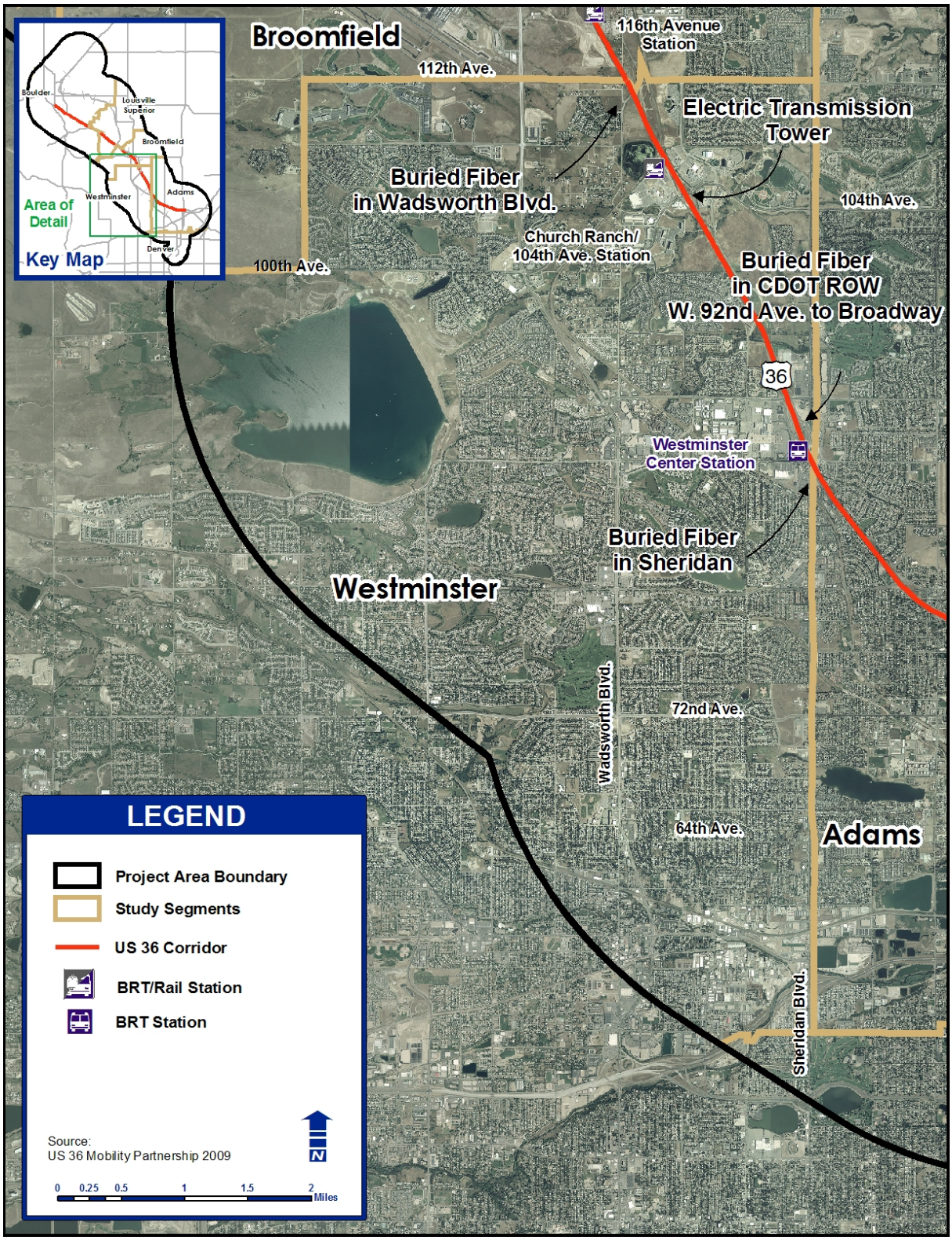
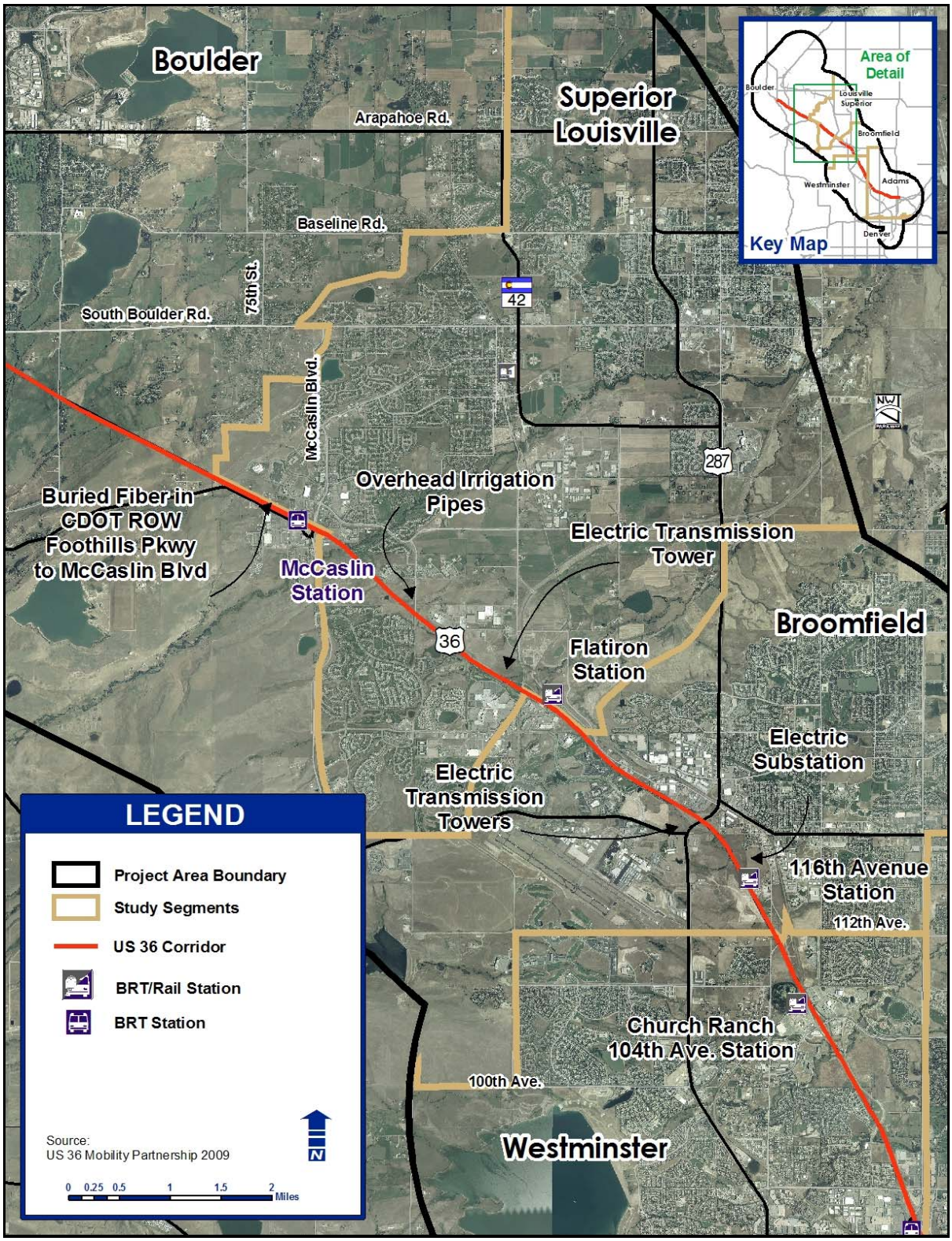


Figure 4.18-2: Major Utility Impacts — Westminster Segment



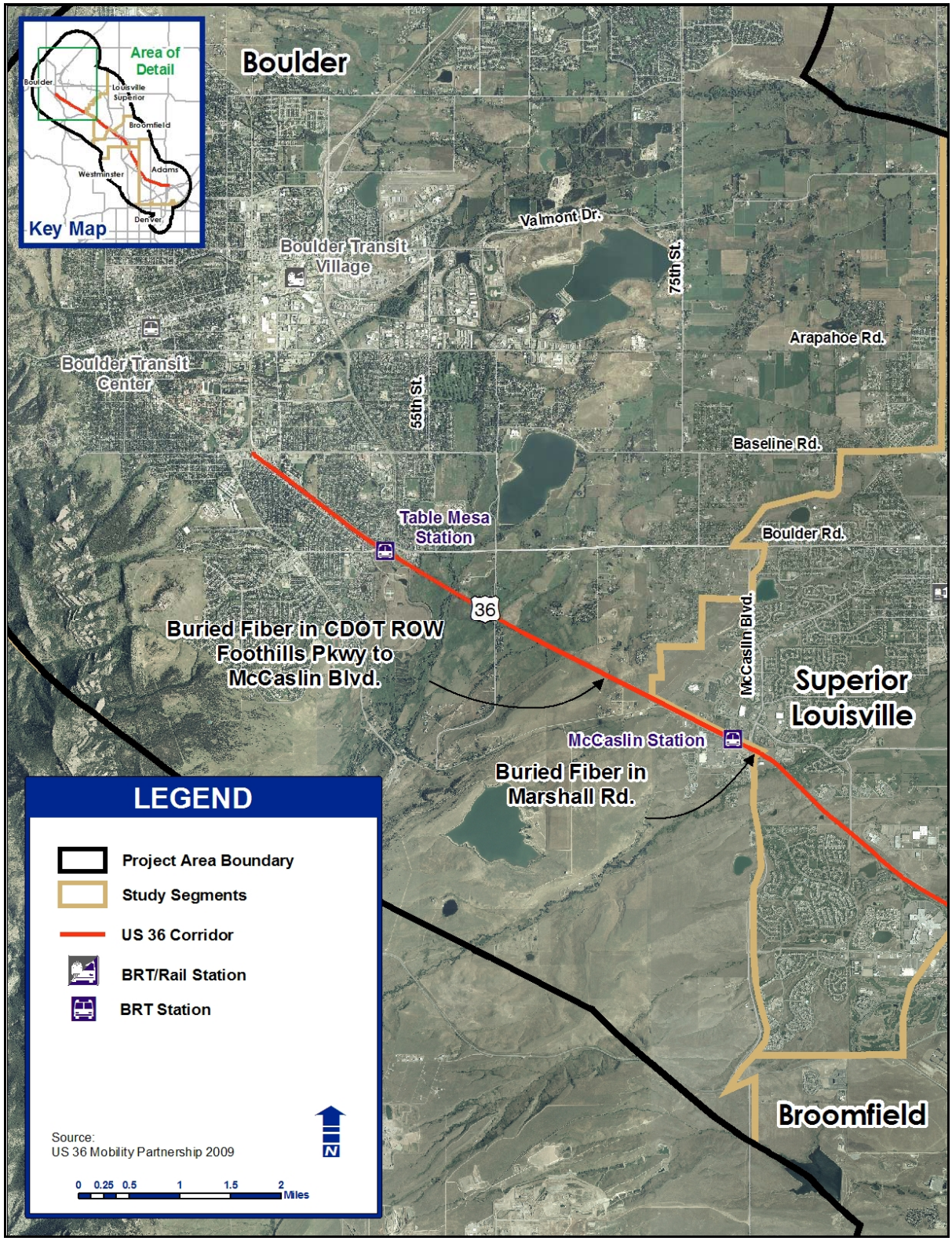
Note: The 116th Avenue Rail Station is not a part of the 2004 FasTracks Program. Additional stations were added in the early planning stages of the US 36 Environmental Impact Statement. Exact rail station locations and additional stations may be reconsidered in the U.S. Army Corps of Engineers/Regional Transportation District Northwest Rail Environmental Assessment/Environmental Evaluation.

Figure 4.18-3: Major Utility Impacts — Broomfield and Superior/Louisville Segments



Note: The 116th Avenue Rail Station is not a part of the 2004 FasTracks Program. Additional stations were added in the early planning stages of the US 36 Environmental Impact Statement. Exact rail station locations and additional stations may be reconsidered in the U.S. Army Corps of Engineers/Regional Transportation District Northwest Rail Environmental Assessment/Environmental Evaluation.

Figure 4.18-4: Major Utility Impacts — Boulder Segment



Relocations and adjustments were evaluated because disruption in service or endangerment to human health and the environment from rupture may result during either action. Table 4.18-6, Summary of Conflicts with Major Utilities, summarizes the utility conflicts.

Table 4.18-6: Summary of Conflicts with Major Utilities

Alternative	Number of Utilities in Package Footprint	Number of Utility Conflicts	
		Relocations	Adjustments
Package 1: No Action	6	4	1
Package 2: Managed Lanes/Bus Rapid Transit	74	15	48
Package 4: General-Purpose Lanes, High-Occupancy Vehicle, and Bus Rapid Transit	74	15	48
Combined Alternative Package (Preferred Alternative): Managed Lanes, Auxiliary Lanes, and Bus Rapid Transit	74	15	48

Source: US 36 Mobility Partnership, 2006.

Note:

Package 1 has many more likely utility conflicts but the ones in this table only represent locations where the Northwest Rail line and highway cross or interface.

Package 1: No Action

Direct Impacts

All Segments

Package 1 presumes that the other funded transportation projects presented in Chapter 2, Alternatives Considered, would proceed. Impacts resulting from these projects are being or have been evaluated as part of other environmental documents; they are not addressed as part of this Environmental Impact Statement.

Indirect Impacts

All Segments

Under Package 1, the planned population increase in the study area would result in additional demand for utility services such as water, sewer, natural gas, and electricity. The expansion of these services will be required to meet this increased demand. In most cases, the cost of the new services will be paid through a combination of user fees and subsidies by existing users.

Package 2: Managed Lanes/Bus Rapid Transit

Direct Impacts

All Segments

Impacts would be greatest in the areas where:

- New toll or bus lanes are proposed that result in widening outside of the existing lanes.
- Cross streets would be realigned, such as Sheridan Boulevard and Wadsworth Parkway.
- The highway would be widened beyond the existing ROW, such as between Pecos Street and Zuni Street.
- Bridges over US 36 would be replaced, such as the structures at Wadsworth Boulevard, South 88th Street, and Cherryvale Road.

Adams Segment

In the Adams Segment, the following major utilities would likely need to be relocated:

- Two electric transmission line towers north and south of the US 36 roadway, west of Broadway.
- Storm sewers in the north and south ROW between Zuni Street and Pecos Street.
- Buried CDOT fiber optic parallel to the highway alignment in the south ROW.

In addition, the following adjustments would likely be required:

- The Pomponio Ditch crossing and buried fiber optic in Pecos Street, Zuni Street, Federal Boulevard, and Lowell Boulevard may need protective casing or adjusted handholes.
- Three crossings of Allen Ditch may need to be extended.
- Storm sewers crossing US 36 between Broadway and west of Federal Boulevard may need to be extended.

Westminster Segment

In the Westminster Segment, the widened highway and bikepath would result in the following relocations to major utilities:

- Buried CDOT fiber optic parallel to US 36 in the south ROW from West 92nd Avenue eastward.
- Electric transmission tower in the northwest fill area of the Church Ranch Boulevard interchange.
- Buried fiber optic line in Sheridan Boulevard and at Wadsworth Boulevard.

In addition, the following adjustments would likely be required:

- Lengthen the culvert containing the Farmers Highline Canal.
- Raise, lower, or relocate manholes/access points to a water line near West 92nd Avenue, a water line and two sanitary sewers near Big Dry Creek, and buried fiber optic conduits near Church Ranch Boulevard.

Broomfield Segment

In the Broomfield Segment, the proposed improvements would result in the following relocations:

- Two electric transmission towers north and south of US 36, midway between Wadsworth Parkway and Wadsworth Boulevard.
- Ten electric transmission towers and approximately 2 miles of the transmission line south of US 36 from the Wadsworth Parkway/120th Avenue interchange to Interlocken Loop.

The US 36 footprint may extend into Xcel's Broomfield substation north of US 36 between Wadsworth Boulevard and Wadsworth Parkway. Minimal impacts would occur to equipment currently located on the property; however, if Xcel expands the site before this project is built, new utility equipment may be affected.

In addition, the following adjustments would likely be required:

- Lengthen the community ditch siphon under US 36.
- Add encasement to the high-pressure gas lines west of the Interlocken interchange.
- Adjust the buried fiber optic lines near Wadsworth Parkway.

Superior/Louisville Segment

In the Superior/Louisville Segment, the proposed improvements would result in the following relocations:

- The overhead pipes carrying irrigation laterals across US 36 west of South 88th Street would need to be relocated.
- Five irrigation ditch crossings would need to be lengthened between South 88th Street and Coal Creek.
- One electric transmission tower west of Interlocken Loop north of US 36 would need to be relocated.

In addition, the following adjustments would likely be required:

- Two irrigation ditch crossings would need to be extended.
- Buried fiber optic at Interlocken Loop and west of McCaslin Boulevard may need adjusted handholes and/or additional protective casing.
- Two gas lines and two water lines may need additional protective casing.

Boulder Segment

In the Boulder Segment, the following major utilities would be impacted by Package 2:

- Buried fiber optic lines in Foothills Parkway, in the south ROW of US 36, and in Marshall Road may need to be adjusted or relocated.
- Six irrigation ditch crossings and a storm sewer crossing may need to be lengthened.
- A sanitary sewer east of South Boulder Creek may need to be relocated or adjusted.
- McGinn Ditch may need to be lengthened if the Cherryvale Road/South Boulder Road bikeway alignment is selected.

Indirect Impacts

All Segments

The population increases described above under Package 1 would be the same with any of the build packages, except that land uses could intensify slightly around a couple of the transit stations. Thus, it is possible that the capacities of the new utilities at these station locations would need to be slightly higher for the build packages than with Package 1. Due to economies of scale, the cost per user would be less than with the lower densities resulting from Package 1.

Package 4: General-Purpose Lanes, High-Occupancy Vehicle, and Bus Rapid Transit

Direct and Indirect Impacts

All Segments

Impacts and mitigation measures along the US 36 corridor from Package 4 would be similar to those previously discussed under Package 2. The same number of utilities would need to be relocated for Packages 2 and 4. Where the Package 4 footprint is narrower than the Package 2 footprint, the associated adjustments would be less. Conversely, where the Package 4 footprint is wider than the Package 2 footprint, the associated adjustments would be greater.

Combined Alternative Package (Preferred Alternative): Managed Lanes, Auxiliary Lanes, and Bus Rapid Transit

Direct and Indirect Impacts

All Segments

Impacts and mitigation measures along the US 36 corridor from the Combined Alternative Package (Preferred Alternative) would be similar to those previously discussed under Package 2. The same number of utilities would need to be relocated for the Combined Alternative Package (Preferred Alternative) and Package 2 and Package 4. Where the Combined Alternative Package (Preferred Alternative) footprint is narrower than the footprint for Package 2 and Package 4, the associated adjustments would be less. Conversely, where the Combined Alternative Package (Preferred Alternative) footprint is wider than the footprint for Package 2 and Package 4, the associated adjustments would be greater.

Mitigation

Detailed information regarding the horizontal and vertical location of utilities will be provided through subsurface potholing as part of preliminary engineering. It is anticipated that many utility impacts will be mitigated through close coordination with the utility companies and municipalities during design and construction. Table 4.18-7, Mitigation Measures — Utilities, summarizes the measures that will be used to mitigate impacts to major utilities in Packages 2 and 4 and the Combined Alternative Package (Preferred Alternative). No mitigation will be necessary with Package 1.

Table 4.18-7: Mitigation Measures — Utilities

Impact	Impact Type	Mitigation Measures
Adjustment or relocation of irrigation ditches	Construction	• Construction will be scheduled during periods of non-use (November through March), wherever possible. • Design will be modified to avoid/minimize conflict wherever possible.
Relocation of electric transmission towers	Construction	• Construction will be scheduled during periods of low demand (October through April), wherever possible. • Design will be modified to avoid/minimize conflict wherever possible.
Adjustment or relocation of high-pressure gas lines	Construction	• Construction will be scheduled during periods of low demand (May through September), wherever possible. • Design will be modified to avoid/minimize conflict wherever possible.
Adjustment or relocation of buried fiber optic	Construction	• Early coordination with utility owners will take place wherever possible. • Design will be modified to avoid/minimize conflict wherever possible.
Adjustment or relocation of water lines and sanitary sewers	Construction	• Design will be modified to avoid conflict wherever possible. • Disruption of service for low-use period will be scheduled. • Disruption of service will be minimized with wet tie-in wherever possible.
Relocation of storm sewers	Construction	• Design will be modified to avoid conflict wherever possible.
New roadway or reduced cover on buried utilities	Construction	• Encasement or protective covers over utilities will be added as appropriate.

Source: US 36 Mobility Partnership, 2006.