

3.13 UTILITIES

3.13.1 Introduction to Analysis

Impacts to existing utilities by transportation projects have the potential to adversely affect the cost and schedule of a project as well as neighboring communities. In this section, utilities that are of a critical nature or are costly and complex to relocate are identified and evaluated within the project study area. The project study area for utilities is defined as all lands within 300 feet of the centerline of the alignments and within 300 feet of the footprint of the station options.

3.13.1.1 Summary of Results

Major utilities were identified within the Southern Section and Northern Section project study area, respectively, including buried fiber optic and telephone cables, electric transmission lines and a substation, treated and recycled water conduits, sanitary and storm sewers, irrigation ditches, high-pressure gas lines, overhead electric distribution and telephone lines, cell phone towers, sanitary lift stations, water pump stations, and oil and gas wells and tank batteries.

As shown in Table 3.13-1, within the Southern Section, the A-3 alignment would have the greatest number of impacts (70 relocations), compared to alignments B-2, B-3, and B-4 (52, 53, and 57, respectively). Station relocations would range from one to six relocations, and from two to four adjustments in the Southern Section depending on the station options selected. Five to 12 relocations and eight to 14 adjustments associated with stations in the Northern Section would be necessary depending on the station options selected.

TABLE 3.13-1. SUMMARY OF POTENTIAL CONFLICTS WITH MAJOR UTILITIES — DUS ACCESS TO 162ND AVENUE AREA

Alternative/Alignment	Number of Major Utilities in the Project Study Area	Number of Potential Utility Conflicts	
		Relocations	Adjustments
No Action Alternative	Not quantified	Not quantified	Not quantified
Build Alternative			
Southern Section — DUS Access to 84th Avenue			
A-3	114	70	9
B-2	90	52	6
B-3	92	53	6
B-4	99	57	7
Northern Section — 84th Avenue to 162nd Avenue Area			
Alignment	85	23	37

Source: North Metro Corridor Project Team, 2009.

Notes:

The numbers in this table do not take into account utilities at stations or implementing mitigation measures that could eliminate a conflict or allow for an adjustment rather than relocation. Potential impacts at stations are listed in Table 3.13-2. Specific mitigation measures will be addressed during later stages of design.

The numbers in this table reflect more than one distinct (physically separated) conflict on a single utility as a separate relocation or adjustment.

DUS = Denver Union Station

Building the CRMF at the Fox North Site, a connected action, would potentially require relocation or modification of two water mains, five storm sewers, five sanitary sewers, one buried gas line, and multiple fiber optic telecommunication and electric lines.

3.13.1.2 Relevant Law

The railroad ROWs in the project study area are owned by the UP Railroad Company and the BNSF Railway Company. Railroad ROW is considered private property by the respective railroad companies and by applicable state laws. As such, the railroad companies have the authority to issue license agreements and, on rare occasions, easements to private and public utility owners to be in their ROW. The agreements and easements specify, among other things, notification requirements and financial responsibilities related to utility relocation. The FRA promulgates and enforces rail safety regulations and provides government support of rail transportation activities.

The Colorado PUC has jurisdiction over railroad companies in Colorado. The state regulations addressing utilities in railroad ROWs include those specifying minimum overhead, track, and side clearances.

As authorized by SAFETEA-LU in 2005, the FTA supports locally planned and operated public mass transit systems throughout the US. FTA has issued guidelines regarding the process of identifying utilities and determining which party is financially responsible for utility relocations, in addition to the content of utility agreements (FTA 2003).

3.13.2 Affected Environment

The project study area for utilities is defined as all lands within 300 feet of the centerline of the alignments and within 300 feet of the footprint of the station options. Table 3.13-1 summarizes the number of major utilities within the project study area for the Build Alternative alignments. Additional information is available in the utilities Technical Memorandums developed by Goodbee and Associates (2006, 2008a, 2008b, 2009).

3.13.2.1 Southern Section — DUS Access to 84th Avenue

From DUS access to 84th Avenue, the project study area goes through residential neighborhoods and areas of commercial and industrial development, including the Suncor refinery south of I-270. North of 70th Avenue, the rail alignment crosses the South Platte River and goes through currently undeveloped land. Major utilities located in the Southern Section project study area include fiber owned by 360 Networks/Sprint, Abovenet, AT&T, Adesta/CDOT, Comcast, Level 3, Paetec, Sprint, MCI/Verizon, and Qwest Communications; potable and recycled water lines owned by Denver Water; sanitary and storm sewers owned by Denver Wastewater Management Division; sanitary sewers owned by Metro Wastewater Reclamation District and South Adams County Water and Sanitation District; a storm sewer owned by Commerce City and Denver Wastewater Management Division; overhead electric distribution and transmission facilities owned by Xcel; high-pressure gas lines owned by Suncor and Rocky Mountain Pipeline; the O'Brian Canal/Burlington Ditch; sanitary lift stations owned by Denver Wastewater Management District and the South Adams County Water and Sanitation District; a potable water pump station owned by the South Adams County Water and Sanitation District; a T-Mobile cell phone tower; and telephone lines owned by Qwest Communications. Major utilities in the Southern Section are listed in the *North Metro Utilities Technical Memorandum*

Addendum (BNSF Alternative) (Goodbee 2008a) and the North Metro Utilities Technical Memorandum Addendum (DUS Access to 38th Street) (Goodbee 2009).

3.13.2.2 Northern Section — 84th Avenue to 162nd Avenue Area

The Northern Section contains residential and commercial areas between 84th Avenue and 136th Avenue, with commercial development becoming less predominant and residential neighborhoods becoming more predominant to the north. North of 136th Avenue, the land is primarily agricultural; small pockets of agricultural land remain between 84th Avenue and 136th Avenue. Major utilities in the Northern Section include fiber owned by Abovenet, Comcast/City of Thornton, E-470 Public Highway Authority, and Qwest Communications; a Sprint cell phone tower; sanitary sewers and potable and raw water lines owned by the cities of Thornton and Northglenn; storm sewers and a sanitary lift station owned by the City of Thornton; overhead electric lines owned by Xcel (and possibly United Power); high-pressure gas lines owned by Xcel; and several irrigation ditches and oil and gas wells, tank batteries, and pipelines. Major utilities in the Northern Section are listed in the *North Metro Basic Utility Report* (Goodbee 2008b).

3.13.3 Impact Evaluation

This evaluation includes analysis of potential DMU or EMU vehicle technology impacts. When the technology impacts this resource, it is described below in Results.

3.13.3.1 Methodology for Impact Evaluation

The *FasTracks Environmental Methodology Manual* (RTD 2006) classifies certain utilities as “major utilities” based on their critical nature or potential high cost and complexity of relocation. These include electric transmission lines and substations, high-pressure gas lines, water lines at least 24 inches in diameter, sanitary sewers at least 18 inches in diameter, storm sewers at least 36 inches in diameter, brick and clay sanitary sewers, sewer and water pump stations and meter stations, fiber optic lines, copper telephone cable greater than 200 pair in size, communication towers, petroleum lines, irrigation ditches, oil and gas wells, and overhead electric. All telephone lines were considered to meet the criteria for major utilities because information regarding their size was unavailable.

The Utility Notification Center of Colorado (UNCC) database and information from previous investigations, including the *Three Corridors Scoping Study* (Parsons 2005) and the utility inventory prepared for the *DUS EIS* (Goodbee 2006), were used for initial identification of private utility companies and municipalities with facilities in the project study 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 topographic maps confirmed the findings and provided additional information.

Potential utility conflicts were identified by comparing the footprint of each of the alternative alignments and stations with the locations of major utilities as plotted on the utility map. The likelihood of a conflict was evaluated by assessing the profile of the proposed improvements, estimated depth/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, adjustment, or no action.

Relocation

The utility would need to be moved horizontally and/or vertically to maintain adequate clearance and cover and to avoid conflict.

Adjustment

The utility would be affected by the proposed improvement but no relocation would be required. Actions considered adjustments include:

- Lengthening pipe or culvert
- Raising, lowering, or moving manholes or valves
- Moving inlets and associated piping
- Extending or adding protective casing
- Moving fire hydrants

No Action

The utility would not be affected by the proposed improvement.

Both relocations and adjustments were identified because it is possible that disruption in service or endangerment to human health and the environment from rupture could result during either action. However, potential relocations are considered more important than potential adjustments because of higher associated costs and complexity. Although the cost, complexity, and lead-time requirements associated with relocations can differ, they are considered equal for this analysis.

3.13.3.2 Results

Major utilities that may need to be relocated due to implementing the Build Alternative are shown on Figure 3.13-1 and Figure 3.13-2. In the Southern Section, major utilities that may need to be relocated are concentrated between Park Avenue West and the South Platte River where up to 35 feet of fill is planned and along Brighton Boulevard, which would be shifted to the east. Major utilities which may need to be relocated include overhead telephone and electric distribution and transmission lines, buried fiber optic, sanitary sewers, storm sewers, high-pressure gas lines, and water lines. In the Northern Section, potential major utility relocations are located primarily at 104th Avenue and 120th Avenue, where grade separations (underpasses or overpasses) are proposed, and include impacts to buried fiber and telephone lines, water lines, overhead telephone and electric distribution lines, sanitary sewers and a lift station, and a high-pressure gas pipeline.

Utilities would be affected by the choice of vehicle technology. If EMU is selected over DMU technology, EMU would require the placement of up to three paralleling stations in the direct impact area. Although the location of the paralleling station(s) is not known, RTD anticipates locating them within station site parameters, if possible, to contain impacts. In addition, although overhead utilities such as electric transmission lines may need to be relocated regardless of which vehicle technology is selected, the higher profile associated with EMU increases the likelihood of such relocations.

FIGURE 3.13-1. POTENTIAL MAJOR UTILITY RELOCATIONS — SOUTHERN SECTION

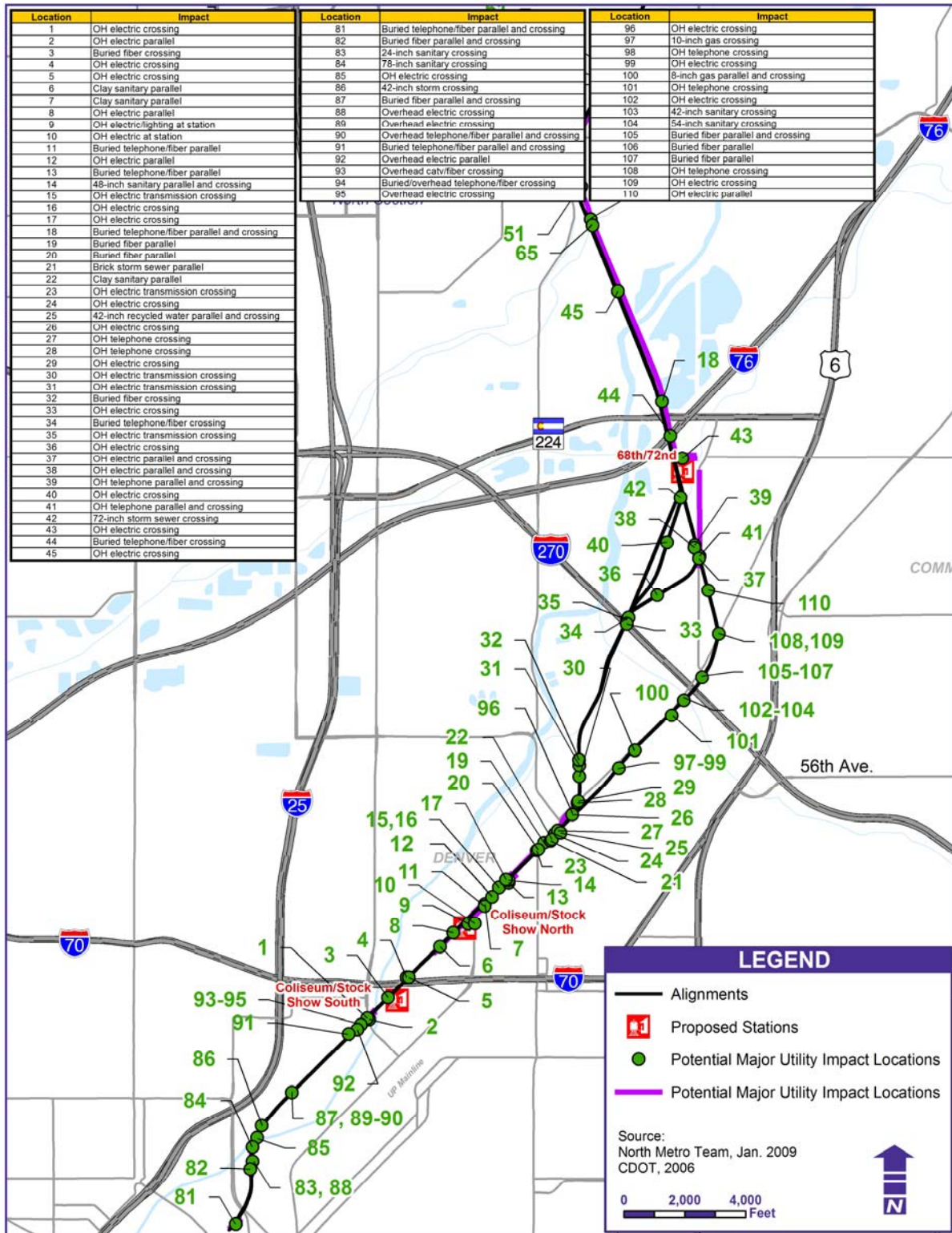
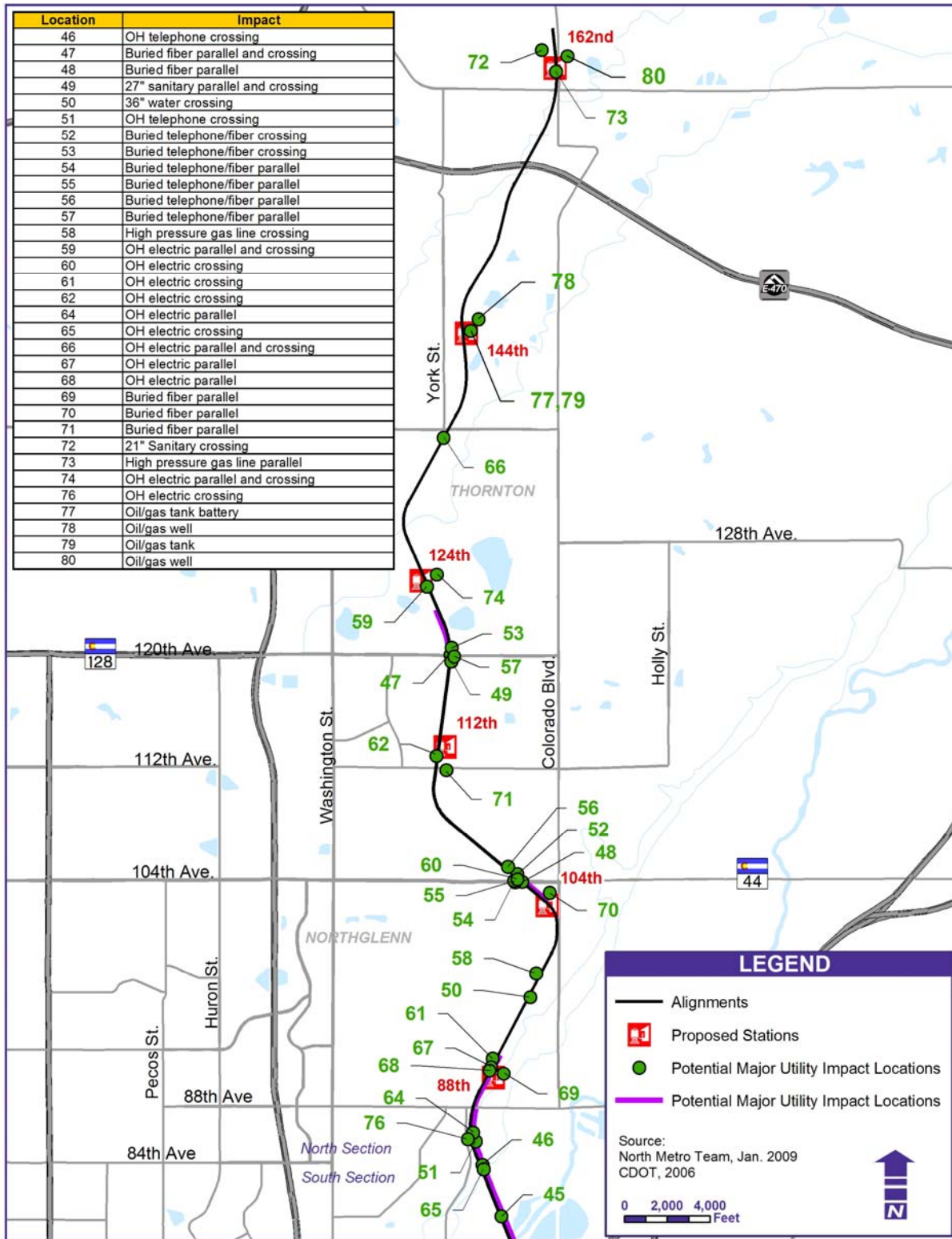


FIGURE 3.13-2. POTENTIAL MAJOR UTILITY RELOCATIONS — NORTHERN SECTION



North Metro Corridor

All utility impacts are expected to be short-term and addressed prior to or during construction by relocation or adjustment. There would be no indirect or long-term impacts. Utilities would also be impacted by the No Action Alternative, because other funded transportation projects are presumed to proceed. A summary of the direct and indirect impacts is provided in Table 3.13-2.

TABLE 3.13-2. DIRECT AND INDIRECT IMPACTS SUMMARY — UTILITIES

Alternative/Alignment		Direct Impacts	Indirect Impacts
NO ACTION ALTERNATIVE <i>SOUTHERN SECTION AND NORTHERN SECTION</i>		Not quantified	Not quantified
BUILD ALTERNATIVE			
<i>SOUTHERN SECTION — DUS Access to 84th Avenue</i>			
Alignments			
A-3		70 relocations 9 adjustments	No indirect impacts
B-2		52 relocations 6 adjustments	No indirect impacts
B-3		53 relocations 6 adjustments	No indirect impacts
B-4		57 relocations 7 adjustments	No indirect impacts
Stations			
Station Target Area	Station Option		
Coliseum/Stock Show (Denver)	Coliseum/Stock Show South	No relocations 3 adjustments	No indirect impacts
	Coliseum/Stock Show North	4 relocations 2 adjustments	No indirect impacts
Commerce City	68 th Avenue (Only Compatible with B-4)	2 relocations No adjustments	No indirect impacts
	72 nd Avenue South	1 relocation 1 adjustment	No indirect impacts
<i>NORTHERN SECTION — 84th Avenue to 162nd Avenue Area</i>			
Alignment		23 relocations 37 adjustments	No indirect impacts
Stations			
Station Target Area	Station Option		
88 th Avenue (Thornton)	88 th Avenue	4 relocations 2 adjustments	No indirect impacts
	88 th Avenue Welby Road Relocation	3 relocations 1 adjustment	No indirect impacts
104 th Avenue (Thornton)	104 th Avenue	1 relocation 3 adjustments	No indirect impacts
112 th Avenue (Northglenn/Thornton)	112 th Avenue Parking West of York Street	1 relocation 1 adjustment	No indirect impacts
	112 th Avenue Parking East of York Street	1 relocation 1 adjustment	No indirect impacts

TABLE 3.13-2. DIRECT AND INDIRECT IMPACTS SUMMARY — UTILITIES

Alternative/Alignment		Direct Impacts	Indirect Impacts
124 th Avenue/ Eastlake (Thornton)	124 th Avenue	1 relocation 4 adjustments	No indirect impacts
144 th Avenue (Thornton)	144 th Avenue West	2 relocations 1 adjustment	No indirect impacts
	144 th Avenue East	3 relocations 1 adjustment	No indirect impacts
	144 th Avenue Split	No relocations No adjustments	No indirect impacts
162 nd Avenue (Thornton)	162 nd Avenue West	2 relocations 3 adjustments	No indirect impacts
	162 nd Avenue East	1 relocation 2 adjustments	No indirect impacts

Source: North Metro Corridor Project Team, 2008.

Notes:

Data presented for the alignments include mainline rail impacts only and do not include station impacts. Selected mix of station options must be added to this number to determine the total impact. Some impacts for mainline rail and stations overlap or coincide.

Number of utility impacts does not include impacts associated with the No Action Alternative.

All impacts are considered temporary construction impacts.

There are no cumulative impacts.

No Action Alternative

The No Action Alternative presumes that other funded transportation projects would proceed, including construction of the proposed FasTracks projects, and improvement projects identified in the *Metro Vision 2030 Plan* (DRCOG 2006a), the *DRCOG 2007-2012 TIP* (DRCOG 2006b), and local jurisdiction CIPs.

Direct Impacts

Impacts to major utilities from third-party projects would be addressed as part of the projects' respective design and construction processes.

Southern Section — DUS Access to 84th Avenue

Adams County and CDOT are planning to replace the existing I-76 structure over the UP Railroad tracks and the I-76/Colorado Boulevard interchange. Impacts to major utilities from these projects would be addressed as part of the projects' respective design and construction processes.

Northern Section — 84th Avenue to 162nd Avenue Area

Seven improvement projects are being planned by Adams County and the City of Thornton that may impact major utilities in the Northern Section:

- New roadway along Thornton Parkway from Steele Street to Colorado Boulevard
- New roadway along Colorado Boulevard from SH 7 to 160th Avenue
- Additional lane(s) along SH 7 from I-25 to US 85
- Roadway realignment along Colorado Boulevard from E-470 to 168th Avenue
- Roadway widening of 128th Avenue from I-25 to York Street

- Roadway widening of 144th Avenue from Washington Street to Colorado Boulevard
- Intersection improvements at 88th Avenue and Devonshire Road

Impacts to major utilities resulting from these projects would be addressed as part of their respective project designs and construction.

Indirect Impacts

No indirect impacts are anticipated from implementing the No Action Alternative.

Temporary Construction Impacts

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

Cumulative Impacts

The projects included under the No Action Alternative would require the extension, augmentation, or modification of utilities. In response to increased development and population growth, new utilities would be built and existing utilities would be replaced and improved, regardless of which transportation or private sector projects occur. Overall, the proposed projects would not result in significant long-term, cumulative, adverse impacts on utilities.

Build Alternative

Direct Impacts

Southern Section — DUS Access to 84th Avenue

Relocations and adjustments to utilities by alignment and station are summarized in Table 3.13-2 and are shown on Figure 3.13-1. Major utilities that may need to be relocated include overhead electric distribution and transmission lines, buried and overhead fiber optic and telephone lines, sanitary and storm sewers, high pressure gas lines, and a water line. For all of the alignments, relocations would be concentrated south of 38th Street where new tracks are planned adjacent to the existing BNSF Brush Subdivision ROW and along Brighton Boulevard (which would be realigned to the east, south of Riverside Cemetery). Additional relocations specific to the A-3 alignment would be concentrated along Brighton Boulevard and the BNSF corridor from the north end of Riverside Cemetery to I-270, where an elevated structure would be built to carry the commuter rail through Sand Creek Junction. For this reason, the greatest number of impacts would result from A-3 (70 relocations and 9 adjustments), compared to alignments B-2, B-3, and B-4 (52, 53, and 57 relocations, and six, six, and seven adjustments, respectively). Station relocations would range from one to six relocations, and from two to four adjustments depending on the mix of the station options selected. A complete listing of the major utilities impacted is provided in the *North Metro Utilities Technical Memorandum Addendum (BNSF Alternative)* (Goodbee 2008a) and the *North Metro Utilities Technical Memorandum Addendum (DUS Access to 38th Street)* (Goodbee 2009).

Northern Section — 84th Avenue to 162nd Avenue Area

In the Northern Section, the Build Alternative would include adding additional track(s) within the existing UP Railroad ROW and minimal grade change, except at 104th Avenue and 120th Avenue where grade separations taking the mainline rail below the cross streets are proposed. As described in Table 3.13-2 and shown in Figure 3.13-2, major utilities that may need to be relocated include buried fiber and telephone lines, water lines, overhead telephone and electric distribution lines, sanitary sewers, and a high-pressure gas pipeline. The alignment would necessitate 23 relocations and 37 adjustments. Five to 12 relocations and eight to 14 adjustments associated with stations would be necessary depending on the station options

selected. A complete listing of major utilities impacted is provided in the *North Metro Basic Utility Report* (Goodbee 2008b).

Indirect Impacts

No indirect impacts associated with the Build Alternative are anticipated.

Temporary Construction Impacts

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

Connected Action - CRMF Fox North Site

According to the *Commuter Rail Maintenance Facility Supplemental Environmental Assessment to FasTracks Commuter Rail Corridors* (FTA and RTD 2009), the CRMF would potentially require relocation or modification of two water mains, five storm sewers, two sanitary sewers, one buried gas line, and several fiber optic telecommunication and electric lines (see Table 3.13-3).

Direct impacts to utilities are detailed in Table 3.13-2. No indirect impacts are anticipated.

TABLE 3.13-3. UTILITIES IN THE CRMF PROJECT STUDY AREA

Utility/Owner	Utility Type	Description
Denver Water	Water	<ul style="list-style-type: none"> • A 36-inch water main runs in an east/west direction south of the West 48th Avenue Frontage Road. • A 4-inch water main runs in an east/west direction beneath the West 48th Avenue Frontage Road.
Denver Wastewater Management Division	Storm	<ul style="list-style-type: none"> • A 42-inch reinforced concrete pipe runs in an east/west direction south of the West 48th Avenue Frontage Road. • A 48- to 54-inch steel pipe runs in an east/west direction beneath the West 48th Avenue Frontage Road. • A 48-inch storm sewer runs in an east/west direction near Owens Corning. • A 36-inch reinforced concrete pipe runs in an east/west direction near Owens Corning. • A 42-inch storm sewer runs in an east/west direction near Owens Corning.
Metro Wastewater Reclamation District	Sanitary	<ul style="list-style-type: none"> • A 15-inch reinforced concrete pipe runs in an east/west direction near Owens Corning.
Private	Sanitary	<ul style="list-style-type: none"> • Four sanitary sewers of unknown size and run in an east/west and north/south direction near Qwest.
Qwest Communications	Telecom	<ul style="list-style-type: none"> • Two overhead telephone lines and one buried telephone line are near the West 48th Avenue Frontage Road and Qwest.
Xcel Energy	Electric/Gas	<ul style="list-style-type: none"> • Four overhead and one underground electric line are near the West 48th Avenue Frontage Road and Qwest. • One buried gas line runs in an east/west direction near Qwest.

Source: CRMF Project Team, 2008.

Note:

CRMF = Commuter Rail Maintenance Facility

Cumulative Impacts

Proposed projects within the North Metro corridor study area would require the extension, augmentation, or modification of utilities. In response to increased development and population growth, new utilities would be built and existing utilities would be replaced and improved, regardless of the transportation or private projects that occur. Overall, the Build Alternative combined with other proposed projects would not result in significant, long-term, adverse, cumulative impacts on utilities. Increased density around transit stations could result in a slightly lower per capita cost for utilities because of shorter distances of new utility lines.

3.13.4 Mitigation

Mitigation measures under the No Action Alternative would be defined and implemented as part of the individual projects.

Under the Build Alternative, more detailed information regarding the location of utilities will be provided as the design process proceeds. It is anticipated that many utility impacts will be mitigated through close coordination with the utility companies and municipalities during design and construction. Table 3.13-4 summarizes the measures that may be used to mitigate impacts to major utilities.

TABLE 3.13-4. PROPOSED MITIGATION MEASURES — UTILITIES

Impact	Impact Type	Mitigation Measures
Adjustment or Relocation of Irrigation Ditches	Construction	<ul style="list-style-type: none"> Construction will be scheduled during periods of non-use or low-use (November to March). Design will be modified to avoid/minimize conflict.
Relocation of Electric Transmission Towers	Construction	<ul style="list-style-type: none"> Construction will be scheduled during periods of low use (October to April). Design will be modified to avoid/minimize conflict. Protect in place.
Adjustment or Relocation of High-Pressure Gas Line(s)	Construction	<ul style="list-style-type: none"> Construction will be scheduled during periods of low use (May to September). Design will be modified to avoid/minimize conflict.
Adjustment or Relocation of Buried Fiber Optic	Construction	<ul style="list-style-type: none"> Early coordination with utility owners will be completed. Design will be modified to avoid/minimize conflict. Protect in place. Variance to minimum depth requirement will be obtained.
Adjustment or Relocation of Water Lines, Sanitary Sewers	Construction	<ul style="list-style-type: none"> Design will be modified to avoid conflict. Disruption of service for low-use period will be scheduled. Disruption of service with wet tie-in will be minimized.
Relocation of Storm Sewers	Construction	<ul style="list-style-type: none"> Design will be modified to avoid/minimize conflict.
New Roadway, Retaining Walls, or Additional/Reduced Cover on Buried Utilities	Construction	<ul style="list-style-type: none"> An encasement or protective cover will be added over utilities (protect in place).

TABLE 3.13-4. PROPOSED MITIGATION MEASURES – UTILITIES

Impact	Impact Type	Mitigation Measures
Relocation of Overhead Telephone and Electric Distribution Lines	Construction	<ul style="list-style-type: none">• Early coordination with utility owners will be completed.

Source: North Metro Corridor Project Team, 2009.