

FEASIBILITY STUDY

PROSPECTOR STREET INTERIM ROADWAY & I-40 GRADE SEPARATION

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1.0 INTRODUCTION

1.1 FOREWORD

The Prospector Street Interim Roadway and I-40 Grade Separation Feasibility Study is part of a project with the City of Kingman (COK) to identify alternatives that will improve access between the lands on both sides of I-40 in the Kingman area. The project would provide an interim roadway between Louise Avenue south of I-40 and Santa Rosa Boulevard north of I-40 with a grade separation over or under I-40 at the proposed Kingman Crossing traffic interchange (TI) location, or at the Prospector Street section line alignment. See **Figure 1.1** for the project corridor study area.

1.2 PURPOSE AND NEED FOR PROJECT

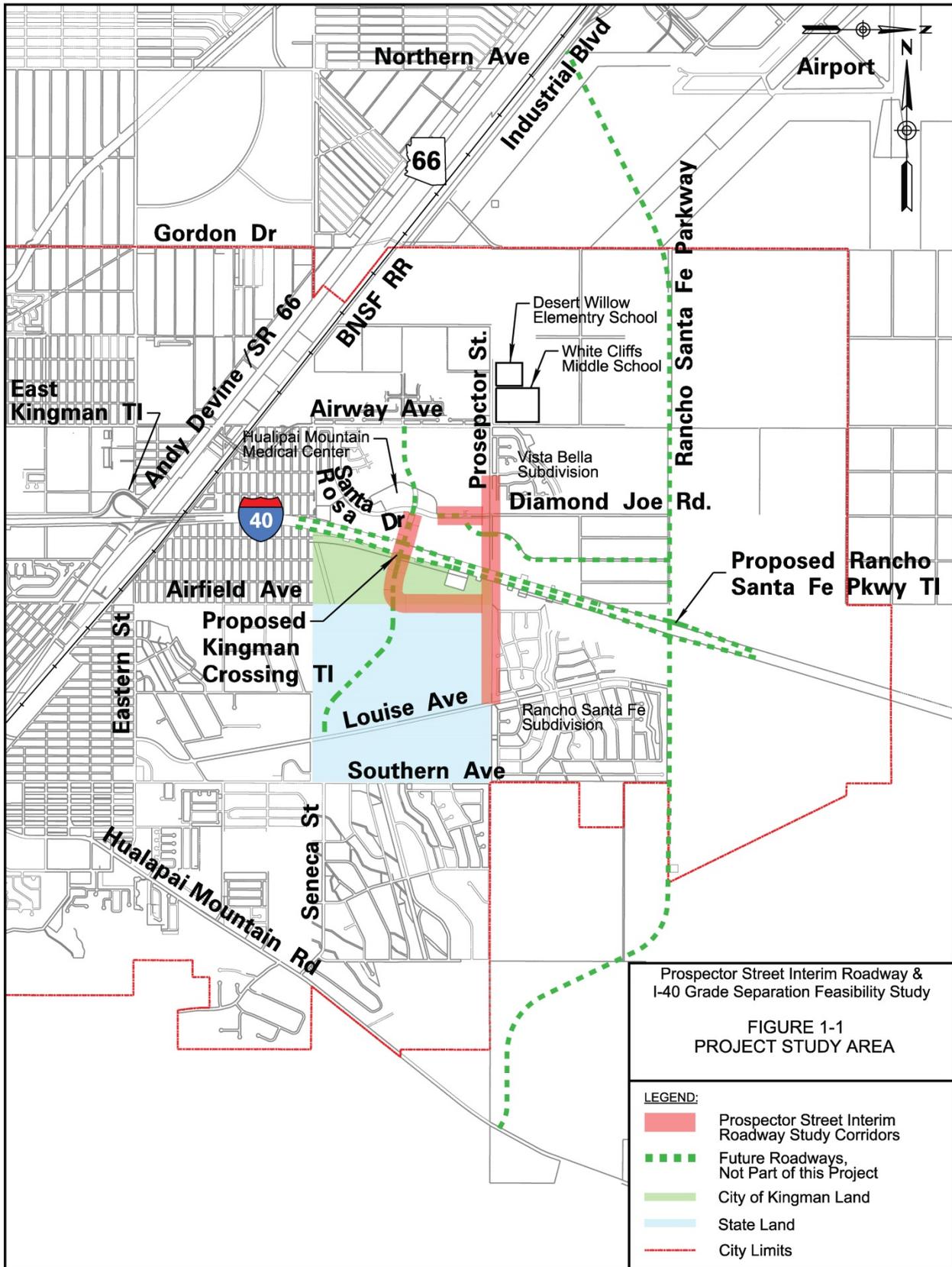
The City of Kingman is an important regional center for northwestern Arizona and is a major hub of transportation, commerce, and government administration. Residential development is occurring within the COK with the largest concentration of growth occurring on the east side of the COK. The area is physically separated from the rest of COK by both I-40 and the Burlington Northern Santa Fe (BNSF) railroad tracks. The only way to access this area is provided by the Hualapai Mountain Road bridge (south of I-40) over the railroad tracks and by the underpass crossing of the BNSF tracks at Airway Avenue (north of I-40). In order to improve access to this area, a variety of roadway improvements are proposed in the Kingman Area Transportation Study (KATS). The I-40 Kingman Crossing TI is part of the recommended plan along with a new arterial street (Kingman Crossing Boulevard) that will eventually link Louise Avenue on the south to Airway Avenue to the north of the TI. Kingman Crossing TI and Kingman Crossing Boulevard are key elements in improving the regional traffic network to service the east Kingman area.

The KATS transportation plan also includes the proposed Rancho Santa Fe Parkway (RSFP) TI that consists of a new TI with I-40, 1-1/2 miles east of the Kingman Crossing TI. This TI will link the Kingman Airport to I-40, and eventually provide access to Hualapai Mountain Road.

The future TI's are not funded and the date of construction is unknown at this time. However, there is a current need to provide improved access between the lands on both sides of I-40. Currently the only access between the areas north and south of I-40 and east of the BNSF tracks is Eastern Avenue undercrossing of I-40, which requires significant amount out of direction distance and travel time to travel between the areas north and south of I-40.

A significant portion of the students attending the Desert Willow Elementary School and the White Cliffs Middle school reside south of I-40. Both schools are located on Prospector Street just north of Airway Avenue north of I-40 (see **Figure 1.1**). Students commuting from the south side of I-40 by vehicle, bicycle, or by walking are faced with a long travel distance around via Eastern Street. Providing a crossing over I-40 at either the proposed KCTI location or along the Prospector Street section line alignment would make the travel distance significantly shorter. This would reduce the exposure of students walking or bicycling to vehicle traffic, reducing the risk of accidents.

Figure 1.1 – Project Study Area



Improved access could be achieved by implementing an interim roadway and a grade separation with I-40, in the vicinity of the proposed Kingman Crossing TI. The interim roadway would connect Louise Avenue south of I-40 with Santa Rosa Drive north of I-40.

The purpose of the Prospector Street Interim Roadway and I-40 Grade Separation Feasibility Study is to investigate concepts to provide a new interim roadway and grade separation with I-40 to provide improved connectivity north and south of I-40 in the east Kingman area.

Two corridors will be evaluated for the interim roadway, as shown in **Figure 1.1**.

- **KCTI Corridor** – begins at Louise Avenue, travels north along the Prospector Street alignment, adjacent to the State Land parcel, turns west along the Airfield Avenue alignment, turns north along the proposed Kingman Crossing Boulevard alignment, crosses I-40 and terminates at Santa Rosa Drive. This corridor option includes extending pavement on Diamond Joe Road east to Prospector Street and extending Prospector Street south to Diamond Joe Road. KCTI Corridor would cross under I-40 with two new bridge structures constructed along I-40 based on the recommended ultimate KCTI configuration.
- **Prospector Street Section Line Corridor** – also begins at Louise Avenue, travels north along the Prospector Street alignment, continues north on the same alignment across I-40 (under or over I-40), and extends north to the existing pavement on Prospector Street north of Diamond Joe Road. This corridor option also includes the extension Diamond Joe Road from east to Prospector Street.

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2.0 EXISTING CHARACTERISTICS OF THE STUDY AREA

2.1 ROADWAYS

The existing improved roadways within the study limits include I-40, Santa Rosa Drive, and Prospector Street.

I-40 is a four-lane divided highway on level terrain consisting of two 12 foot lanes in each direction, a 4-foot inside shoulder, and a 10-foot outside shoulder. An 84 foot median separates the eastbound and westbound lanes. The horizontal alignment of I-40 within the project limits is on tangent. Existing I-40 pavement consists of asphalt concrete (AC) for all lanes and shoulders in both directions.

Santa Rosa Drive is an improved roadway to a point approximately 700 feet east of the proposed Kingman Crossing Boulevard (Hualapai Medical Center) where the improved roadway terminates and becomes an unimproved roadway to the east. The improved roadway section is AC pavement and consists of two 12 foot wide lanes in each direction, a wide raised median, curb and gutter and sidewalks on both sides. The unimproved roadway is on the Diamond Joe Road alignment and continues east of the Prospector Street Alignment.

There are no existing roadway improvements along the Prospector Street alignment, between Louise Avenue and I-40. Prospector Street is an unimproved roadway between I-40 and a point approximately 400 feet north of Diamond Joe Road where it becomes an improved paved roadway to the north. The improved roadway is AC pavement with a total width of approximately 36 feet. The west side of the roadway does not have curb and gutter or a sidewalk. The east side of the roadway has curb and gutter and a sidewalk.

2.2 RIGHT-OF-WAY

The existing right-of-way (R/W) width along I-40 is 308 feet within the project limits. There is a 10 foot wide communications utility easement located along the north R/W line of I-40. There are several drainage easements of various sizes at drainage crossings on both sides on I-40.

The existing R/W width varies along the Prospector Street section line corridor between Louise Avenue and Diamond Joe Road. Between Louise Avenue and Airfield Avenue, the existing R/W width is 42 feet east of the section line, and there is a 60 foot wide roadway easement west of the section line across the State land parcel, for a total of width of 102 feet. There is no roadway R/W between Airfield Avenue and a point approximately 304 feet north of I-40 (in line with Grand Canyon Road). From this point north to Diamond Joe Road the existing R/W width is 42 feet (east of the section line). North of Diamond Joe Road the existing R/W width is 84 feet centered on the section line.

There are two 9 foot wide utility easements along the Prospector Street alignment, abutting the north and south I-40 right-of-way lines. The limits of the easements are from Airfield Avenue to I-40 and from I-40 to a point approximately 304 feet north of the I-40 R/W. The east edges of the easements are 42 feet east of the section line.

Along the unimproved section of the Diamond Joe Road alignment from a point 700 feet east of the proposed Kingman Crossing Boulevard to Prospector Street, there is no existing R/W. There is a 20 foot wide electric line easement and a 15 foot wide gas line easement along the south side of Santa Rosa Drive/Diamond Joe Road, west of Prospector Street.

There is no existing right-of-way along the Kingman Crossing Boulevard alignment.

2.3 LAND USE

Land within the project limits is primarily privately owned, undeveloped, and rural in nature as shown in **Figure 1.1**. The land south of Airfield Avenue and west of the Prospector Street alignment is owned by Arizona State Land Department (ASLD); its future use has not yet been determined. The land east of the ASLD parcel is existing residential (Rancho Santa Fe Subdivision). The land between Airfield Avenue and I-40 on the west side of the Prospector Street alignment is owned by the COK and is planned for retail, office, commercial, and civic development. The land east of the COK parcels is privately owned and vacant. The land between I-40 and Diamond Joe Road, on both sides of the Prospector Street alignment, is privately owned and is planned for retail, commercial, and residential development to the north.

2.4 DRAINAGE

The topography surrounding the project site slopes generally from south to north and rainfall runoff collects in several defined natural streambeds. There are several drainage crossings under I-40, consisting of pipe culverts and concrete box culverts.

2.5 UTILITIES

There are several existing utilities within the project limits. See **Table 2.1** for a list of the utilities and their locations.

Table 2.1 – Existing Utilities

Utility Owner	Utility Type	Location
Frontier Communications	TI carrier line	Within a 10-foot easement along the north I-40 right-of-way line
Frontier Communications	36 strand fiber cable and 200 pair copper cable	Approximately 37.5 feet east of the Prospector Street section line, between Louise Avenue and Airway Avenue. Inside 8-inch casing under I-40.
Unisource Electric	Overhead 12kV distribution line	Single phase line between I-40 and Diamond Joe Road. Three phase north of Diamond Joe Road.
Unisource Gas	4" PE gas line	Along the south side of Santa Rosa Drive/Diamond Joe Road, west of Prospector Street and along the west side of Prospector Street, north of Diamond Joe Road.
City of Kingman	12" sewer line	Located 7 feet south of the Airfield Avenue Mid-Section Line

3.0 TRAFFIC ANALYSIS

3.1 YEAR 2030 CONDITIONS ASSESSMENT

This section presents a summary of the traffic analysis that discusses the tools, methods, and assumptions employed in the assessment and concept development of the Prospector Street Grade Separation and connecting roads. The purpose of this assessment is to determine the lane requirements for the Prospector Street alternative scenarios.

3.2 YEAR 2030 TRAVEL FORECAST MODEL

Traffic forecasts for the Prospector Street Grade Separation Study build upon the transportation model developed for the 2011 Kingman Area Transportation Study (KATS). The final TransCAD model files that provided the model results presented in the 2011 KATS reports were not available. Preliminary TransCAD model files were provided by Kimley-Horn, the consulting firm that prepared the 2011 KATS report, but the 2030 network provided in the TransCAD model files do not match the 2030 network shown on Figure 17 in the KATS report (see **Figure 3.1**). The provided TransCAD model files were updated to closely match, as much as possible, the 2030 full build out roadway network in the KATS report for this study. Two additional major roadways were added to the model from the 2030 Kingman General Plan (see **Figure 3.2**). The two added roadways include extending Rancho Santa Fe Parkway north from Airway Avenue to Industrial Parkway, and extending Industrial Parkway southwest from the Airport to Airway Avenue. In addition, several of the centroid connectors were adjusted to provide a more realistic distribution of traffic volumes from the Traffic Analysis Zones (TAZ) to the roadway network. The socioeconomic data provided with the TransCAD model files was assumed to be the same used in the final KATS study.

A 2030 Existing Network model was also developed based on the 2030 baseline network shown on Figure 14 in the KATS report (see **Figure 3.3**) that used the 2030 TAZ population and employment data and the existing roadway network.

Once the TransCAD model was updated, several model scenarios were developed to ascertain the traffic impacts, and to determine the lane requirements for each scenario. The following model scenarios were developed:

1. **KATS Full Build (No TI's)** – This scenario assumes full build out of the 2030 KATS roadway network, but without traffic interchanges (TI) at Kingman Crossing Boulevard TI (KCTI) and Rancho Santa Fe Parkway (RSFP).
2. **KATS Full Build (KCTI + RSFP TI)** – The KATS Full build is the updated KATS model as described above. It provides traffic interchanges at Kingman Crossing Boulevard and Rancho Santa Fe Parkway, but no grade separation of I-40 at Prospector Street.
3. **KATS Full Build (KCTI Only)** – The KATS Full build is the updated KATS model as described above, but only provides traffic interchange at Kingman Crossing Boulevard, and no grade separation of I-40 at Prospector Street.

4. **KATS Full Build (KCTI + RSFP TI + PGS)** – The Prospector Grade Separation (PGS) is added to the KATS (KCB TI + RSFP TI) Full build scenario.
5. **KATS Full Build (PGS Only)** – This scenario adds grade separation of I-40 at Prospector Street to the 2030 Full Build (No TI's) scenario (No traffic interchanges at Kingman Crossing Boulevard and Rancho Santa Fe Parkway).
6. **KATS Full Build (KCTI + PGS)** – This scenario adds a traffic interchange at Kingman Crossing Boulevard and grade separation of I-40 at Prospector Street to the 2030 Full Build (No TI's) scenario (No traffic interchange at Rancho Santa Fe Parkway).
7. **KATS Full Build (RSFP TI + PGS)** – This scenario adds a traffic interchange at Rancho Santa Fe Parkway Boulevard and grade separation of I-40 at Prospector Street to the 2030 Full Build (No TI's) scenario (No traffic interchange at Kingman Crossing Boulevard).
8. **KATS 2030 Existing Network (No TI's)** – The Existing Network scenario assumes no future build out of the existing roadway network without any TI's at Kingman Crossing Boulevard and Rancho Santa Fe Parkway.
9. **KATS Existing Network (KCTI Only)** – This scenario adds a traffic interchange at Kingman Crossing Boulevard to the 2030 Existing Network (No TI's) scenario.
10. **KATS Existing Network (PGS Only)** – This scenario adds grade separation of I-40 at Prospector Street to the 2030 Existing Network (No TI's) scenario.
11. **KATS Existing Network (KCTI + PGS)** – This scenario adds a traffic interchange at Kingman Crossing Boulevard and grade separation of I-40 at Prospector Street to the 2030 Existing Network (No TI's) scenario.

Figure 3.1 – KATS 2030 Full Build Roadway Network and Traffic Volumes (Source 2011 KATS)

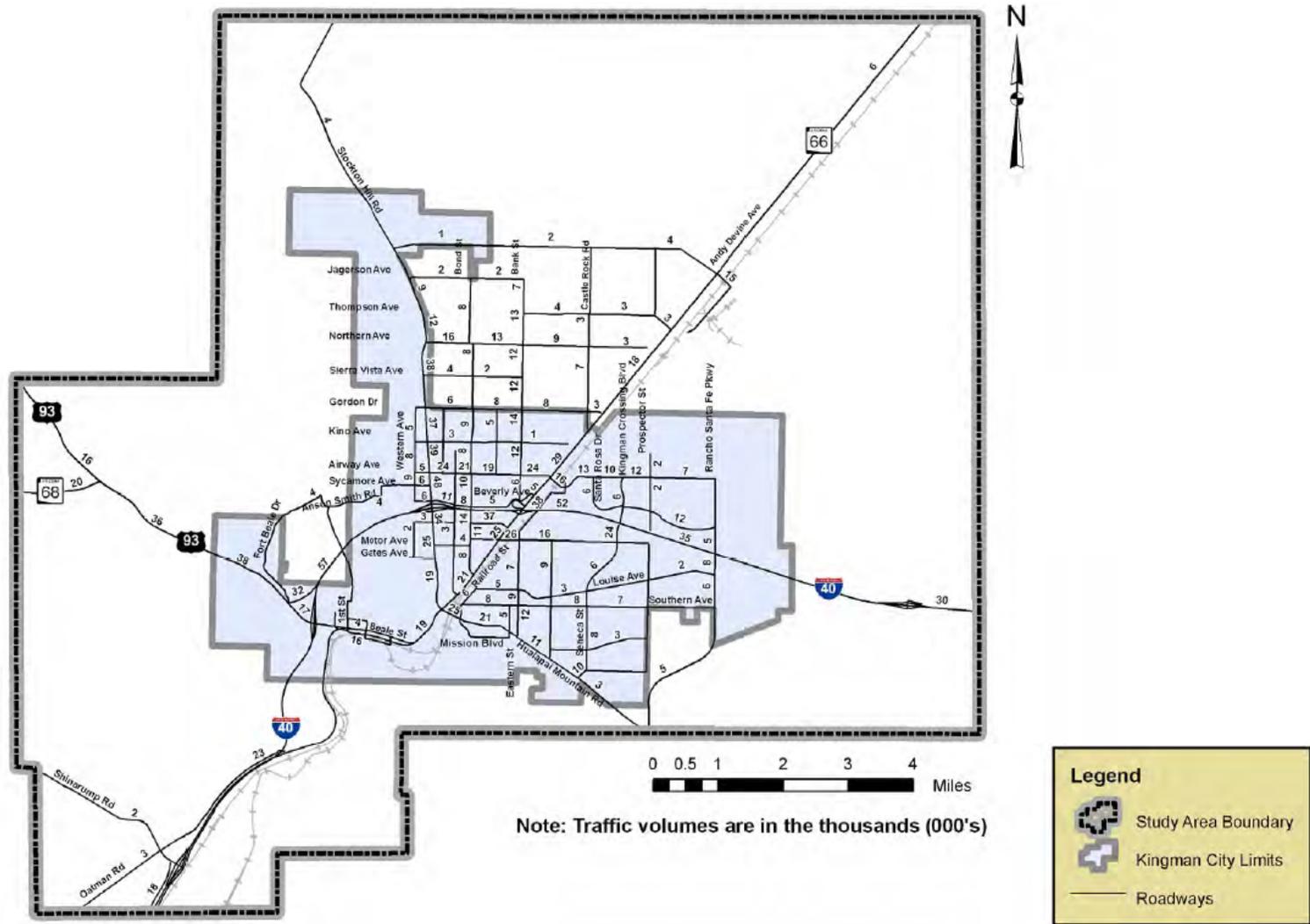


Figure 17: 2030 Daily Traffic Volumes with Recommended Improvements

Figure 3.2 – Kingman General Plan 2030 (Source City of Kingman General Plan Update 2030)

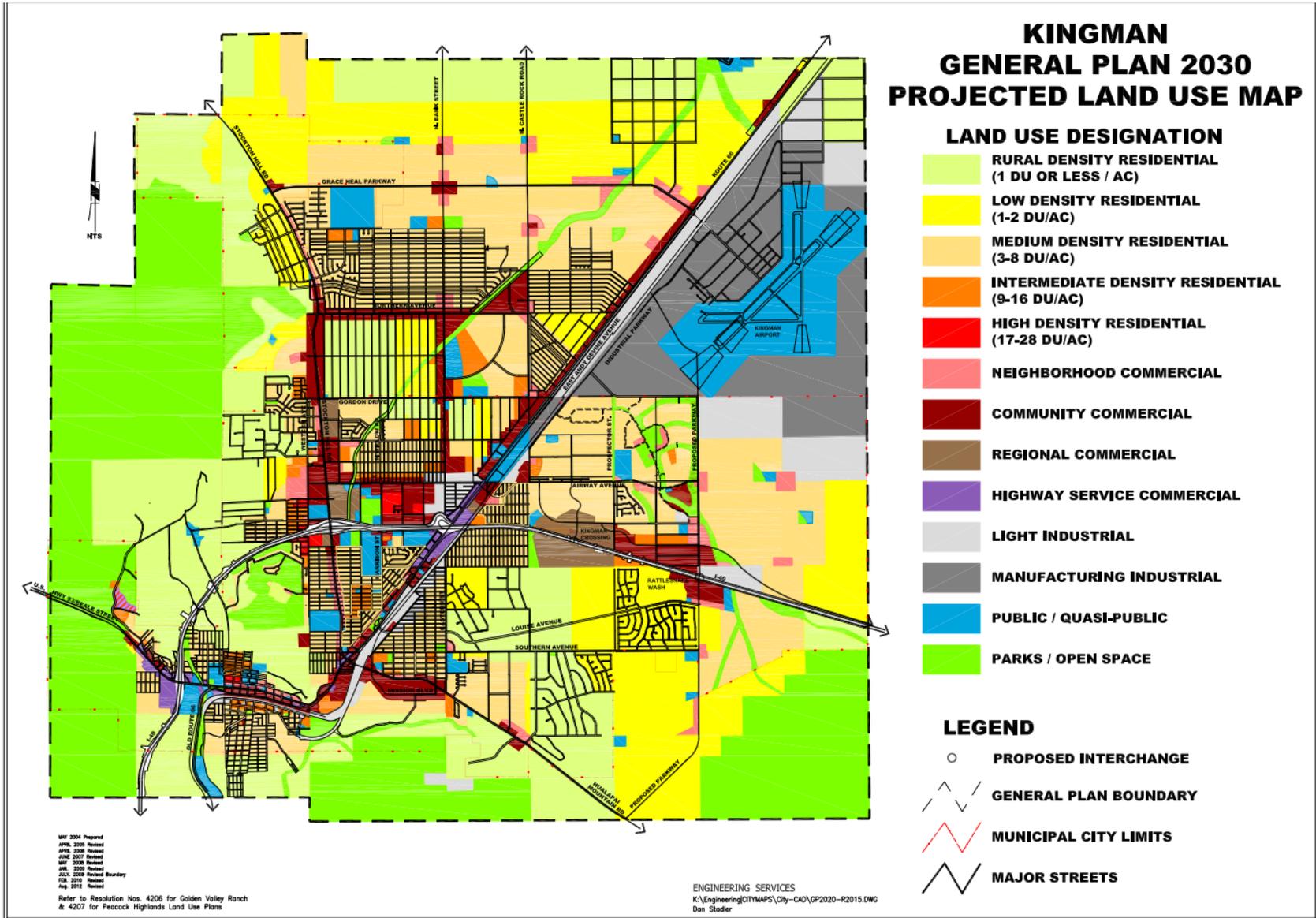


Figure 3.3 – Projected 2030 Existing (No-Build) Roadway Network and Traffic Volumes (Source 2011 KATS)

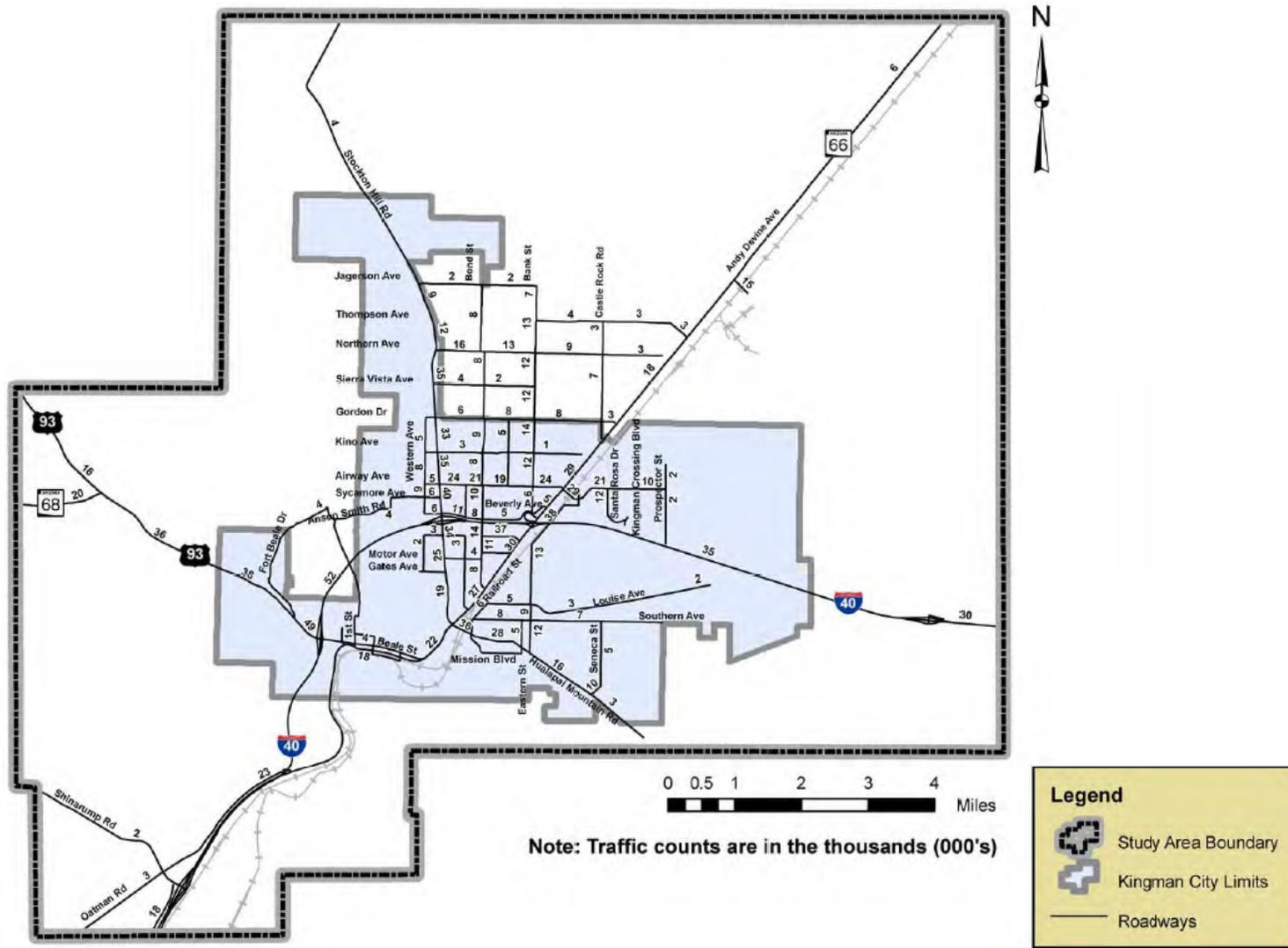


Figure 14: Projected Baseline 2030 Daily Traffic Volumes

3.2.1 Year 2030 Daily Volumes

The updated KATS model was run for each of the model scenarios. The total Year 2030 daily volume output from these model runs are shown in **Appendix A**, and the volumes for the existing and proposed roads crossing I-40 east of the railroad tracks are summarized in **Table 3.1**.

Table 3.1 – Summary of 2030 Daily Traffic Volumes

Scenario	Daily Two-way Roadway Volumes (1000's)				
	Airway Ave. (Between Andy Devine and Eastern)	Eastern St. (Between Airway Ave & Airfield Ave)	Kingman Crossing Blvd (N/S)*	Prospector St. (Crossing over I-40)	Rancho Santa Fe Pkwy (N/S)*
1 – KATS Full Build (No TI's)	31.9	14.7	-	-	-
2 - KATS Full Build (KCTI & RSFP TI)	26.0	0.2	20.9 / 22.0	-	5.0 / 6.3
3 - KATS Full Build (KCTI Only)	26.3	0.2	25.7/27.1	-	-
4 - KATS Full Build (KCTI+PGS+RSFP TI)	26.0	0.2	18.1 / 19.3	3.0	4.9 / 6.2
5 - KATS Full Build (PGS only)	35.4	6.1	-	12.3	-
6 - KATS Full Build (KCTI+PGS)	26.4	0.2	20.6 / 22.4	5.3	-
7 - KATS Full Build (PGS+RSFP TI)	29.8	4.0	-	8.3	6.6 / 7.6
8 – KATS Existing Network (No TI's)	38.1	23.5	-	-	-
9 - KATS Existing Network (KCTI Only)	32.7	3.9	25.4 / 33.9	-	-
10 – KATS Existing Network (PGS only)	41.6	7.8	-	19.2	-
11 – KATS Existing Network (KCTI+PGS)	32.8	3.8	31.6 / 23.0	2.5	-

KCTI = Kingman Crossing Boulevard TI, PGS = Prospector Grade Separation, RSFP TI = Rancho Santa Fe Parkway TI
* (N/S) = North of I-40 / South of I-40

3.3 YEAR 2030 LEVEL OF SERVICE (LOS)

The 2030 daily traffic volumes for the four roadway crossings of I-40 were compared to the maximum daily volume thresholds for LOS C and LOS D to identify existing roadways that are approaching their maximum capacity and to determine lane requirements for proposed roadways. The daily volume thresholds for LOS C and LOS D shown in **Table 3.2** are derived from Table 4-1 in the Florida Department of Transportation's *2002 Quality/Level of Service Handbook*. **Table 3.3** summarizes the recommended number of lanes for proposed roadways and the resulting LOS for each of the four roadway crossings of I-40.

**Table 3.2 – Daily Volume Thresholds for LOS C and LOS D
(Source: Florida Department of Transportation)**

FDOT Rdwy Type	Description of Roadway	Number of Through Lanes	Maximum Daily Volume for LOS C	Maximum Daily Volume for LOS D
A	Collector/Arterial with no left-turn lanes	2	9,000	12,300
B	Collector/Arterial with left-turn lanes	2	11,200	15,400
C	Collector/Arterial with no left-turn lanes	4	19,500	24,500
D	Collector/Arterial with left-turn lanes	4	24,700	31,100
E	Collector/Arterial with raised median & left-turn lanes	4	26,000	32,700
F	Arterial with left-turn lanes	6	38,300	46,700
G	Arterial with raised median & left-turn lanes	6	40,300	49,200
H	Uninterrupted flow highway	2	13,800	19,600
I	Uninterrupted flow highway	4	47,800	61,800
J	Freeway	4	52,000	67,200
K	Freeway	6	81,700	105,800

Table 3.3 – Summary of 2030 Level of Service & Recommended Number of Lanes

Scenario	Eastern St			Kingman Crossing Blvd			Prospector St.			Rancho Santa Fe Pkwy		
	No. of Lanes (Prop)	FDOT Rdwy Type	LOS	No. of Lanes (Prop)	FDOT Rdwy Type	LOS	No. of Lanes (Prop)	FDOT Rdwy Type	LOS	No. of Lanes (Prop)	FDOT Rdwy Type	LOS
1 – KATS Full Build (No TI's)	2	B	C - D	-		-	-		-	-		-
2 - KATS Full Build (KCTI & RSFP TI)	2	B	>C	4	D	>C	-		-	2	B	>C
3 - KATS Full Build (KCTI Only)	2	B	>C	4	D	>C	-		-	-		-
4 - KATS Full Build (KCTI+PGS+RSFP TI)	2	B	>C	4	D	>C	2	B	>C	2	B	>C
5 - KATS Full Build (PGS only)	2	B	>C	-		-	2 / 4	B/D	C-D/ >C	-		-
6 - KATS Full Build (KCTI+PGS)	2	B	>C	4	D	>C	2	B	>C	-		-
7 - KATS Full Build (PGS+RSFP TI)	2	B	>C	-		-	2	B	>C	2	B	>C
8 – KATS Existing Network (No TI's)	4	D	C	-		-	-		-	-		-
9 – KATS Existing Network (KCTI Only)	2	B	>C	4	D	C - D	-		-	-		-
10 – KATS Existing Network (PGS only)	2	B	>C	-		-	4	D	C	-		-
11 – KATS Existing Network (KCTI+PGS)	2	B	>C	4	D	C - D	2	B	>C	-		-

KCTI = Kingman Crossing Blvd TI, PGS = Prospector Grade Separation, RSFP TI = Rancho Santa Fe Parkway TI

Existing roadway segments with existing daily volumes below the maximum volume threshold for LOS C likely do not need additional through capacity, while roadway segments with existing daily volumes above the maximum volume threshold for LOS D will probably need additional through capacity. For roadway segments with existing daily volumes between the maximum volume thresholds for LOS C and LOS D, more detailed analysis should be conducted to evaluate intersection geometry, signal timing, and number and spacing of driveways to determine if additional through capacity is needed.

For proposed roadway segments, the number of lanes required was increased to meet LOS C (based on Collector/Arterial with left-turn lanes criteria) and are shown in **Table 3.3**.

3.4 TRAVEL TIME ANALYSIS

A travel time analysis was performed to compare the travel time between the No-build option and the two build options. The travel time analysis was performed on three travel routes as shown in **Figures 3.4, 3.5 and 3.6**. The travel time was determined based on the assumed and existing posted speed limits, associated speed limit segment length, and estimated delays at signals and stop controlled intersections on each travel route. **Table 3.4** summarizes the travel time for both directions along each travel route for each alternative alignment. Detailed calculations are shown in the table in **Appendix B**.

Table 3.4 – Travel Time Segment Limits & Travel Time

Travel Time Scenario No.	Origin	Destination	Alternative Alignment	Total Length (miles)	Total Travel Time (min)	Total Travel Time (min) (Reverse Direction)
1	Prospector St. & Louise Ave. Intersection	Prospector St. & Airway Ave. Intersection	No-Build (Louise-Eastern-Airway)	5.5	11.0	11.5
			Alt 1 - Kingman Crossing Alignment	2.7	5.4	5.4
			Alt 2 - Prospector Street Alignment	1.7	3.3	3.3
2	Eastern St & Louise Ave. Intersection	Prospector St. & Airway Ave. Intersection	No-Build (Louise-Eastern-Airway)	3.5	7.0	7.5
			Alt 1 - Kingman Crossing Alignment	4.8	9.5	9.3
			Alt 2 - Prospector Street Alignment	3.7	7.4	7.3
3	Eastern St. and Airfield Ave. Intersection	Prospector St. & Airway Ave. Intersection	No-Build (Louise-Eastern-Airway)	2.7	5.7	6.2
			Alt 1 - Kingman Crossing Alignment	5.5	11.0	10.9
			Alt 2 - Prospector Street Alignment	4.5	9.0	8.9

3.5 CONCLUSIONS

- For each of the build scenarios (KATS Full Build and 2030 Existing Network), the traffic volumes on Eastern Street crossing under I-40 (between Airfield Ave and Airway Avenue) are significantly reduced, eliminating the need for future widening of Eastern Street. Providing a grade separation at Prospector Street with either or both adjacent traffic interchanges would have the greatest reduction of traffic on Eastern Street. The large reduction of traffic on Eastern Street would significantly improve the traffic operations and reduce congestion at the Airway Avenue and Diamond Street/Yavapai Street couplet traffic signal.
- The KATS Full Build (KCTI + RSPF TI) and (KCTI + PGS) scenarios would reduce the congestion at the Andy Devine/SR 66 TI, and reduce traffic on Airway Avenue. The KATS Full Build (PGS + RSFP TI) scenario would reduce the congestion slightly at the Andy Devine/SR 66 TI, but not as much as the KATS Full Build (KCTI + RSPF TI) and (KCTI + PGS) scenarios would.
- Providing just a grade separation at Prospector would increase the congestion at the Andy Devine/SR 66 TI and increase traffic on Airway Avenue. This is likely due to Airway Avenue being the center crossing of the BNSF railroad tracks and this scenario would provide the most direct route to I-40 and the west Kingman area from the area south of I-40 and east of the BNSF railroad tracks.
- Based on the model results with one or two future TI’s at Kingman Crossing or at RSFP (Scenarios 4, 6, 7 & 11), the lane requirements for Prospector Street would require two-lanes for a grade separation over/under I-40. For Scenarios 4, 6 and 11, two-lanes would be adequate well past 2045 (30 year forecast horizon) based on the KATS 2.39% annual growth rate. For Scenario 7, two-lanes would be adequate until approximately 2042, well past the typical 20 year forecast horizon.
- If it is anticipated that TI’s would not be constructed at both KCB and RSFP, it is recommended that the Prospector Street grade separation be constructed as a four-lane arterial.

- For the option of providing an interim Prospector Street with the grade separation located at the future KCTI location, two-lanes would be required for the interim roadway.
- Travel time between the areas north and south of I-40 would be significantly reduced from the No-build option.

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Figure 3.4 – Travel Time Scenario #1 Routes

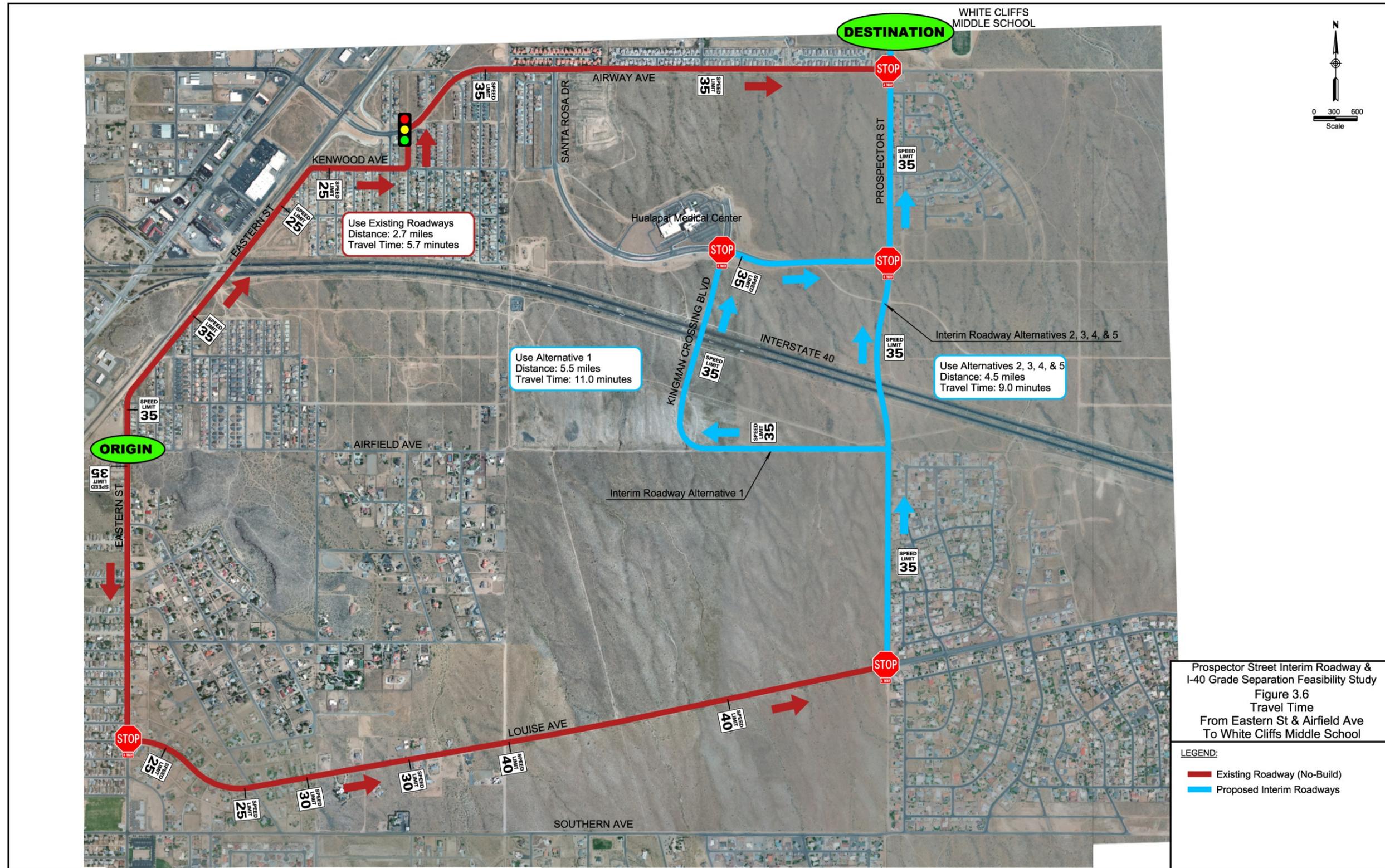


Figure 3.5 – Travel Time Scenario #2 Routes



Fig 3-5 Travel Time Eastern-Louise.dgn 3/1/2016 2:42:05 PM

Figure 3.6 – Travel Time Scenario #3 Routes



4.0 ALTERNATIVE DEVELOPMENT

This section describes development of the alternatives and the major design features used to develop the alternatives.

4.1 DESIGN CRITERIA

The alternative alignments will be designed to meet current ADOT, AASHTO and COK design criteria. The following design controls will be used for development of the alignment and layout of the recommended alternative.

Table 4.1 – Design Controls

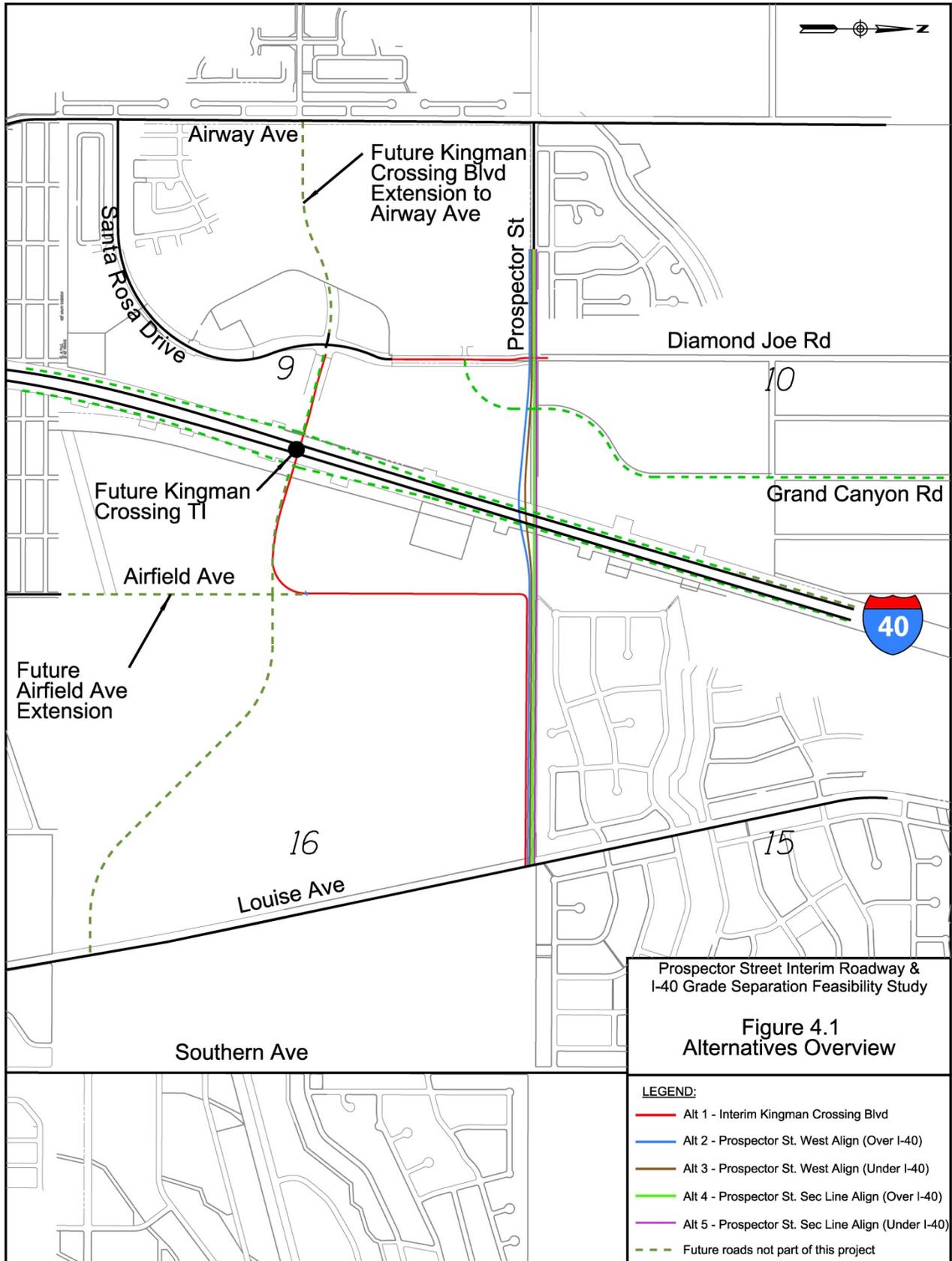
Description	Kingman Crossing Boulevard (Southern to Airway Ave - Ultimate)	Prospector Street
Design Year:	2030	2030
Street Classification	Four-Lane Arterial	Two-lane Collector
Design Vehicle:	WB-67	SU-40
Design Speed:	45 mph	35 mph
Superelevation:	0.04 ft/ft max	0.04 ft/ft max
Maximum Horizontal Curve:	D=8°03'25" (R=711 ft)	D=15°26'27" (R=371 ft)
Maximum Gradient:	6.5% (within access control limits – ADOT) 12.0% (COK)	12%
Travel Lane Width:	12 ft inside, 11 ft outside	12 ft
Median Width:	16 ft Raised Median (KATS)	12 ft Two-way Left Turn (KATS)
Outside Shoulder Width:	6.5 ft Bike Lane (KATS)	6.5 ft Bike Lane (KATS)
Normal Cross-Slope:	0.02 ft/ft	0.02 ft/ft
Vertical Clearance:	16.5 ft 16 ft to false work over traffic	16.5 ft 16 ft to false work over traffic
Slope Standards:	3H:1V (within access control limits – ADOT) 3H:1V (COK)	3H:1V
Minimum Vertical Curve Length:	3 x design speed = 135 ft	3 x design speed = 105 ft
Minimum Right-of-way Width	100 ft (KATS)	70 ft (KATS)

4.2 ALIGNMENT ALTERNATIVES

Five alignment alternatives were developed for evaluation. All five alternatives include an interim roadway along the Prospector Street Alignment between Louise Avenue and Airfield Avenue. All alternatives also include and interim roadway along the Diamond Joe Road alignment between Santa Rosa Drive and Prospector Street; and on Prospector Street, north of Diamond Joe Road, tying into the improved section of Prospector Street. **Figure 4.2** shows the overview of all the build Alternatives.

The following sections describe the interim roadway and I-40 grade separation alternatives that have been considered.

Figure 4.1 – Alternatives Overview



4.2.1 No-Build Alternative

The no-build alternative would not construct an interim roadway grade separation over I-40 to provide better access between the areas north and south of I-40. The existing street network would be unchanged.

4.2.2 Alternative 1 – Interim Kingman Crossing Boulevard

This alternative would have the interim roadway alignment curve west onto the Airfield Avenue alignment from the Prospector Street alignment. The alignment would then curve to the north and join the proposed Kingman Crossing Boulevard alignment and tie into the existing intersection at Santa Rosa Drive. A portion of the proposed Kingman Crossing Boulevard would serve as the interim roadway. The profile of the interim roadway would match the profile of the proposed Kingman Crossing Boulevard roadway, passing under I-40. The two bridges proposed for Kingman Crossing Boulevard would be constructed to allow the interim roadway to pass under I-40. **Figure 4.2** shows Alternative 1 alignment

4.2.3 Alternative 2 – Prospector Street West Alignment (Over I-40)

This alternative would shift the interim roadway approximately 175 feet west of the Prospector Street Alignment, between Airfield Avenue and Diamond Joe Road. The shift in the alignment would eliminate conflicts with an existing drainage culvert crossing under I-40 and accommodate a proposed open channel on the downstream end of the culvert. The profile of the interim roadway would elevate over I-40 with a new two-span bridge.

4.2.4 Alternative 3 – Prospector Street West Alignment (Under I-40)

This alternative is similar to Alternative 2, but the profile of the interim roadway would depress under I-40. Two new bridges would be constructed to allow the interim roadway to pass under I-40.

4.2.5 Alternative 4 – Prospector Street Section Line Alignment (Over I-40)

This alternative is similar to Alternative 2, but the alignment would be on section line between Airfield Avenue and Diamond Joe Road. The profile of the interim roadway would elevate over I-40 with a new two-span bridge.

4.2.6 Alternative 5 – Prospector Section Line Alignment (Under I-40)

This alternative is similar to Alternative 3, but the alignment would be on section line between Airfield Avenue and Diamond Joe Road. The profile of the interim roadway would depress under I-40 and two new bridges would be constructed on I-40.

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**Figure 4.2 – Alternative 1
Kingman Crossing Alignment (Under I-40)**

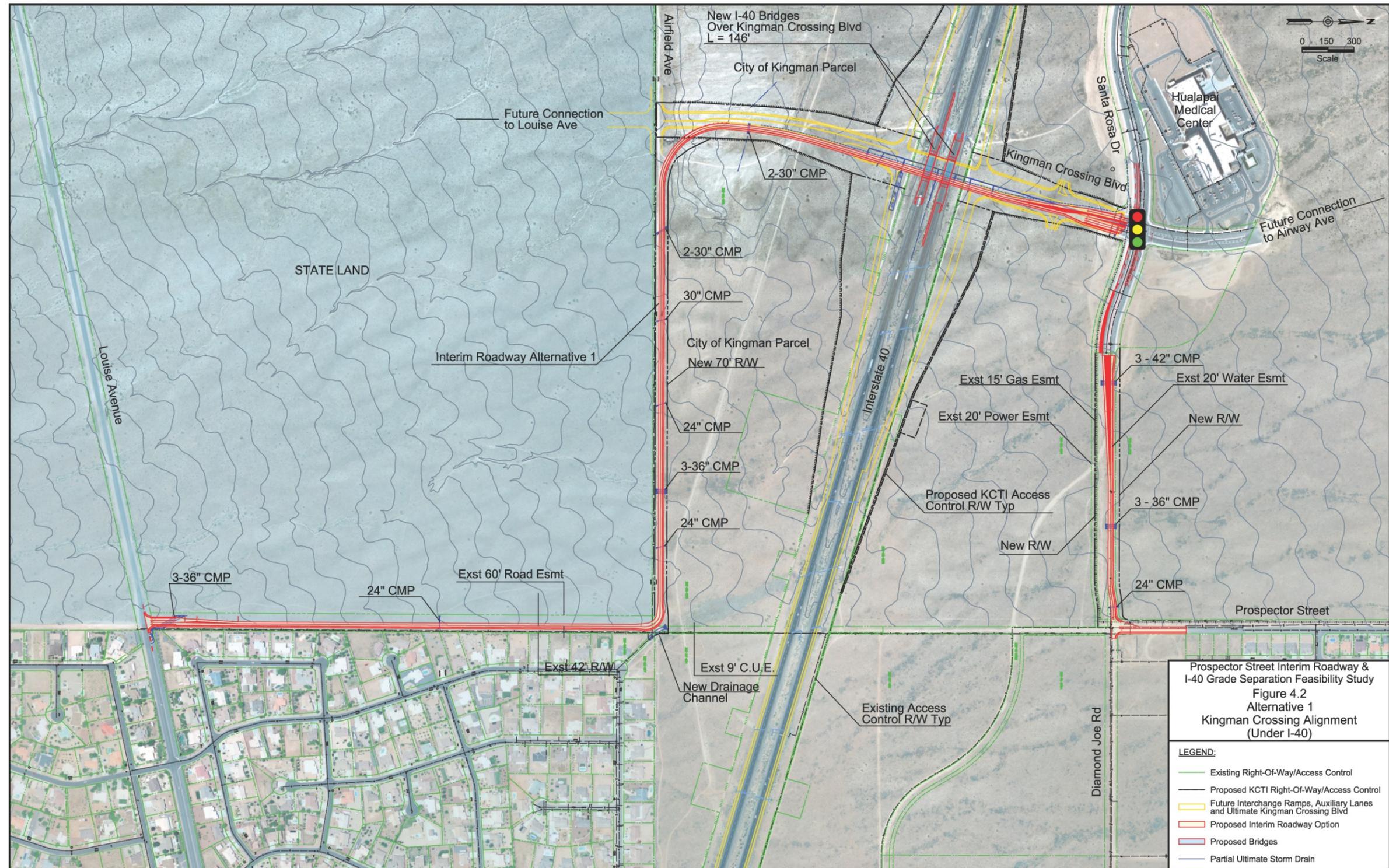
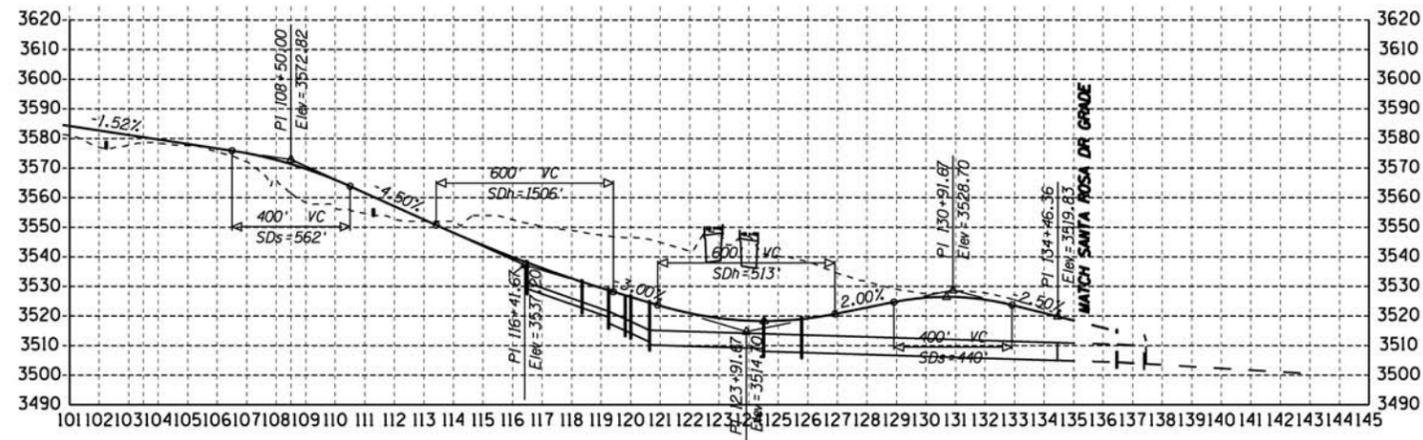
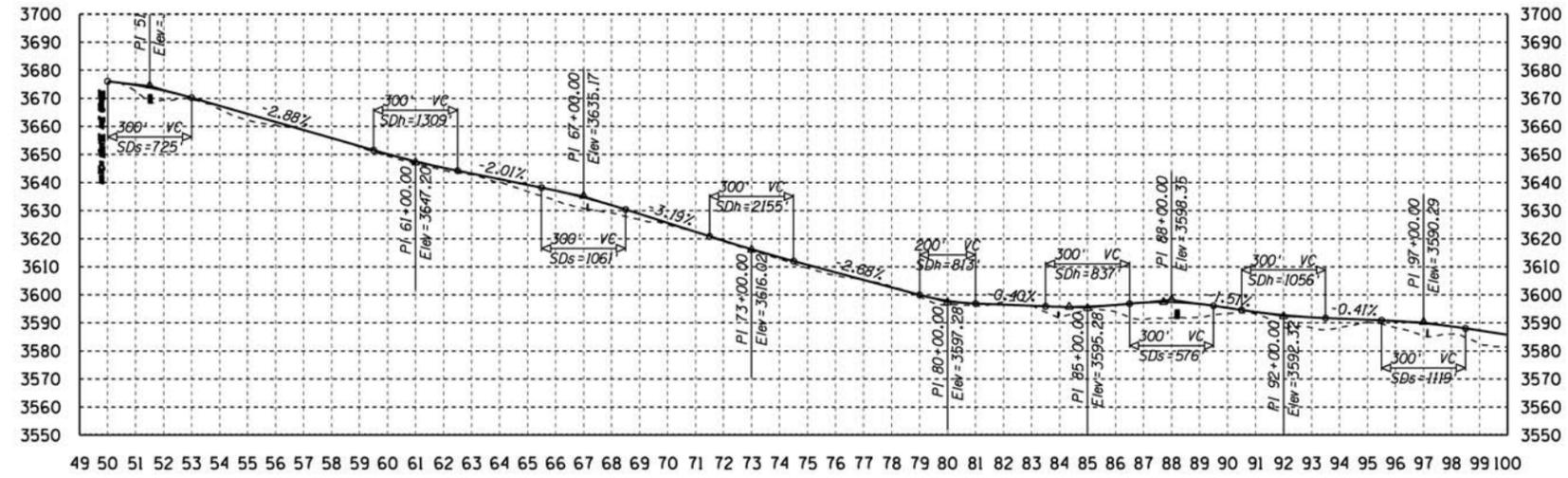


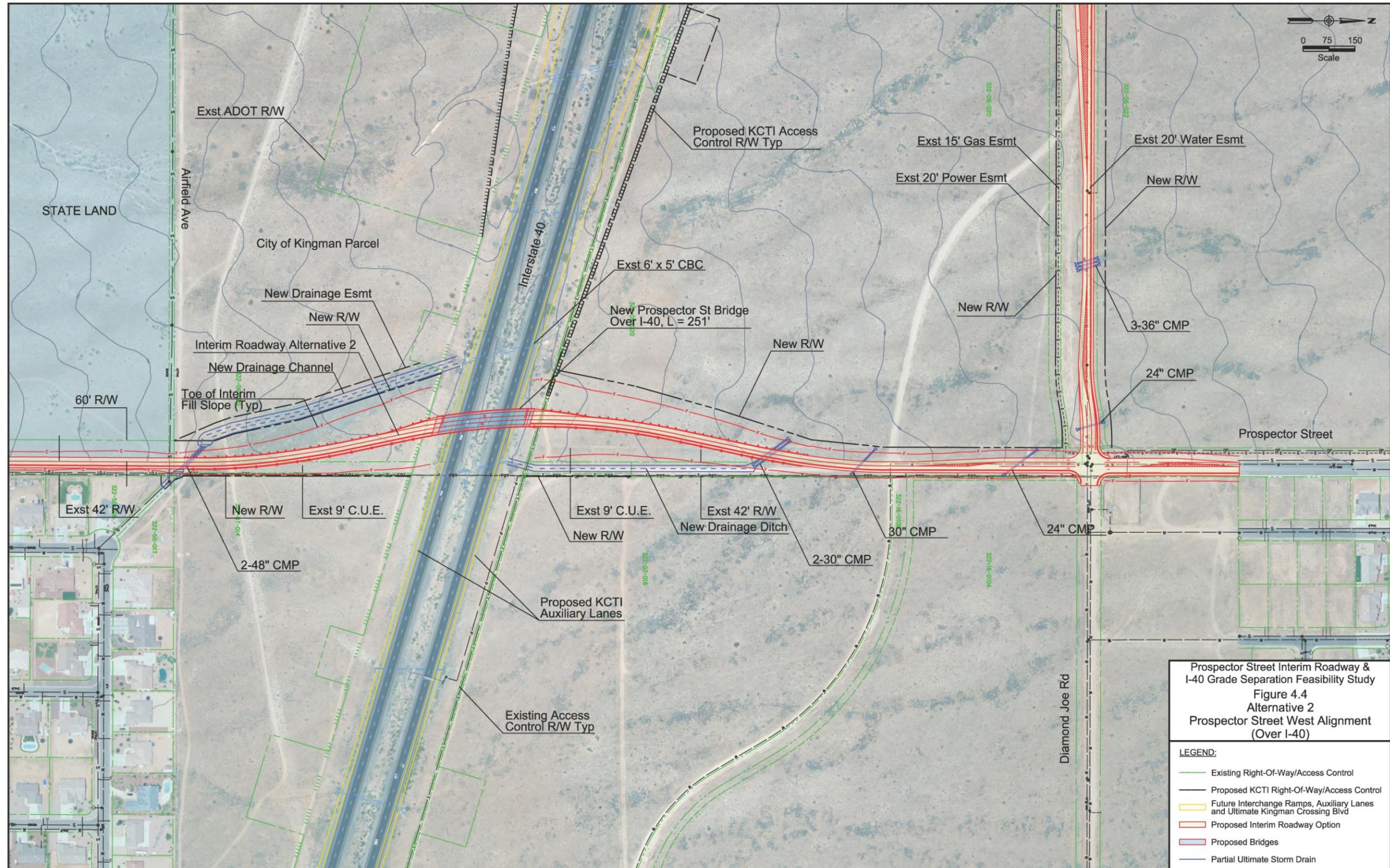
Figure 4.3 – Alternative 1 – Profile
Kingman Crossing Alignment

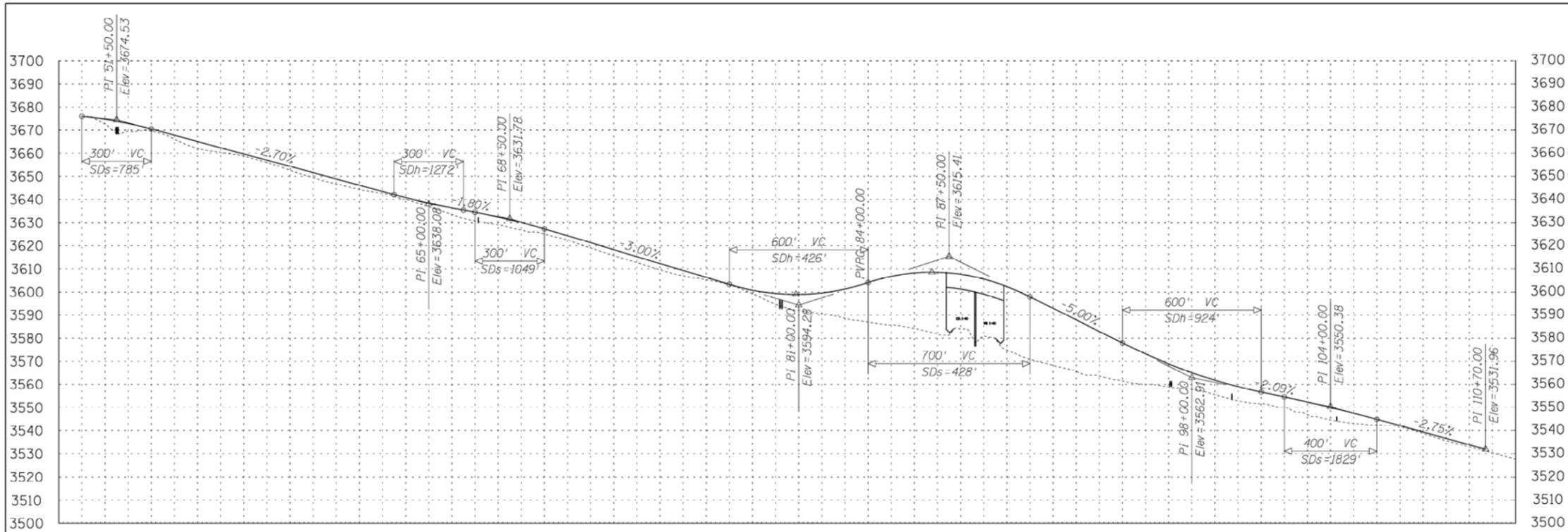


Alternative 1 – Kingman Crossing Grade Separation

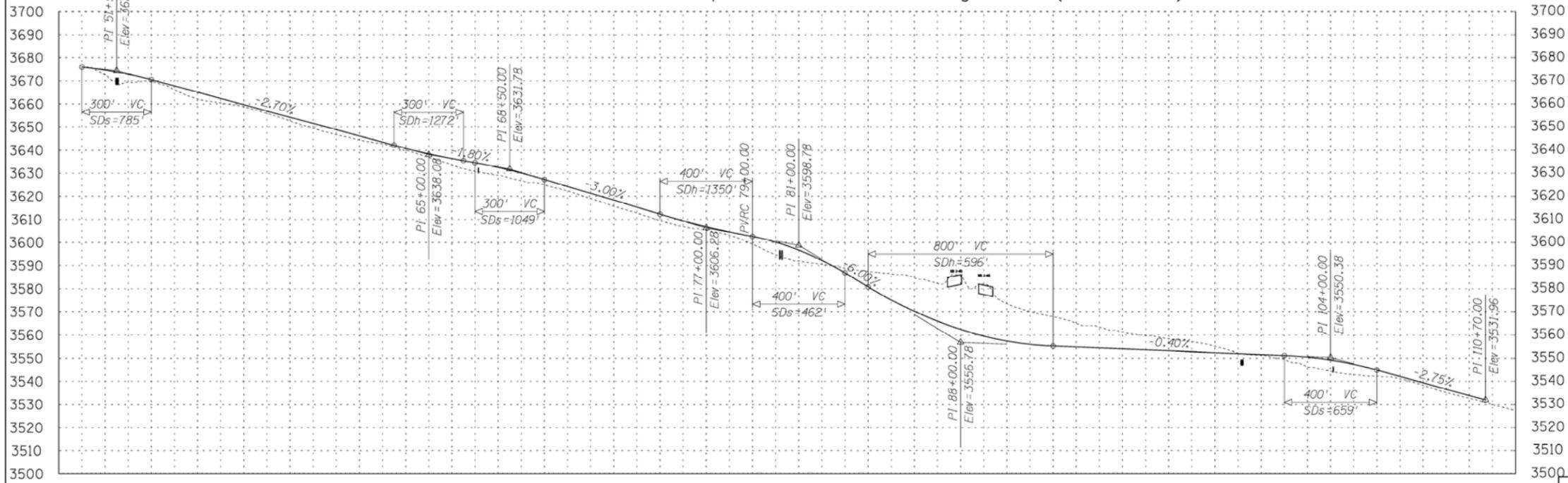
Prospector Street Interim Roadway &
I-40 Grade Separation Feasibility Study
Figure 4.3
Alternative 1 - Profile
Kingman Crossing Alignment

**Figure 4.4 – Alternative 2
Prospector Street West Alignment (Over I-40)**





Alternative 2 – Propsector Street West Alignment (Over I-40)



Alternative 3 – Propsector Street West Alignment (Under I-40)

Propsector Street Interim Roadway & I-40 Grade Separation Feasibility Study

Figure 4.5
Alternative 2 & 3 - Profiles
Propsector Street West Alignments

Figure 4.6 – Alternative 3
Prospector Street West Alignment (Under I-40)

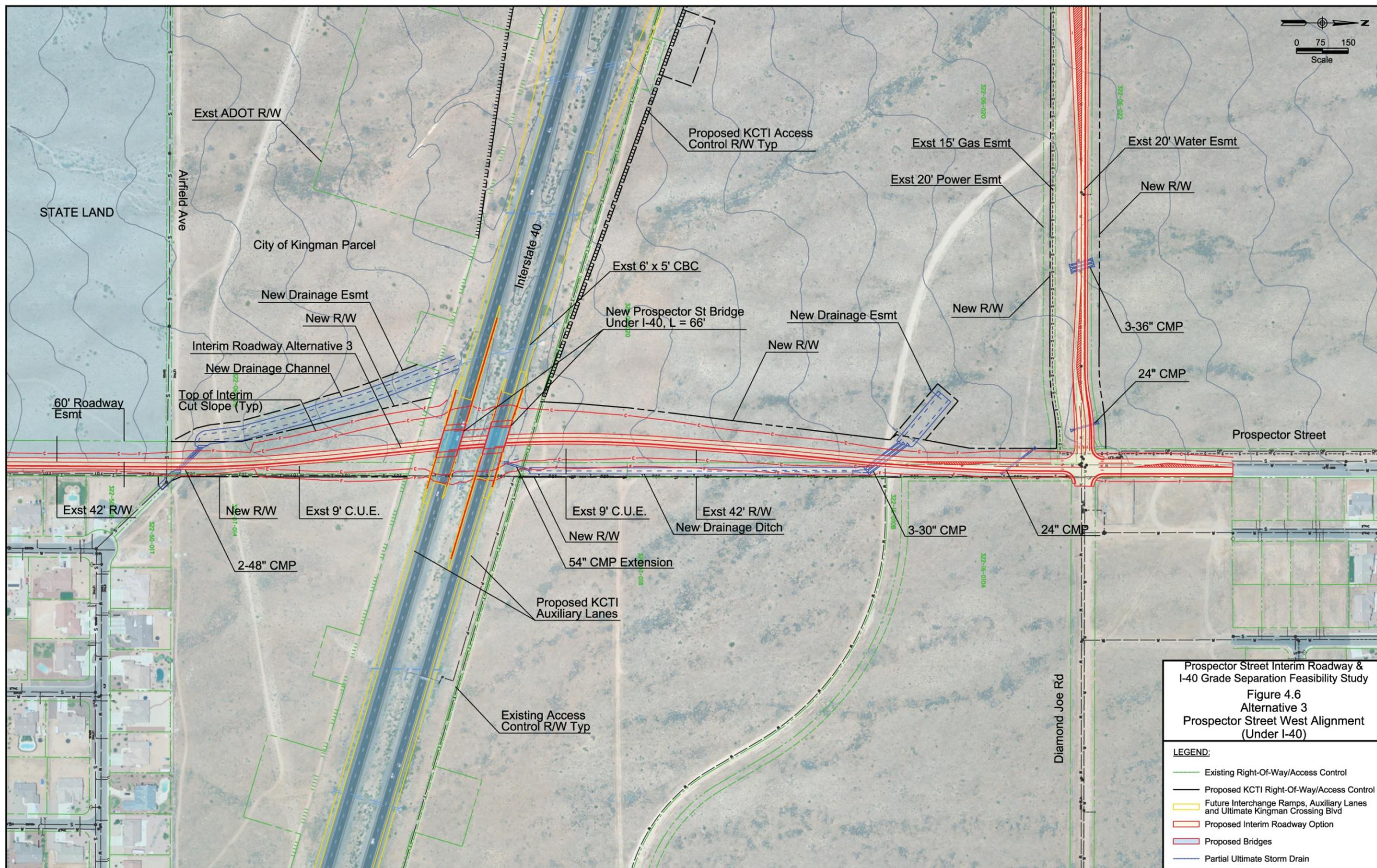
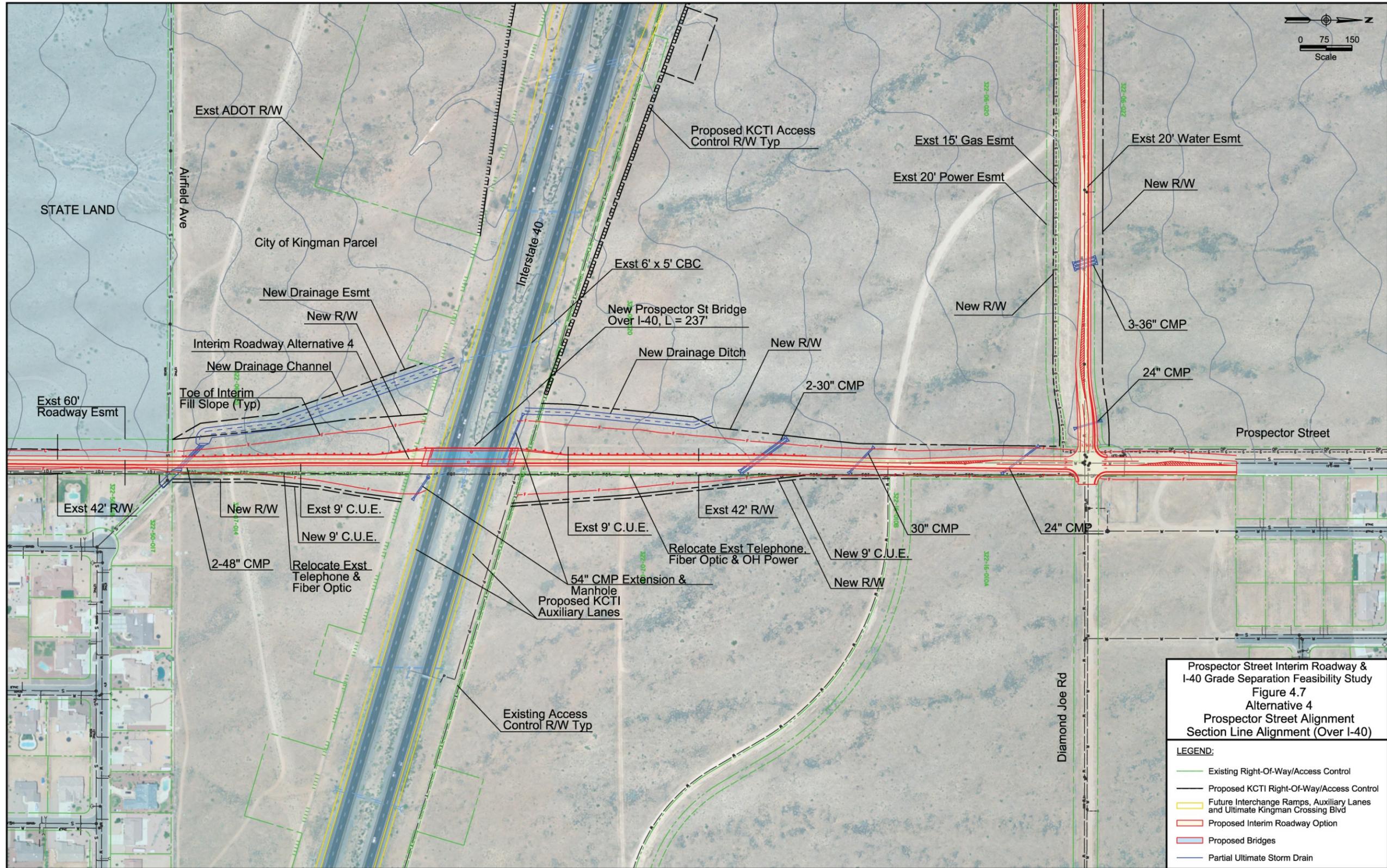
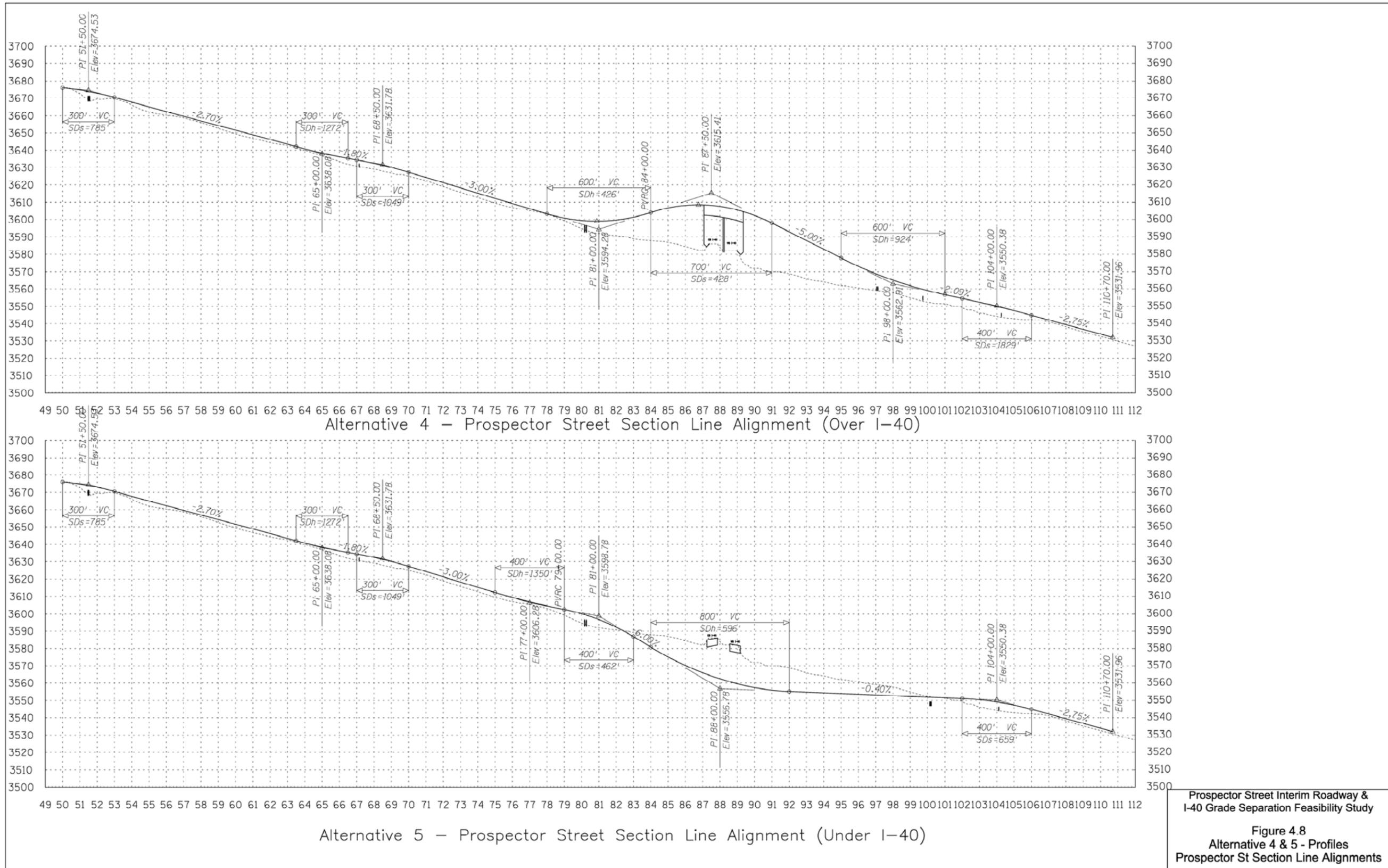


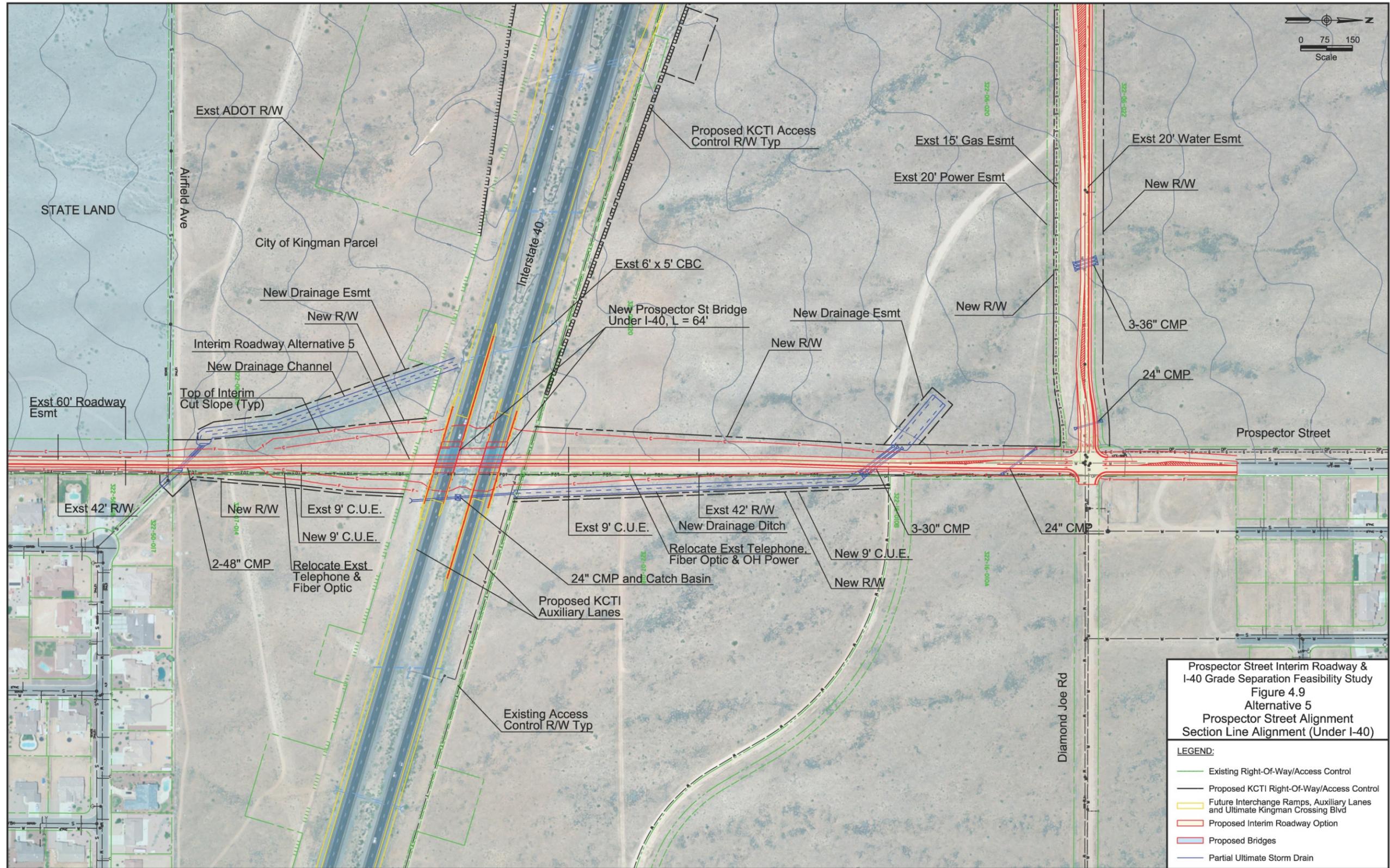
Figure 4.7 – Alternative 4
 Propesor Street Alignment – Section Line Alignment (Over I-40)





Prospector Street Interim Roadway & I-40 Grade Separation Feasibility Study
 Figure 4.8
 Alternative 4 & 5 - Profiles
 Prospector St Section Line Alignments

Figure 4.9 – Alternative 5
 Prospector Street Alignment
 Section Line Alignment (Under I-40)



Prospector Street Interim Roadway & I-40 Grade Separation Feasibility Study
 Figure 4.9
 Alternative 5
 Prospector Street Alignment
 Section Line Alignment (Under I-40)

LEGEND:

- Existing Right-Of-Way/Access Control
- Proposed KCTI Right-Of-Way/Access Control
- Future Interchange Ramps, Auxiliary Lanes and Ultimate Kingman Crossing Blvd
- Proposed Interim Roadway Option
- Proposed Bridges
- Partial Ultimate Storm Drain

4.3 ALTERNATIVE TYPICAL SECTIONS

The KATS report contained recommended roadway cross sections for different types of local roadway classifications. Based on the results of the traffic analysis, only two lanes are required for Prospector Street for the interim and ultimate condition with the assumption that the KCTI will be constructed in the future. The ultimate Prospector Street would be classified as a 2-Lane Collector with Curb. **Figure 4.910** shows the KATS 2-Lane Collector with Curb roadway section. For the Prospector alignment alternatives, the center two-way left-turn lane would be eliminated between Airfield Avenue and Grand Canyon Road, in the raised or depressed sections of the roadway crossing I-40. The interim build alternatives would only build one half of the 2-Lane Collector with Curb roadway section that would be striped only to provide two lanes without any bike lanes or the two-way left-turn lane. **Figure 4.101** shows the interim roadway sections for the build alternatives.

4.4 DRAINAGE

4.4.1 Preliminary Drainage Requirements

Preliminary drainage requirements for each alternative were developed to determine preliminary roadway culvert sizes and drainage channels to estimate drainage related construction costs.

4.4.2 Drainage Design Criteria

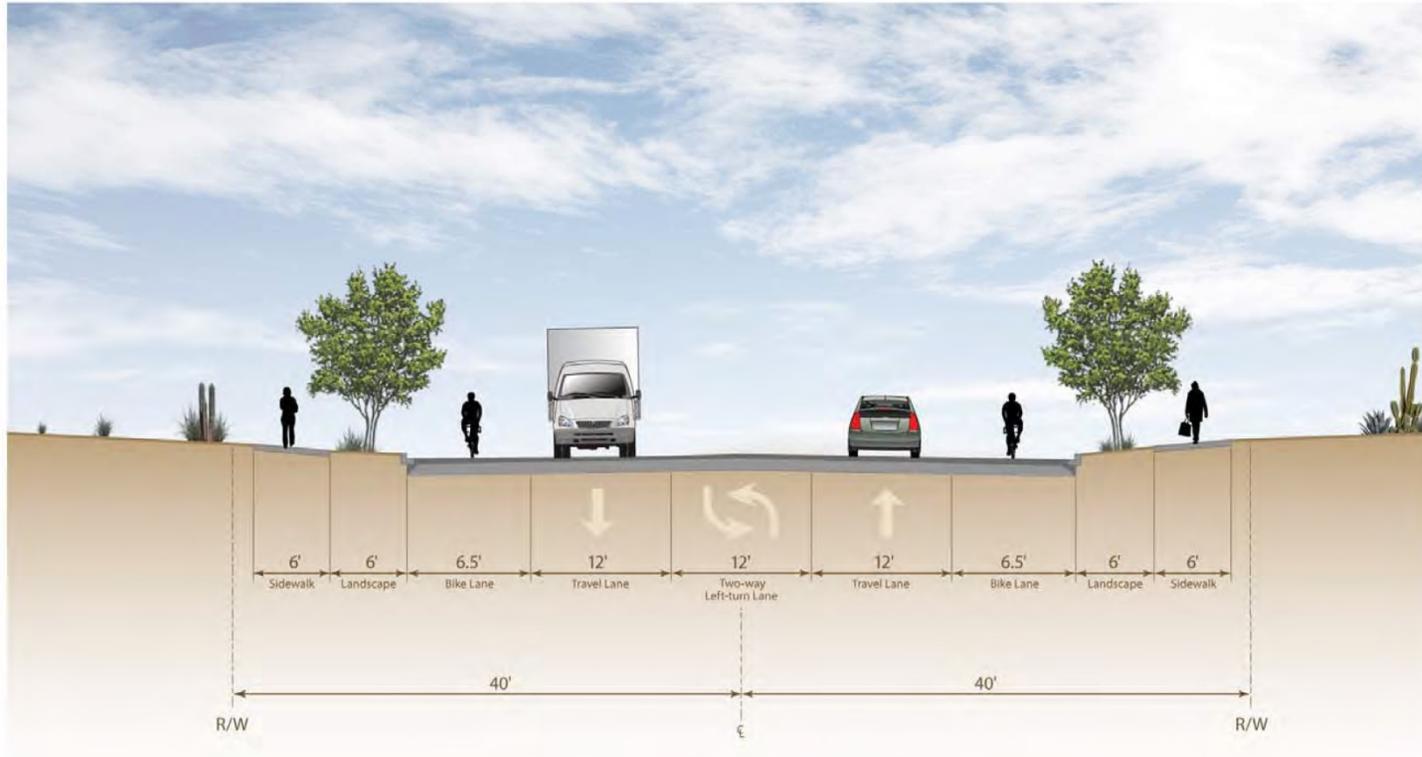
The drainage design criteria will comply with the COK criteria for the design of Kingman Crossing Boulevard. In those instances where the COK has no applicable drainage criteria, the ADOT drainage criteria will be followed. The design of all facilities along I-40 and within ADOT right-of-way will follow the ADOT drainage criteria explicitly. No conflicts with COK criteria are anticipated in that case.

City of Kingman Design Criteria

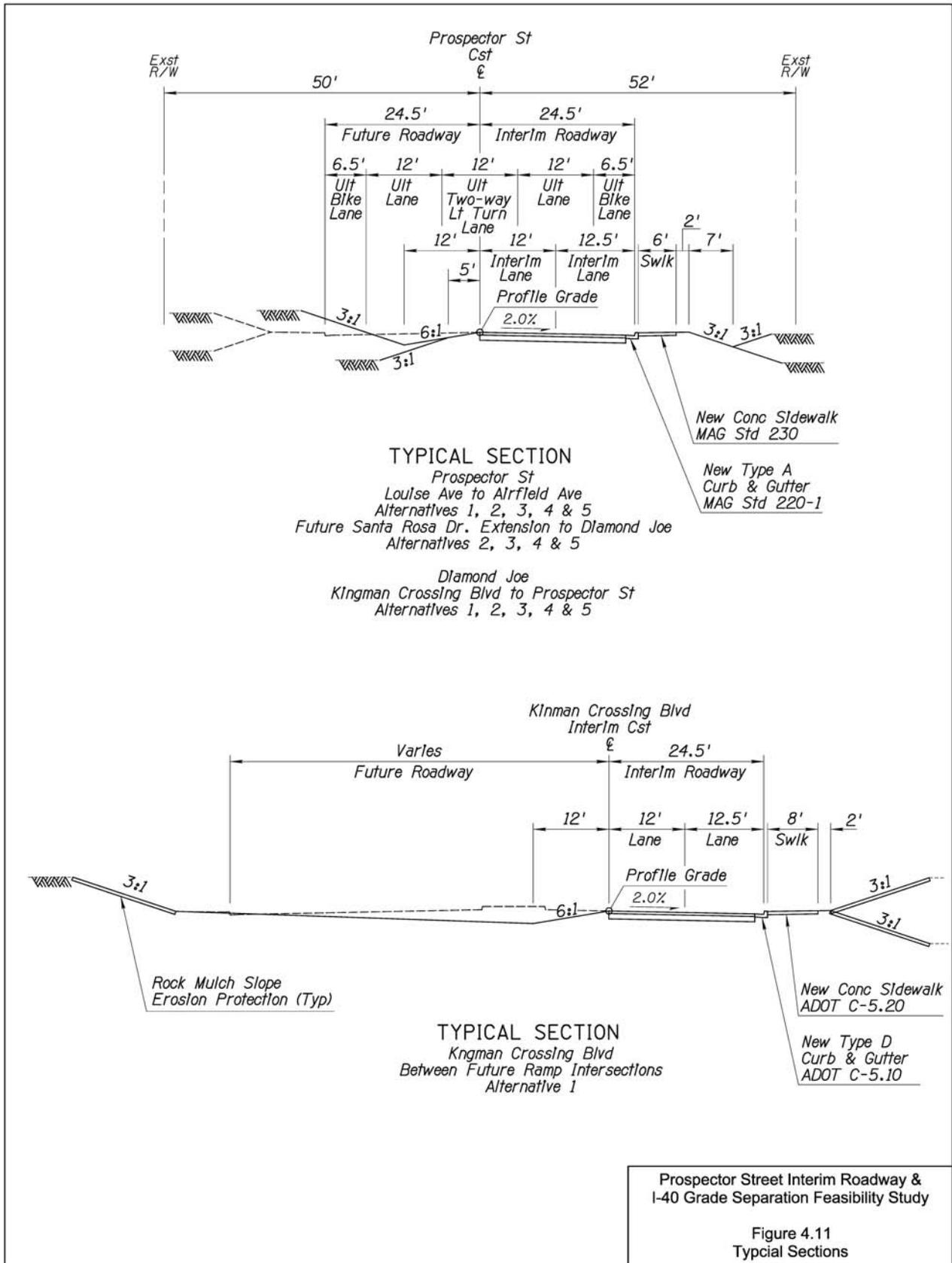
The following criteria are taken from the “Design and Administrative Manual — Kingman Area Drainage Master Drainage Plan” (June 1988):

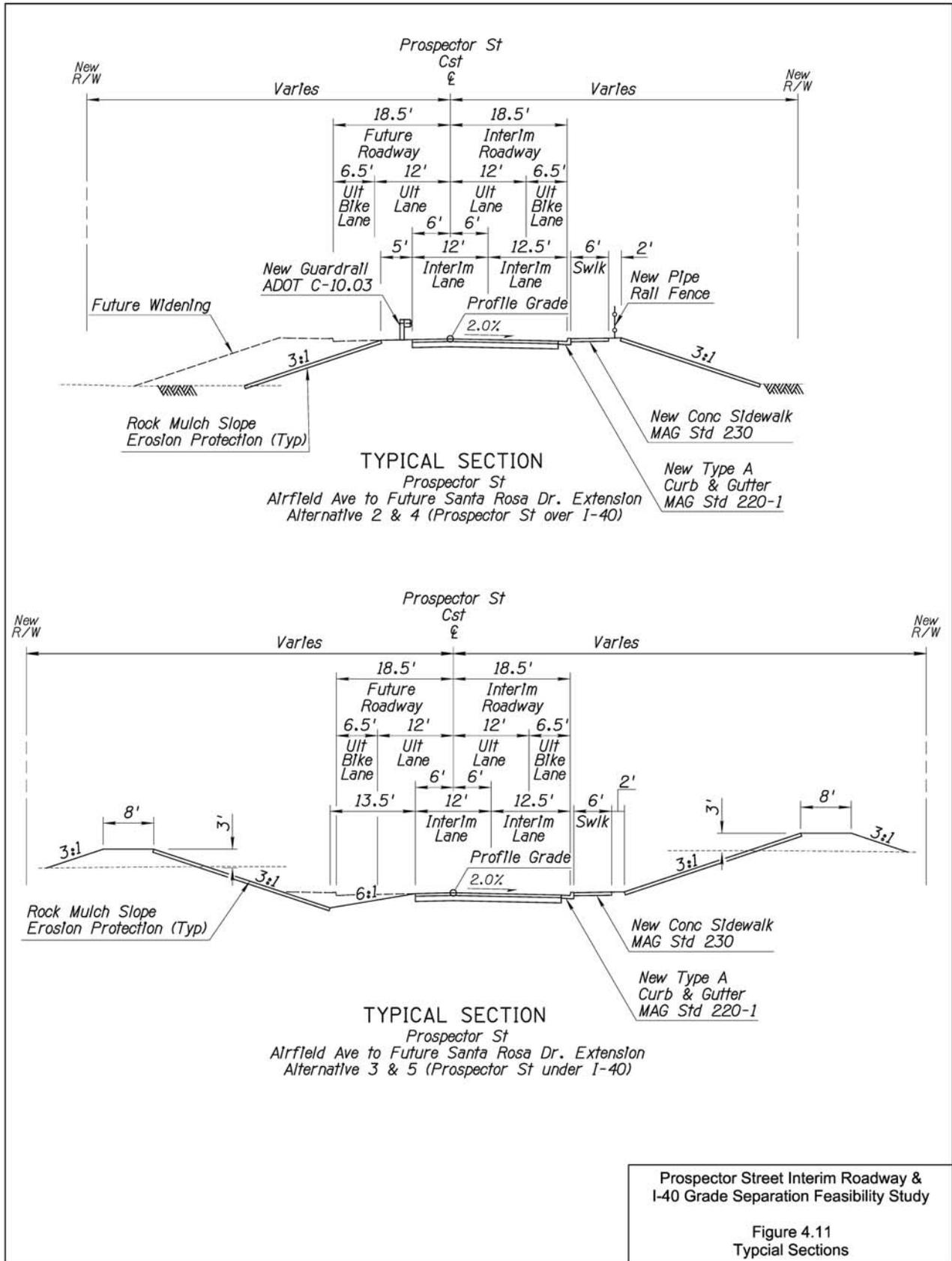
- Drainage systems — 10-year storm runoff (and minimize damage from the 100-year storm event).
- Onsite runoff storage — Storage facilities shall be sized to limit the downstream flows for up to the 100 year storm, to the greater of historic levels or the capacity of the downstream conveyance system. (The 100-year storm will be used for design.)
- Roadway crossings shall be designed to convey the 100-year flow through a culvert and/or overtopping the roadway to the area downstream of the crossing to which flow would have gone prior to the crossing construction. (The flow path of the 100-year runoff shall not be changed).
- Maximum overtopping depth — 1.0 foot for the 100-year flow.
- No roadway overtopping for 10-year storm runoff (unless designated by COK). The ADOT criteria of the 50-year storm for culvert barrel design will govern.

Figure 4.10 – KATS 2-Lane Collector



2-Lane Collector With Curb





Prospector Street Interim Roadway & I-40 Grade Separation Feasibility Study
 Figure 4.11
 Typical Sections

- Onsite runoff shall be contained between roadway curbs for 10-year storm, while maintaining one non-flooded lane in each direction (for streets with four lanes or more).
- Maximum depth of flow / ponding shall be 0.5 feet over the crown (non-curbed sections).
- The 100-year flow shall be contained within the street right-of-way.

The flows from some existing culverts or streambeds would have to be diverted for short distances and then would be discharged at a location that would not constitute a change in the 100-year flow. To ensure that there are no 100-year flow diversions, all of the new drainage structures would be designed for the 100-year flows.

4.4.3 Preliminary Drainage Design

The KCTI Design Concept Report (DCR) study included a Preliminary Drainage Report that documented the existing drainage conditions for the proposed KCTI. This report summarized the existing hydrologic analyses, adequacy of existing I-40 drainage structures, recommended drainage structures, a proposed detention basin, and other drainage related information required to support the design concept of the proposed KCTI. The hydrologic offsite watershed sub-basin boundaries were modified based on the proposed alternative alignments to determine preliminary cross culvert sizing.

Preliminary offsite and onsite drainage systems have been developed for each alternative and are shown on **Figures 4.2 through 4.9**. The watershed delineation maps and the Preliminary off-site storm runoff flows are shown in **Appendix C**.

Roadway culvert crossings for all of the alternatives were developed to convey the 100-year flow through a culvert with no overtopping the roadway. The roadway profiles at these locations could not be dipped to provide a 10-year culvert crossing and maintain the flow path of the 100-year runoff within the current drainage way.

4.4.3.1 Common Drainage Design between Alternatives

Drainage design elements that are common for all alternatives occur on the Prospector Street alignment between Louise Avenue and Airfield, and along the Santa Rosa extension from 700 feet east of the proposed Kingman Crossing Boulevard to Prospector Street. The common drainage elements are shown on **Figure 4.2**. Cross culverts ranging in size from 24-inch to 42-inch will be required at five locations to convey the 100-year.

4.4.3.2 Alternative 1 – Interim Kingman Crossing Boulevard

Cross culverts ranging in size from 24-inch to 36-inch would be required at five locations along the Airfield alignment portion between Prospector and Kingman Crossing Boulevard to convey the 100-year flow. For the section of the roadway depressed under I-40, a portion of the ultimate KCTI storm drain system would be constructed to provide positive drainage of the depressed area. The proposed KCTI storm drain trunk line along Kingman Crossing Boulevard would be constructed along with laterals to new catch basins along the interim roadway. The proposed KCTI storm drain trunk line would be 24-inches at the south end and increase in size up 60-inch diameter where it would connect into the existing 72-inch storm drain pipe that was constructed

as part of the Hualapai Medical Center project. **Figure 4.2** shows the proposed drainage elements for this alternative.

The outfall channel from the Rancho Santa Fe subdivision at the corner of Prospector Street and Airfield Avenue would to be extended to protect the new roadway embankment.

4.4.3.3 Alternative 2 – Prospector Street West Alignment (Over I-40)

No culverts are required under the elevated roadway embankment between Airfield Avenue and I-40. The outfall channel from the Rancho Santa Fe subdivision at the corner of Prospector Street and Airfield Avenue would to be extended to I-40 to protect the new roadway embankment.

North of I-40 to Diamond Joe Road, three culverts would be required under the elevated roadway embankment ranging in size from 24-inches to 30-inches. A new drainage ditch would be required along the east side of the roadway embankment to convey flows from the existing 54-inch culvert under I-40 to a new culvert under the Prospector Street embankment. **Figure 4.4** shows the proposed drainage elements for this alternative.

4.4.3.4 Alternative 3 – Prospector Street West Alignment (Under I-40)

This alternative depresses Prospector Street under I-40. The roadway profile has been developed to provide a positive drain to the north so that a pump station is not required to drain the depressed area. The roadway profile daylights approximately 500 feet south of Diamond Joe Road. At this point the roadway flows can be conveyed into an existing drainage way. At the same daylight point, a new culvert would be required to convey the offsite flows from the east back into the current drainage way. **Figure 4.6** shows the proposed drainage elements for this alternative.

The outfall channel from the Rancho Santa Fe subdivision at the corner of Prospector Street and Airfield Avenue would be extended to I-40 to protect depressed roadway section under I-40.

4.4.3.5 Alternative 4 – Prospector Street Section Line Alignment (Over I-40)

The culvert requirements are similar to Alternative 2 with one exception. The existing 54-inch culvert under I-40 would be extended to avoid conflict with the proposed bridge abutment footings. A new outfall ditch would run along the west side of roadway embankment to convey flows back into the current drainage way. **Figure 4.7** shows the proposed drainage elements for this alternative.

4.4.3.6 Alternative 5 – Prospector Street Section Line Alignment (Over I-40)

The drainage requirements are very similar to Alternative 3. **Figure 4.9** shows the proposed drainage elements for this alternative.

4.5 PRELIMINARY BRIDGE REQUIREMENTS

Preliminary bridge types have been developed to determine estimate bridge costs for each alternative and are summarized in **Table 4.2**.

Table 4.2 – Preliminary Bridge Requirements

Alternative	Bridge Type	Number of Decks	Length (FT)	Width (EA)	Deck Area (SF) (EA)	Deck Area (SF) (Total)	Total Bridge Cost	SF Costs
1	Single Span AASHTO Girder	2	146	45.17	6595	13190	\$1,570,000	\$119
2	Two Span AASHTO Girder	1	251	52.33	13135	13135	\$1,410,000	\$107
3	Single Span AASHTO Girder	2	66	57.17	3773	7546	\$1,420,000	\$188
4	Two Span AASHTO Girder	1	237	52.33	12402	12402	\$1,380,000	\$111
5	Single Span AASHTO Girder	2	64	57.17	3659	7318	\$1,410,000	\$193

4.6 PRELIMINARY RIGHT-OF-WAY REQUIREMENTS

Preliminary new R/W requirements have been developed for each alternative and are summarized in **Table 4.3** and shown in **Figures 4.2, 4.4, 4.6, 4.7, and 4.9**.

Table 4.3 – Preliminary Right-of-Way Requirements

Parcel Number	Owner	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
		New R/W	New Esmt	New R/W	New Esmt	New R/W	New Esmt	New R/W	New Esmt	New R/W	New Esmt
322-06-010	City of Kingman	13.4		2.2	0.8	1.7	1.2	1.6	1.2	1.4	1.4
322-07-014	Fuller, Jimmy & Barbara Trustees Etal	0.1		0.7		0.7		1.1	0.1	1.8	0.1
322-06-020	Kingman Crossing LLC	9.3		8.3		7.9	0.3	7.4		6.6	0.3
322-07-018	Kingman Crossing LLC	0.0		0.3		0.3		1.1	0.2	1.5	0.2
3225-06-022	Pioneer Title	0.8		0.8		0.8		0.8		0.8	
	Total Area	23.6	0.0	12.3	0.8	11.4	1.5	12.0	1.5	12.1	2.0
Total R/W Costs @ \$25,000/Acre (cost not applied to COK property)		\$255,000		\$252,500		\$242,500		\$260,000		\$267,500	

4.7 COST ESTIMATES

Preliminary cost estimates were prepared for each alternative and are summarized in **Table 4.4**. Detailed cost estimates are contained in **Appendix D**.

Table 4.4 – Summary of Project Costs

Alternative	Total Construction Costs	Design Costs	Right-of-way Costs	Utility Relocation Costs	Total Project Costs
1	\$8,480,000	\$590,000	\$255,000	\$5,000	\$9,330,000
2	\$6,480,000	\$450,000	\$253,000	\$5,000	\$7,188,000
3	\$5,950,000	\$420,000	\$243,000	\$5,000	\$6,618,000
4	\$6,300,000	\$440,000	\$260,000	\$70,000	\$7,070,000
5	\$5,970,000	\$420,000	\$268,000	\$70,000	\$6,728,000

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5.0 EVALUATION OF ALTERNATIVES

5.1 EVALUATION OF ALTERNATIVES

Evaluation of each of the interim roadway and I-40 grade separation alternatives is based on several evaluation factors. A summary of the alternatives evaluation is presented in **Table 5.1**.

5.2 RECOMMENDATIONS

Based on the evaluation matrix and in consultation with City of Kingman, **Alternative 1 – Interim Kingman Crossing Boulevard and Alternative 3 – Prospector Street West Alignment (under I-40) are recommended for further development.** Alternative 1 was carried forward because it would utilize the proposed KCTI crossing of I-40 which would minimize the overall construction costs and right-of-way impact to the area if both KCTI and the Prospector Street grade separation are constructed. Alternative 3 was carried forward because it provides the lowest construction and right-of-way costs.

The results of the Feasibility Study was presented to the Kingman City Council at the March 15, 2016 Council Meeting. Subsequently the April 5, 2016 Council Meeting, the Kingman City Council approved **Alternative 1 – Interim Kingman Crossing Boulevard** as the preferred alternative to be carried forward into design and construction.

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Table 5.1 – Alternative Evaluation Matrix

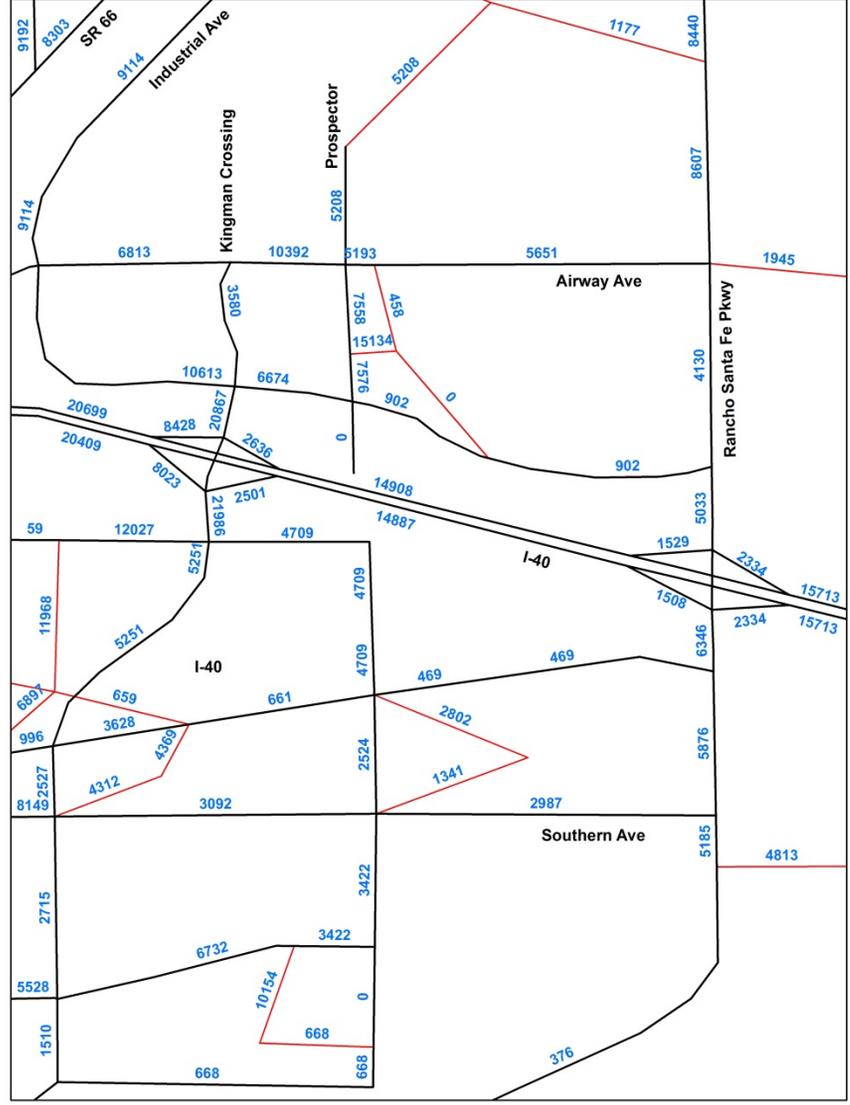
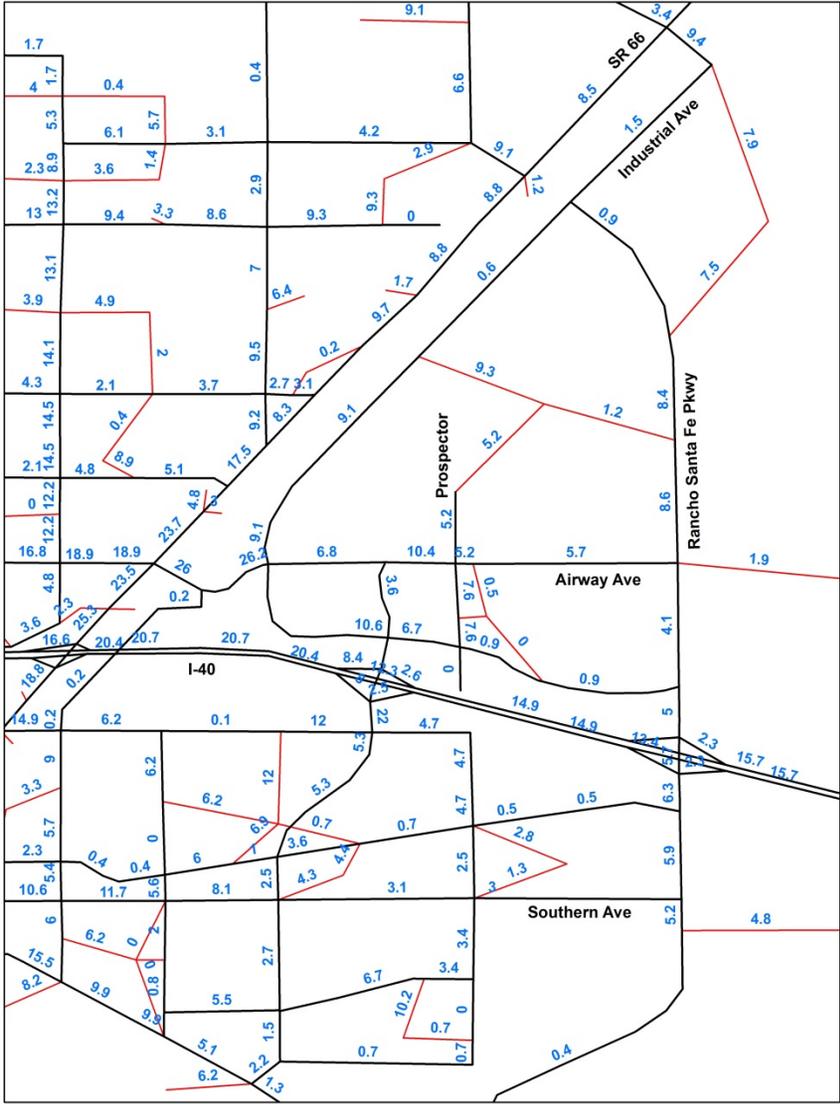
EVALUATION CRITERIA	ALTERNATIVE 1 KINGMAN CROSSING ALIGNMENT (UNDER I-40)	ALTERNATIVE 2 PROSPECTOR STREET WEST ALIGNMENT (OVER I-40)	ALTERNATIVE 3 PROSPECTOR STREET WEST ALIGNMENT (UNDER I-40)	ALTERNATIVE 4 PROSPECTOR STREET SECTION LINE ALIGNMENT (OVER I-40)	ALTERNATIVE 5 PROSPECTOR STREET SECTION LINE ALIGNMENT (UNDER I-40)
Construction, Engineering and R/W Costs (2015)	<ul style="list-style-type: none"> Constr, Util & Eng. costs = \$9,075,000 Right-of-Way Cost = \$255,000 Total Project Cost = \$9,330,000 	<ul style="list-style-type: none"> Constr, Util & Eng. costs = \$6,935,000 Right-of-Way Cost = \$253,000 Total Project Cost = \$7,188,000 	<ul style="list-style-type: none"> Constr, Util & Eng. costs = \$6,375,000 Right-of-Way Cost = \$243,000 Total Project Cost = \$6,618,000 	<ul style="list-style-type: none"> Constr, Util & Eng. costs = \$6,810,000 Right-of-Way Cost = \$260,000 Total Project Cost = \$7,070,000 	<ul style="list-style-type: none"> Constr, Util & Eng. costs = \$6,460,000 Right-of-Way Cost = \$268,000 Total Project Cost = \$6,728,000
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Advantage</i>
Roadway Geometry & Safety Horizontal Alignment Vertical Alignment	<ul style="list-style-type: none"> Two 90° horizontal curves, 1 meets 35 mph design criteria, the other meets 20 mph design criteria Vertical alignment meets 45 mph design criteria 	<ul style="list-style-type: none"> Three horizontal curves (R=1909') required to avoid utilities. All curves meet 45 mph design criteria. Vertical alignment meets 45 design criteria 	<ul style="list-style-type: none"> Three horizontal curves (R=3819', 3819', & 5729') required to avoid utilities. All curves meet 45 mph design criteria. Vertical alignment meets 45 design criteria 	<ul style="list-style-type: none"> No horizontal curves required. Meets 45 mph Design Speed Vertical alignment meets 45 design criteria 	<ul style="list-style-type: none"> No horizontal curves required. Meets 45 mph Design Speed Vertical alignment meets 45 design criteria
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>
Earthwork Total Excavation Volume Borrow/Waste Volume Borrow/Waste Haul	<ul style="list-style-type: none"> Requires 182,000 CY of excavation to construct the undercrossing of I-40. Requires hauling off 151,000 CY of waste material. Potential waste sites include the old ADOT borrow pits on adjacent City of Kingman land Earthwork cost = \$910,000 	<ul style="list-style-type: none"> Requires 98,000 CY of borrow material to construct the roadway embankment from Louise Ave to Santa Rosa. Will require long hauls from borrow pits that are as far as 20 miles away depending on the quantity and suitability of borrow material available. Earthwork cost = \$712,000 	<ul style="list-style-type: none"> Requires 74,000 CY of excavation to construct the undercrossing of I-40. Requires hauling off 60,000 CY of waste material. Potential waste sites include the old ADOT borrow pits on adjacent City of Kingman land. Earthwork cost = \$391,000 	<ul style="list-style-type: none"> Requires 84,000 CY of borrow material to construct the roadway embankment from Louise Ave to Santa Rosa. Will require long hauls from borrow pits that are as far as 20 miles away depending on the quantity and suitability of borrow material available. Earthwork cost = \$564,000 	<ul style="list-style-type: none"> Requires 75,000 CY of excavation to construct the undercrossing of I-40. Requires hauling off 61,000 CY of waste material. Potential waste sites include the old ADOT borrow pits on adjacent City of Kingman land. Earthwork cost = \$391,000
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Advantage</i>
Traffic Operational Impacts Traffic Volumes & LOS Travel Time	<ul style="list-style-type: none"> Eliminates the need for future widening of Eastern Street. Improves the traffic operations at the Airway Ave/Diamond St/Yavapai St signal Travel time between the Prospector St. & Louise Ave. Intersection and the Prospector St. & Airway Ave. Intersection = 5.4 minutes (2.7 miles) 	<ul style="list-style-type: none"> Eliminates the need for future widening of Eastern Street. Improves the traffic operations at the Airway Ave/Diamond St/Yavapai St signal Travel time between the Prospector St. & Louise Ave. Intersection and the Prospector St. & Airway Ave. Intersection = 3.3 minutes (1.7 Miles) 	<ul style="list-style-type: none"> Eliminates the need for future widening of Eastern Street. Improves the traffic operations at the Airway Ave/Diamond St/Yavapai St signal Travel time between the Prospector St. & Louise Ave. Intersection and the Prospector St. & Airway Ave. Intersection = 3.3 minutes(1.7 Miles) 	<ul style="list-style-type: none"> Eliminates the need for future widening of Eastern Street. Improves the traffic operations at the Airway Ave/Diamond St/Yavapai St signal Travel time between the Prospector St. & Louise Ave. Intersection and the Prospector St. & Airway Ave. Intersection = 3.3 minutes(1.7 Miles) 	<ul style="list-style-type: none"> Eliminates the need for future widening of Eastern Street. Improves the traffic operations at the Airway Ave/Diamond St/Yavapai St signal Travel time between the Prospector St. & Louise Ave. Intersection and the Prospector St. & Airway Ave. Intersection = 3.3 minutes(1.7 Miles)
	<i>Net Effect: Neutral</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Advantage</i>
Structures Bridge Type Length & Deck Area	<ul style="list-style-type: none"> Structure Type: Twin Single-span precast-prestressed AASHTO Type VI I-girder Bridge Length: 146' Structure Width: 45.17' Total Bridge area: 13,190 SF Bridge Cost: \$1,570,000 	<ul style="list-style-type: none"> Structure Type: Single Two-span precast-prestressed AASHTO Type VI I-girder Bridge Length: 251' Structure Width: 52.33' Total Bridge area: 13,135 SF Bridge Cost: \$1,410,000 	<ul style="list-style-type: none"> Structure Type: Twin Single-span precast-prestressed AASHTO Type VI I-girder Bridge Length: 66' Structure Width: 57.17' Total Bridge area: 7,546 SF Bridge Cost: \$1,420,000 	<ul style="list-style-type: none"> Structure Type: Single Two-span precast-prestressed AASHTO Type VI I-girder Bridge Length: 237' Structure Width: 52.33' Total Bridge area: 12,402 SF Bridge Cost: \$1,380,000 	<ul style="list-style-type: none"> Structure Type: Twin Single-span precast-prestressed AASHTO Type VI I-girder Bridge Length: 64' Structure Width: 57.17' Total Bridge area: 7,318 SF Bridge Cost: \$1,410,000
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>

EVALUATION CRITERIA	ALTERNATIVE 1 KINGMAN CROSSING ALIGNMENT (UNDER I-40)	ALTERNATIVE 2 PROSPECTOR STREET WEST ALIGNMENT (OVER I-40)	ALTERNATIVE 3 PROSPECTOR STREET WEST ALIGNMENT (UNDER I-40)	ALTERNATIVE 4 PROSPECTOR STREET SECTION LINE ALIGNMENT (OVER I-40)	ALTERNATIVE 5 PROSPECTOR STREET SECTION LINE ALIGNMENT (UNDER I-40)
Utility Impacts Number & Type Length of Relocation	<ul style="list-style-type: none"> Will require the relocation of the T1 carrier line located along the existing north I-40 right-of-way line. Length = 300' 	<ul style="list-style-type: none"> Will require the relocation of the T1 carrier line located along the existing north I-40 right-of-way line. Length = 300' 	<ul style="list-style-type: none"> Will require the relocation of the T1 carrier line located along the existing north I-40 right-of-way line. Length = 300' 	<ul style="list-style-type: none"> Will require the relocation of the T1 carrier line located along the existing north I-40 right-of-way line. Length = 300' Will require the relocation of the Fiber Optic & Telephone line located along the Prospector Street Section line between Airfield and future Santa Rosa Drive extension. Length = 2100' Will require the relocation of the overhead power line located along the Prospector Street Section line between I-40 and future Santa Rosa Drive extension. Length = 1100' 	<ul style="list-style-type: none"> Will require the relocation of the T1 carrier line located along the existing north I-40 right-of-way line. Length = 300' Will require the relocation of the Fiber Optic & Telephone line located along the Prospector Street Section line between Airfield and future Santa Rosa Drive extension. Length = 2100' Will require the relocation of the overhead power line located along the Prospector Street Section line between I-40 and future Santa Rosa Drive extension. Length = 1100'
	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Disadvantage</i>
Impacts to I-40	<ul style="list-style-type: none"> Given that the new EB and WB I-40 overpasses will be constructed at-grade on the existing alignments, temporary detours will be required during construction. Temporary two-lane median cross overs on I-40 will need to be constructed to maintain two-lanes in each direction on I-40 for the long term closure required to construct each bridge. 	<ul style="list-style-type: none"> Traffic can be maintained on I-40 with minimal closures. Nighttime closures of I-40 will be required to place the bridge girders. Temporary one-lane median cross overs on I-40 will need to be constructed before placing the bridge girders. Only one-lane cross overs are necessary during nighttime closures due to lower traffic volumes at night. 	<ul style="list-style-type: none"> Given that the new EB and WB I-40 overpasses will be constructed at-grade on the existing alignments, temporary detours will be required during construction. Temporary two-lane median cross overs on I-40 will need to be constructed to maintain two-lanes in each direction on I-40 for the long term closure required to construct each bridge. 	<ul style="list-style-type: none"> Traffic can be maintained on I-40 with minimal closures. Nighttime closures of I-40 will be required to place the bridge girders. Temporary one-lane median cross overs on I-40 will need to be constructed before placing the bridge girders. Only one-lane cross overs are necessary during nighttime closures due to lower traffic volumes at night. 	<ul style="list-style-type: none"> Given that the new EB and WB I-40 overpasses will be constructed at-grade on the existing alignments, temporary detours will be required during construction. Temporary two-lane median cross overs on I-40 will need to be constructed to maintain two-lanes in each direction on I-40 for the long term closure required to construct each bridge.
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Advantage</i>	<i>Net Effect: Disadvantage</i>
Drainage Floodplains Drainage Crossings	<ul style="list-style-type: none"> Grade separation and interim road improvements require 11 culvert crossings. Minimal impacts to existing drainage patterns. Requires constructing 2100' of the ultimate Kingman Crossing TI storm drain system. Does not impact any I-40 cross culverts 	<ul style="list-style-type: none"> Grade separation and interim road improvements require 10 culvert crossings. Minimal impacts to existing drainage patterns. Does not impact any I-40 cross culverts 	<ul style="list-style-type: none"> Grade separation and interim road improvements require 8 culvert crossings. Requires diversion channel to maintain existing drainage patterns. Requires the extension of one culvert under I-40 	<ul style="list-style-type: none"> Grade separation and interim road improvements require 10 culvert crossings. Minimal impacts to existing drainage patterns. Does not impact any I-40 cross culverts 	<ul style="list-style-type: none"> Grade separation and interim road improvements require 8 culvert crossings. Requires diversion channel to maintain existing drainage patterns. Requires the extension of one culvert under I-40
	<i>Net Effect: Disadvantage</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>
Environmental Considerations	No known adverse impacts.	No known adverse impacts.	No known adverse impacts.	No known adverse impacts.	No known adverse impacts.
	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>	<i>Net Effect: Neutral</i>

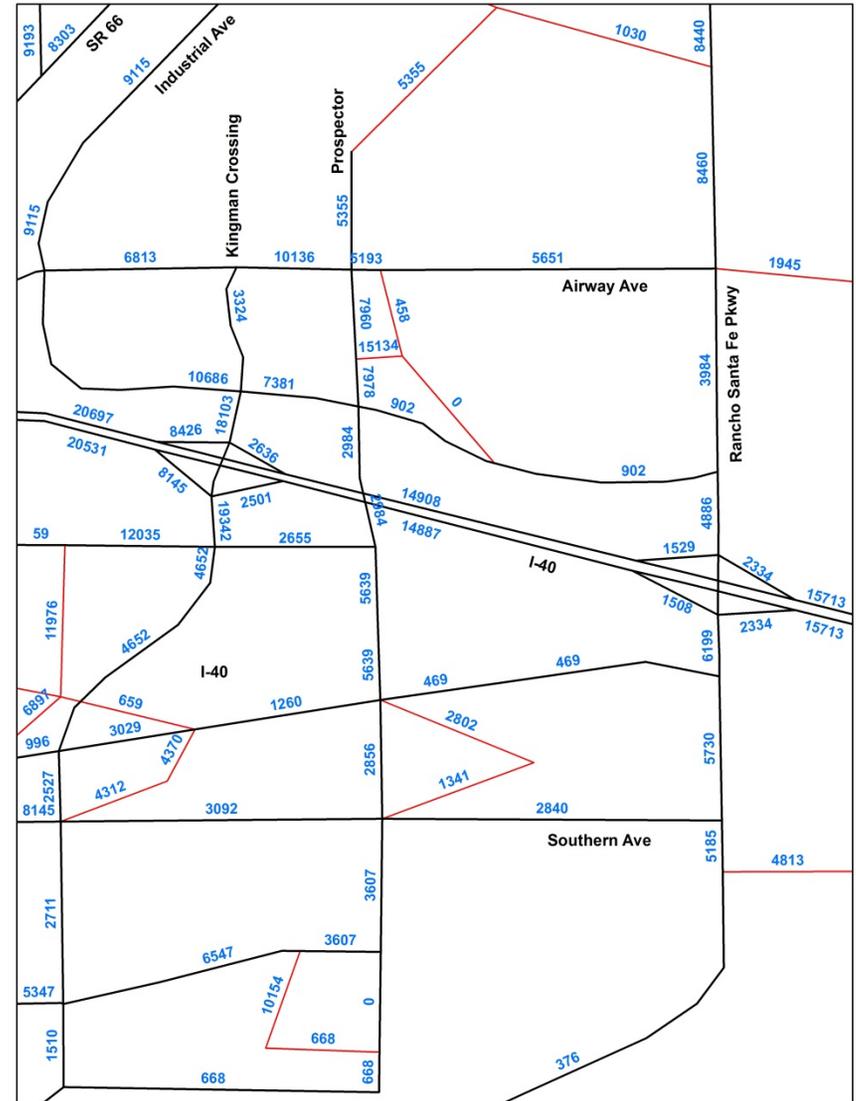
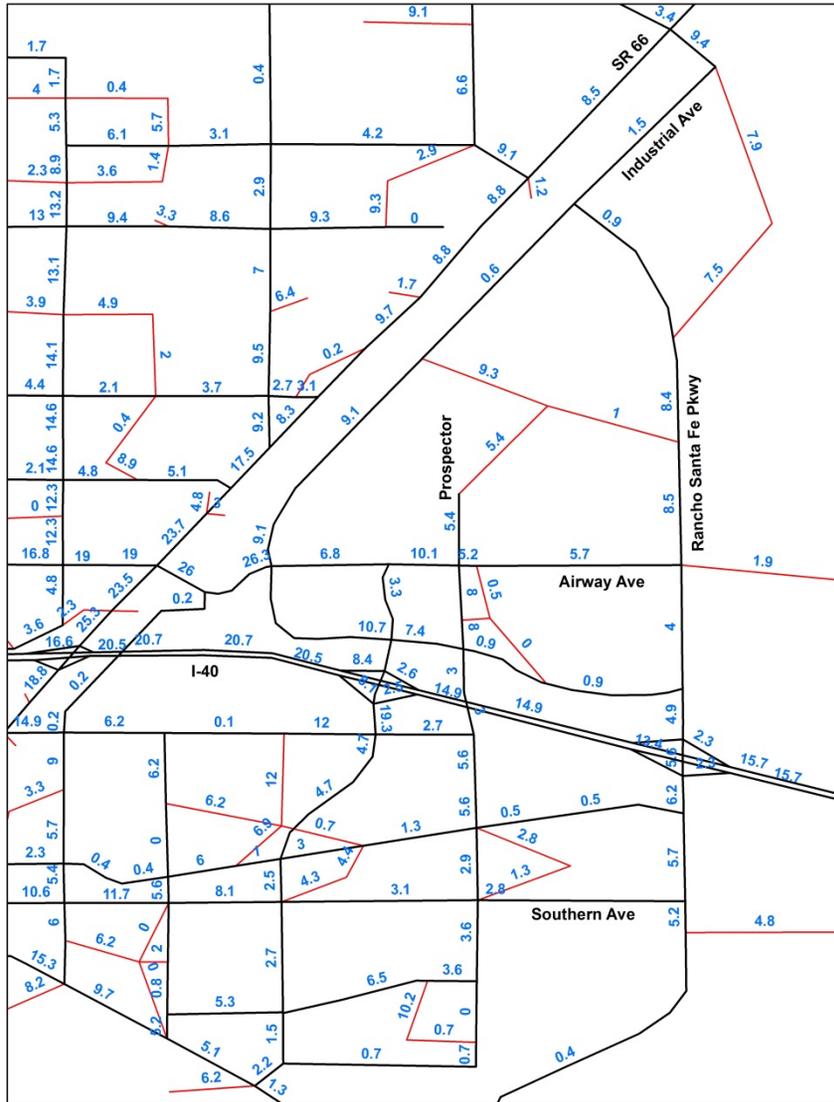
APPENDIX A

TRAFFIC MODEL OUTPUT NETWORKS

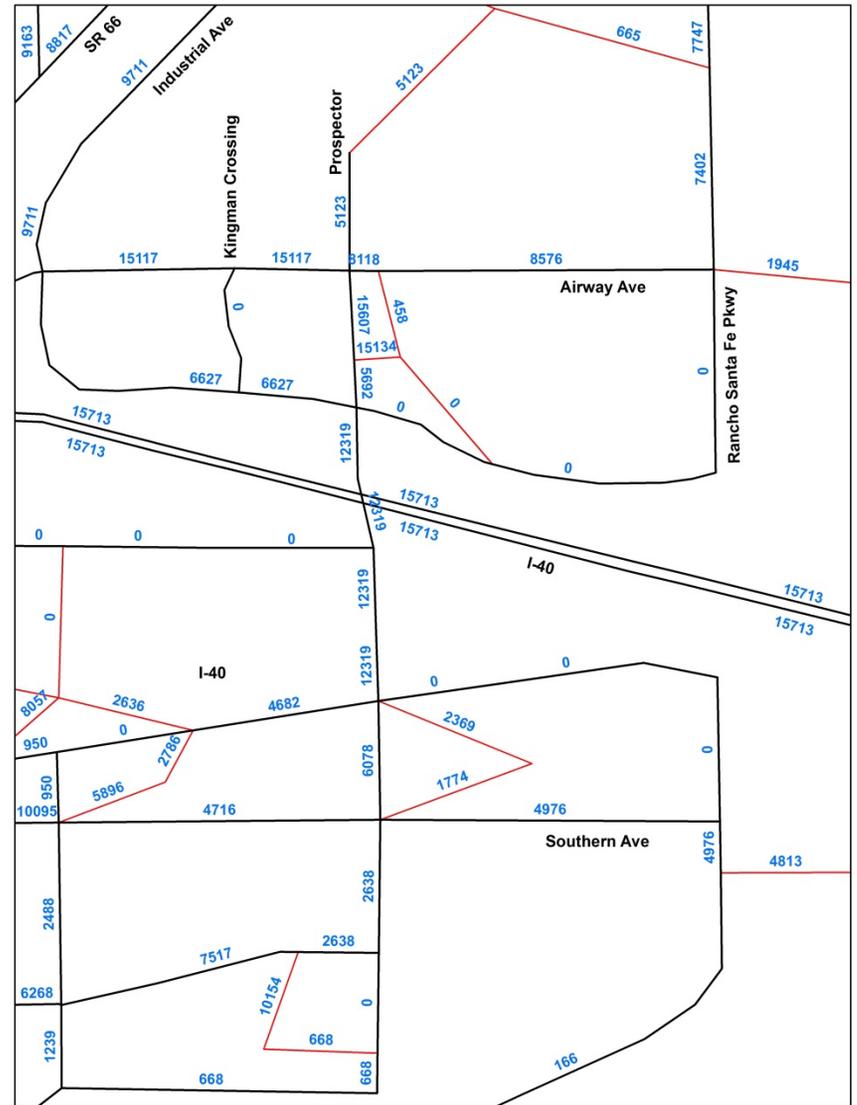
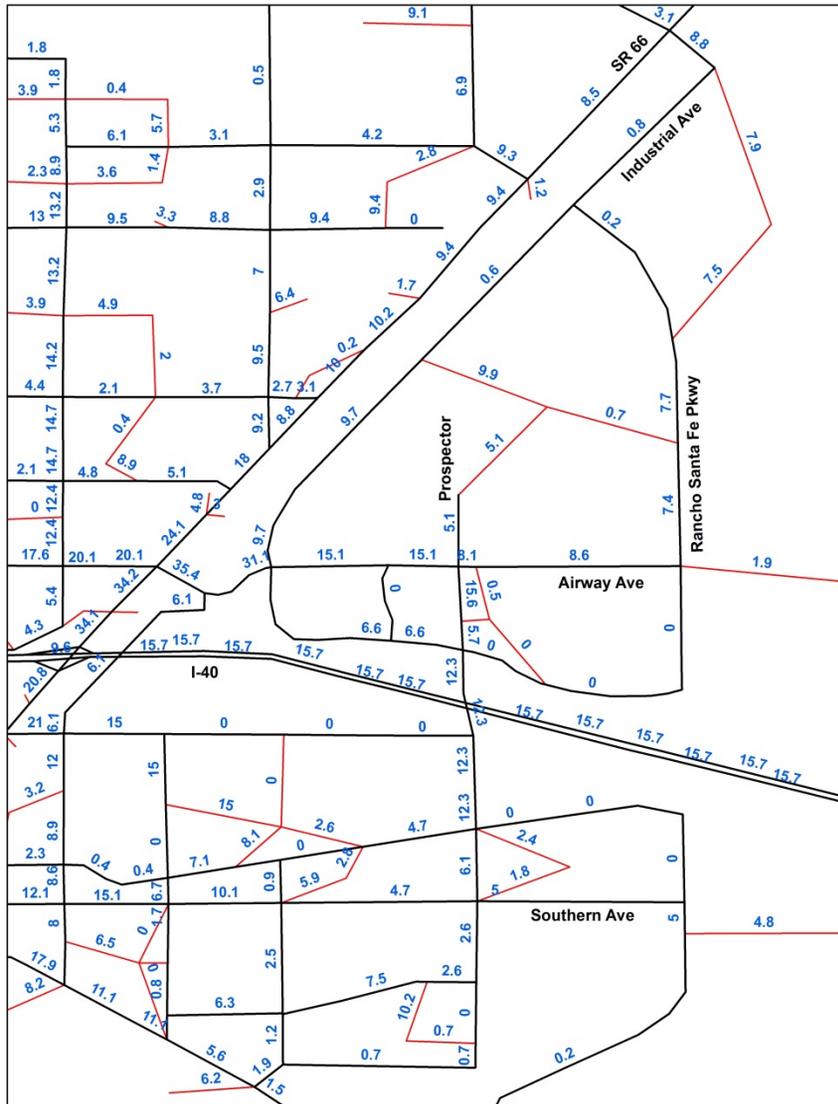
Scenario 2: KATS Full Build (KCB TI & RSFP TI) – Overview left (Volume in 1000's) / Zoomed View Right



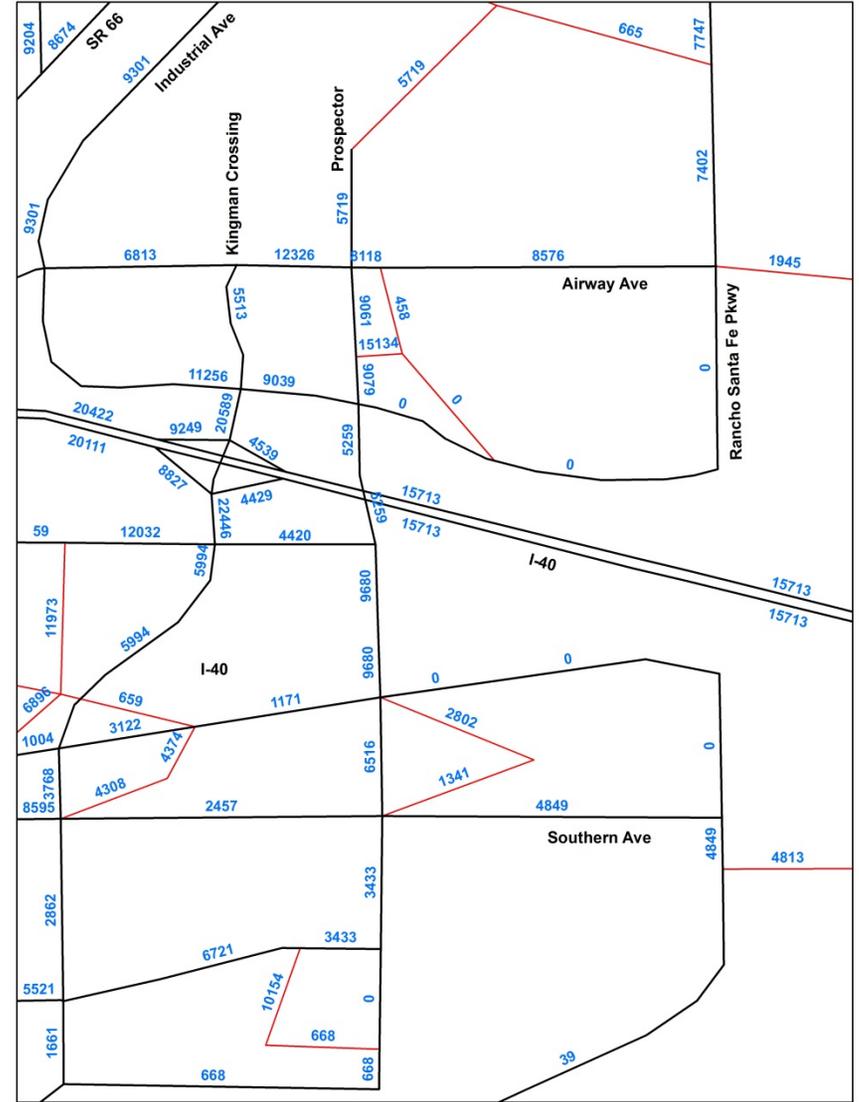
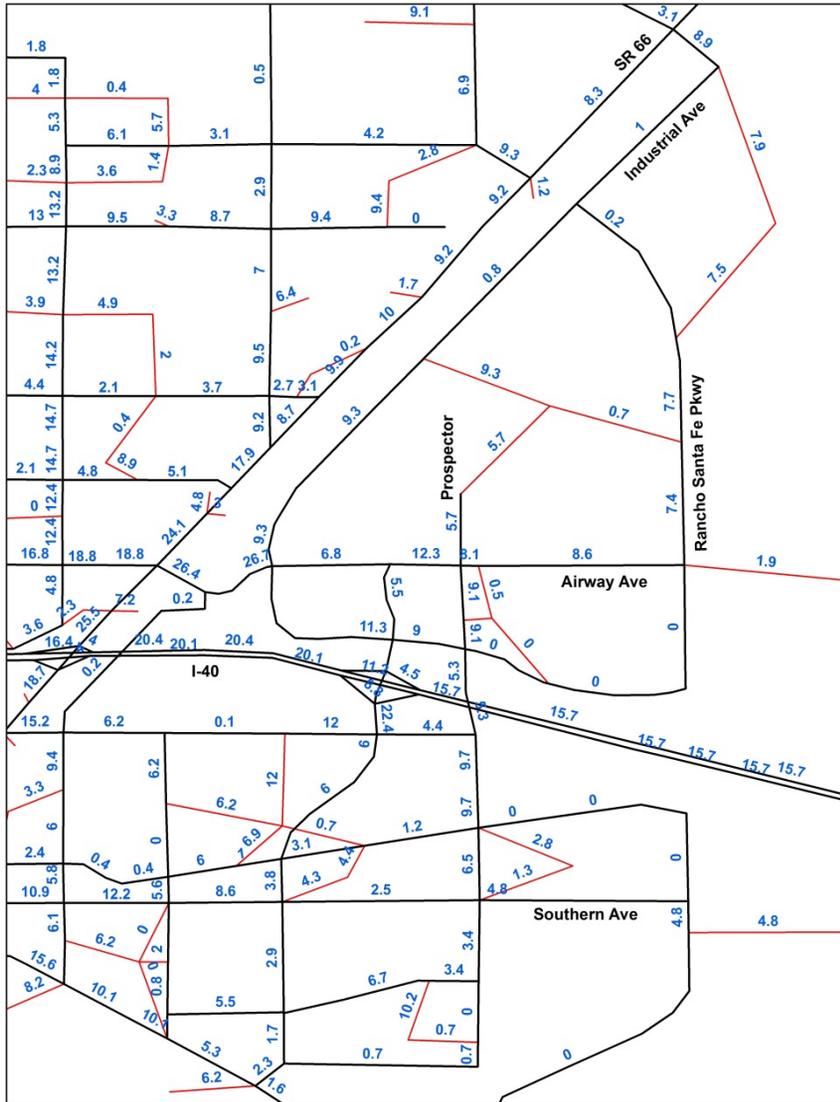
Scenario 4: KATS Full Build (KCB TI + PGS + RSP TI) – Overview left (Volume in 1000's) / Zoomed View Right



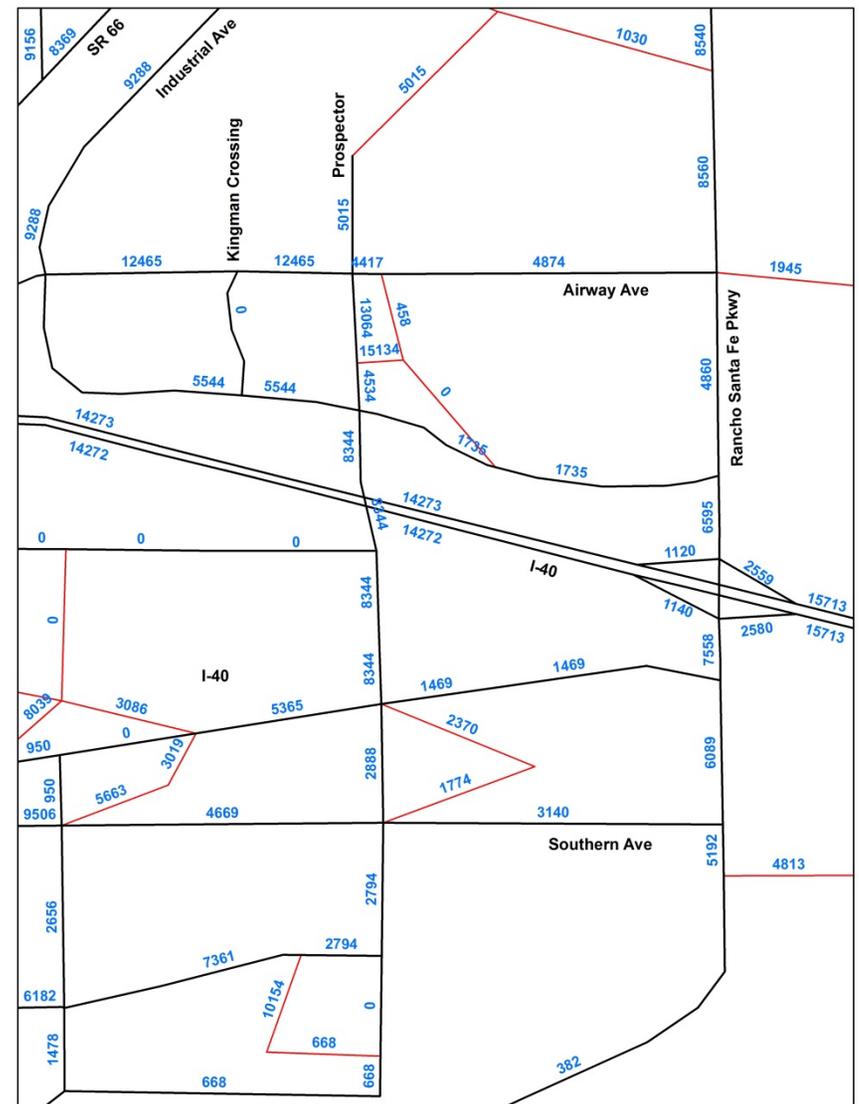
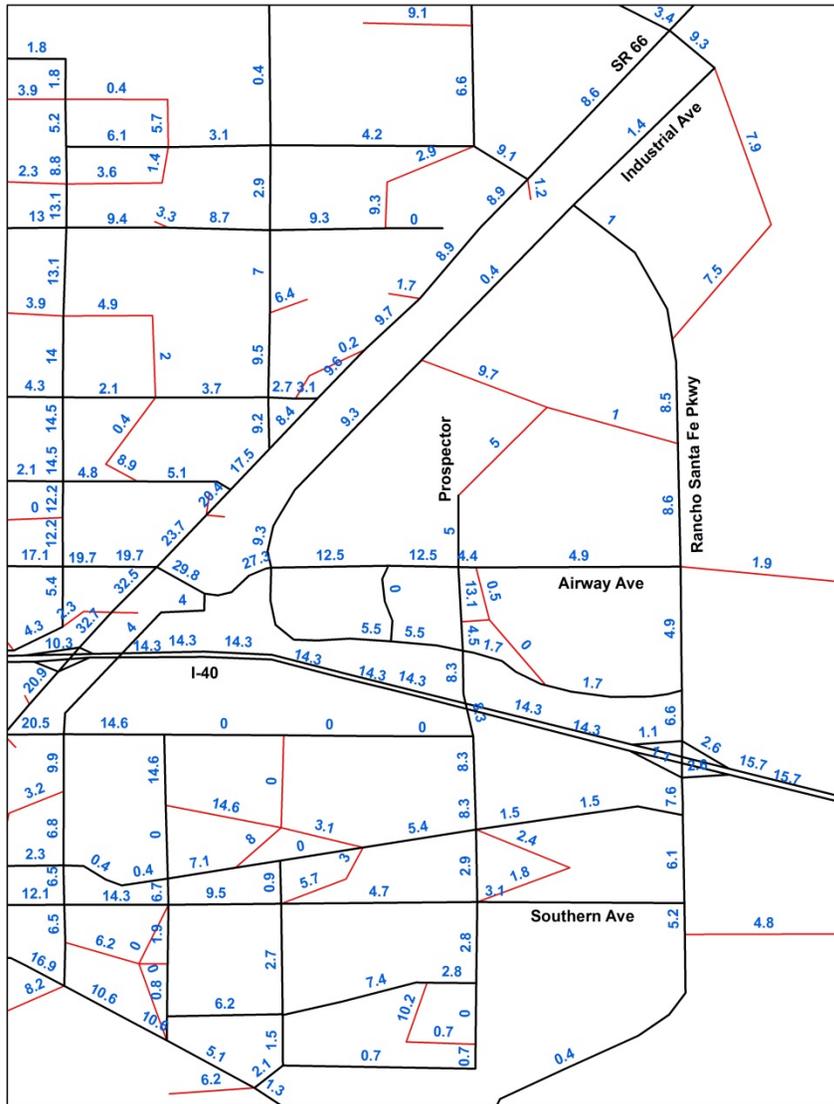
Scenario 5: KATS Full Build (PGS Only) – Overview left (Volume in 1000's) / Zoomed View Right



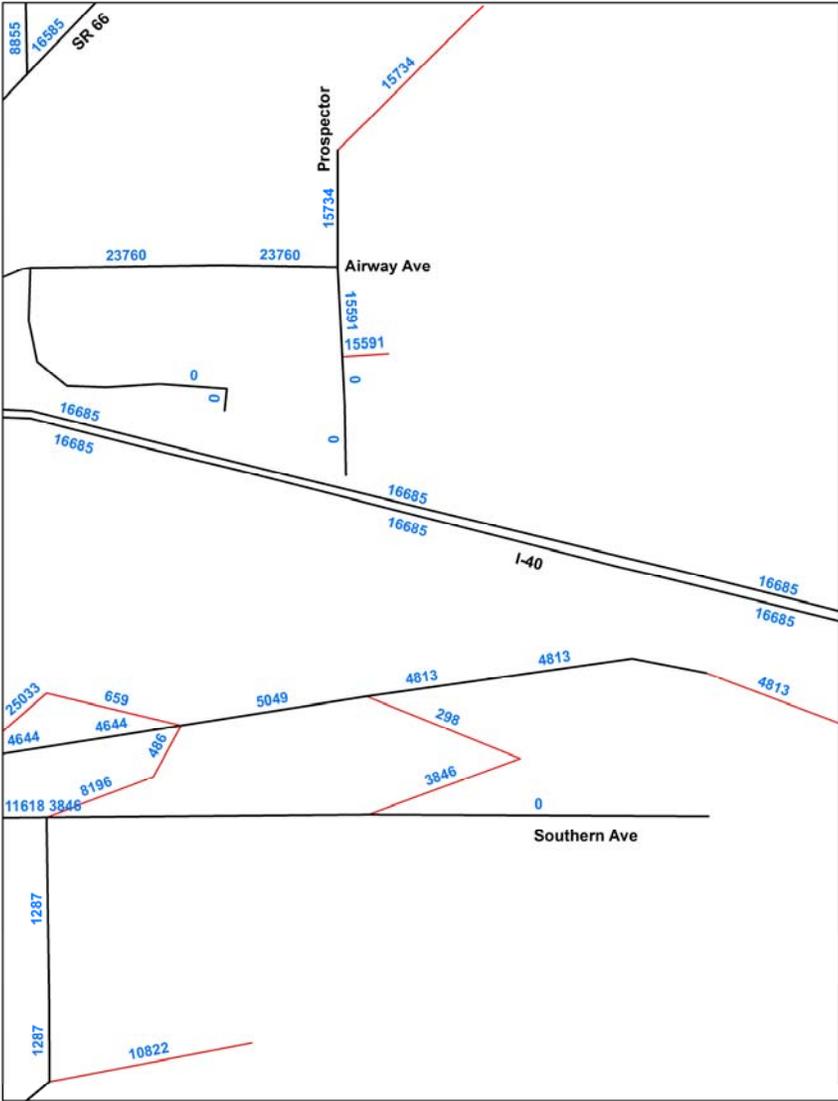
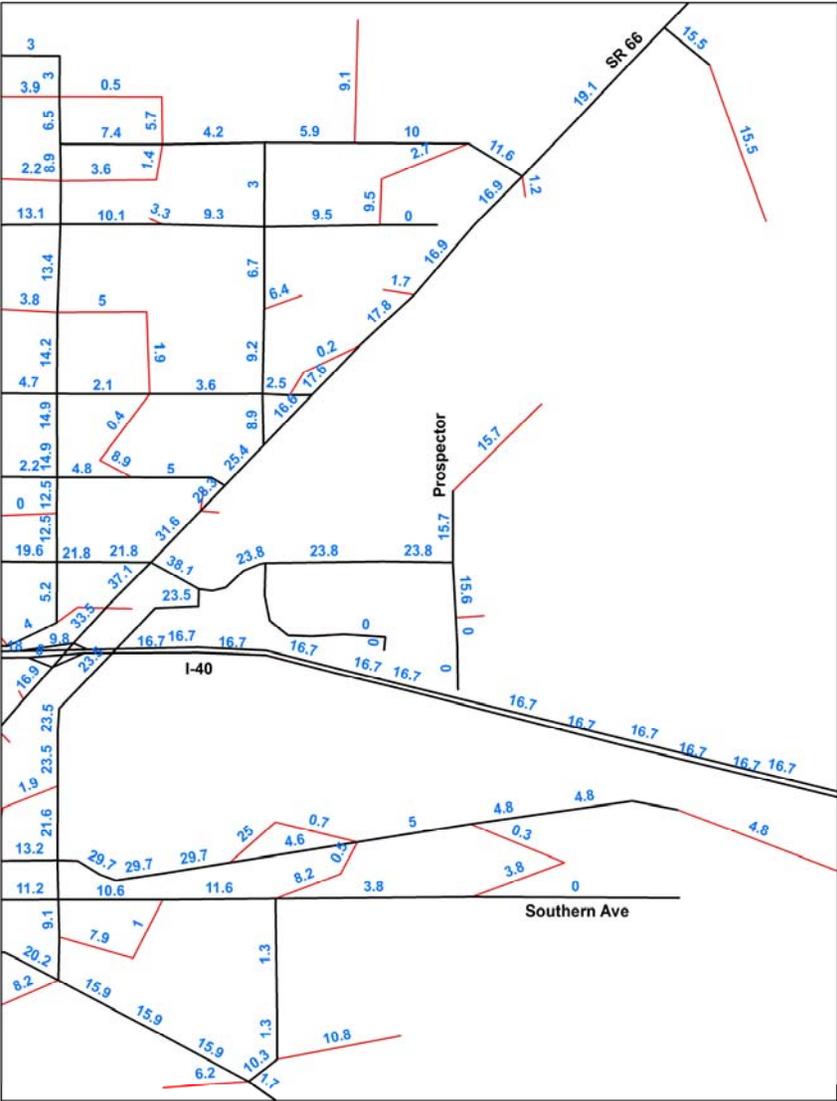
Scenario 6: KATS Full Build (KCB TI + PGS) – Overview left (Volume in 1000's) / Zoomed View Right



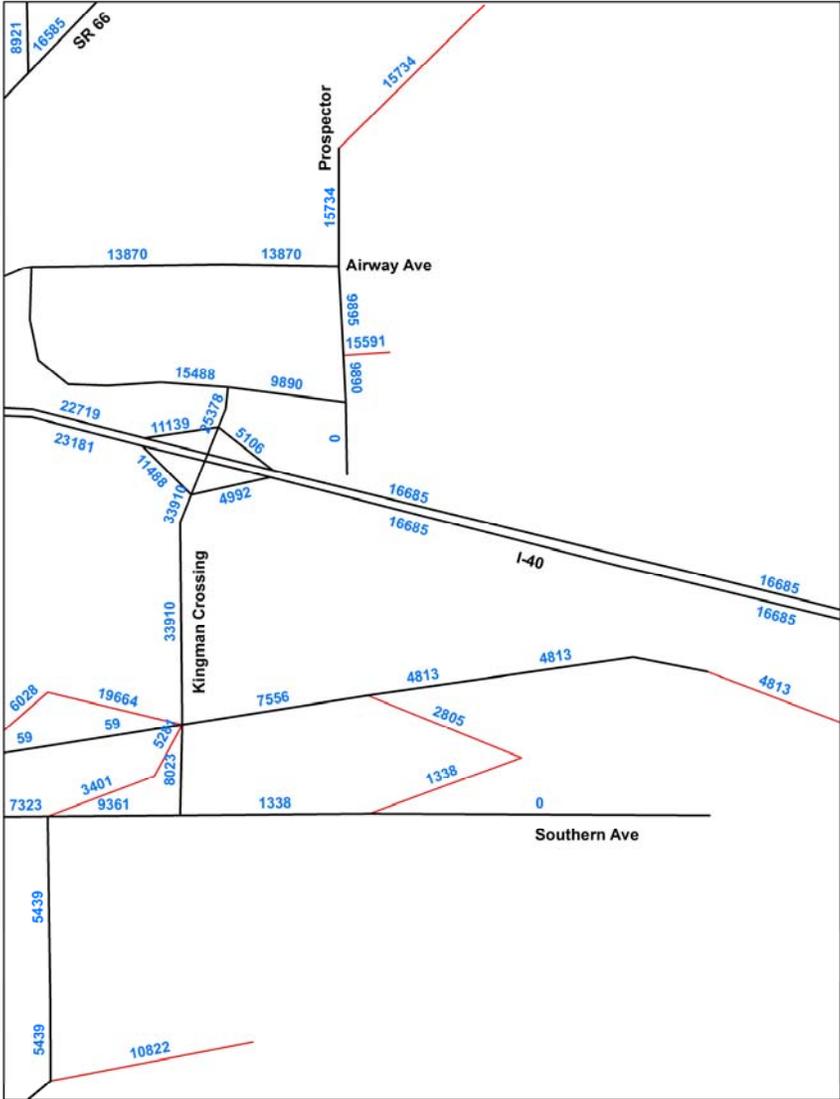
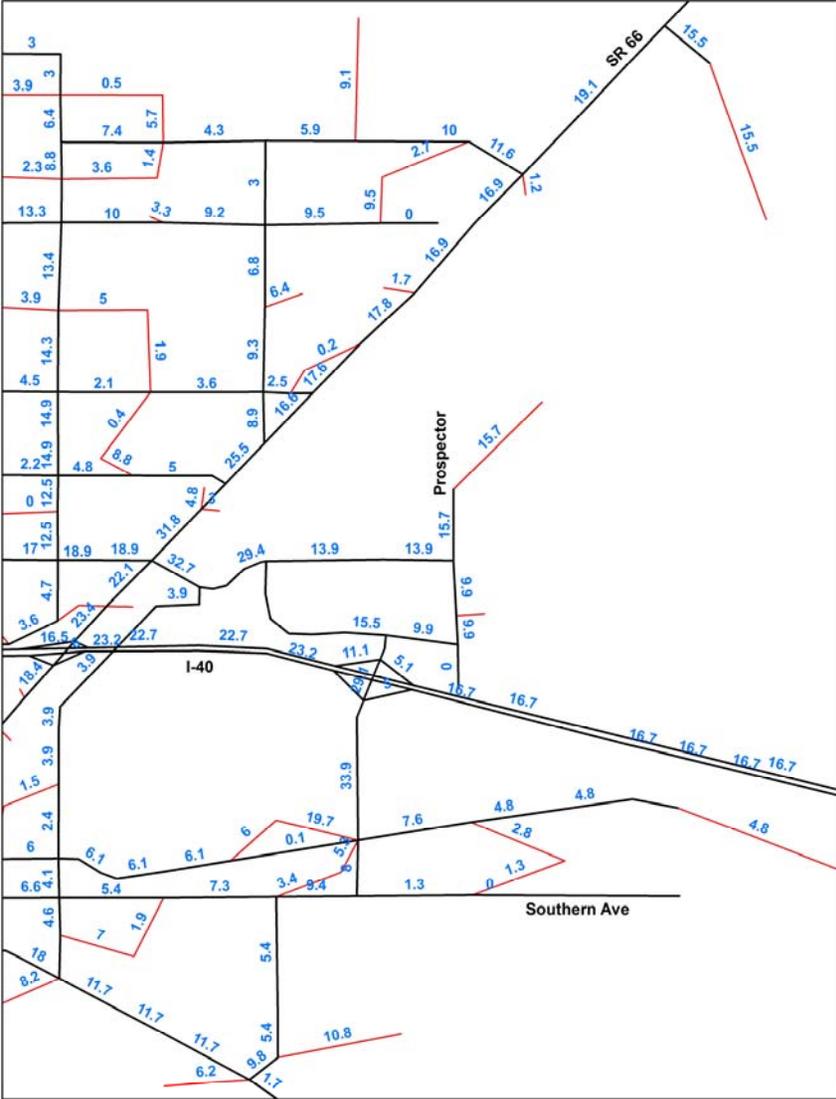
Scenario 7: KATS Full Build (PGS + RSFP TI) – Overview left (Volume in 1000's) / Zoomed View Right



Scenario 8: 2030 Existing Network (No TI's) – Overview left (Volume in 1000's) / Zoomed View Right



Scenario 11: 2030 Existing Network (KCB TI + PGS Only) – Overview left (Volume in 1000's) / Zoomed View Right



APPENDIX B

TRAVEL TIME ANALYSIS

TRAVEL TIME ANALYSIS

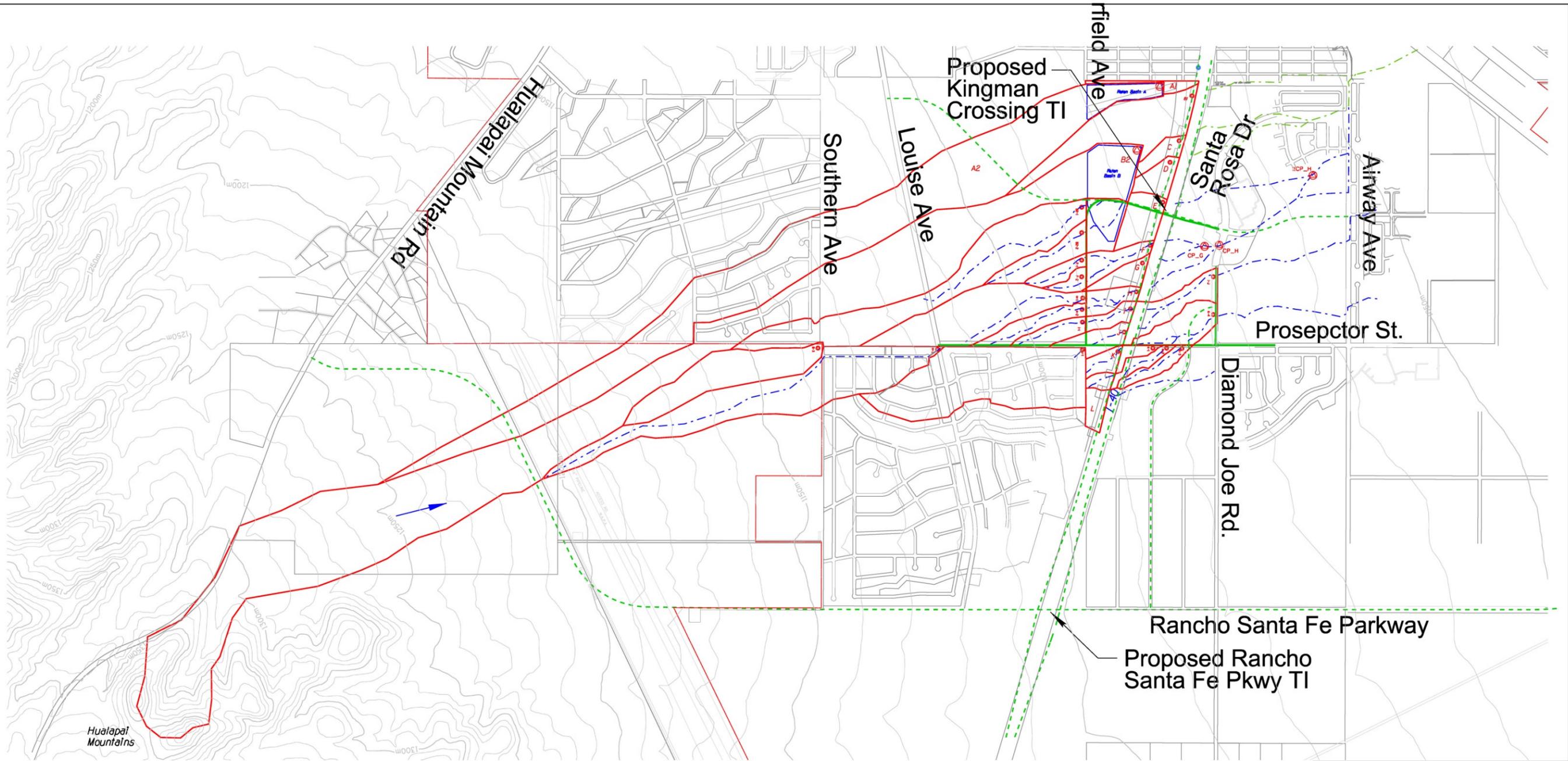
Alternative	25 mph	Travel Time (min)	30 mph	Travel Time (sec)	35 mph	Travel Time (min)	40 mph	Travel Time (min)	15 sec Each	60 sec Each	Total Distance (mile)	Total Travel Time (min)
	Distance (ft)		Distance (ft)		Distance (ft)		Distance (ft)		Stop Sign Delay (min)	Traffic Signal Delay (min)		
Prospector & Louise to White Cliffs Middle School												
No-Build	4,945	2.2	2,475	0.9	15,637	5.1	6,020	1.7	0.5	0.5	5.5	11.0
Alt 1 - Kingman Crossing Blvd Alignment	0	0.0	0	0.0	14,242	4.6	0	0.0	0.75	0.0	2.7	5.4
Alt 2 - Prospector Street Alignment	0	0.0	0	0.0	8,755	2.8	0	0.0	0.5	0.0	1.7	3.3
Eastern & Louise to White Cliffs Middle School												
No-Build	2,540	1.2	0	0.0	15,687	5.1	0	0.0	0.25	0.5	3.5	7.0
Alt 1 - Kingman Crossing Blvd Alignment	2,680	1.2	2,846	1.1	14,310	4.6	5,312	1.5	1.0	0.0	4.8	9.5
Alt 2 - Prospector Street Alignment	2,680	1.2	2,846	1.1	8,846	2.9	5,312	1.5	0.75	0.0	3.7	7.4
Eastern & Airfield to White Cliffs Middle School												
No-Build	2,540	1.2	0	0.0	11,654	3.8	0	0.0	0.25	0.5	2.7	5.7
Alt 1 - Kingman Crossing Blvd Alignment	2,724	1.2	2,846	1.1	18,293	5.9	5,312	1.5	1.25	0.0	5.5	11.0
Alt 2 - Prospector Street Alignment	2,724	1.2	2,846	1.1	12,806	4.2	5,312	1.5	1.0	0.0	4.5	9.0
White Cliffs Middle School to Prospector & Louise												
No-Build	5,261	2.4	2,846	1.1	15,599	5.1	5,312	1.5	0.5	1.0	5.5	11.5
Alt 1 - Kingman Crossing Blvd Alignment	0	0.0	0	0.0	14,242	4.6	0	0.0	0.75	0.0	2.7	5.4
Alt 2 - Prospector Street Alignment	0	0.0	0	0.0	8,755	2.8	0	0.0	0.5	0.0	1.7	3.3
White Cliffs Middle School to Eastern & Louise												
No-Build	2,537	1.2	0	0.0	15,599	5.1	0	0.0	0.25	1.0	3.4	7.5
Alt 1 - Kingman Crossing Blvd Alignment	2,349	1.1	2,475	0.9	14,310	4.6	5,950	1.7	1.0	0.0	4.8	9.3
Alt 2 - Prospector Street Alignment	2,349	1.1	2,475	0.9	8,846	2.9	5,950	1.7	0.75	0.0	3.7	7.3
White Cliffs Middle School to Eastern & Airfield												
No-Build	2,537	1.2	0	0.0	11,614	3.8	0	0.0	0.25	1.0	2.7	6.2
Alt 1 - Kingman Crossing Blvd Alignment	2,349	1.1	2,475	0.9	18,293	5.9	5,950	1.7	1.25	0.0	5.5	10.9
Alt 2 - Prospector Street Alignment	2,349	1.1	2,475	0.9	12,806	4.2	5,950	1.7	1.0	0.0	4.5	8.9

APPENDIX C

**PRELIMINARY SUMMARY OF OFFSITE FLOWS & WATERSHED
DELINEATION MAPS**

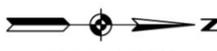
Table C.1 Preliminary Summary of Offsite Flows

Sub-Basin	Area (ac)	C	Tc		i ₁₀ (in)	Q ₁₀ (cfs)	i ₁₀₀ (in)	Q ₁₀₀ (cfs)	Preliminary Culvert Size	
			L (ft)	Tc (hr)					Q ₁₀	Q ₁₀₀
B2-1	143.00	0.50	10200	0.944	1.626	116.2	2.538	181.5	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
B2-2	19.30	0.50	2310	0.214	4.094	39.5	6.195	59.8	2-24" CMP W/ End Sec	2-30" CMP W/ End Sec
B-3	53.40	0.50	4400	0.407	2.920	78.0	4.484	119.7	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
F-1	8.30	0.50	1550	0.167	4.540	18.8	6.832	28.4	1-24" CMP W/ End Sec	1-30" CMP W/ End Sec
F-2	5.20	0.50	920	0.167	4.540	11.8	6.832	17.8	1-24" CMP W/ End Sec	1-24" CMP W/ End Sec
H-1	61.50	0.50	4763	0.441	2.781	85.5	4.278	131.6	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
H-2	14.20	0.50	2463	0.228	3.977	28.2	6.027	42.8	1-30" CMP W/ End Sec	2-24" CMP W/ End Sec
H-1, H-2	75.70	0.50	4763	0.441	2.781	105.3	4.278	161.9	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
H-3	110.00	0.50	8700	0.806	1.836	101.0	2.859	157.2	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
I-1	10.20	0.28	1610	0.167	4.540	13.0	6.832	19.5	1-24" CMP W/ End Sec	1-24" CMP W/ End Sec
J-1	107.30	0.50	5280	0.489	2.605	139.8	4.017	215.5	2-42" CMP W/ Hdwl	2-48" CMP W/ Hdwl
K	6.60	0.28	1123	0.167	4.536	8.4	6.827	12.6	1-24" CMP W/ End Sec	1-24" CMP W/ End Sec
K-1	4.40	0.50	970	0.167	4.536	10.0	6.827	15.0	1-24" CMP W/ End Sec	1-24" CMP W/ End Sec
K-2	10.20	0.50	1920	0.178	4.427	22.6	6.670	34.0	1-30" CMP W/ End Sec	1-30" CMP W/ End Sec
K-3	8.10	0.50	1620	0.167	4.536	18.4	6.827	27.6	1-24" CMP W/ End Sec	1-30" CMP W/ End Sec
K,K-1, K-2	21.20	0.50	1920	0.178	4.427	46.9	6.670	70.7	2-24" CMP W/ End Sec	2-30" CMP W/ End Sec
K,K-1, K-2, K-3	29.30	0.50	2150	0.199	4.224	61.9	6.382	93.5	2-30" CMP W/ End Sec	3-30" CMP W/ End Sec
K-4	47.50	0.50	3100	0.287	3.554	84.4	5.414	128.6	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
I-J	159.30	0.50	7600	0.704	2.029	161.6	3.151	251.0	2-42" CMP W/ Hdwl	3-42" CMP W/ Hdwl
B2-1	143.00	0.50	10200	0.944	1.626	116.2	2.538	181.5	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
B2-2	19.30	0.50	2310	0.214	4.094	39.5	6.195	59.8	2-24" CMP W/ End Sec	2-30" CMP W/ End Sec
B-3	53.40	0.50	4400	0.407	2.920	78.0	4.484	119.7	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
F-1	8.30	0.50	1550	0.167	4.540	18.8	6.832	28.4	1-24" CMP W/ End Sec	1-30" CMP W/ End Sec
F-2	5.20	0.50	920	0.167	4.540	11.8	6.832	17.8	1-24" CMP W/ End Sec	1-24" CMP W/ End Sec
H-1	61.50	0.50	4763	0.441	2.781	85.5	4.278	131.6	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
H-2	14.20	0.50	2463	0.228	3.977	28.2	6.027	42.8	1-30" CMP W/ End Sec	2-24" CMP W/ End Sec
H-1, H-2	75.70	0.50	4763	0.441	2.781	105.3	4.278	161.9	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec
H-3	110.00	0.50	8700	0.806	1.836	101.0	2.859	157.2	3-30" CMP W/ End Sec	3-36" CMP W/ End Sec



- NOTES:**
- 1) Contours are shown at a 10-meter Interval (METRIC).
 - 2) Watershed sub-basin boundaries are for the existing case.
 - 3) Boundaries were interpreted from the figures in the Conceptual Hydrology Study For APN 322-06-010.

METRIC CONTOURS
10 meter Interval
(See Note 1)



Scale: 1:2000
(11 x 17 plot)

**Prospector Street Interim Roadway & I-40 Grade Separation Feasibility Study
WATERSHED DELINEATION MAP**

- Prospector Street Interim Roadway Study Corridors
- - - Future Roadways Not Part of This Project
- K Offsite Sub-Basin Boundary and Concentration Point
- - - Downstream Flowpath (Existing)
- Flow Direction
- Retention Basin (Existing)

APPENDIX D

PRELIMINARY DETAILED COST ESTIMATES

FOR EACH ALTERNATIVE

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 1 - KINGMAN CROSSING ALIGNMENT (UNDER I-40)
Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	20	\$1,000.00	\$20,000.00
2020101	REMOVE FENCE	L.FT.	556	\$2.00	\$1,112.00
2030301	ROADWAY EXCAVATION	CU.YD.	181,749	\$5.00	\$908,745.00
2030451	CHANNEL EXCAVATION	CU.YD.	457	\$6.00	\$2,742.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	9,102	\$28.00	\$254,856.00
4040111	BITUMINOUS TACK COAT	TON	11	\$400.00	\$4,400.00
4040116	APPLY BITUMINOUS TACK COAT	HOUR	21	\$150.00	\$3,150.00
4040270	ASPHALT BINDER (PG 70-10)	TON	723	\$500.00	\$361,500.00
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	14,450	\$40.00	\$578,000.00
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	136	\$90.00	\$12,240.00
5012524	STORM DRAIN PIPE, 24"	L.FT.	963	\$70.00	\$67,410.00
5012548	STORM DRAIN PIPE, 48"	L.FT.	443	\$180.00	\$79,740.00
5012560	STORM DRAIN PIPE, 60"	L.FT.	139	\$200.00	\$27,800.00
5012572	STORM DRAIN PIPE, 72"	L.FT.	970	\$250.00	\$242,500.00
5012924	PIPE CULVERT, 24"	L.FT.	181	\$80.00	\$14,480.00
5012930	PIPE CULVERT, 30"	L.FT.	175	\$100.00	\$17,500.00
5012936	PIPE CULVERT, 36"	L.FT.	696	\$100.00	\$69,600.00
5012942	PIPE CULVERT, 42"	L.FT.	231	\$120.00	\$27,720.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	5	\$350.00	\$1,750.00
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	6	\$400.00	\$2,400.00
5014036	FLARED END SECTION, 36" (C-13.25)	EACH	12	\$450.00	\$5,400.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	6	\$700.00	\$4,200.00
5030001	CONCRETE CATCH BASIN (C-15.10) SINGLE, H=8' OR LESS	EACH	8	\$2,500.00	\$20,000.00
5030141	CONCRETE CATCH BASIN (MEDIAN)	EACH	1	\$3,500.00	\$3,500.00
5030152	CONCRETE CATCH BASIN (MEDIAN DIKES) (STD C-15.90)	EACH	6	\$4,000.00	\$24,000.00
5050001	MANHOLE (C-18.10) (NO. 1) (FOR PIPES 6" TO 36")	EACH	1	\$400.00	\$400.00
6016087	HEADWALL	EACH	3	\$5,000.00	\$15,000.00
608XX01	SIGNING(	L.SUM	1	\$10,000.00	\$10,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	3,777	\$0.50	\$1,888.50
7040004	PAVEMENT MARKING (YELLOW SPRAYED THERMOPLASTIC)(0.060")	L.FT.	24,263	\$0.50	\$12,131.50
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	4	\$75.00	\$300.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	9	\$75.00	\$675.00
8050003	SEEDING (CLASS II)	ACRE	7.6	\$3,500.00	\$26,600.00
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	1,141	\$80.00	\$91,280.00

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 1 - KINGMAN CROSSING ALIGNMENT (UNDER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9020028	CHAIN LINK FENCE (C-12.20, TYPE 1, H=72 IN)	L.FT.	299	\$10.00	\$2,990.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	212.5	\$20.00	\$4,250.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	2	\$3,000.00	\$6,000.00
9080101	CONCRETE CURB AND GUTTER, TYPE A (MAG DET. 220)	L.FT.	10,611	\$20.00	\$212,220.00
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	62,766	\$5.00	\$313,830.00
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	4	\$1,500.00	\$6,000.00
9130051	RIPRAP (DUMPED) (D50=6")	CU.YD.	25	\$80.00	\$2,000.00
999X001	NEW BRIDGE (KINGMAN CROSSING BLVD AT I-40)	L.SUM	1	\$1,570,000.00	\$1,570,000.00
	SUBTOTAL 1				<u>\$5,030,310.00</u>
934XX01	UNIDENTIFIED ITEMS (15%)	COST	15%		\$754,546.50
	SUBTOTAL 2				<u>\$5,784,856.50</u>
209XX01	FURNISH WATER (	COST	1%		\$57,848.57
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$57,848.57
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	5%		\$289,242.83
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$115,697.13
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$115,697.13
	SUBTOTAL 2				<u>\$6,421,190.72</u>
901XX01	MOBILIZATION	COST	10%		\$642,119.07
	SUBTOTAL 3				<u>\$7,063,309.79</u>
	CONSTRUCTION CONTINGENCIES	COST	5%		\$353,165.49
	CONSTRUCTION ENGINEERING	COST	14%		\$988,863.37
	CONSULTANT SERVICE (PDS)	COST	1%		\$70,633.10
	TOTAL CONSTRUCTION COST				<u>\$8,475,971.74</u>
	DESIGN ENGINEERING	COST	7%		\$593,318.02
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$5,000.00	\$5,000.00
			TOTAL PROJECT COST =		\$9,074,289.77

CITY OF KINGMAN

ITEMIZED ESTIMATEALTERNATIVE 2 - PROSPECTOR STREET WEST ALIGNMENT (OVER I-40)
Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	13	\$1,000.00	\$13,000.00
2020101	REMOVE FENCE	L.FT.	698	\$2.00	\$1,396.00
2030301	ROADWAY EXCAVATION	CU.YD.	4,562	\$4.00	\$18,248.00
2030451	CHANNEL EXCAVATION	CU.YD.	1,621	\$6.00	\$9,726.00
2030901	BORROW	CU.YD.	97,851	\$7.00	\$684,957.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	6,514	\$28.00	\$182,392.00
4040111	BITUMINOUS TACK COAT	TON	8	\$400.00	\$3,200.00
4040116	APPLY BITUMINOUS TACK COAT	HOURL	15	\$150.00	\$2,250.00
4040270	ASPHALT BINDER (PG 70-10)	TON	517	\$500.00	\$258,500.00
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	10,343	\$40.00	\$413,720.00
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	97	\$90.00	\$8,730.00
5012924	PIPE CULVERT, 24"	L.FT.	252	\$80.00	\$20,160.00
5012930	PIPE CULVERT, 30"	L.FT.	327	\$100.00	\$32,700.00
5012936	PIPE CULVERT, 36"	L.FT.	585	\$100.00	\$58,500.00
5012942	PIPE CULVERT, 42"	L.FT.	240	\$120.00	\$28,800.00
5012948	PIPE CULVERT, 48"	L.FT.	186	\$150.00	\$27,900.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	5	\$350.00	\$1,750.00
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	6	\$400.00	\$2,400.00
5014036	FLARED END SECTION, 36" (C-13.25)	EACH	6	\$450.00	\$2,700.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	6	\$700.00	\$4,200.00
6110202	METAL HANDRAIL (MAG DET. 145, TYPE 4)	L.FT.	1,539	\$45.00	\$69,255.00
6016087	HEADWALL	EACH	5	\$5,000.00	\$25,000.00
608XX01	SIGNING(	L.SUM	1	\$10,000.00	\$10,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	2,932	\$0.50	\$1,466.00
7040004	PAVEMENT MARKING (YELLOW SPRAYED THERMOPLASTIC)(0.060")	L.FT.	18,952	\$0.50	\$9,476.00
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	4	\$75.00	\$300.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	8	\$75.00	\$600.00
8050003	SEEDING (CLASS II)	ACRE	2.4	\$3,500.00	\$8,400.00
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	2,229	\$80.00	\$178,320.00
9020028	CHAIN LINK FENCE (C-12.20, TYPE 1, H=72 IN)	L.FT.	607	\$10.00	\$6,070.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	1,415	\$20.00	\$28,300.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	2	\$3,000.00	\$6,000.00
9050404	GUARD RAIL TRANSITION, W-BEAM TO CONCRETE HALF BARRIER	EACH	2	\$2,500.00	\$5,000.00
9080101	CONCRETE CURB AND GUTTER, TYPE A (MAG DET. 220)	L.FT.	7,522	\$20.00	\$150,440.00

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 2 - PROSPECTOR STREET WEST ALIGNMENT (OVER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	44,229	\$5.00	\$221,145.00
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	5	\$1,500.00	\$7,500.00
9130051	RIPRAP (DUMPED) (D50=6")	CU.YD.	21	\$80.00	\$1,680.00
999X001	NEW BRIDGE (PROSECTOR STREET UNDERPASS AT I-40)	L.SUM	1	\$1,410,000.00	\$1,410,000.00
	SUBTOTAL 1				<u>\$3,914,181.00</u>
934XX01	UNIDENTIFIED ITEMS (15%)	COST	15%		\$587,127.15
	SUBTOTAL 2				<u>\$4,501,308.15</u>
209XX01	FURNISH WATER (	COST	1%		\$45,013.08
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$45,013.08
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	3%		\$135,039.24
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$90,026.16
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$90,026.16
	SUBTOTAL 2				<u>\$4,906,425.88</u>
901XX01	MOBILIZATION	COST	10%		\$490,642.59
	SUBTOTAL 3				<u>\$5,397,068.47</u>
	CONSTRUCTION CONTINGENCIES	COST	5%		\$269,853.42
	CONSTRUCTION ENGINEERING	COST	14%		\$755,589.59
	CONSULTANT SERVICE (PDS)	COST	1%		\$53,970.68
	TOTAL CONSTRUCTION COST				<u>\$6,476,482.17</u>
	DESIGN ENGINEERING	COST	7%		\$453,353.75
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$5,000.00	\$5,000.00
			TOTAL PROJECT COST =		<u>\$6,934,835.92</u>

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 3 - PROSPECTOR STREET WEST ALIGNMENT (UNDER I-40)
Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	14	\$1,000.00	\$14,000.00
2020101	REMOVE FENCE	L.FT.	648	\$2.00	\$1,296.00
2030301	ROADWAY EXCAVATION	CU.YD.	73,666	\$5.00	\$368,330.00
2030451	CHANNEL EXCAVATION	CU.YD.	3,798	\$6.00	\$22,788.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	6,627	\$28.00	\$185,556.00
4040111	BITUMINOUS TACK COAT	TON	8	\$400.00	\$3,200.00
4040116	APPLY BITUMINOUS TACK COAT	HOURL	15	\$150.00	\$2,250.00
4040270	ASPHALT BINDER (PG 70-10)	TON	526	\$500.00	\$263,000.00
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	10,521	\$40.00	\$420,840.00
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	99	\$90.00	\$8,910.00
5012924	PIPE CULVERT, 24"	L.FT.	330	\$80.00	\$26,400.00
5012930	PIPE CULVERT, 30"	L.FT.	367	\$100.00	\$36,700.00
5012936	PIPE CULVERT, 36"	L.FT.	585	\$100.00	\$58,500.00
5012942	PIPE CULVERT, 42"	L.FT.	240	\$120.00	\$28,800.00
5012948	PIPE CULVERT, 48"	L.FT.	186	\$150.00	\$27,900.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	5	\$350.00	\$1,750.00
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	6	\$400.00	\$2,400.00
5014036	FLARED END SECTION, 36" (C-13.25)	EACH	6	\$450.00	\$2,700.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	6	\$700.00	\$4,200.00
6016087	HEADWALL	EACH	6	\$5,000.00	\$30,000.00
608XX01	SIGNING(	L.SUM	1	\$10,000.00	\$10,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	1,808	\$0.50	\$904.00
7040004	PAVEMENT MARKING (YELLOW SPRAYED THERMOPLASTIC)(0.060")	L.FT.	18,873	\$0.50	\$9,436.50
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	4	\$75.00	\$300.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	8	\$75.00	\$600.00
8050003	SEEDING (CLASS II)	ACRE	5.0	\$3,500.00	\$17,500.00
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	1,427	\$80.00	\$114,160.00
9020028	CHAIN LINK FENCE (C-12.20, TYPE 1, H=72 IN)	L.FT.	600	\$10.00	\$6,000.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	1,413	\$20.00	\$28,260.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	2	\$3,000.00	\$6,000.00
9050040	GUARD RAIL, END TERMINAL ASSEMBLY	EACH	2	\$700.00	\$1,400.00
9050404	GUARD RAIL TRANSITION,W-BEAM TO CONCRETE HALF BARRIER	EACH	4	\$2,500.00	\$10,000.00
9080101	CONCRETE CURB AND GUTTER, TYPE A (MAG DET. 220)	L.FT.	7,791	\$20.00	\$155,820.00
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	45,847	\$5.00	\$229,235.00

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 3 - PROSPECTOR STREET WEST ALIGNMENT (UNDER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	5	\$1,500.00	\$7,500.00
9130051	RIPRAP (DUMPED) (D50=6")	CU.YD.	21	\$80.00	\$1,680.00
999X001	NEW BRIDGE (PROSECTOR STREET OVERPASS AT I-40)	L.SUM	1	\$1,420,000.00	\$1,420,000.00
	SUBTOTAL 1				<u>\$3,528,315.50</u>
934XX01	UNIDENTIFIED ITEMS (15%)	COST	15%		\$529,247.33
	SUBTOTAL 2				<u>\$4,057,562.83</u>
209XX01	FURNISH WATER (	COST	1%		\$40,575.63
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$40,575.63
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	5%		\$202,878.14
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$81,151.26
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$81,151.26
	SUBTOTAL 2				<u>\$4,503,894.74</u>
901XX01	MOBILIZATION	COST	10%		\$450,389.47
	SUBTOTAL 3				<u>\$4,954,284.21</u>
	CONSTRUCTION CONTINGENCIES	COST	5%		\$247,714.21
	CONSTRUCTION ENGINEERING	COST	14%		\$693,599.79
	CONSULTANT SERVICE (PDS)	COST	1%		\$49,542.84
	TOTAL CONSTRUCTION COST				<u>\$5,945,141.05</u>
	DESIGN ENGINEERING	COST	7%		\$416,159.87
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$5,000.00	\$5,000.00
				TOTAL PROJECT COST =	<u>\$6,366,300.92</u>

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 4 - PROSPECTOR STREET SECTION LINE ALIGNMENT (OVER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	13	\$1,000.00	\$13,000.00
2020101	REMOVE FENCE	L.FT.	773	\$2.00	\$1,546.00
2030301	ROADWAY EXCAVATION	CU.YD.	4,034	\$5.00	\$20,170.00
2030451	CHANNEL EXCAVATION	CU.YD.	1,510	\$6.00	\$9,060.00
2030901	BORROW	CU.YD.	83,563	\$7.00	\$584,941.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	6,504	\$28.00	\$182,112.00
4040111	BITUMINOUS TACK COAT	TON	8	\$400.00	\$3,200.00
4040116	APPLY BITUMINOUS TACK COAT	HOURL	15	\$150.00	\$2,250.00
4040270	ASPHALT BINDER (PG 70-10)	TON	516	\$500.00	\$258,000.00
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	10,325	\$40.00	\$413,000.00
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	97	\$90.00	\$8,730.00
5012924	PIPE CULVERT, 24"	L.FT.	474	\$80.00	\$37,920.00
5012930	PIPE CULVERT, 30"	L.FT.	405	\$100.00	\$40,500.00
5012936	PIPE CULVERT, 36"	L.FT.	585	\$100.00	\$58,500.00
5012942	PIPE CULVERT, 42"	L.FT.	240	\$120.00	\$28,800.00
5012948	PIPE CULVERT, 48"	L.FT.	186	\$150.00	\$27,900.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	7	\$350.00	\$2,450.00
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	6	\$400.00	\$2,400.00
5014036	FLARED END SECTION, 36" (C-13.25)	EACH	6	\$450.00	\$2,700.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	6	\$700.00	\$4,200.00
5050001	MANHOLE (C-18.10) (NO. 1) (FOR PIPES 6" TO 36")	EACH	2	\$400.00	\$800.00
6110202	METAL HANDRAIL (MAG DET. 145, TYPE 4)	L.FT.	1,517	\$45.00	\$68,265.00
6016087	HEADWALL	EACH	5	\$5,000.00	\$25,000.00
608XX01	SIGNING(	L.SUM	1	\$10,000.00	\$10,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	1,816	\$0.50	\$908.00
7040004	PAVEMENT MARKING (YELLOW SPRAYED THERMOPLASTIC)(0.060")	L.FT.	18,922	\$0.50	\$9,461.00
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	4	\$75.00	\$300.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	8	\$75.00	\$600.00
8050003	SEEDING (CLASS II)	ACRE	2.6	\$3,500.00	\$9,100.00
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	2,160	\$80.00	\$172,800.00
9020028	CHAIN LINK FENCE (C-12.20, TYPE 1, H=72 IN)	L.FT.	694	\$10.00	\$6,940.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	1,413	\$20.00	\$28,260.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	2	\$3,000.00	\$6,000.00
9050404	GUARD RAIL TRANSITION,W-BEAM TO CONCRETE HALF BARRIER	EACH	2	\$2,500.00	\$5,000.00

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 4 - PROSPECTOR STREET SECTION LINE ALIGNMENT (OVER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9080101	CONCRETE CURB AND GUTTER, TYPE A (MAG DET. 220)	L.FT.	7,521	\$20.00	\$150,420.00
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	44,225	\$5.00	\$221,125.00
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	5	\$1,500.00	\$7,500.00
9130051	RIPRAP (DUMPED) (D50=6")	CU.YD.	23	\$80.00	\$1,840.00
999X001	NEW BRIDGE (PROSECTOR STREET UNDERPASS AT I-40)	L.SUM	1	\$1,380,000.00	\$1,380,000.00
	SUBTOTAL 1				<u>\$3,805,698.00</u>
934XX01	UNIDENTIFIED ITEMS (15%)	COST	15%		\$570,854.70
	SUBTOTAL 2				<u>\$4,376,552.70</u>
209XX01	FURNISH WATER (	COST	1%		\$43,765.53
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$43,765.53
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	3%		\$131,296.58
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$87,531.05
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$87,531.05
	SUBTOTAL 2				<u>\$4,770,442.44</u>
901XX01	MOBILIZATION	COST	10%		\$477,044.24
	SUBTOTAL 3				<u>\$5,247,486.69</u>
	CONSTRUCTION CONTINGENCIES	COST	5%		\$262,374.33
	CONSTRUCTION ENGINEERING	COST	14%		\$734,648.14
	CONSULTANT SERVICE (PDS)	COST	1%		\$52,474.87
	TOTAL CONSTRUCTION COST				<u>\$6,296,984.02</u>
	DESIGN ENGINEERING	COST	7%		\$440,788.88
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$70,000.00	\$70,000.00
			TOTAL PROJECT COST =		<u>\$6,807,772.91</u>

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 5 - PROSPECTOR STREET SECTION LINE ALIGNMENT (UNDER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	14	\$1,000.00	\$14,000.00
2020101	REMOVE FENCE	L.FT.	733	\$2.00	\$1,466.00
2030301	ROADWAY EXCAVATION	CU.YD.	75,279	\$5.00	\$376,395.00
2030451	CHANNEL EXCAVATION	CU.YD.	2,537	\$6.00	\$15,222.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	6,624	\$28.00	\$185,472.00
4040111	BITUMINOUS TACK COAT	TON	8	\$400.00	\$3,200.00
4040116	APPLY BITUMINOUS TACK COAT	HOURL	15	\$150.00	\$2,250.00
4040270	ASPHALT BINDER (PG 70-10)	TON	526	\$500.00	\$263,000.00
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	10,516	\$40.00	\$420,640.00
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	99	\$90.00	\$8,910.00
5012530	STORM DRAIN PIPE, 30"	L.FT.	245	\$80.00	\$19,600.00
5012924	PIPE CULVERT, 24"	L.FT.	252	\$80.00	\$20,160.00
5012930	PIPE CULVERT, 30"	L.FT.	367	\$100.00	\$36,700.00
5012936	PIPE CULVERT, 36"	L.FT.	585	\$100.00	\$58,500.00
5012942	PIPE CULVERT, 42"	L.FT.	240	\$120.00	\$28,800.00
5012948	PIPE CULVERT, 48"	L.FT.	186	\$150.00	\$27,900.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	5	\$350.00	\$1,750.00
5014030	FLARED END SECTION, 30" (C-13.25)	EACH	6	\$400.00	\$2,400.00
5014036	FLARED END SECTION, 36" (C-13.25)	EACH	6	\$450.00	\$2,700.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	6	\$700.00	\$4,200.00
5030141	CONCRETE CATCH BASIN (MEDIAN)	EACH	1	\$3,500.00	\$3,500.00
6016087	HEADWALL	EACH	7	\$5,000.00	\$35,000.00
608XX01	SIGNING(	L.SUM	1	\$10,000.00	\$10,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	1,816	\$0.50	\$908.00
7040004	PAVEMENT MARKING (YELLOW SPRAYED THERMOPLASTIC)(0.060")	L.FT.	18,916	\$0.50	\$9,458.00
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	4	\$75.00	\$300.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	8	\$75.00	\$600.00
8050003	SEEDING (CLASS II)	ACRE	5.0	\$3,500.00	\$17,500.00
8101016	EROSION CONTROL (ROCK MULCH)	CU.YD.	1,416	\$80.00	\$113,280.00
9020028	CHAIN LINK FENCE (C-12.20, TYPE 1, H=72 IN)	L.FT.	689	\$10.00	\$6,890.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	1,413	\$20.00	\$28,260.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	2	\$3,000.00	\$6,000.00
9050040	GUARD RAIL, END TERMINAL ASSEMBLY	EACH	2	\$700.00	\$1,400.00
9050404	GUARD RAIL TRANSITION,W-BEAM TO CONCRETE HALF BARRIER	EACH	4	\$2,500.00	\$10,000.00

CITY OF KINGMAN

ITEMIZED ESTIMATE

ALTERNATIVE 5 - PROSPECTOR STREET SECTION LINE ALIGNMENT (UNDER I-40)
 Prospector Street Interim Roadway & Grade Separation Feasibility Study

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9080101	CONCRETE CURB AND GUTTER, TYPE A (MAG DET. 220)	L.FT.	7,786	\$20.00	\$155,720.00
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	45,817	\$5.00	\$229,085.00
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	5	\$1,500.00	\$7,500.00
9130051	RIPRAP (DUMPED) (D50=6")	CU.YD.	21	\$80.00	\$1,680.00
999X001	NEW BRIDGE (PROSECTOR STREET OVERPASS AT I-40)	L.SUM	1	\$1,410,000.00	\$1,410,000.00
	SUBTOTAL 1				<u>\$3,540,346.00</u>
934XX01	UNIDENTIFIED ITEMS (15%)	COST	15%		\$531,051.90
	SUBTOTAL 2				<u>\$4,071,397.90</u>
209XX01	FURNISH WATER (	COST	1%		\$40,713.98
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$40,713.98
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	5%		\$203,569.90
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$81,427.96
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$81,427.96
	SUBTOTAL 2				<u>\$4,519,251.67</u>
901XX01	MOBILIZATION	COST	10%		\$451,925.17
	SUBTOTAL 3				<u>\$4,971,176.84</u>
	CONSTRUCTION CONTINGENCIES	COST	5%		\$248,558.84
	CONSTRUCTION ENGINEERING	COST	14%		\$695,964.76
	CONSULTANT SERVICE (PDS)	COST	1%		\$49,711.77
	TOTAL CONSTRUCTION COST				<u>\$5,965,412.20</u>
	DESIGN ENGINEERING	COST	7%		\$417,578.85
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$70,000.00	\$70,000.00
				TOTAL PROJECT COST =	<u>\$6,452,991.06</u>