



Utilities Report

In support of the
Environmental Impact Statement

South Mountain Transportation Corridor in Maricopa County, Arizona

Arizona Department of Transportation
Federal Highway Administration
in cooperation with
U.S. Army Corps of Engineers
U.S. Bureau of Indian Affairs
Western Area Power Administration



November 2012

Federal-aid Project Number: NH-202-D(ADY)
ADOT Project Number: 202L MA 054 H5764 01L



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Abstract: This document assesses and describes the effects on utilities that would occur as a result of the construction and operation of the proposed South Mountain Freeway, as adopted in the 2003 *Regional Transportation Plan*. Contents of this document will be presented in Chapter 4 of the South Mountain Transportation Corridor Environmental Impact Statement.

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List of Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
C	Central
E	Eastern
E1	E1 Alternative
EIS	environmental impact statement
FHWA	Federal Highway Administration
FO	fiber optic
FR	Full Reconstruction
I-10	Interstate 10
kV	kilovolt
MAG	Maricopa Association of Governments
OH	overhead
PR	Partial Reconstruction
RID	Roosevelt Irrigation District
R/W	right-of-way
SMTTC	South Mountain Transportation Corridor
SR	State Route
SRP	Salt River Project
TI	traffic interchange
UG	underground
UPRR	Union Pacific Railroad
W	Western
W101CFR	W101 Alternative, Central Option, Full Reconstruction
W101CPR	W101 Alternative, Central Option, Partial Reconstruction
W101EFR	W101 Alternative, Eastern Option, Full Reconstruction
W101EPR	W101 Alternative, Eastern Option, Partial Reconstruction
W101WFR	W101 Alternative, Western Option, Full Reconstruction
W101WPR	W101 Alternative, Western Option, Partial Reconstruction
W59	W59 Alternative
W71	W71 Alternative
Western	Western Area Power Administration

Glossary

affected environment	Those elements of the Study Area that may be changed by the proposed alternatives. These changes might be positive or negative in nature.
Arizona Department of Transportation (ADOT)	The state agency responsible for state roads and highways.
capacity	The maximum number of vehicles that a given section of roadway or traffic lane can accommodate.
continued lateral	A sublateral branching off a main irrigation lateral.
cumulative impact	The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 Code of Federal Regulations § 1508.7)
direct impact	A change caused by the action that occurs at the same time and same place as the action.
Eastern Section	The portion of the Study Area located east of 59th Avenue.
environmental impact statement (EIS)	The project documentation prepared in accordance with the National Environmental Policy Act when the project is anticipated to have a significant impact on the environment.
Federal Highway Administration (FHWA)	A branch of the U.S. Department of Transportation responsible for administering the Federal-aid Program. The program provides financial resources and technical assistance for constructing, preserving, and improving the National Highway System along with other urban and rural roads.
kilovolt (kV)	One thousand volts.
lateral	A type of irrigation feature branching off of a canal that can be a lined or unlined ditch or pipe.
major utility	A utility feature that falls into one of the following categories: power lines 69 kV or over, gas and petroleum pipelines over 10 inches in diameter, water pipelines over 12 inches in diameter, sewer lines over 36 inches in diameter, fiber-optic cable and telephone lines, pump stations, railroads, and canals.
mitigation	An action taken to reduce or eliminate an adverse impact stemming from construction, operation, or maintenance of a proposed action alternative. Mitigation could reduce the magnitude and extent of an impact from a level of significance to a level of insignificance. Mitigation includes <i>avoiding</i> the impact altogether by not taking a certain action or parts of an action; <i>minimizing</i> impacts by limiting the degree of magnitude of the action and its implementation; <i>rectifying</i> the impact by repairing, rehabilitating, or restoring the affected environment; <i>reducing or eliminating</i> the impact over time by preservation and maintenance operations during the life of the action; and <i>compensating</i> for the impact by replacing or providing substitute resources or environments. (40 Code of Federal Regulations § 1508.20)

pipel lateral	A reinforced concrete pipe branching off of an irrigation canal.
right-of-way (R/W)	Publicly owned land used or intended to be used for transportation and other purposes.
secondary impact	A change caused by the action that is later in time or farther removed in distance, but is still reasonably foreseeable. Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems.
Study Area	The geographic area within which action alternative solutions to the problem are developed.
underground (UG) primary	An underground electrical 12 kV power line.
utility	An entity that transmits or distributes communication, cable television, electricity, light, heat, gas, petroleum products, water, sewer, waste, or any other similar commodity that directly or indirectly serves the public. For the purposes of this report, a railroad is also considered a utility.
Western Section	The portion of the Study Area located west of 59th Avenue.

1. Project Description and Purpose and Need

Project Description

The Arizona Department of Transportation (ADOT) is studying the South Mountain Transportation Corridor (SMTC) in southern Phoenix, Maricopa County, Arizona. The South Mountain Freeway corridor was adopted into the Maricopa Association of Governments (MAG) regional freeway system in 1985 as part of the *MAG Freeway/Expressway Plan* (MAG 1985), at which time it was placed on the state highway system by the State Transportation Board. In 1988, ADOT prepared a design concept report and a state-level environmental assessment for the project, identified at that time as the South Mountain Parkway (ADOT 1988a, 1988b). As presented then, the project would connect Interstate 10 (I-10) (Maricopa Freeway) south of Phoenix with I-10 (Papago Freeway) west of the city, following an east-to-west alignment along Pecos Road through the western tip of the Phoenix South Mountain Park/Preserve, then north to I-10 between 59th and 99th avenues. Because of the time elapsed since those documents were approved and to secure eligibility for federal funding for a proposed project within this corridor, ADOT and the Federal Highway Administration (FHWA) are now preparing an environmental impact statement (EIS) in accordance with the National Environmental Policy Act. In November 2004, the MAG *Regional Transportation Plan* (2003) was placed before Maricopa County voters, who approved the sales tax funding the plan. The South Mountain Freeway was included in this plan.

Alternatives considered for the SMTC included past freeway proposals as well as transportation system management, transportation demand management, transit improvements, arterial street network improvements, and land use controls. A freeway facility was determined to best address the project purpose and need. Therefore, this report discusses the potential impacts of a proposed freeway in the SMTC.

The Study Area for the EIS encompasses more than 156 square miles and is divided into a Western Section and an Eastern Section at a location common to all action alternatives (Figure 1). The division between sections occurs just east of 59th Avenue and south of Elliot Road.

Within the Western Section, three action alternatives are being considered for detailed study. These are the W59, W71, and W101 Alternatives. The W59 Alternative would connect to I-10 at 59th Avenue, while the W71 Alternative would connect at 71st Avenue. The W101 Alternative would connect to I-10 at the existing State Route (SR) 101L (Agua Fria Freeway)/I-10 system traffic interchange (TI) and has six associated options. The W101 Alternative options vary geographically among the Western (W), Central (C), and Eastern (E) Options and would vary geometrically based on a Partial Reconstruction (PR) or a Full Reconstruction (FR) of the system TI.

Improvements to I-10 (Papago Freeway) would occur for each Western Section action alternative (W59, W71, and W101). Improvements to SR 101L would occur for each option associated with the W101 Alternative.

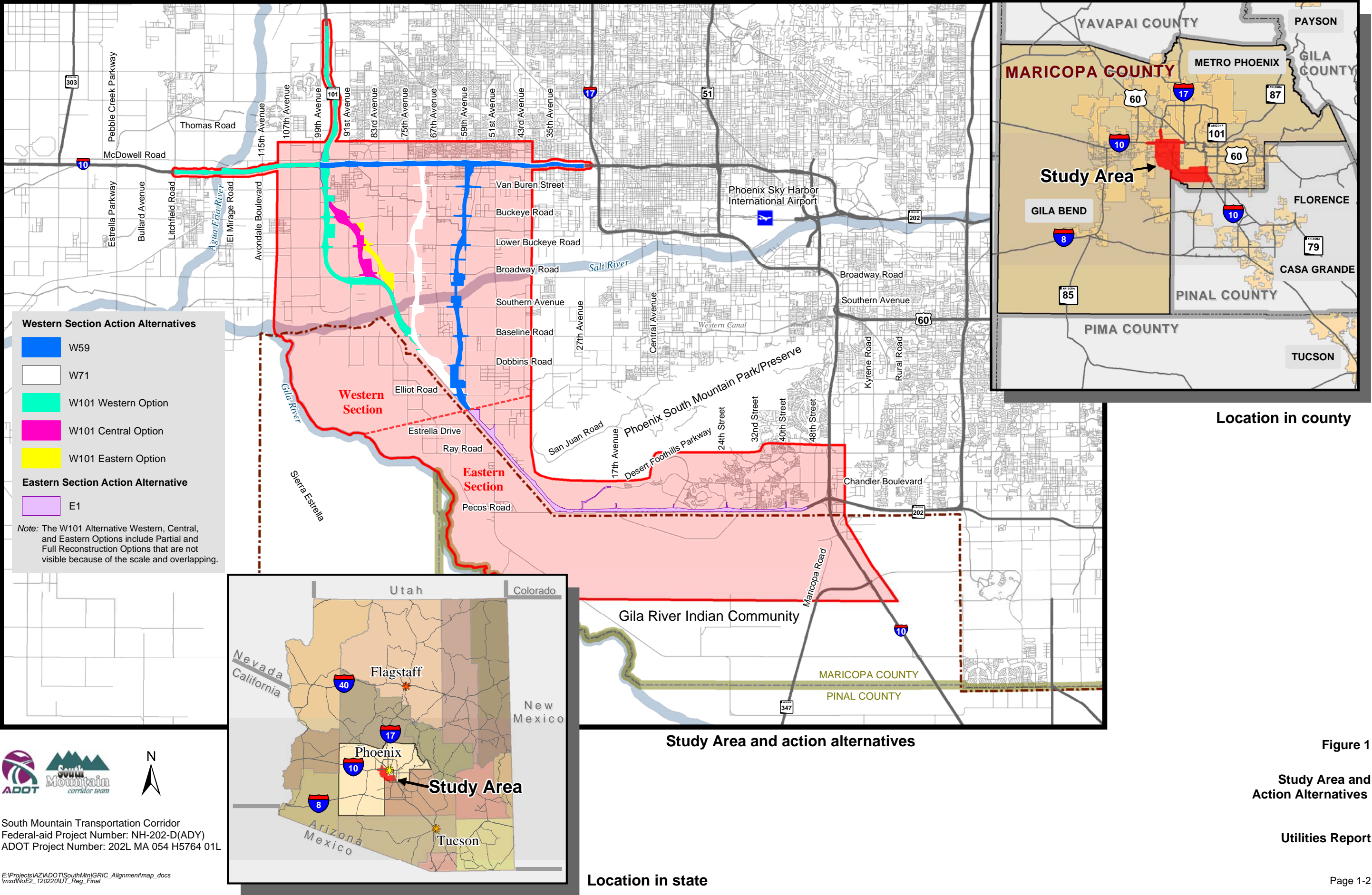


Figure 1
Study Area and
Action Alternatives
Utilities Report

Project Description and Purpose and Need

Within the Eastern Section of the Study Area, one action alternatives is being considered. The E1 Alternative would begin near Elliot Road and 59th Avenue and proceed to the southeast to Pecos Road, which it would follow to the east until connecting to I-10 (Maricopa Freeway) at the Pecos Road/I-10/SR 202L (Santan Freeway) system TI.

The action alternatives and options are summarized in Table 1.

Table 1. Action Alternatives and Options

Section	Interstate 10 Connection	Action Alternative	Option – Broadway Road to Buckeye Road	Option – State Route 101L/ Interstate 10 Connection Reconstruction	Option Name
Western	59th Avenue	W59	— ^a	—	—
	71st Avenue	W71	—	—	—
	State Route 101L	W101	Western	Partial Reconstruction	W101WPR
				Full Reconstruction	W101WFR
			Central	Partial Reconstruction	W101CPR
				Full Reconstruction	W101CFR
			Eastern	Partial Reconstruction	W101EPR
				Full Reconstruction	W101EFR
Eastern	Pecos Road	E1	—	—	—

^a not applicable

The No-Action Alternative is being considered for the entire Study Area.

Purpose and Need

An analysis of population trends, land use plans, and travel demand shows that a considerable traffic problem in the Phoenix metropolitan area is projected for the future, resulting in the need for a new freeway in the SMTTC. This traffic problem is likely to worsen if plans are not made to accommodate the regional travel anticipated. The purpose of a freeway within the SMTTC is to support a solution to traffic congestion. Between the early 1950s and the mid-1990s, the metropolitan area grew by over 500 percent, compared with approximately 70 percent for the United States as a whole (MAG 2001). From 1980 to 2005, the Maricopa County population more than doubled, from 1.5 million to 3.7 million. The MAG region has been one of the fastest-growing metropolitan areas in the United States; Phoenix is now the fifth-largest city in the country, and the region ranks as the 12th-largest metropolitan area in the country.

Travel demand and vehicle miles driven in the metropolitan area are expected to increase at a faster rate than the population. MAG projections (conducted in collaboration with the Arizona Department of Economic Security) indicate Maricopa County's population will increase from 3.7 million in 2005 to 6.5 million in 2035 (MAG 2009). It is projected that in the next 25 years, daily vehicle miles traveled will increase from 101 million to 185 million.

Project Description and Purpose and Need

Even with anticipated improvements in light rail service, bus service, trip reduction programs, and existing roads and freeways, vehicle traffic volumes are expected to exceed the capacity of Phoenix metropolitan area streets and highways by as much as 11 percent in 2035. A freeway within the SMTTC would accommodate approximately 6 percentage points of the 11 percent of the unmet travel demand and would be part of an overall traffic solution.

2. Affected Environment

Because of the large number and varying types of utilities contained in the Study Area, the utilities are presented by type and size in this report. Appendix A includes figures detailing the location of utilities in the Study Area.

Western Section

The Western Section of the Study Area contains multiple large-diameter gas and petroleum pipelines, high-voltage electricity transmission lines, and regional sanitary sewer lines. The City of Phoenix 91st Avenue and the City of Tolleson wastewater treatment plants are adjacent to some of the action alternatives. The Western Section also includes the Union Pacific Railroad (UPRR) tracks, the Roosevelt Irrigation District (RID) Canal, the Salt River Project (SRP) Grand Canal, and major fiber-optic (FO) telephone lines.

Eastern Section

The Eastern Section of the Study Area includes major utilities such as multiple large-diameter gas lines operated by Kinder Morgan Energy Partners, multiple large-diameter sewer lines and water lines operated by the City of Phoenix, and several high-voltage electricity transmission lines operated by SRP and the Western Area Power Administration (Western).

3. Environmental Consequences

Potential direct impacts on utilities are presented for the Western and Eastern Section action alternatives and the No-Action Alternative in the following sections. Also discussed are cumulative and secondary impacts. The major utilities are highlighted because of the complexities associated with relocation or avoidance. A major utility falls into one of the following categories: electricity transmission lines 69 kilovolt (kV) or greater, gas and petroleum pipelines over 10 inches in diameter, water pipelines over 12 inches in diameter, sewer lines over 36 inches in diameter, FO cable and telephone lines, pump stations, railroads, and canals.

The conflict length of the utility is estimated based on length of the utility within the proposed freeway right-of-way (R/W). The actual extent of the impact and the need for avoidance or relocations would be determined during the final design phase.

Impacts Associated with the Western Section Action Alternatives

All of the Western Section action alternatives would affect several large utilities. The extent and complexity of the effects would vary among the action alternatives, but would be relatively similar in scale. The identified impacts are typical for a project of this size. Specific utility impacts for each action alternative are identified in the following sections. Appendix A presents figures detailing the location of utilities in the Study Area.

W59 Alternative

The potential utility impacts of the W59 Alternative are presented in Table 2. Noteworthy observations regarding the major utilities include:

- ▶ The drainage channel associated with the W59 Alternative would affect major underground utilities that run along major arterial streets. To avoid or minimize the relocation of these utilities, the drainage channel may need to be siphoned under the utilities.
- ▶ Impacts to the RID canal and UPRR main line and spur tracks (and utilities within their R/W) would be avoided by constructing bridges over the utilities.
- ▶ An SRP power substation at 59th Avenue and Lower Buckeye Road would be located adjacent to—but outside of—the W59 Alternative R/W and is not included in Table 2.
- ▶ Arizona Public Service has completed preliminary design for the relocation of conflicting lines along the Elwood Street alignment. They would need to be raised to allow the freeway to pass underneath. The two poles nearest the freeway would be replaced with new poles to provide the additional vertical clearance.
- ▶ Western also has power lines along the Elwood Street alignment that would need to be raised by replacing the two poles nearest the freeway.

Table 2. Utilities within the W59 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
AT&T			
Telephone	UG-FO ^a	west–east	Durango Street between 63rd and 55th avenues Conflict length is 650 feet.
City of Phoenix			
Water	6 inches	west–east	Baseline Road between 63rd and 59th avenues Conflict length is 1,450 feet.
	12 inches	west–east	Baseline Road between 63rd and 59th avenues Conflict length is 1,300 feet.
	6 inches	west–east	Southern Avenue between 63rd and 59th avenues Conflict length is 1,350 feet.
	12 inches	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 1,300 feet.
	12 inches	west–east	Buckeye Road between 59th and 55th avenues Conflict length is 100 feet.
	12 inches	west–east	Van Buren Street between 59th and 55th avenues Conflict length is 1,300 feet with two lines.
	12 inches	west–east	Roosevelt Street between 59th and 55th avenues Conflict length is 760 feet.
Sewer	90 inches ^a	west–east	Broadway Road between 63rd and 59th avenues Total conflict length is 3,200 feet (two lines).
	24 inches	north–south	59th Avenue between Durango and Van Buren streets Conflict length is 10,480 feet.
	8 inches	west–east	Buckeye Road between 59th and 55th avenues Conflict length is 1,275 feet.
	12 inches	west–east	Buckeye Road between 59th and 55th avenues Conflict length is 1,300 feet.
Cox			
Cable	OH-FO ^a	west–east	Buckeye Road between 63rd and 59th avenues Conflict length is 650 feet.
	OH-FO ^a	west–east	Van Buren Street between 59th and 55th avenues Conflict length is 650 feet.
Kinder Morgan Energy Partners			
Petroleum	20 inches ^a	west–east	Harrison Street between 63rd and 55th avenues Conflict length is 540 feet.
CenturyLink			
Telephone	UG	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,700 feet.
		west–east	Dobbins Road between 63rd and 59th avenues Conflict length is 3,300 feet.
		west–east	Baseline Road between 63rd and 59th avenues Conflict length is 3,600 feet with three lines.
		west–east	Southern Avenue between 63rd and 59th avenues Conflict length is 1,300 feet.
		west–east	Lower Buckeye Road between 63rd and 59th avenues Conflict length is 1,300 feet.

Table 2. Utilities within the W59 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
		north–south	59th Avenue between Durango Street and Lower Buckeye Road Conflict length is 2,640 feet.
		west–east	Buckeye Road between 63rd and 55th avenues Conflict length is 650 feet.
		west–east	Van Buren Street between 59th and 55th avenues Conflict length is 650 feet.
		west–east	Roosevelt Street between 59th and 55th avenues Conflict length is 755 feet.
Roosevelt Irrigation District			
Irrigation	Large canal ^a	west–east	Roosevelt Canal – Durango Street between 59th and 55th avenues Conflict length is 565 feet.
	Lateral	west–east	Salt Canal – Van Buren Street and 55th Avenue Conflict length is 870 feet.
Southwest Gas			
Gas	4 inches	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 1,230 feet.
	10 inches	west–east	Buckeye Road between 59th and 55th avenues Conflict length is 650 feet.
	4 inches	west–east	Roosevelt Street and 55th Avenue Conflict length is 345 feet.
	4 inches	west–east	Van Buren Street between 59th and 51st avenues Conflict length is 1,300 feet (two lines)
	4 inches	north– south	Between 59th and 51st avenues and I-10 Conflict length is 525 feet.
Sprint			
Telephone	UG-FO ^a	west–east	Lower Buckeye Road between 63rd and 59th avenues Conflict length is 1,300 feet.
Arizona Public Service			
Power	OH-230 kV ^a	west–east	Elwood Street between 63rd and 59th avenues Conflict length is 470 feet.
Salt River Project			
Power	OH-12 kV	north–south	59th Avenue between Elliot Road and Estrella Drive Conflict length is 1,300 feet.
	OH-12 kV	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,670 feet.
	OH-12 kV	west–east	Dobbins Road between 63rd and 59th avenues Conflict length is 1,350 feet.
	OH-12 kV	west–east	Baseline Road between 63rd and 59th avenues Conflict length is 1,030 feet.
	OH-12 kV	west–east	Southern Avenue between 63rd and 59th avenues Conflict length is 890 feet.
	OH-69 kV ^a	west–east	Southern Avenue between 63rd and 59th avenues Conflict length is 1,350 feet.

Table 2. Utilities within the W59 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
	OH-230 kV ^a	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 860 feet.
	OH-12 kV	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 1,350 feet.
	OH-69 kV ^a	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 1,350 feet.
	OH-69 kV ^a	west–east	Lower Buckeye Road between 63rd and 59th avenues Conflict length is 1,415 feet.
	OH-69 kV ^a	north–south	59th Avenue between Lower Buckeye Road and Van Buren Street Conflict length is 10,300 feet.
	OH-12 kV	north–south	59th Avenue between Durango Street and Lower Buckeye Road Conflict length is 1,430 feet.
	OH-12 kV	west–east	Durango Street between 59th and 55th avenues Conflict length is 560 feet.
	OH-12 kV	west–east	Buckeye Road between 59th and 55th avenues Conflict length is 1,485 feet.
	UG-Primary ^b	west–east	Buckeye Road between 63rd and 59th avenues Conflict length is 650 feet.
	OH-12 kV	west–east	Harrison Street between 63rd and 59th avenues Conflict length is 650 feet.
	OH-69 kV ^a	west–east	Harrison Street between 63rd and 59th avenues Conflict length is 665 feet.
	UG-Primary	west–east	Van Buren Street between 59th and 55th avenues Conflict length is 650 feet.
	OH-12 kV	west–east	Van Buren Street between 59th and 55th avenues Conflict length is 650 feet.
<i>Salt River Project</i>			
Irrigation	Continued lateral	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 1,180 feet.
	Open drain	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 750 feet.
	Open drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,670 feet.
	Drain piped	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,120 feet.
	Continued lateral	west–east	Between Dobbins Road, Elliot Road, 63rd Avenue, and 59th Avenue Conflict length is 1,180 feet.
	Continued lateral	west–east	Dobbins Road between 63rd and 59th avenues Conflict length is 1350 feet.
	Open drain	west–east	Baseline Road between 63rd and 59th avenues Conflict length is 1,015 feet.
	Piped lateral	west–east	Broadway Road between 63rd and 59th avenues Conflict length is 2,000 feet.

Table 2. Utilities within the W59 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
	Open drain	west–east	Lower Buckeye Road between 63rd and 59th avenues Conflict length is 1,415 feet.
	Continued lateral	north–south	59th Avenue between Durango Street and Lower Buckeye Road Conflict length is 1,460 feet.
	Continued lateral	west–east	Elliot Road between 59th and 51st avenues Conflict length is 2,270 feet.
	Piped drain	north–south	71st Avenue and I-10 Conflict length is 500 feet.
	Piped lateral	north–south	67th Avenue and I-10 Conflict length is 520 feet.
	Piped lateral	north–south	59th Avenue and I-10 Conflict length is 555 feet.
	Piped lateral	north–south	51st Avenue and I-10 Conflict length is 535 feet.
	Piped lateral	north–south	47th Avenue and I-10. Conflict length is 590 feet.
	Piped lateral	north–south	43rd Avenue and I-10. Conflict length is 535 feet.
<i>Union Pacific Railroad</i>			
Railroad	One track ^a	west–east	Harrison Street between Van Buren Street and Buckeye Road Conflict length is 595 feet.
<i>Western Area Power Administration</i>			
Power	OH-230 kV ^a	west–east	Elwood Street between 63rd and 59th avenues Conflict length is 470 feet.

Sources: company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility ^b underground 12 kV electricity transmission line

W71 Alternative

Potential utility impacts of the W71 Alternative are presented in Table 3. Noteworthy observations regarding the major utilities include:

- The drainage channel associated with the W71 Alternative would affect the major underground utilities that run along major arterial streets. To avoid or minimize the relocation of these utilities, the drainage channel may need to be siphoned under the utilities.
- Impacts to the RID canal and UPRR main line and spur tracks (and utilities within their R/W) would be avoided by constructing bridges over the utilities.

Table 3. Utilities within the W71 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
<i>AT&T</i>			
Telephone	UG-FO ^a	west–east	Harrison Street and 71st Avenue Conflict length is 640 feet.
<i>City of Phoenix</i>			
Water	12 inches	west–east	Broadway Road and 71st Avenue Conflict length is 1,570 feet.
	12 inches	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 850 feet.
	12 inches	west–east	Buckeye Road and 71st Avenue Conflict length is 1,630 feet.
	8 inches	north–south	71st Avenue and Buckeye Road Conflict length is 2,360 feet.
	12 inches	west–east	Van Buren Street and 71st Avenue Conflict length is 1,520 feet.
	8 inches	north–south	71st Avenue and Roosevelt Street Conflict length is 790 feet.
	90 inches ^a	west–east	Broadway Road between 75th and 71st avenues Total conflict length is 2,655 feet (two lines).
	8 inches	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 1,150 feet.
Sewer	8 inches	west–east	Buckeye Road and 71st Avenue Conflict length is 1,630 feet.
	12 inches	west–east	Van Buren Street and 71st Avenue Conflict length is 190 feet.
<i>Cox</i>			
Cable	UG-FO ^a	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 1,150 feet.
	UG	west–east	Van Buren Street and 71st Avenue Conflict length is 690 feet.
	OH-FO ^a	north–south	71st Avenue between I-10 and Van Buren Street Conflict length is 4,185 feet.
<i>Kinder Morgan Energy Partners</i>			
Petroleum	20 inches ^a	west–east	Between 67th and 75th avenues and between Van Buren Street and Buckeye Road Conflict length is 635 feet.
	6 inches	west–east	Roosevelt Street and 71st Avenue Conflict length is 660 feet.

Table 3. Utilities within the W71 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
CenturyLink			
Telephone	UG	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,590 feet.
		west–east	Dobbins Road and 67th Avenue Conflict length is 2,070 feet.
		west–east	Baseline Road between 75th and 71st avenues Conflict length is 1,360 feet.
		west–east	Southern Avenue between 75th and 71st avenues Conflict length is 1,375 feet.
		west–east	Broadway Road between 75th and 71st avenues Total conflict length is 2,530 feet (two lines).
		west–east	Lower Buckeye Road and 71st Avenue Total conflict length is 1,700 feet (two lines).
		west–east	Buckeye Road and 71st Avenue Conflict length is 1,115 feet.
		north–south	71st Avenue and Buckeye Road Conflict length is 1,350 feet.
		west–east	Van Buren Street and 71st Avenue Conflict length is 2,225 feet.
		north–south	71st Avenue and Van Buren Street Conflict length is 2,570 feet.
Roosevelt Irrigation District			
Irrigation	Large canal ^a	west–east	Roosevelt Canal – Harrison Street and 71st Avenue Conflict length is 650 feet.
	Large canal ^a	north–south	Roosevelt Canal – 91st Avenue and I-10 Conflict length is 560 feet.
	Lateral	west–east	Salt Canal – Van Buren Street and 71st Avenue Conflict length is 905 feet.
Southwest Gas			
Gas	4 inches	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 1,350 feet.
	10 inches	west–east	Buckeye Road and 71st Avenue Conflict length is 1630 feet.
	4 inches	west–east	Van Buren Street and 71st Avenue Conflict length is 1,520 feet.
Sprint			
Telephone	UG-FO ^a	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 840 feet.

Table 3. Utilities within the W71 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
<i>Salt River Project</i>			
Power	OH-12 kV	north–south	59th Avenue between Elliot Road and Estrella Drive Conflict length is 1,475 feet.
	OH-12 kV	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	OH-12 kV	west–east	Dobbins Road between 67th and 63rd avenues Conflict length is 2,540 feet.
	OH-69 kV ^a	west–east	Baseline Road between 75th and 71st avenues Conflict length is 1,930 feet.
	OH-230 kV ^a	west–east	Broadway Road and 71st Avenue Conflict length is 915 feet.
	OH-69 kV ^a	west–east	Broadway Road and 71st Avenue Conflict length is 1,570 feet.
	OH-69 kV ^a	west–east	Lower Buckeye Road and 71st Avenue Conflict length is 1,350 feet.
	UG-Primary ^b	west–east	Buckeye Road and 71st Avenue Conflict length is 1,630 feet.
	OH-69 kV ^a	west–east	Harrison Street and 71st Avenue Conflict length is 645 feet.
	OH-69 kV ^a	north–south	71st Avenue between Roosevelt and Van Buren streets Conflict length is 2,780 feet.
Irrigation	Continued lateral	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 2,265 feet.
	Open drain	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 750 feet.
	Open drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	Piped drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,700 feet.
	Continued lateral	west–east	Between Dobbins and Elliot roads and between 67th and 63rd avenues Conflict length is 2,265 feet.
	Continued lateral	west–east	Dobbins Road and 67th Avenue Conflict length is 2,280 feet.
	Open drain	west–east	Between Baseline and Dobbins roads at 71st Avenue Conflict length is 585 feet.
	Continued lateral	west–east	South of Broadway Road between 75th and 71st avenues Conflict length is 1,005 feet.
	Open drain	west–east	Broadway Road between 75th and 71st avenues Conflict length is 1,370 feet.

Table 3. Utilities within the W71 Alternative's Right-of-way

Utility	Size or Type	Direction of Utility	Location
	Continued lateral	north–south	71st Avenue between Buckeye Road and Durango Street Conflict length is 1,005 feet.
	Piped lateral	west–east	Buckeye Road and 71st Avenue Conflict length is 1,630 feet.
	Open drain	west–east	Harrison Street and 71st Avenue Conflict length is 315 feet.
	Continued lateral	west–east	Harrison Street and 71st Avenue Conflict length is 350 feet.
	Continued lateral	west–east	Van Buren Street and 71st Avenue Conflict length is 395 feet.
	Piped lateral	west–east	Van Buren Street and 71st Avenue Conflict length is 1,125 feet.
	Piped drain	north–south	71st Avenue between I-10 and Van Buren Street Conflict length is 4,195 feet.
	Piped lateral	north–south	87th Avenue and I-10 Conflict length is 465 feet.
	Piped lateral	north–south	83rd Avenue and I-10 Conflict length is 520 feet.
	Piped lateral	north–south	79th Avenue and I-10 Conflict length is 560 feet.
	Piped lateral	north–south	75th Avenue and I-10 Conflict length is 605 feet.
	Piped lateral	north–south	67th Avenue and I-10 Conflict length is 560 feet.
	Piped lateral	north–south	59th Avenue and I-10 Conflict length is 595 feet.
	Piped lateral	north–south	55th Avenue and I-10 Conflict length is 500 feet.
<i>Union Pacific Railroad</i>			
Railroad	Two tracks ^a	west–east	71st Avenue between Van Buren Street and Buckeye Road Conflict length is 655 feet.
<i>Western Area Power Administration</i>			
Power	OH-230 kV ^a	west–east	Elwood Street and 71st Avenue Conflict length is 1,200 feet.

Sources: company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility ^b underground 12 kV electricity transmission line

W101WPR and W101WFR Alternatives

The W101WPR and W101WFR Alternatives are discussed jointly in this section because they differ little in their overall impacts on utilities. The W101WFR Alternative would involve approximately:

- ▶ 600 more feet of the City of Phoenix 66-inch-diameter sanitary sewer line near 99th Avenue
- ▶ 400 more feet of Cox overhead FO cable at Van Buren Street
- ▶ 500 more feet of Cox overhead FO cable at 99th Avenue
- ▶ 675 more feet of City of Tolleson 12-inch-diameter water line along Roosevelt Street
- ▶ 400 more feet of CenturyLink underground telephone cable at Van Buren Street

Potential utility impacts of the W101WPR and W101WFR Alternatives are presented in Table 4. Noteworthy observations regarding the major utilities include:

- ▶ The drainage channel associated with the W101 Alternative and Options would affect the major underground utilities that run along major arterial streets. To avoid or minimize the relocation of these utilities, the drainage channel may need to be siphoned under the utilities.
- ▶ Impacts to the UPRR main line and spur tracks (and utilities within its R/W) would be avoided by constructing bridges over the tracks.

Table 4. Utilities within the W101WPR and W101WFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
City of Avondale			
Sewer	12 inches	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 435 feet.
City of Phoenix			
Water	8 inches	north–south	87th Avenue and Roeser Road Conflict length is 1,170 feet.
	12 inches	north–south	91st Avenue and Broadway Road Conflict length is 1,045 feet.
	12 inches	west–east	Broadway Road and 91st Avenue Conflict length is 515 feet.
Sewer	36 inches	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 1,185 feet.
	72 inches ^a	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 1,185 feet.
	84 inches ^a	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 1,185 feet.
	72 inches ^a	north–south	87th Avenue between Roeser and Broadway roads Conflict length is 1,700 feet.

Table 4. Utilities within the W101WPR and W101WFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	84 inches ^a	north–south	87th Avenue between Roeser and Broadway roads Conflict length is 1,700 feet.
	60 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 795 feet.
	42 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 560 feet.
<i>City of Tolleson</i>			
Water	12 inches	west–east	East of 99th Avenue between Van Buren Street and Buckeye Road Total conflict length is 2,370 feet (three lines).
	12 inches	west–east	East of 99th Avenue along Roosevelt Street Conflict length is 1,045 feet.
Sewer	16 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,400 feet.
	66 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,725 feet.
	48 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 660 feet.
	36 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 560 feet.
<i>Cox</i>			
Cable	OH	west–east	87th Avenue between Broadway and Roeser roads Conflict length is 1,775 feet.
	UG-FO ^a	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,340 feet with two fiber vaults.
	OH-FO ^a	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,030 feet.
<i>Kinder Morgan Energy Partners</i>			
Petroleum	12 inches ^a	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 930 feet.
	20 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 620 feet.
<i>CenturyLink</i>			
Telephone	UG	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,590 feet.
		west–east	Dobbins Road and 67th Avenue Conflict length is 2,070 feet.
		west–east	Baseline Road and 75th Avenue Conflict length is 1,590 feet.

Table 4. Utilities within the W101WPR and W101WFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
		north–south	75th Avenue and Baseline Road Total conflict length is 3,430 feet (two lines).
		west–east	Broadway Road and 91st Avenue Conflict length is 1,125 feet.
		north–south	91st Avenue and Broadway Road Total conflict length is 2,080 feet (three lines down to two lines).
		west–east	North of Durango Street between 99th and 95th avenues Total conflict length is 3,560 feet (two lines).
		west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,775 feet.
		west–east	Van Buren Street between 99th and 95th avenues Conflict length is 745 feet.
Southwest Gas			
Gas	4 inches	west–east	Lower Buckeye Road between 99th and 95th avenues Conflict length is 1,340 feet.
	4 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,030 feet.
	10 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 740 feet.
	4 inches	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,950 feet.
	4 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 995 feet.
Sprint			
Telephone	UG-FO ^a	west–east	Lower Buckeye Road between 99th and 95th avenues Conflict length is 750 feet.
Salt River Project			
Power	OH-12 kV	north–south	59th Avenue between Elliot Road and Estrella Drive Conflict length is 1,475 feet.
	OH-12 kV	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	OH-12 kV	west–east	Dobbins Road and 67th Avenue Conflict length is 2,540 feet.
	OH-12 kV	west–east	Baseline Road and 75th Avenue Conflict length is 2,175 feet.
	OH-69 kV ^a	west–east	Southern Avenue between 83rd and 79th avenues Conflict length is 385 feet.
	OH-69 kV ^a	north–south	83rd Avenue between Broadway and Roeser roads Conflict length is 1,205 feet.

Table 4. Utilities within the W101WPR and W101WFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	OH-69 kV ^a	north–south	91st Avenue between Broadway and Roeser roads Conflict length is 1,040 feet.
	OH-230 kV ^a	west–east	Broadway Road between 95th and 91st avenues Conflict length is 970 feet.
	OH-69 kV ^a	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,400 feet.
Irrigation	Continued lateral	west–east	Between Elliot and Estrella roads at 59th Avenue Conflict length is 2,250 feet.
	Open drain	west–east	Between Elliot and Estrella roads at 59th Avenue Conflict length is 750 feet.
	Open drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	Piped drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,700 feet.
	Continued lateral	west–east	Between Dobbins and Elliot roads and between 67th and 63rd avenues Conflict length is 2,265 feet.
	Continued lateral	west–east	Dobbins Road and 67th Avenue Conflict length is 2,280 feet.
	Open drain	west–east	Between Baseline and Dobbins roads and between 75th and 71st avenues Conflict length is 950 feet.
	Open drain	north–south	83rd Avenue between Broadway and Roeser roads Conflict length is 1,235 feet.
	Continued lateral	north–south	83rd Avenue between Broadway and Roeser roads Conflict length is 990 feet.
	Continued lateral	west–east	Roeser Road between 87th and 83rd avenues Conflict length is 990 feet.
	Open drain	north–south	87th Avenue between Broadway and Roeser roads Conflict length is 1,905 feet.
	Continued lateral	west–east	Broadway Road between 91st and 83rd avenues Conflict length is 860 feet.
	Continued lateral	north–south	91st Avenue between Broadway and Roeser roads Conflict length is 1,525 feet.
	Continued lateral	north–south	95th Avenue just north of Broadway Road Conflict length is 735 feet.
	Open drain	west–east	Elwood Street between 99th and 95th avenues Conflict length is 735 feet.
	Continued lateral	west–east	Lower Buckeye Road between 99th and 95th avenues Conflict length is 750 feet.

Table 4. Utilities within the W101WPR and W101WFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	Open drain	west–east	Durango Road between 99th and 95th avenues Conflict length is 1,730 feet.
	Piped drain	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,400 feet.
	Open drain	north–south	107th Avenue and I-10 Conflict length is 475 feet.
	Piped lateral	north–south	99th Avenue and I-10 Conflict length is 960 feet.
	Piped lateral	north–south	95th Avenue and I-10 Conflict length is 615 feet.
	Continued lateral	north–south	91st Avenue and I-10 Conflict length is 570 feet.
	Piped lateral	north–south	87th Avenue and I-10 Conflict length is 480 feet.
	Piped lateral	north–south	83rd Avenue and I-10 Conflict length is 545 feet.
	Piped lateral	north–south	79th Avenue and I-10 Conflict length is 500 feet.
	Piped lateral	north–south	75th Avenue and I-10 Conflict length is 530 feet.
<i>Union Pacific Railroad</i>			
Railroad	Two tracks ^a	west–east	99th Avenue between Van Buren Street and Buckeye Road Conflict length is 640 feet.
<i>Western Area Power Administration</i>			
Power	OH-230 kV ^a	west–east	Elwood Street between 99th and 95th avenues Conflict length is 515 feet.

Sources: company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility

W101CPR and W101CFR Alternatives

The W101CPR and W101CFR Alternatives are discussed jointly in this section because they differ little in their overall impacts on utilities. The W101CFR Alternative would involve approximately:

- ▶ 600 more feet of the City of Phoenix 66-inch-diameter sanitary sewer line near 99th Avenue
- ▶ 400 more feet of Cox overhead FO cable at Van Buren Street
- ▶ 500 more feet of Cox overhead FO cable at 99th Avenue
- ▶ 675 more feet of City of Tolleson 12-inch-diameter water line along Roosevelt Street
- ▶ 400 more feet of CenturyLink underground telephone cable at Van Buren Street

Potential utility impacts of the W101CPR and W101CFR Alternatives are presented in Table 5.

Noteworthy observations regarding the major utilities include:

- The drainage channel associated with the W101 Alternative and Options would affect the major underground utilities that run along major arterial streets. To avoid or minimize the relocation of these utilities, the drainage channel may need to be siphoned under the utilities.
- Impacts to the UPRR main line and spur tracks (and utilities within its R/W) would be avoided by constructing bridges over the tracks.

Table 5. Utilities within the W101CPR and W101CFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
<i>City of Avondale</i>			
Sewer	12 inches	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 435 feet.
<i>City of Phoenix</i>			
Water	8 inches	north–south	87th Avenue between Roeser and Broadway roads Conflict length is 1,140 feet.
	12 inches	west–east	Broadway Road and 87th Avenue Conflict length is 1,450 feet.
	12 inches	west–east	Broadway Road and 87th Avenue Conflict length is 1,450 feet.
	12 inches	west–east	Lower Buckeye Road between 91st and 87th avenues Conflict length is 1,265 feet.
	12 inches	west–east	Harrison Street between 99th and 95th avenues Conflict length is 815 feet.
	pump station ^a	not applicable	Buckeye Road between 99th and 91st avenues Conflict is pump station in middle of action alternative.
Sewer	36 inches	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 730 feet.
	72 inches ^a	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 730 feet.
	84 inches ^a	north–south	83rd Avenue between Southern Avenue and Broadway Road Conflict length is 730 feet.
	72 inches ^a	north–south	87th Avenue between Roeser and Broadway roads Conflict length is 3,010 feet.
	84 inches ^a	north–south	87th Avenue between Roeser and Broadway roads Conflict length is 3,010 feet.
	72 inches ^a	west–east	Broadway Road and 87th Avenue Conflict length is 1,200 feet.
	60 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,560 feet.

Table 5. Utilities within the W101CPR and W101CFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	42 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 810 feet.
City of Tolleson			
Water	12 inches	west–east	East of 99th Avenue between Van Buren Street and Buckeye Road Total conflict length is 3,735 feet (three lines).
	12 inches	west–east	East of 99th Avenue along Roosevelt Street Conflict length is 1,045 feet.
Sewer	16 inches	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 1,995 feet.
	36 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,550 feet.
	20 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,270 feet.
	8 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,165 feet.
	20 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,105 feet.
	54 inches ^a	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,030 feet.
	36 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,060 feet.
	66 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 560 feet.
	48 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 560 feet.
	36 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 1,005 feet.
Cox			
Cable	OH	north–south	87th Avenue between Broadway and Roeser roads Conflict length is 2,910 feet.
	UG-FO ^a	west–east	Lower Buckeye Road between 91st and 87th avenues Conflict length is 1,260 feet.
	OH-FO ^a	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,030 feet.
Kinder Morgan Energy Partners			
Petroleum	12 inches ^a	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,920 feet.
	20 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 990 feet.

Table 5. Utilities within the W101CPR and W101CFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
CenturyLink			
Telephone	UG	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 2,385 feet.
		west–east	Dobbins Road and 67th Avenue Conflict length is 2,070 feet.
		west–east	Baseline Road and 75th Avenue Conflict length is 1,590 feet.
		north–south	75th Avenue and Baseline Road Total conflict length is 3,060 feet (two lines).
		west–east	Broadway Road and 87th Avenue Conflict length is 960 feet.
		north–south	North of Durango Street and 91st Avenue Total conflict length is 2,900 feet (three lines).
		west–east	Van Buren Street between 99th and 95th avenues Conflict length is 740 feet.
Southwest Gas			
Gas	4 inches	west–east	Lower Buckeye Road between 99th and 95th avenues Conflict length is 690 feet.
	4 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 150 feet.
	10 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,960 feet.
	4 inches	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,770 feet.
	4 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 990 feet.
Sprint			
Telephone	UG-FO ^a	west–east	Lower Buckeye Road between 91st and 87th avenues Conflict length is 940 feet.
Salt River Project			
Power	OH-12 kV	north–south	59th Avenue between Elliot Road and Estrella Drive Conflict length is 150 feet.
	OH-12 kV	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	OH-12 kV	west–east	Dobbins Road and 67th Avenue Conflict length is 2,540 feet.
	OH-12 kV	west–east	Baseline Road and 75th Avenue Conflict length is 2,510 feet.

Table 5. Utilities within the W101CPR and W101CFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	OH-69 kV ^a	west–east	Southern Avenue between 83rd and 79th avenues Conflict length is 390 feet.
	OH-69 kV ^a	north–south	83rd Avenue between Broadway and Roeser roads Conflict length is 740 feet.
	OH-230 kV ^a	west–east	Broadway Road and 87th Avenue Conflict length is 1,940 feet.
	OH-69 kV ^a	north–south	91st Avenue between Buckeye Road and Harrison Street Conflict length is 1,045 feet.
	OH-69 kV ^a	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 2460 feet.
Irrigation	Continued lateral	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 385 feet.
	Open drain	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 750 feet.
	Open drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	Piped drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,705 feet.
	Continued lateral	west–east	Between Dobbins and Elliot roads and between 67th and 63rd avenues Conflict length is 2,265 feet.
	Continued lateral	west–east	Dobbins Road and 67th Avenue Conflict length is 2,280 feet.
	Open drain	west–east	Between Baseline and Dobbins roads and between 75th and 71st avenues Conflict length is 950 feet.
	Open drain	north–south	83rd Avenue between Roeser Road and Southern Avenue Conflict length is 700 feet.
	Continued lateral	north–south	83rd Avenue between Roeser Road and Southern Avenue Conflict length is 700 feet.
	Continued lateral	west–east	Roeser Road and 87th Avenue Conflict length is 595 feet.
	Continued lateral	west–east	Between Broadway and Roeser roads and 87th Avenue Conflict length is 1,310 feet.
	Continued lateral	west–east	North of Broadway Road and 87th Avenue Conflict length is 360 feet.
	Continued lateral	north–south	91st Avenue between Buckeye Road and Durango Street Conflict length is 4,260 feet.
	Continued lateral	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 780 feet.

Table 5. Utilities within the W101CPR and W101CFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	Open drain	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 880 feet.
	Open drain	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,135 feet.
	Continued lateral	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 740 feet.
	Open drain	north–south	107th Avenue and I-10 Conflict length is 475 feet.
	Piped lateral	north–south	99th Avenue and I-10 Conflict length is 965 feet.
	Piped lateral	north–south	95th Avenue and I-10 Conflict length is 540 feet.
	Continued lateral	north–south	91st Avenue and I-10 Conflict length is 575 feet.
	Piped lateral	north–south	87th Avenue and I-10 Conflict length is 480 feet.
	Piped lateral	north–south	83rd Avenue and I-10 Conflict length is 545 feet.
	Piped lateral	north–south	79th Avenue and I-10 Conflict length is 500 feet.
	Piped lateral	north – south	75th Avenue and I-10 Conflict length is 530 feet.
<i>Union Pacific Railroad</i>			
Railroad	Two tracks ^a	west–east	99th Avenue between Van Buren Street and Buckeye Road Conflict length is 840 feet.
<i>Western Area Power Administration</i>			
Power	OH-230 kV ^a	west–east	Elwood Street between 91st and 87th avenues Conflict length is 490 feet.

Sources: Company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility

W101EPR and W101EFR Alternatives

The W101EPR and W101EFR Alternatives are discussed jointly in this section because they differ little in their overall impacts on utilities. The W101EFR Alternative would involve approximately:

- ▶ 600 more feet of the City of Phoenix 66-inch-diameter sanitary sewer line near 99th Avenue
- ▶ 400 more feet of Cox overhead FO cable at Van Buren Street
- ▶ 500 more feet of Cox overhead FO cable at 99th Avenue

- ▶ 675 more feet of City of Tolleson 12-inch-diameter water line along Roosevelt Street
- ▶ 400 more feet of CenturyLink underground telephone cable at Van Buren Street

The potential utility impacts of the W101EPR and W101EFR Alternatives are presented in Table 6. Noteworthy observations regarding the major utilities include:

- ▶ The drainage channel associated with the W101 Alternative and options would affect the major underground utilities that run along major arterial streets. To avoid or minimize the relocation of these utilities, the drainage channel may need to be siphoned under the utilities.
- ▶ Impacts to the UPRR main line and spur tracks (and utilities within its R/W) would be avoided by constructing bridges over the utilities.

Table 6. Utilities within the W101EPR and W101EFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
<i>City of Phoenix</i>			
Water	12 inches	west–east	Broadway Road between 83rd and 79th avenues Conflict length is 1,425 feet.
	12 inches	west–east	Lower Buckeye Road between 87th and 83rd avenues Conflict length is 1,915 feet.
	12 inches	north–south	95th Avenue between Buckeye Road and Harrison Street Conflict length is 1,025 feet.
Sewer	90 inches ^a	west–east	Broadway Road between 83rd and 79th avenues Conflict length is 1,425 feet
	84 inches ^a	west–east	Broadway Road between 83rd and 79th avenues Conflict length is 1,425 feet.
	24 inches	north–south	83rd Avenue and Elwood Street Conflict length is 1,020 feet.
	60 inches ^a	north–south	95th Avenue between Buckeye Road and Harrison Street Conflict length is 990 feet.
	42 inches ^a	north–south	95th Avenue between Buckeye Road and Harrison Street Conflict length is 990 feet.
	60 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,560 feet.
	42 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,560 feet.
<i>City of Tolleson</i>			
Water	12 inches	west–east	East of 99th Avenue between Van Buren Street and Buckeye Road Total conflict length is 2,960 feet (three lines)
	12 inches	west–east	East of 99th Avenue along Roosevelt Street Conflict length is 1,045 feet.

Table 6. Utilities within the W101EPR and W101EFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
Sewer	16 inches	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 2,460 feet.
	36 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,995 feet.
	20 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,550 feet.
	8 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,285 feet.
	20 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,105 feet.
	54 inches ^a	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,030 feet.
	36 inches	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 1,050 feet.
	66 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,560 feet.
	48 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 1,560 feet.
	36 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 785 feet.
Cox			
Cable	UG	west–east	Roeser Road between 83rd and 79th avenues Conflict length is 465 feet.
	OH	north–south	83rd Avenue between Harris Street and Broadway Road Conflict length is 1,585 feet.
	UG-FO ^a	west–east	Lower Buckeye Road between 95th and 91st avenues Conflict length is 1,890 feet.
	OH-FO ^a	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,030 feet.
Kinder Morgan Energy Partners			
Petroleum	12 inches ^a	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,765 feet.
	20 inches ^a	west–east	Harrison Street between 99th and 95th avenues Conflict length is 720 feet.
CenturyLink			
Telephone	UG	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,590 feet.
		west–east	Dobbins Road and 67th Avenue Conflict length is 2,070 feet.

Table 6. Utilities within the W101EPR and W101EFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
		west–east	Baseline Road and 75th Avenue Conflict length is 1,610 feet.
		north–south	75th Avenue and Baseline Road Conflict length is 3,060 feet (two lines).
		north–south	North of Durango Street and 91st Avenue Total conflict length is 2,940 feet (three lines).
Southwest Gas			
Gas	4 inches	west–east	Lower Buckeye Road between 99th and 95th avenues Conflict length is 1,375 feet.
	4 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 1,960 feet.
	10 inches	west–east	Buckeye Road between 99th and 95th avenues Conflict length is 2,310 feet.
	4 inches	west–east	Van Buren Street between 99th and 95th avenues Conflict length is 1,770 feet.
	4 inches	west–east	Roosevelt Street between 99th and 95th avenues Conflict length is 990 feet.
Sprint			
Telephone	UG-FO ^a	west–east	Lower Buckeye Road between 87th and 83rd avenues Conflict length is 1,160 feet.
Salt River Project			
Power	OH-12 kV	north–south	59th Avenue between Elliot Road and Estrella Drive Conflict length is 1,475 feet.
	OH-12 kV	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,970 feet.
	OH-12 kV	west–east	Dobbins Road and 67th Avenue Conflict length is 2,540 feet.
	OH-12 kV	west–east	Baseline Road and 75th Avenue Conflict length is 2,480 feet.
	OH-69 kV ^a	west–east	Southern and 79th avenues Conflict length is 460 feet.
	OH-230 kV ^a	west–east	Broadway Road between 83rd and 79th avenues Conflict length is 1,150 feet.
	OH-69 kV ^a	west–east	Broadway Road between 83rd and 79th avenues Conflict length is 1,425 feet.
	OH-69 kV ^a	north–south	91st Avenue between Buckeye Road and Durango Street Conflict length is 1,040 feet.
	OH-69 kV ^a	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 2,460 feet.

Table 6. Utilities within the W101EPR and W101EFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
Irrigation	Continued lateral	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 2,280 feet.
	Open drain	west–east	Between Elliot Road and Estrella Drive at 59th Avenue Conflict length is 750 feet.
	Open drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,880 feet.
	Piped drain	west–east	Elliot Road between 63rd and 59th avenues Conflict length is 1,700 feet.
	Continued lateral	west–east	Between Dobbins and Elliot roads and between 63rd and 67th avenues Conflict length is 2,280 feet.
	Continued lateral	west–east	Dobbins Road between 63rd and 67th avenues Conflict length is 2,265 feet.
	Open drain	west–east	Between Baseline and Dobbins roads at 71st Avenue Conflict length is 1,915 feet.
	Open drain	west–east	Roeser Road between 83rd and 79th avenues Conflict length is 725 feet.
	Continued lateral	west–east	Broadway Road and 83rd Avenue Conflict length is 2,030 feet.
	Open drain	west–east	Elwood Street between 87th and 83rd avenues Conflict length is 725 feet.
	Open drain	west–east	Lower Buckeye Road between 87th and 83rd avenues Conflict length is 1,915 feet.
	Continued lateral	west–east	Lower Buckeye Road between 87th and 83rd avenues Conflict length is 1,390 feet.
	Open drain	west–east	Durango Street and 87th Avenue Conflict length is 900 feet.
	Continued lateral	north–south	91st Avenue between Buckeye Road and Durango Street Conflict length is 1,150 feet.
	Continued lateral	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 770 feet.
	Open drain	west–east	Buckeye Road between 95th and 91st avenues Conflict length is 1,180 feet.
	Piped lateral	north–south	95th Avenue between Harrison Street and Buckeye Road Conflict length is 815 feet.
	Open drain	north–south	107th Avenue and I-10 Conflict length is 475 feet.
	Piped lateral	north–south	99th Avenue and I-10 Conflict length is 970 feet.

Table 6. Utilities within the W101EPR and W101EFR Alternatives' Rights-of-way

Utility	Size or Type	Direction of Utility	Location
	Piped lateral	north–south	95th Avenue and I-10 Conflict length is 540 feet.
	Continued lateral	north–south	91st Avenue and I-10 Conflict length is 570 feet.
	Piped lateral	north–south	87th Avenue and I-10 Conflict length is 480 feet.
	Piped lateral	north–south	83rd Avenue and I-10 Conflict length is 545 feet.
	Piped lateral	north–south	79th Avenue and I-10 Conflict length is 500 feet.
	Piped lateral	north–south	75th Avenue and I-10 Conflict length is 530 feet.
Union Pacific Railroad			
Railroad	Two tracks ^a	west–east	99th Avenue between Van Buren Street and Buckeye Road Conflict length is 840 feet.
Western Area Power Administration			
Power	OH-230 kV ^a	west–east	Elwood Street and 83rd Avenue Conflict length is 645 feet.

Sources: company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility

Impacts Associated with the Eastern Section Action Alternative

The Eastern Section action alternative would affect several large utilities. The identified impacts are typical for a project of this size and magnitude. Specific utility impacts are identified in the following section. Appendix A presents figures detailing the location of utilities in the Study Area.

E1 Alternative

Potential utility impacts of the E1 Alternative are presented in Table 7. Noteworthy observations regarding the major utilities include:

- SRP has a 500 kV overhead power line that runs adjacent to the proposed freeway alignment from 44th Street to Elliot Road. The proposed freeway would not directly affect this line. A number of poles and towers along the corridor, however, would require adequate access (gates off crossroads) and maintenance areas (35 by 60 feet). In addition, towers within the mountainous areas would need relocated access roads because the proposed freeway would cut off the existing roads. The existing roads cross private land. Coordination with SRP regarding these access roads would continue through the design phase. Near 51st Avenue, the 500 kV electricity transmission lines would need to be raised to allow the relocated Western power lines to pass underneath. This would affect a minimum of two poles. SRP and Western have coordinated the preliminary design associated with this conflict.

- The Western overhead power lines would be realigned to the north and raised to cross over the freeway. The lines would pass under the SRP 500 kV lines.
- Arizona Public Service has completed preliminary design for relocating its 230 kV power lines that cross the proposed freeway near Pecos Road and 42nd Street. The poles would be realigned to the west and would cross over the freeway and under the existing SRP 500 kV power line. The relocation would not require any easements on Gila River Indian Community land.
- All of the west–east underground utilities located within the Pecos Road R/W would need to be relocated into a utility corridor north or south of the E1 Alternative R/W.

Table 7. Utilities within the E1 Alternative's Right-of-way

Utility	Size	Direction of Utility	Location
<i>City of Phoenix</i>			
Water	12 inches	north–south	32nd Street and Pecos Road Conflict length is 400 feet.
	12 inches	north–south	28th Street and Pecos Road Conflict length is 285 feet.
	12 inches	north–south	24th Street and Pecos Road Conflict length is 670 feet.
	48 inches ^a	west–east	Pecos Road between 24th and 32nd streets Conflict length is 5,610 feet.
	48 inches ^a	west–east	Pecos Road between 16th and 24th streets Conflict length is 4,630 feet.
	48 inches ^a	west–east	Pecos Road between Central Avenue and 16th Street Conflict length is 6,020 feet.
	48 inches ^a	west–east	Pecos Road between 27th and Central avenues Conflict length is 10,445 feet.
	48 inches ^a	west–east	Pecos Road between 35th and 27th avenues Conflict length is 2,680 feet.
	48 inches ^a	north–south west–east	Between Estrella Drive and Ray Road and between 51st and 43rd avenues Conflict length is 3,500 feet.
	48 inches ^a	north–south	51st Avenue between Estrella Drive and Ray Road Conflict length is 1,545 feet.
Sewer	36 inches	west–east	Pecos Road between 40th and 48th streets Conflict length is 3,030 feet.
	48 inches ^a	west–east	Pecos Road between 40th and 48th streets Conflict length is 970 feet.
	36 inches	west–east	Pecos Road between 32nd and 40th streets Conflict length is 5,255 feet.
Sewer	48 inches ^a	west–east	Pecos Road between 32nd and 40th streets Conflict length is 5,230 feet.

Table 7. Utilities within the E1 Alternative's Right-of-way

Utility	Size	Direction of Utility	Location
	36 inches	west–east	Pecos Road between 29th and 32nd streets Conflict length is 2,855 feet.
	48 inches ^a	west–east	Pecos Road between 29th and 32nd streets Conflict length is 2,450 feet.
	6 inches	west–east	Pecos Road between Central Avenue and 16th Street Conflict length is 3,165 feet.
	8 inches	west–east	Pecos Road between Central Avenue and 16th Street Conflict length is 3,305 feet.
	12 inches	west–east	Pecos Road between Central Avenue and 16th Street Conflict length is 5,385 feet.
	12 inches	west–east	Pecos Road between 27th and Central avenues Conflict length is 10445 feet.
Kinder Morgan Energy Partners			
Gas	16 inches ^a	north–south	47th Avenue between Ray Road and Estrella Drive Conflict length is 1,575 feet.
Petroleum	8 inches	north–south	51st Avenue between Ray Road and Estrella Drive Conflict length is 2,750 feet.
	6 inches	west–east	Pecos Road between 43rd Avenue and 48th Street Conflict length is 43,740 feet.
CenturyLink			
Telephone	UG	west–east	Pecos Road between 8th and 16th streets Conflict length is 4,090 feet.
		west–east	Pecos Road between 16th and 24th streets Conflict length is 5,845 feet.
		west–east	Pecos Road between 24th and 32nd streets Conflict length is 5,590 feet.
		west–east	Pecos Road between 32nd and 40th streets Conflict length is 4,280 feet.
		north–south	51st Avenue between Estrella Drive and Ray Road Conflict length is 2,005 feet.
		west–east	Estrella Drive between 55th and 51st avenues Conflict length is 775 feet.
Southwest Gas			
Gas	4 inches	west–east	Pecos Road between 43rd Avenue and 24th Street Conflict length is 30,390 feet.
	4 inches	north–south	51st Avenue between Ray Road and Estrella Drive Conflict length is 2,750 feet.
Arizona Public Service			
Power	OH-230 kV ^a	north–south	42nd Street alignment at Pecos Road Conflict length is 400 feet.

Table 7. Utilities within the E1 Alternative's Right-of-way

Utility	Size	Direction of Utility	Location
<i>Salt River Project</i>			
Power	OH-Primary	north-south	40th Street and Pecos Road Conflict length is 625 feet.
	UG-Primary ^b	north-south	Pecos Road at 40th Street Total conflict length is 1,200 feet (two lines).
	UG-Primary	north-south	Pecos Road at 32nd Street Conflict length is 330 feet.
	UG-Primary	north-south	Pecos Road at 28th Street Conflict length is 330 feet.
	UG-Primary	north-south	Pecos Road at 24th Street Conflict length is 700 feet.
	UG-Primary	north-south	Pecos Road at Desert Foothills Parkway Conflict length is 660 feet.
	OH-12 kV	north-south	West of Desert Foothills Parkway across Pecos Road Total conflict length is 1,400 feet (two lines).
	UG-Primary	north-south	Pecos Road at 17th Avenue Conflict length is 660 feet.
	OH-Primary	north-south	Between Ray and Pecos roads and 43rd and 35th avenues Conflict length is 550 feet.
	OH-12 kV	north-south	51st Avenue between Estrella and Ray roads Conflict length is 2,105 feet.
	OH-12 kV	west-east	Estrella Drive between 55th and 51st avenues Conflict length is 820 feet.
	OH-500 kV	north-south west-east	Parallels Gila River Indian Community boundary from 51st Avenue to Interstate 10 Conflict length is 800 feet.
Irrigation	Continued lateral	north-south	Estrella Drive and 55th Avenue Conflict length is 790 feet.
<i>Western Area Power Administration</i>			
Power	OH-230 kV ^a	north-south	47th Avenue between Estrella Drive and Ray Road Conflict length is 830 feet.

Sources: company and agency utility maps

Notes: UG = underground, OH = overhead, FO = fiber optic, kV = kilovolt

^a major utility ^b underground 12 kV electricity transmission line

Impacts Associated with the No-Action Alternative

The No-Action Alternative would result in no direct project-related impacts on utilities. Indirectly, selection of the No-Action Alternative may increase the pace of urban expansion in some areas because some land (set aside for freeway R/W in the past by local jurisdictions) could be released and become available for development. Additionally, expansion of arterial streets to handle increasing travel demand

might occur. Therefore, it is anticipated that utility relocations and construction of new utilities would also occur under the No-Action Alternative.

Secondary and Cumulative Impacts

No secondary or cumulative impacts are anticipated with implementation of the proposed freeway. Utilities would be relocated or restored to at least existing conditions. Major disruptions would be avoided.

The existing utility companies and local agencies plan no major future projects in the Study Area except for the expansion of the City of Phoenix 91st Avenue Wastewater Treatment Plant. However, there would be additional work (service lines) to supply power and water to the new and proposed housing subdivisions and businesses in the area. This work would be minor relative to the existing major facilities. Based on inquiries to several companies, it is anticipated that additional communication (cell) towers could be constructed in the Study Area.

4. Mitigation

The following describes potential mitigation measures for ADOT to consider as future commitments to be implemented as part of the project to avoid, reduce, or otherwise mitigate utility impacts associated with the proposed project. The discussion of these measures in this report does not obligate ADOT to these specific measures. ADOT, along with FHWA, may choose to modify, delete, or add measures to mitigate impacts.

ADOT Design Responsibilities

Mitigation to reduce the total utility impacts is included in the design of the facilities. Where appropriate, for example, with the Sprint FO line, encasement of existing facilities would be considered to lessen impacts. A structure over Lower Buckeye Road would also help reduce the impacts to the Sprint facility and a longer structure over the RID Canal would help alleviate impacts to the AT&T FO line.

ADOT Right-of-Way Responsibility

Where appropriate, ADOT Right-of-Way would coordinate following initial design—but in advance of final design of the freeway—to designate necessary utility corridors for relocations.

ADOT Construction District Responsibility

ADOT would provide extensive and timely coordination with all local agencies and private facility owners to minimize the effects of utility relocations and adjustments. Developing construction schedules to coincide with scheduled maintenance periods and off-peak loads would also be a key element.

Contractor Responsibilities

Coordination efforts would occur with the affected utilities to minimize disruption of service.

5. Conclusions

The action alternatives would directly affect several large utilities. The extent and complexity of the effects would vary among the action alternatives, but would be relatively similar in scale and consistent with projects of similar size and magnitude. Throughout the Phoenix metropolitan area, ADOT and FHWA have demonstrated experience in the construction of projects like the proposed action. Disruptions to utility services, if necessary, would be restricted to being short-term and localized. Advanced planning would be accomplished during the Selected Alternative's design phase (if an action alternative were identified as the Selected Alternative) so that interruptions in utility services to customers would not occur or would be minimized. ADOT and project contractors would continue to coordinate with utility providers during the design phase and project construction to identify potential problems and/or conflicts and to provide opportunities for their resolution prior to proposed actions. Although the No-Action Alternative would not have any direct impacts on utilities, utility construction and relocation would occur as part of anticipated residential and commercial development within the Study Area.

6. Bibliography/References

Arizona Department of Transportation (ADOT). 1988a. *Southwest Loop Highway (SR 218) Design Concept Report*. September. Phoenix.

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Maricopa Association of Governments (MAG). 1985. *MAG Freeway/Expressway Plan*. Phoenix.

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———. 2003. *Regional Transportation Plan*. November. Phoenix.

———. 2009. *Extension of MAG 2007 Socioeconomic Projections to 2035 for Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone*. January. Phoenix.

Utility maps were obtained for the following entities:

- | | |
|------------------------------------|-----------------------------|
| ▶ Arizona Public Service | ▶ MCI Worldcom ^b |
| ▶ AT&T | ▶ Qwest ^c |
| ▶ City of Glendale | ▶ RID |
| ▶ City of Goodyear | ▶ Southwest Gas |
| ▶ City of Phoenix | ▶ Sprint |
| ▶ City of Tolleson | ▶ SRP |
| ▶ Cox Communication | ▶ TCG Phoenix (AT&T) |
| ▶ El Paso Natural Gas ^a | ▶ UPRR |
| ▶ Kinder Morgan Energy Partners | ▶ Western |
| ▶ Level 3 Communications | |

^a acquired by Kinder Morgan Energy Partners on March 9, 2012

^b became MCI, Inc. (doing business as Verizon), and became part of Verizon Communications in 2006

^c CenturyLink acquired Qwest in 2011

Appendix A

Utility Locations in the Study Area

Figure A-1	Power
Figure A-2	Gas
Figure A-3	Water
Figure A-4	Sewer
Figure A-5	Telephone
Figure A-6	Cable
Figure A-7	Railroad
Figure A-8	Irrigation

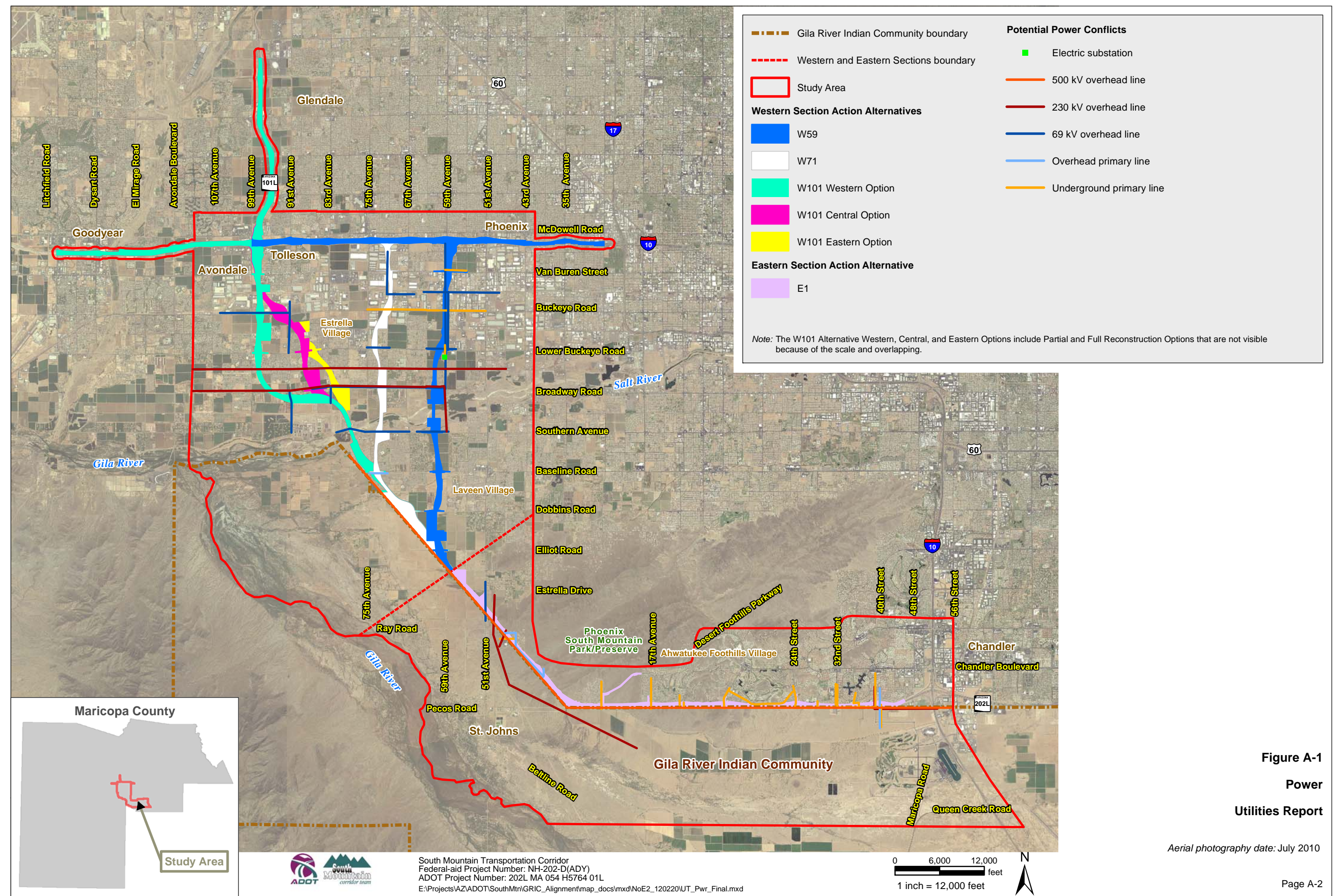


Figure A-1
Power Utilities Report

Aerial photography date: July 2010

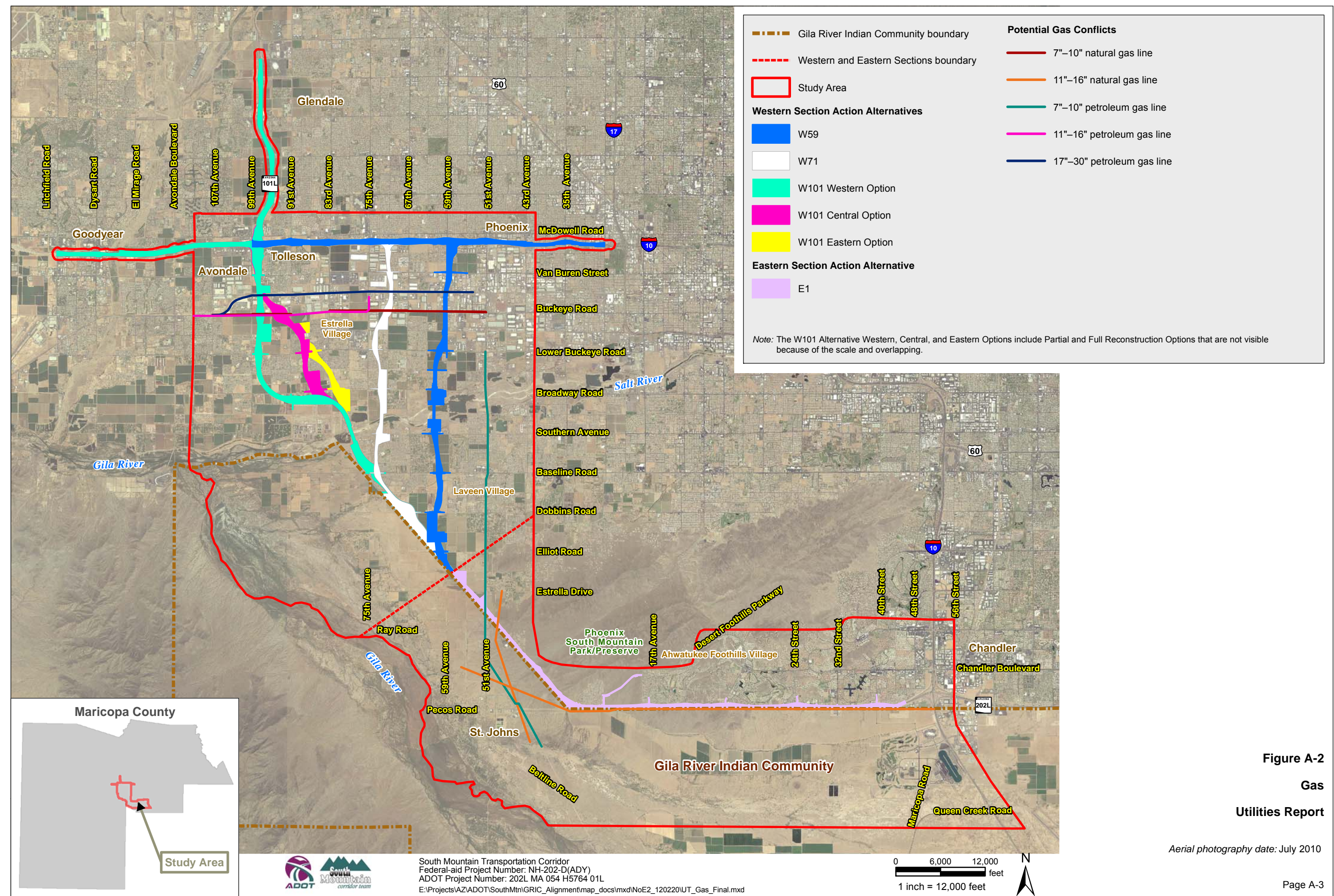
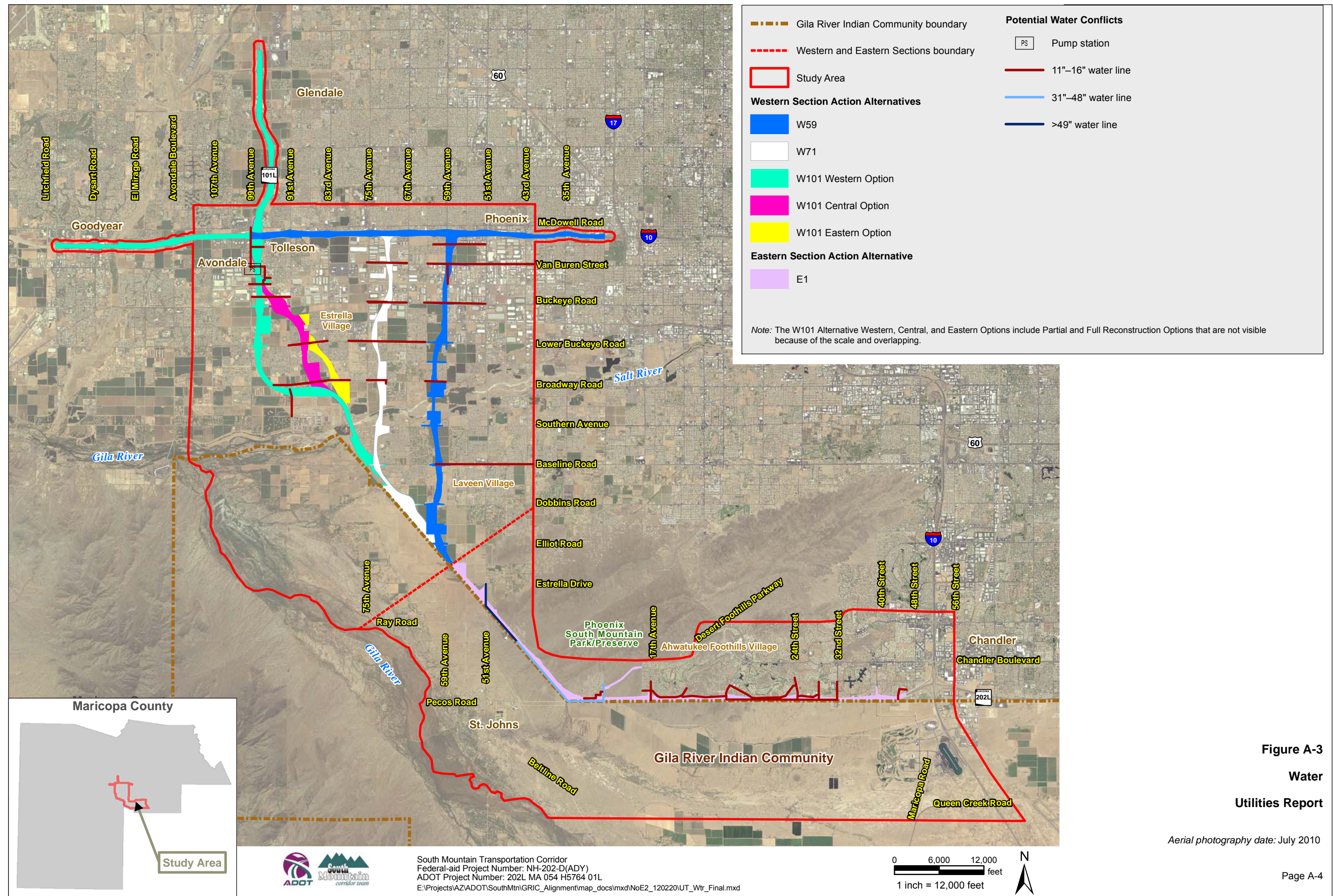


Figure A-2
Gas
Utilities Report

Aerial photography date: July 2010



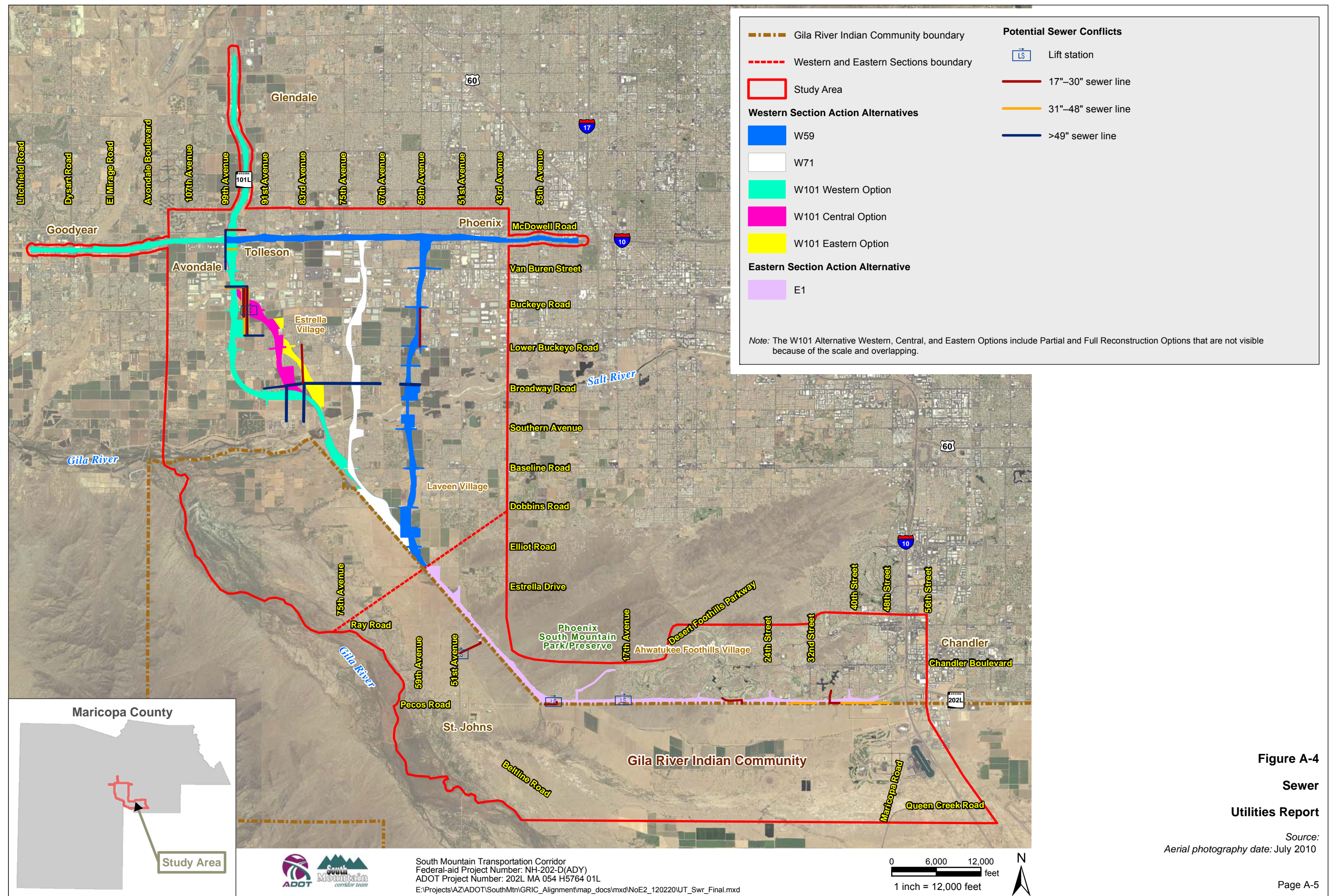


Figure A-4
Sewer
Utilities Report

Source:
Aerial photography date: July 2010

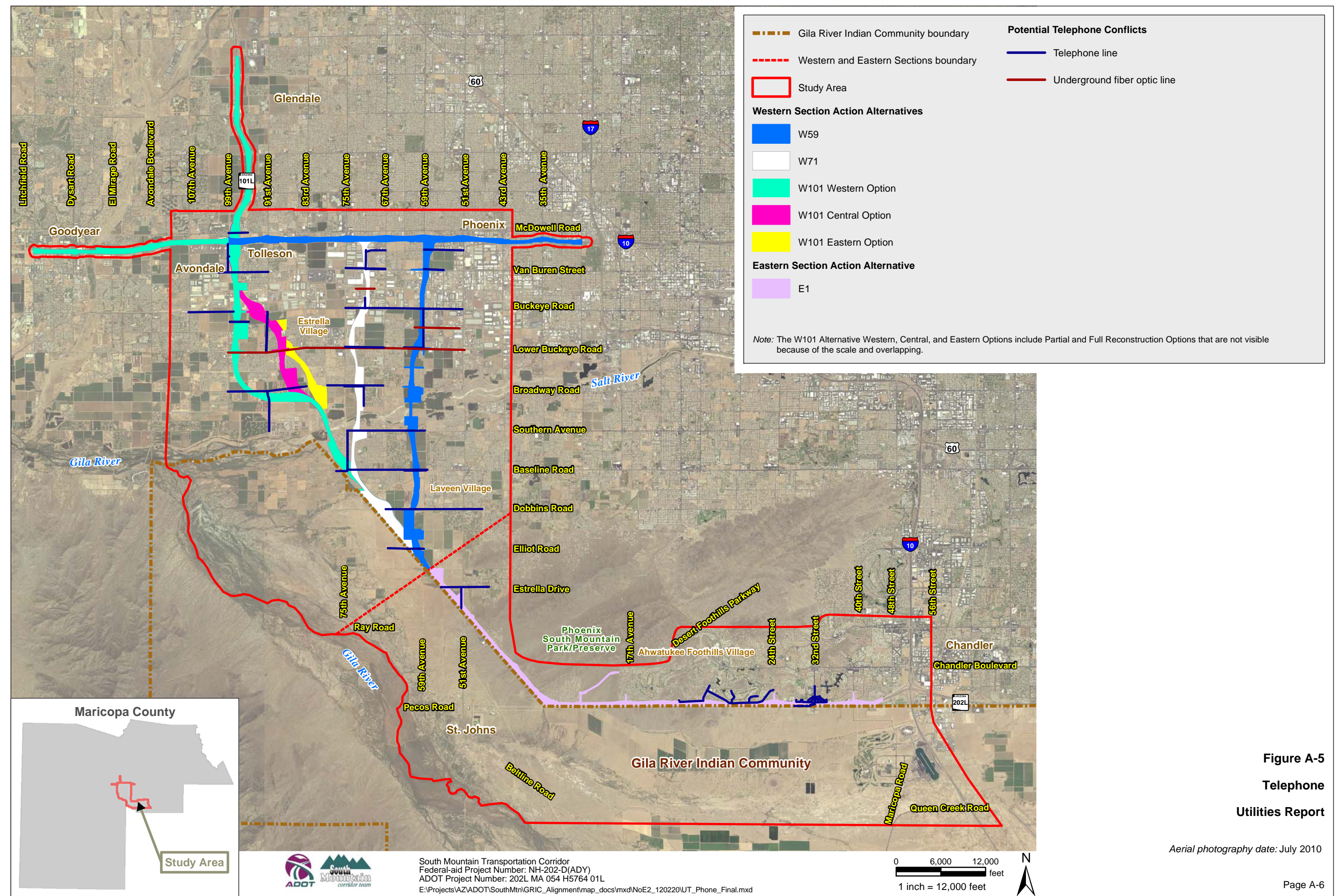


Figure A-5
Telephone
Utilities Report

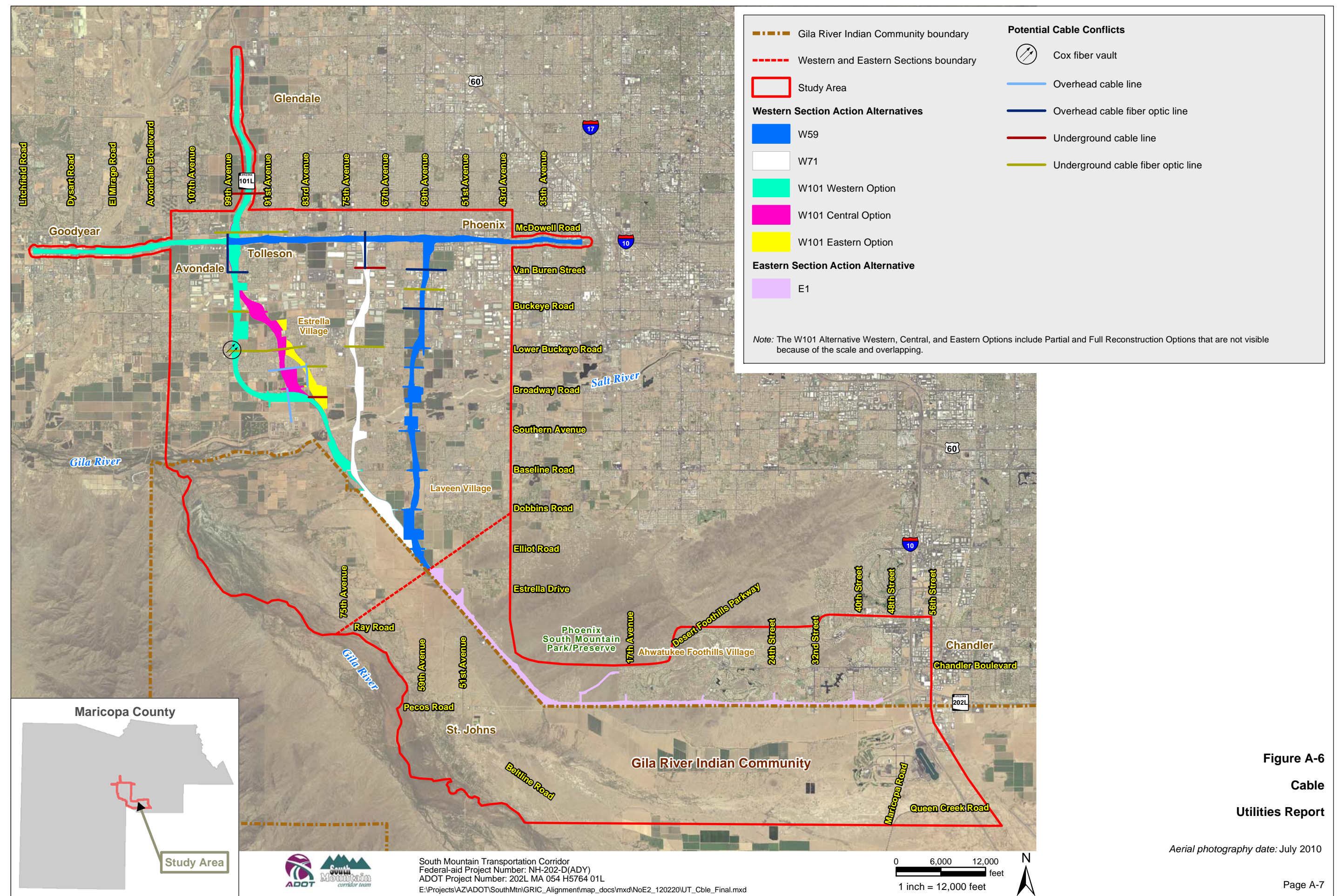


Figure A-6
Cable
Utilities Report

Aerial photography date: July 2010

