

# FINAL DESIGN CONCEPT REPORT



## I-40, Kingman Crossing Traffic Interchange

**ADOT TRACS No. H7147  
Federal No. STP-040-B(AUE)**

**June 2010**

Prepared for:  
**City of Kingman**  
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In association with EcoPlan Associates, Inc.



EXP 12/31/10



ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 STATEWIDE PROJECT MANAGEMENT GROUP  
**PROJECT DETERMINATION**

Fiscal Year 9      Project Number 040MO54 H714701L      County and District MOHAVE COUNTY, KINGMAN DISTRICT      Project Location and Highway i-40, KINGMAN CROSSING TRAFFIC INTERCHANGE KINGMAN - ASH FORK HIGHWAY

Description: KINGMAN CROSSING TRAFFIC INTERCHANGE

Existing Program N      Program Year: TBD      Estimated Cost: \$ 19,571,000

Operating Partnership Category: A       B       N       X       N/A

Reports Required: Location and Design Concept Report      Yes       No

Design Concept Report      Yes       No

Class I       Class II       Class III

Public Hearing:

In the Highway Development process, at least one public hearing or the opportunity for a hearing will be offered for any project that:

- requires a significant amount of new right-of-way;       otherwise has a significant social, economic, environmental or other effect;
- substantially changes the layout or function of connecting roadway or the facility being improved;       is controversial on environmental grounds;
- has a significant adverse impact on abutting real property;       or has significant floodplain encroachment;
- none of the above conditions apply.

Recommends:      Yes       No  Public Forum  
       Offer a combined Location/Design Hearing  
       Offer separate Location/Design Hearings  
       Hold a Design Public Hearing

*Vincent...* 9/3/10      *Thor Anderson* 9/8/10  
VINCENT... GROUP MANAGER, STATEWIDE PROJECT MANAGEMENT GROUP, 614E      THOR ANDERSON, MANAGER/ENVIRONMENTAL PLANNING GROUP, 619E

Comments: \_\_\_\_\_

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cc: Project Funding, 204B  
 PLEASE ensure that FHWA's comments in the 2/24/10 COA approval letter are considered and implemented - RECD: in regard to elongated accel & decel lanes.

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## EXECUTIVE SUMMARY

This Design Concept Report (DCR) presents the results of the study for the Kingman Crossing Traffic Interchange (TI). The proposed project would involve the construction of a new traffic interchange (TI) on Interstate 40 (I-40) at Milepost (MP) 55.0, approximately 1.5 miles east of the existing I-40/State Route 66 (East Kingman) TI. The project would also involve the construction of a new arterial street, Kingman Crossing Boulevard, between the south TI ramp intersections and Santa Rosa Drive on the north. A total of approximately 0.32 miles of new roadway will be constructed. Kingman Crossing Boulevard will eventually be extended south to Southern Avenue and north to Airway Avenue by others.

The City of Kingman (COK) 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 the new 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, plus eventually provide access to Hualapai Mountain Road. Initially, RSFP TI will connect to Louise Avenue on the south. A design and construction project for the RSFP TI is on the Arizona Department of Transportation (ADOT) Statewide Transportation Improvement Program.

The purpose of the I-40 Kingman Crossing Design Concept and Environmental Study is to investigate concepts to provide a new traffic interchange and arterial street connections to Santa Rosa Drive to provide improved access to the East Kingman area.

An Intergovernmental Agreement (IGA) will need to be developed between the COK and ADOT to determine the limits of ADOT ownership and maintenance within the access control limits.

Based on the evaluation of the alternatives considered, the following is a summary of the recommended alternative as shown in **Figure E1**.

- Construct a new I-40 overpass TI with full access and arterial connection to Santa Rosa Drive to the north.
- The configuration of the new overpass traffic interchange will be a compact diamond interchange and will be comprised of standard one-lane on and off ramps. Both entrance and exit ramps will be designed as parallel type ramps. The parallel portion of the westbound (WB) exit ramp and the eastbound (EB) on ramp will be elongated and extended to the east approximately 2,300 feet from the ramp gore areas. This will effectively lay the groundwork for the future auxiliary lanes between Kingman Crossing TI and the

proposed RSFP TI; this will allow for a seamless connection during the construction of the proposed RSFP west side ramps.

- The Kingman Crossing Boulevard crossroad will be depressed under I-40 with I-40 remaining at grade. Kingman Crossing Boulevard between the ramp intersections will provide two through lanes and two left-turn lanes northbound and southbound.
- Traffic signals will be provided at the two TI ramp intersections and at the Santa Rosa Drive and Kingman Crossing Boulevard intersection. Street lighting will be provided along Kingman Crossing Boulevard and at the ramp freeway entrance and exit locations.
- A break in the access control line along Kingman Crossing Boulevard between the TI and Santa Rosa Drive will be provided to allow for future right-in/right-out driveways to provide access for future development. The distance to the break in access control along Kingman Crossing Boulevard shall be a minimum of 300 feet beyond the end of the ramp curb radius return as per RDG Section 506. Separate right-turn lanes will be provided for each right-in/right-out driveway.
- Between the TI ramps and Santa Rosa Drive, three through lanes in each direction would be constructed. The Kingman Crossing Boulevard improvements will include curb and gutter and sidewalks to accommodate drainage and pedestrian traffic. The improvements will also include a raised concrete curbed median to aid in the control of access along Kingman Crossing Boulevard and to provide a greater separation between opposing traffic.
- In the future, Kingman Crossing Boulevard will be extended south to Louise Avenue and north to Airway Avenue. Santa Rosa Drive, which was recently constructed as part of the Hualapai Medical Center, will provide the arterial connection from the TI to Airway Avenue until Kingman Crossing Boulevard is constructed to Airway Avenue.
- The I-40 EB and WB Kingman Crossing TI overpass structures will consist of two single-span cast-in-place and post-tensioned concrete box girder superstructures with a total span length of 210 feet. The structures will be constructed to provide for future outside widening for a third lane on I-40.

The total project cost, which includes design and utility relocations, is \$19,571,000 (2010 dollars). The estimated total construction cost is \$17,950,000. The final design cost is estimated at \$1,257,000. Private utility relocation costs are estimated at \$300,000.

The recommended alternative will require acquisition of approximately 27.09 acres of new right-of-way, plus 1.36 acres for drainage easements and 0.92 acre for utility easements from private lands.

Four additional reports have been prepared as part of the project, which include the Traffic Report, Preliminary Drainage Report, Change of Access Report (COAR), and the Categorical Exclusion (CE) environmental document. The CE document was approved by the Federal Highway Administration (FHWA) on December 3, 2009. FHWA has determined the COAR is acceptable from an engineering and operational standpoint and has approved the request for Change of Access to I-40 at MP 55.0. A copy of FHWA's Change of Access approval letter dated February 24, 2010, is included in Appendix E.

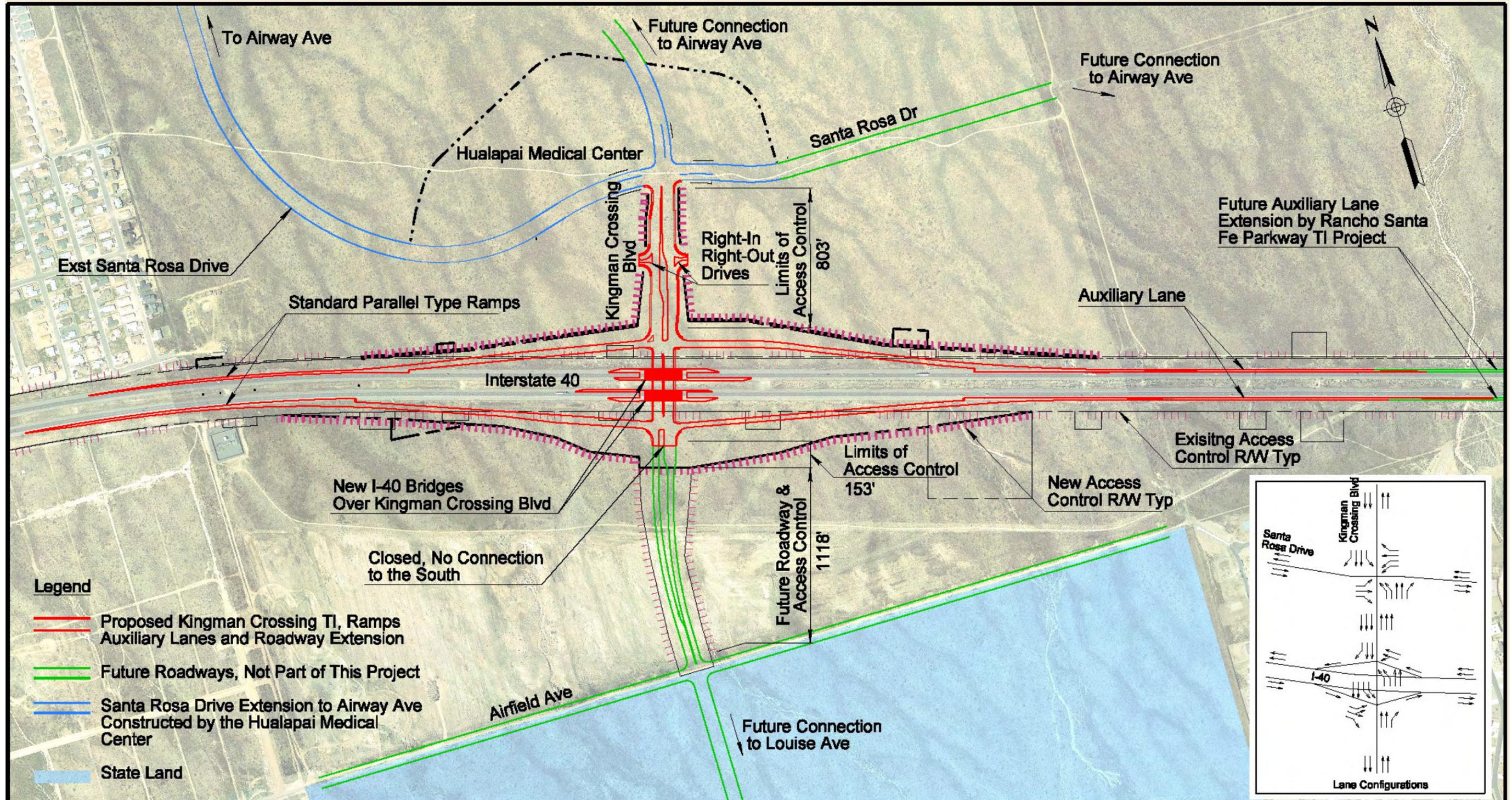


FIGURE E1 KINGMAN CROSSING RECOMMENDED ALTERNATIVE - COMPACT DIAMOND OVERPASS TRAFFIC INTERCHANGE

## SUMMARY OF MITIGATION MEASURES

Mitigation measures were presented in the CE and are listed here in their final version. These mitigation measures will be implemented by the City of Kingman by incorporating them into the project construction documents. The following mitigation measures and commitments are **not** subject to modification without the prior written approval of the FHWA.

### Design Responsibilities

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.
- The ADOT project manager will contact the ADOT hazardous materials coordinator (602.712.7767) 30 days prior to bid advertisement to determine the need for additional site assessment.

### Roadside Development Responsibility

- Protected native plants within the project limits will be impacted by this project; therefore, the ADOT Roadside Development Section will determine if Arizona Department of Agriculture notification is needed. If notification is needed, the ADOT Roadside Development Section will send the notification at least 60 calendar days prior to the start of construction.

### Kingman District Responsibilities

- The Engineer will submit the contractor's Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Kingman District environmental coordinator.
- No paint stripe obliteration will occur until the lead-based paint abatement plan is approved and implemented.
- The Engineer will review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.

### Contractor Responsibilities

- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.

- The contractor, in association with the Kingman District, shall submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the Kingman District has reviewed and approved the Stormwater Pollution Prevention Plan.
- For pavement yellow striping obliteration (i.e., striping removal only):
  - An approved contractor shall develop and implement a lead-based paint abatement plan for the removal of the lead-based paint, Toxicity Characteristic Leaching Procedure testing of the generated waste stream, and proper disposal of the waste stream derived from yellow paint stripe obliteration within the project limits. A list of approved lead-based paint abatement contractors is attached to the special provisions. The contractor shall follow all applicable federal, state, and local codes and regulations, including ADOT Standard Specifications, related to the treatment and handling of lead-based paint.
  - The contractor shall submit a lead-based paint removal and disposal plan for the removal of yellow paint striping within the project limits to the Engineer and the ADOT hazardous materials coordinator (602.712.7767) for review and approval at least 10 working days prior to paint stripe obliteration.
  - No paint stripe obliteration shall occur until the lead-based paint abatement plan is approved by the ADOT hazardous materials coordinator and implemented.
  - Visible fugitive dust emissions from paint removal shall be controlled through wet or dry (e.g., vacuum) means during the removal process. If the liquid waste stream generated by a water-blasting obliteration method passes the Toxicity Characteristic Leaching Process analysis, it may be used as a dust palliative or for compaction on the project. If the water is not used on the project, it shall be properly disposed of in accordance with all applicable federal, state, and local regulations.
- The contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with concrete box culvert extensions and submit it to the Engineer for review. After Engineer approval, the notification shall be submitted to the ADOT hazardous materials coordinator (602.712.7767) for a 5-working-day review and approval. Upon approval by the ADOT hazardous materials coordinator, the contractor shall file the notification with the Arizona Department of Environmental Quality at least 10 working days prior to demolition/rehabilitation associated with the concrete box culverts (see ADOT Policy SAF-6.01, February 23, 2004). The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.

## 1.0 INTRODUCTION

### 1.1 FOREWORD

The Kingman Crossing Boulevard traffic interchange (TI) Design Concept Study and environmental study is part of a project with the City of Kingman (COK) to identify alternatives that will improve access to East Kingman. Ultimately, the project would provide a new Interstate 40 (I-40) TI with an overpass approximately 1.5 miles east of Andy Devine Avenue, as well as arterial street connections. See **Figure 1-1** for the project study area.

### 1.2 PURPOSE AND NEED FOR PROJECT

COK 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. Future growth is expected to continue to take place in the area. 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 the new 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 recently completed 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 purpose of the I-40 Kingman Crossing Design Concept and Environmental Study is to investigate concepts to provide a new traffic interchange and arterial street connections to provide improved access to the East Kingman area. Specific major goals for this project are:

- Perform design concept and environmental studies for a new I-40 TI structure with full access and arterial connections to Santa Rosa Drive. Santa Rosa Drive, which was recently constructed as part of the Hualapai Medical Center project, will provide the arterial connection from the TI to Airway Avenue.
- Improve access to the rapidly growing East Kingman area.
- Complete improvements that were previously identified in the City of Kingman General Plan and the Kingman Area Transportation Study.

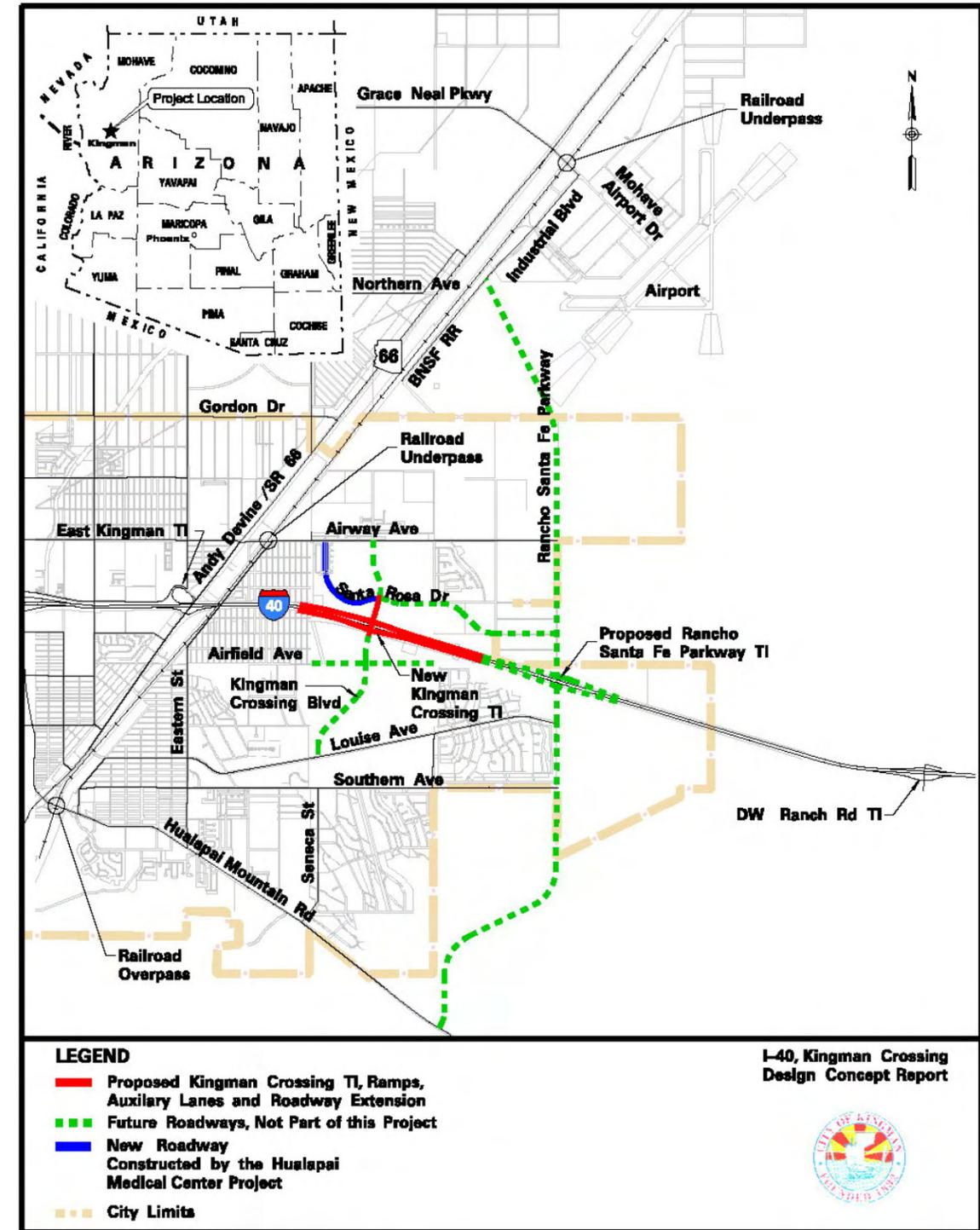


Figure 1-1 Project Study Area

### 1.3 DESCRIPTION OF PROJECT (RECOMMENDED ALTERNATIVE)

The recommended alternative will construct a new compact diamond overpass TI with full access and arterial connections to Santa Rosa Drive. Kingman Crossing Boulevard will be depressed under I-40 with I-40 remaining at grade. This alternative is described in further detail below. Preliminary typical sections and plan and profile sheets for the recommended alternative are shown in **Appendix A**.

#### 1.3.1 Project Limits

The study area is located on the east side of the City of Kingman, east of State Highway 66 (Andy Devine Avenue) and south of the airport as shown on **Figure 1-1**. The Project limits on I-40 will extend from MP 54.3 (Station 2840+00) to MP 55.9 (Station 2925+12), and the limits for Kingman Crossing Boulevard will extend from I-40 to Santa Rosa Drive.

#### 1.3.2 Proposed Pavement Width

**Table 1-1 Proposed Pavement Width**

Roadway Section	Roadway Width
I-40 Mainline	38' Each Direction (Existing)
I-40/Kingman Crossing TI Ramps	28'
Kingman Crossing – Airfield to I-40 (future)	Varies 81' to 131' (includes variable width median)
Kingman Crossing – At I-40 within Interchange	119' (includes 6' median)
Kingman Crossing – I-40 to Santa Rosa Drive	Varies 143' to 117' (includes variable width median)

#### 1.3.3 Total Number of Proposed Lanes

**Table 1-2 Total Number of Proposed Lanes**

Roadway Section	Roadway Width
I-40 Mainline	2 Lanes in Each Direction (Existing)
I-40/Kingman Crossing TI Ramps	1 lane
Kingman Crossing – Airfield to I-40 (future)	4 Lanes
Kingman Crossing – At I-40 within Interchange	4 Lanes (2 SB lanes, 2 NB lanes)
Kingman Crossing – I-40 to Santa Rosa Drive	6 Lanes

#### 1.3.4 New Right-of-Way

Approximately 27.09 acres of new right-of-way, plus 1.36 acres for drainage easements and 0.92 acre for utility easements from private lands will need to be acquired.

#### 1.3.5 Access Control

Access control along Kingman Crossing Boulevard will be required; it is recommended that full access control be extended from just south of the south ramp intersection to Santa Rosa Drive on the north. North of I-40, the access control distance from the north ramp radius return to Santa Rosa Drive would be approximately 803 feet. The ADOT access control limits would extend 300 feet from the ramp radius

returns. Beyond this point, access control will need to be obtained, implemented, and preserved by the COK with a written agreement and/or through the local agency permitting process. Two exceptions would provide for right-in/right-out access drives 300 feet north of the ramp radius return to provide access to the parcels of land north of the TI on each side of Kingman Crossing Boulevard. Kingman Crossing Boulevard to the south will be terminated just south of the south ramp intersection with the access control line extending across the south leg of Kingman Crossing Boulevard. FHWA has given approval for the interim one-sided TI with the stipulation that access to parcels south of I-40 will not be allowed until the COK prepares a second COAR for approval once the connecting roadway at Louise Avenue or Southern Avenue is constructed at some time in the future.

#### 1.3.6 Curb, Gutter, Sidewalks, Bicycle Lanes, and Medians

No curb and gutter will be required on I-40 or the ramps. New curb and gutter will be used along the outside edge on Kingman Crossing Boulevard. New vertical curb will be used for the median curb on Kingman Crossing Boulevard with curb and gutter used along the low side of the superelevated section of the median south of the interchange. The Kingman Crossing Boulevard improvements will include a variable width (16-foot minimum width) raised median with concrete curb to aid in the control of access along Kingman Crossing Boulevard and to provide a greater separation between opposing traffic. Kingman Crossing Boulevard will include a 6.5-foot-wide bicycle lane in each direction.

#### 1.3.7 Striping, Marking, and Signing

Striping, marking and signing will be in accordance with the 2003 *Manual on Uniform Traffic Control Devices* (MUTCD), the Arizona Supplement to the 2003 MUTCD and the latest ADOT Traffic Engineering Policies, Guides, and Procedures Manual.

#### 1.3.8 Drainage Improvements

Preliminary offsite and onsite drainage systems have been developed for the recommended alternative and described below and are shown on the Preliminary Plan Sheets in **Appendix A**.

##### I-40 TI Drainage Offsite Design

Four culvert crossings (A-D) along I-40 located to the west of the new TI will be extended to accommodate the roadway widening of I-40 and the new west side ramps. Culvert A will only be extended on the south (inlet) side. Culverts B and C will each be extended at both ends. No changes are anticipated for the existing median drains that discharge into these culverts.

The upstream half of Culvert D (south of the median) and the inlet must be removed or abandoned in place. The upstream portion of Culvert D and the existing inlet must be removed to accommodate the new Ramp B of the interchange. The offsite flow for Culvert D will be diverted into a new offline detention basin that will be constructed upstream from Culvert C.

Seven culvert crossings (I-N) along I-40 located to the east of the new TI will each be extended at both ends. No changes are anticipated for the existing median drains that discharge into these culverts.

Culvert H must be removed, and a longer, lower culvert will be constructed to provide sufficient clearance under the new Ramps C and D.

The new TI will have the crossroad depressed under I-40. The entrance and exit ramps will rise from below existing ground, and then match existing I-40 grade. Three culvert crossings that will be cut off by the new ramps are:

- Culvert E, Station 2953+00 — Flow to be diverted via a new V-ditch (crown ditch) into new 24-inch storm drain lateral. The pipe size can be reduced because approximately half of the flow will be diverted to an offline detention basin on the east side of the TI. The existing culvert was also oversized for the existing flow.
- Culverts F and G — Culvert inflows will be diverted into a 6-foot bottom width, 2:1 side slope, riprap lined collector channel. The channel will be constructed south and above the new cut slope for Ramp D. The channel will discharge into a drop inlet for a new 48-inch diameter storm drain lateral.

### Offline Detention Basins

At the southeast corner of the new interchange, an offline detention basin with a 20-foot bottom width, 2:1 side slopes will be constructed immediately south of the new collector channel which includes a flow splitter to divert peak flows from the channel into the detention basin. The stored runoff (132,000 cubic feet) will be dissipated through a 12-inch pipe that bleeds off back into the channel, downstream of the splitter.

A new 48-inch storm drain lateral will be constructed at the outlet for the channel/detention basin.

Upstream from Culvert C, a similar collector channel will intercept the peak runoff from the watersheds for Culvert C and D. The channel will also be equipped with a splitter that diverts peak runoff into another offline detention basin with a triangular bottom, 2:1 side slopes. The stored runoff (18,300 cubic feet) will be dissipated through a 12-inch pipe that bleeds off back into the collector channel, downstream of the splitter.

That channel will discharge into Culvert C.

### I-40 TI Onsite Drainage Design

A new storm drain trunk line along Kingman Crossing Boulevard will start at the aforementioned 48-inch lateral and drain northward. The trunk line will increase up to a 60-inch diameter at the south ramp intersection. This pipe reach will have a uniform slope where it will be constructed under the existing freeway.

Collector storm drains from each new TI ramp will discharge into the trunk line. Catch basins along Kingman Crossing Boulevard will discharge into the trunk line, via 24-inch diameter laterals.

At the northern ramps, the trunk line diameter will increase to 72 inches and will continue north to the outlet northwest of the new intersection with Santa Rosa Drive.

The storm drain outfall will connect to the existing 72-inch storm drain pipe that was constructed as part of the Hualapai Medical Center project.

### Kingman Crossing Boulevard Drainage Design

Kingman Crossing Boulevard will be constructed for approximately 1,600 feet south of the I-40 centerline. This portion will match existing grade at Airfield Avenue. Roadside runoff from the new cut slopes will drain over the curb and gutter along the new roadway. The gutter flow will be intercepted by new freeway catch basins at the locations with curb and gutter. During final design, the need for slotted drain will be determined on a case by case basis. A sag curve is located at the north ramp intersection. Therefore, catch basins are recommended on both the north and south approaches to that intersection.

### Ramp Drainage Design

The ramps will each have roadside V-ditches that drain toward the ramp intersections with Kingman Crossing Boulevard. Area inlet catch basins are recommended at the downstream ends of each V-ditch.

### Median Drainage Design

At the locations Culvert E, F, and G, there are existing median drains immediately east of the existing culverts. Since these culverts are being decommissioned, the median drains will no longer have outlets. To remedy this situation, the median flows for Culverts F and G will be directed to a new median dike catch basin that will be installed just east of the new interchange cut slope. That new median drain will discharge via a lateral into the storm drain network. Any culvert or pipe to be abandoned in place shall be plugged and filled with a sand cement slurry to fill all voids.

The existing median drain for Culvert E will be removed and the median graded to drain to the median inlet at Culvert D. The north portion of Culvert D will continue to function, but only as a median drain.

### 1.3.9 Structures

The I-40 eastbound (EB) and westbound (WB) overpass structures will consist of two single-span cast-in-place and post-tensioned concrete box girder superstructures with a total span length of 210 feet. The structures will be constructed to provide for future outside widening for a third lane on I-40.

### 1.3.10 Utilities

The following utility companies have utilities within the project limits: Frontier Communication, City of Kingman, and Unisource Energy. No utility conflict are anticipated except that the Frontier Communication T1 carrier line located along the north I-40 right-of-way line will need to be relocated to the outside and along the new north I-40 right-of-way line within a new utility easement.

Future development north and south of I-40 may require locating water and sewer lines along Kingman Crossing Boulevard. Coordination with COK will be required during final design as future utility crossings are planned by the COK.

### 1.3.11 Traffic Control

It will be necessary to maintain traffic on I-40 during construction of the grade separation structures for the proposed traffic interchange and the reconstruction of Culvert H at Station 2893+04. 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. The ramps will be used to detour traffic through the construction zone to maintain two lanes of traffic in each direction. The entrance ramps would be designed as two-lane ramps to the gore areas with temporary striping to tie into I-40 traffic lanes. The exit ramps would be designed as single-lane ramps with wider shoulders to accommodate two lanes of detour traffic. Temporary pavement will be needed through the ramp intersections with Kingman Crossing Boulevard to provide a smooth transition across the intersection.

## 1.4 PROJECT OBJECTIVES

The primary objective of this study is to investigate alternatives for constructing a new TI on I-40 to provide access to and accommodate traffic volumes generated by the growing East Kingman area. Each alternative will be described and evaluated in terms of engineering feasibility, traffic service benefits, potential sensitive environmental issues, and project costs. The intent of this study is to develop the concept of the project in detail, to define the design parameters for final design, and to provide direction and scale of improvement.

## 1.5 CHARACTERISTICS OF THE CORRIDOR

### 1.5.1 Roadway Characteristics

Within the study limits, 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 eastbound and westbound roadways have a 1.5 percent left-to-right cross slope. The horizontal alignment of I-40 within the project limits is on tangent. The profile grade is approximately 1 percent. Existing I-40 pavement consists of asphalt concrete (AC) for all lanes and shoulders in both directions.

The posted speed limit on I-40 in the vicinity of the proposed interchange is 75 miles per hour (mph). The nearest adjacent interchanges on I-40 are located at Andy Devine Avenue, approximately 1.5 miles west and at DW Ranch Road, approximately 4.5 miles east. The proposed Rancho Santa Fe Parkway (RSFP) and TI is located approximately 1.5 miles east. The COK renamed Rattlesnake Wash TI and Mohave Drive to RSFP in 2009 during the design of the RSFP TI. There are no existing frontage roads in this area.

There are no existing roadway improvements along the Kingman Crossing Boulevard alignment and Airfield Avenue.

The average elevation of the study area is approximately 3,510 feet. The terrain is gently sloping and rising to the south.

The original and successor construction projects for I-40 which have occurred within the project limits are shown in **Table 1-3**.

**Table 1-3 Original and Successor Construction Projects**

Project No.	As-Built Date	Scope of Work
I-40-2(36)	1970	Grade and drain
I-40-2(77)	1979	Sign rehabilitation
I-40-2-907	1974	Scour protection
FRI-I-40-2(89)	1984	Safety improvements
IM-40-2(116)	1997	Remove and replace ACFC

### 1.5.2 Land Use

Land within the project limits is primarily privately owned, undeveloped, and rural in nature as shown in **Figure 1-2**. At the south end of the project, the land south of Airfield Avenue is owned by Arizona State Land Department; its future use has not yet been determined. The land between Airfield Avenue and I-40 on either side of Kingman Crossing Boulevard is owned by the COK and is planned for retail, office, commercial, and civic development. On the north end of the project, the land around the Kingman Crossing Boulevard and Santa Rosa Drive intersection is privately owned and is planned for retail, commercial, and residential development to the north.

### 1.5.3 Right-of-Way

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

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

### 1.5.4 Structures

The Arizona State Highway System Bridge Record indicates there are no structures within the project limits on I-40.

### 1.5.5 Utilities

There are two existing utilities within the project limits. See **Table 1-4** for a list of the utilities and their locations.

**Table 1-4 Existing Utilities**

Utility Owner	Utility Type	Location
Frontier Communication	TI carrier line	Within a 10-foot easement along the north I-40 right-of-way line
City of Kingman	12" sewer line	Located 7 feet south of the Airfield Avenue Mid-Section Line

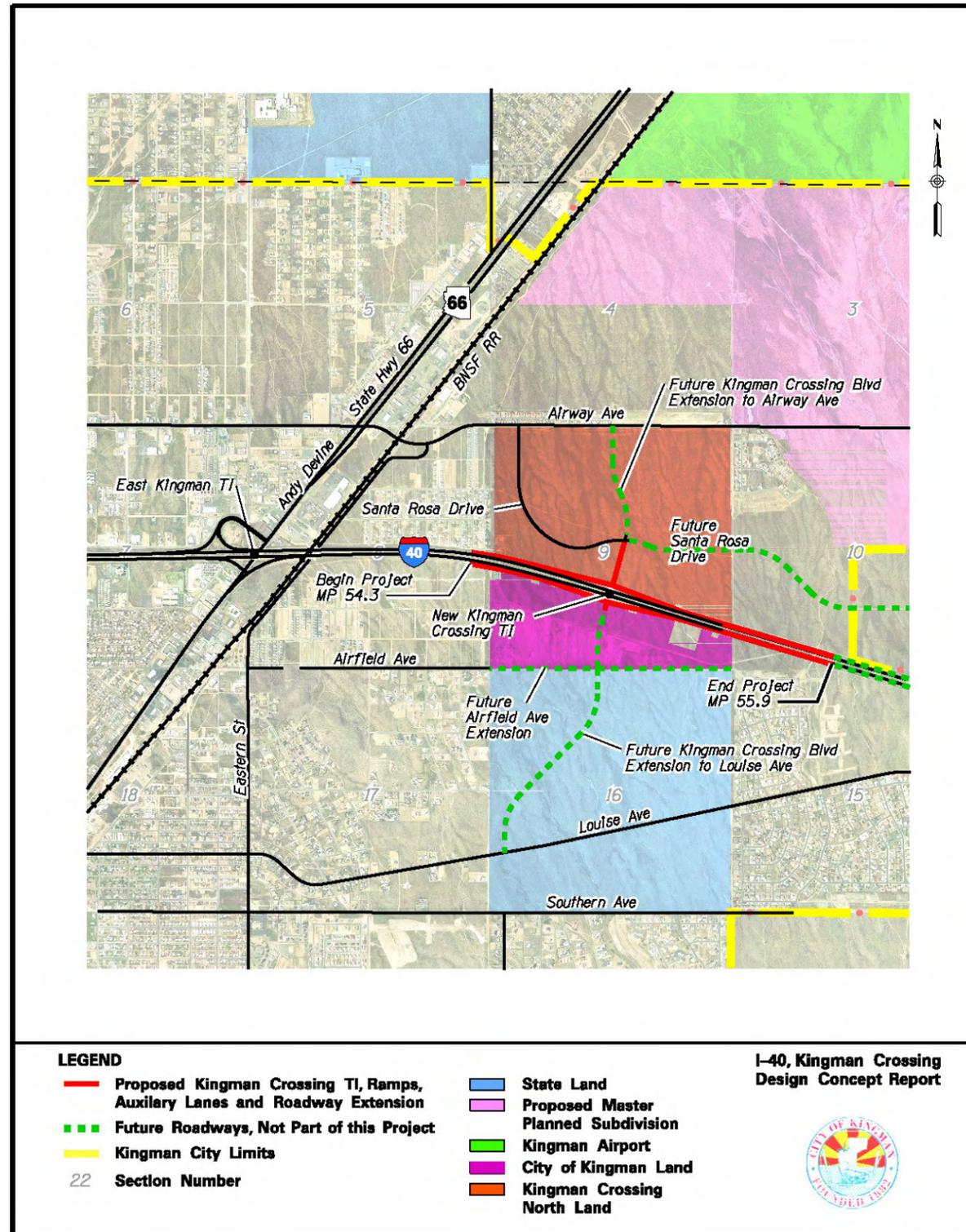


Figure 1-2 Project Overview

### 1.5.6 Existing Drainage Characteristics

The topography surrounding the project site slopes generally from south to north and rainfall runoff collects in several defined natural streambeds. There are 14 existing drainage crossings under I-40, consisting of six pipe culverts and eight concrete box culverts.

There is an existing borrow pit south of I-40 that was used during the original I-40 construction. The pit intercepts and retains the some of the drainage that would normally flow under I-40.

### 1.5.7 Proposed Projects Adjacent to Kingman Crossing TI

There is a new TI, RSFP, planned between the proposed Kingman Crossing TI and the existing DW Ranch Road TI as shown in **Figure 1-1**. The RSFP TI will be located 1.5 miles east of the Kingman Crossing TI along the RSFP section line alignment. The RSFP TI will construct a new compact diamond overpass TI with full access to I-40 and will have an arterial connection to Louise Avenue on the south side, and connections to both Airway Avenue and farther north to Industrial Boulevard. The RSFP crossroad will be depressed under I-40 with I-40 remaining at grade. Construction of the RSFP TI is programmed for FY 2014.

## 2.0 TRAFFIC AND ACCIDENT ANALYSIS

### 2.1 TRAFFIC DATA

#### 2.1.1 Existing Conditions

Interstate 40 is currently a rural divided highway with two lanes in each direction. The posted speed limit on I-40 in the vicinity of the proposed new interchange is 75 mph. Interchanges in the Kingman vicinity on I-40 are located at DW Ranch Road, Andy Devine Avenue (SR 66), Stockton Hill Road, and US 93. There are no existing frontage roads in this area.

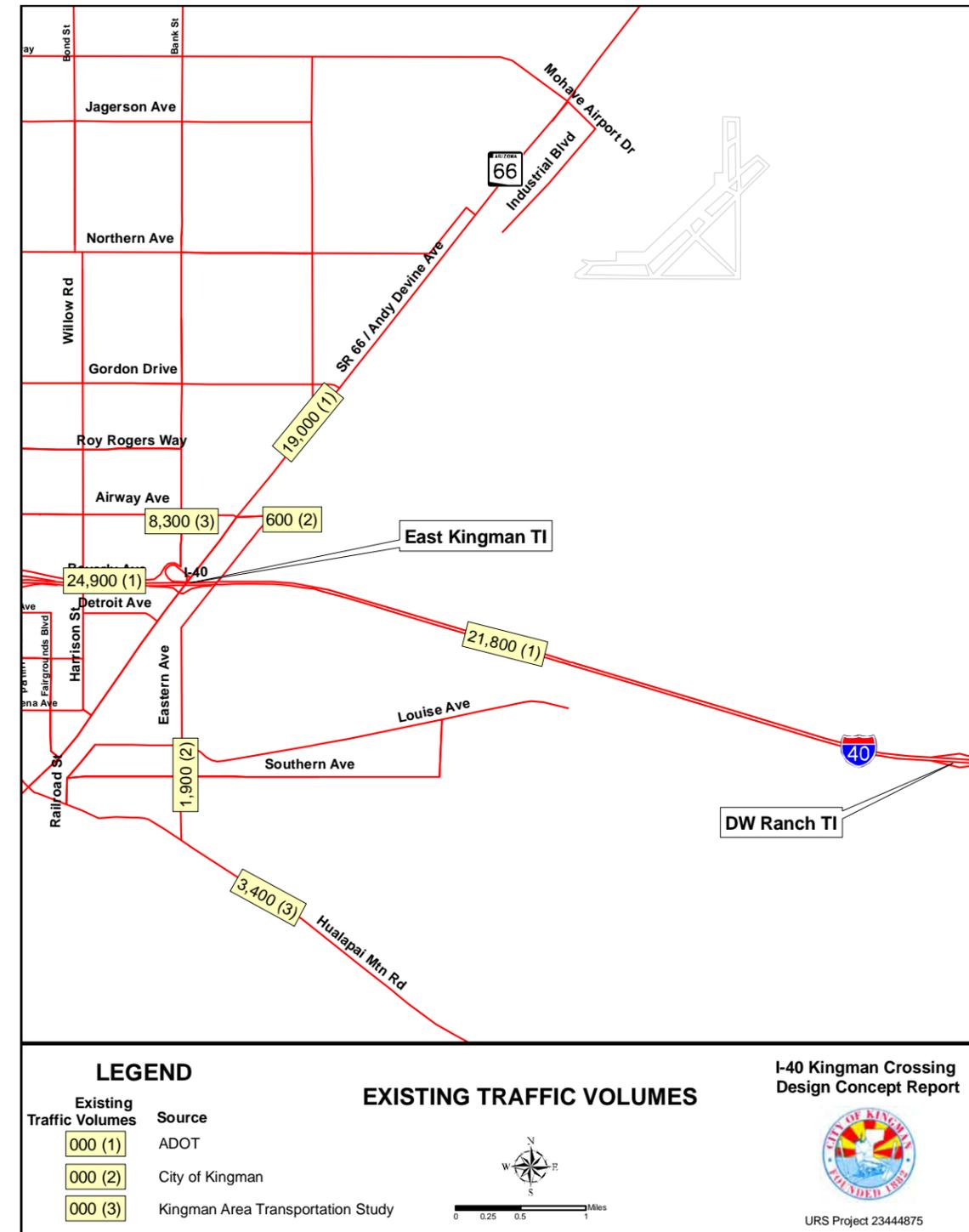
Twenty-four-hour traffic volumes along I-40 from US 93 to DW Ranch Road and Andy Devine Avenue (SR 66) for the Years 2003 to 2005 are shown in **Table 2-1**. The Year 2005 average annual daily traffic (AADT) volume for I-40 from US 93 to DW Ranch Road ranged from 36,900 to 21,800 vehicles per day.

**Table 2-1 I-40 and SR 66 Average Daily Traffic (Years 2003-2005)**

Route	From	To	Segment Length (miles)	AADT 2003	AADT 2004	AADT 2005
I-40	Exit 48, US 93 / SB40 / Beale Street	Exit 52, Stockton Hill Road	2.82	29,300	32,300	36,900
I-40	Exit 52, Stockton Hill Road	Exit 53, SR 66 / SB 40	1.39	23,700	24,400	24,900
I-40	Exit 53, SR 66 / SB 40	Exit 59, DW Ranch Road	6.57	19,900	20,000	21,800
SR 66	I-40 (Exit 53)	Mohave Airport Drive	4.48	17,000	20,400	19,000

Source: <http://tpd.azdot.gov/datateam/documents/SHSAADT0305.xls>

Figure 2-1 shows the existing traffic volumes for selected streets in the study area.



**Figure 2-1 Existing Daily Traffic Volumes**

## 2.2 TRAVEL FORECASTING MODEL

The I-40, Kingman Crossing TI Study builds upon the transportation model developed for the Kingman Area Transportation Study (KATS). The socioeconomic data and roadway network in the model were updated to the Year 2030 for this study, which includes the proposed Kingman Crossing TI and Kingman Crossing Boulevard. The proposed roadway improvements and modifications were based on an analysis of volumes extracted from the updated Year 2030 version of the KATS travel demand model.

### 2.2.1 Year 2030 KATS Model

The KATS model was originally developed for a forecast year of 2023. The socioeconomic data were updated to the Year 2030 for this study. The COK provided updated land use plans and development plans, serving as the basis for updating from 2023 to 2030. Overall the population estimate went from 77,748 (KATS Year 2023 estimate) to an estimated 100,166 for the Year 2030. This is approximately a 29 percent increase or a growth rate of just under 4 percent per year, which is the same growth rate used in the original KATS study.

The model roadway network was also updated for this study. The original 2023 network, updated to Year 2030, served as the No Build alternative, and a Year 2030 Build alternative was developed to evaluate traffic on I-40, the Kingman Crossing TI, Kingman Crossing Boulevard, and the proposed RSFP (Rattlesnake Wash) TI and RSFP (Mohave Drive).

The No Build alternative uses the original 2023 network with minor network updates for the Year 2030.

The Build alternative model contains the Kingman Crossing TI and the proposed RSFP TI at RSFP.

### 2.2.2 Year 2030 Daily Volumes

The updated KATS model was run with the new socioeconomic data and networks. The total Year 2030 daily volume output from these model runs is shown in the figures below. **Figure 2-2** shows the Year 2030 daily volumes for the No Build condition, and **Figure 2-3** shows the Year 2030 daily volumes for the Build alternative condition.

**Figure 2-3** shows:

- The addition of the Kingman Crossing TI reduces traffic on Andy Devine, Airway Avenue (east of Eastern Avenue), and Southern Avenue. The largest volume decreases occur on Andy Devine Road and on Airway Avenue (east of Diamond Street), indicating that the additional connection to I-40 provides an attractive alternate east-west route to these roads.
- There is a substantial difference in traffic volumes on Kingman Crossing Boulevard north and south of Santa Rosa Drive. Traffic volumes are about twice as high on Kingman Crossing Boulevard south of Santa Rosa Drive, indicating Santa Rosa Drive offers favorable local access and serves future development to and from the interchange.

## 2.3 YEAR 2030 PEAK HOUR VOLUMES

The total daily volume output was taken from the modified KATS model and used to develop peak hour turning movements on Kingman Crossing Boulevard and I-40. The AM and PM peak hours were each assumed to carry 10 percent of the total daily volume; this assumption was used in the previous Kingman Area Transportation Study and modeling effort. The model itself does not assign directional information for the peak hours of traffic. Therefore, peak directional percentage splits were assumed for each peak hour on Kingman Crossing Boulevard and at the interchanges, as shown in **Figure 2-4**.

### 2.3.1 Kingman Crossing TI

For the Kingman Crossing TI, AM peak directions of southbound and westbound were assumed with a 55 percent split in the peak direction. In the PM peak hour for both scenarios the assumed directional splits were reversed from what they were in the AM peak hour. This methodology was consistent with the I-40, RSFP TI Traffic Report.

- At the Kingman Crossing TI, a 55/45 split was assumed favoring traffic from nearby residential areas toward employment in Kingman and areas west and south (most Kingman Airport and Airport Industrial Park-related traffic will use the RSFP TI).
- On Kingman Crossing Boulevard, a 55/45 directional split was assumed in the AM towards I-40, with the same split in the PM away from I-40. This reflects the commuter nature of traffic from work to home, as shown in **Figure 2-4**.

### 2.3.2 I-40 Freeway

The final AM and PM peak hour volumes on I-40 were developed by starting with the volumes for the upstream end of the freeway. Then the ramp entering and exiting volumes were added and subtracted to develop I-40 volumes further downstream.

## 2.4 YEAR 2030 PEAK HOUR TURNING MOVEMENTS

After developing peak hour link volumes and directional splits, these volumes were input into a spreadsheet using the methodology outlined in *National Cooperative Highway Research Program (NCHRP) Report 255*. Some slight modifications were made to the through traffic volume so that the volumes would balance between intersections.

The final turning movements for the Build Alternative are shown in **Figure 2-5**.

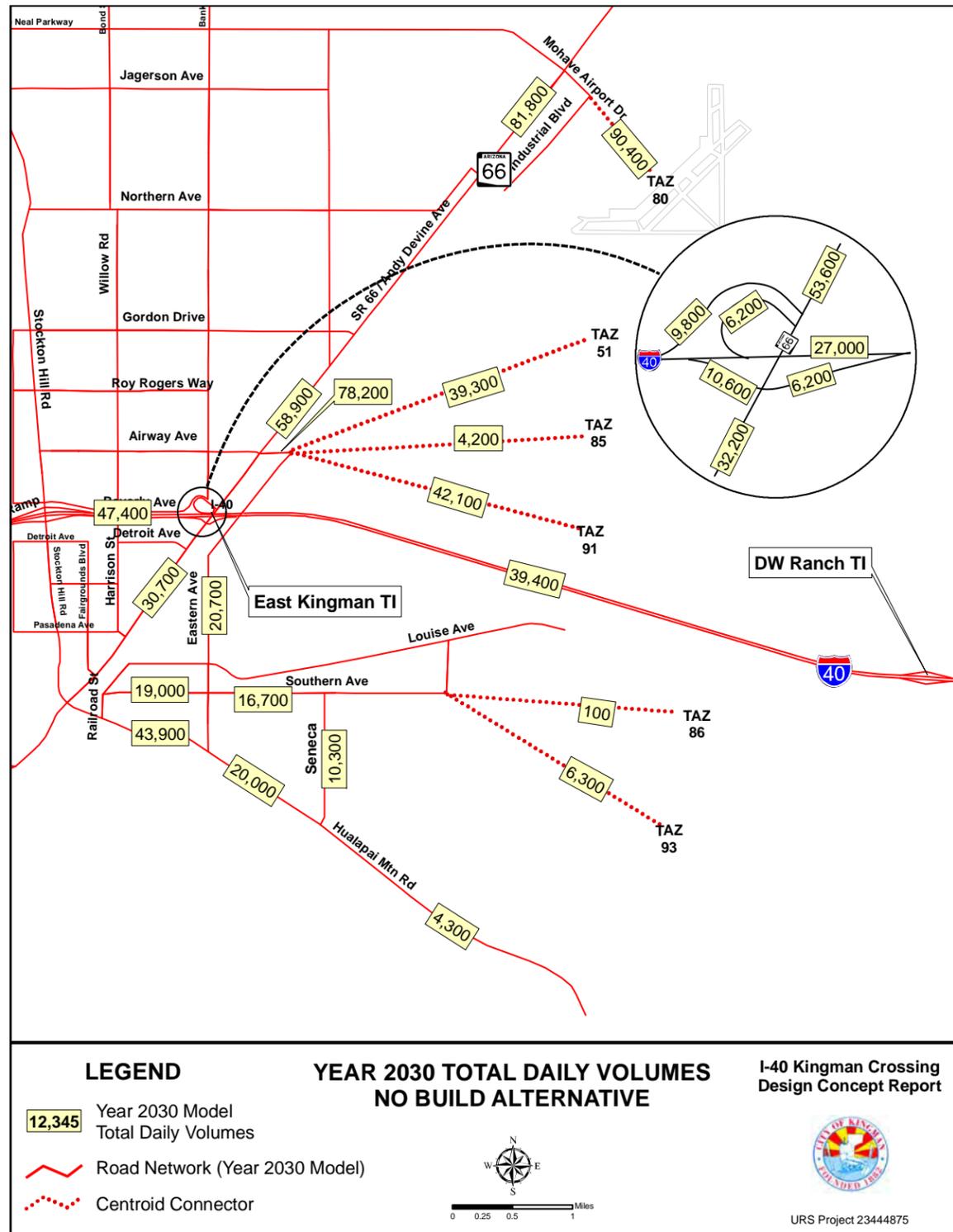


Figure 2-2 Year 2030 Daily Traffic Volumes: No Build Alternative

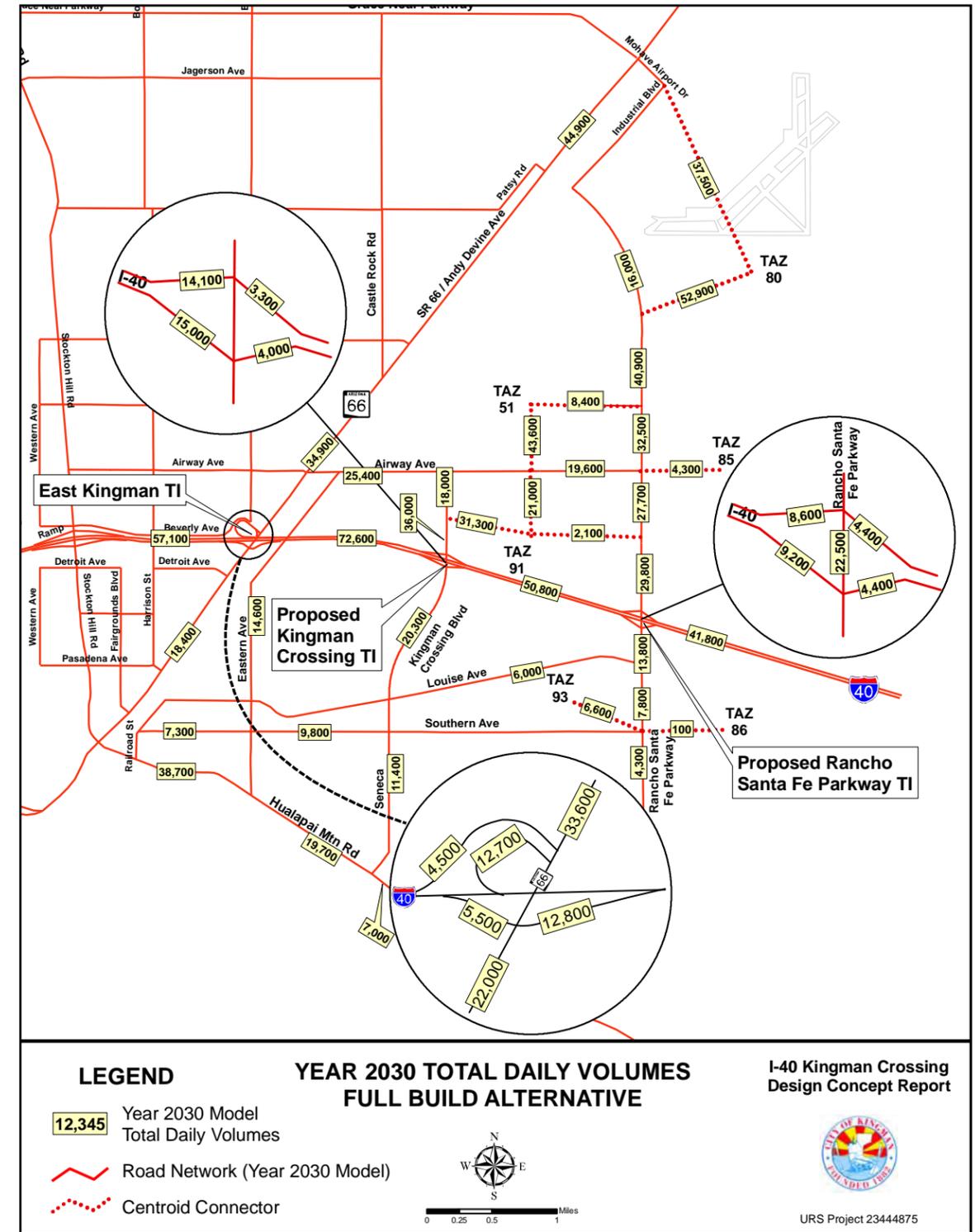


Figure 2-3 Year 2030 Daily Total Volumes: Build Alternative

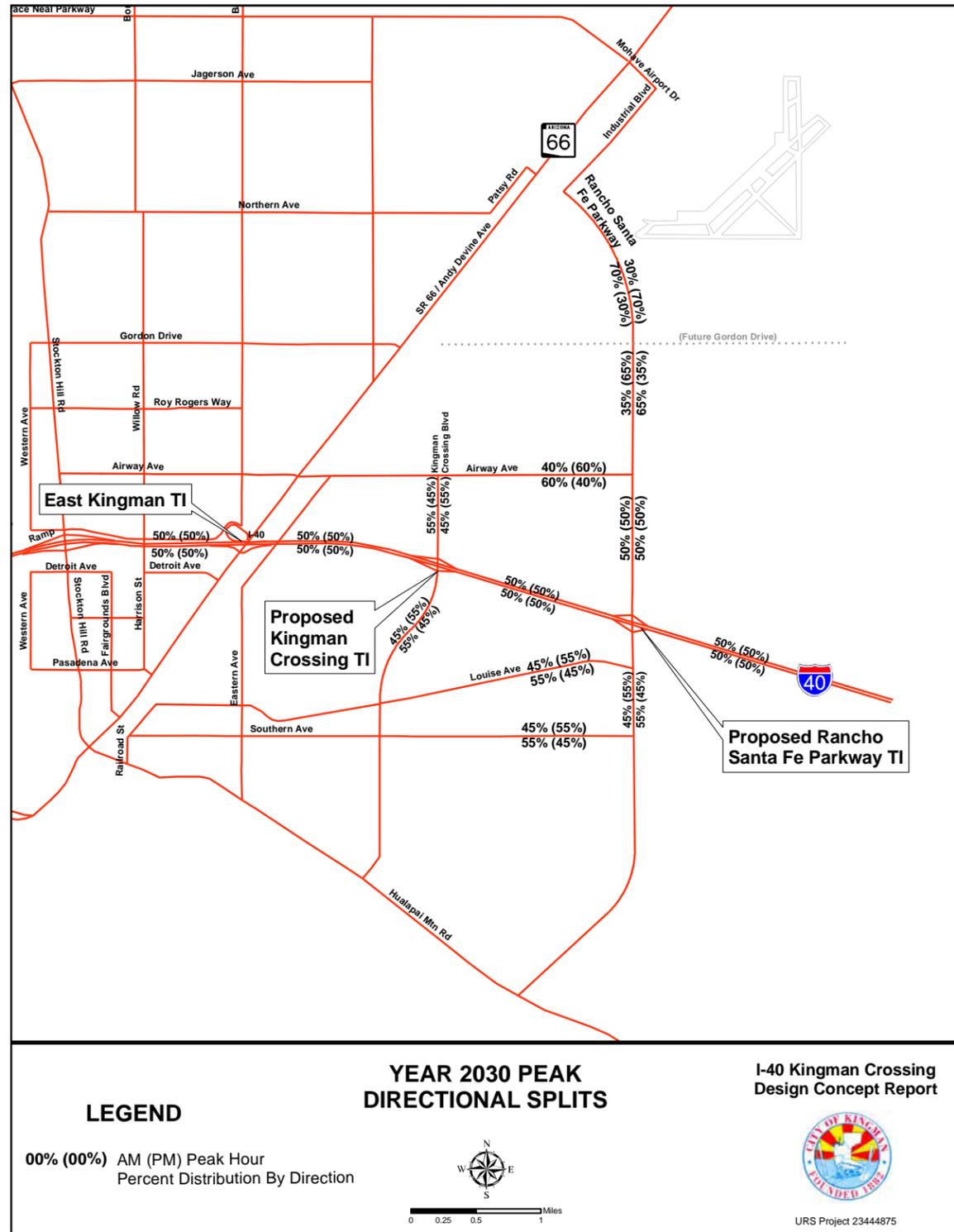


Figure 2-4 Year 2030 Peak Directional Splits

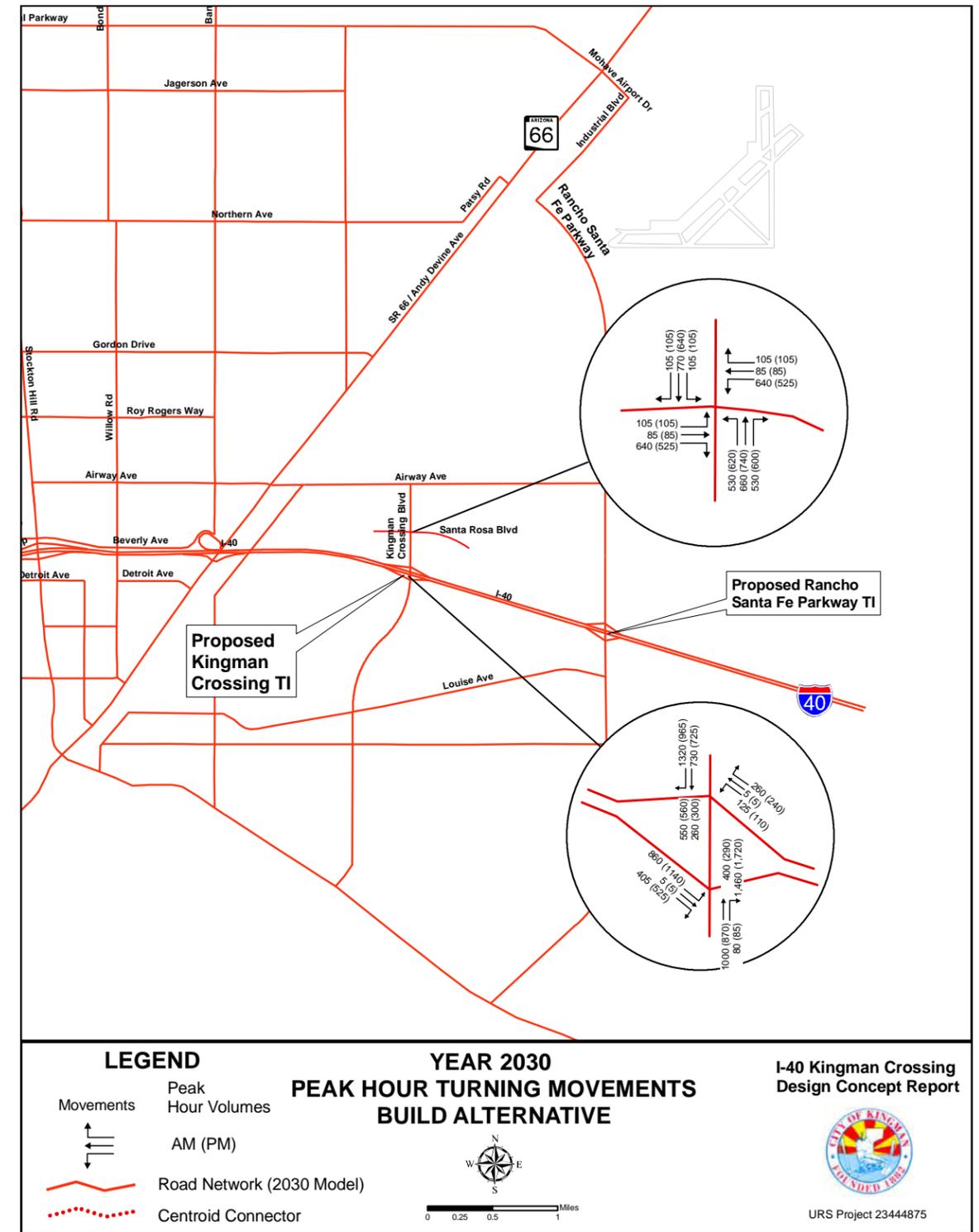


Figure 2-5 Year 2030 Peak Hour Turning Movements: Build Alternative

## 2.5 TRAFFIC OPERATIONAL ANALYSIS

### 2.5.1 Year 2030 Kingman Crossing Boulevard Level of Service

Using the turning movement volumes, peak hour level of service (LOS) analysis was conducted. For a signalized intersection, the *Highway Capacity Manual* (HCM), published by the Transportation Research Board, considers the average delay per vehicle to determine the LOS. LOS is calculated for each approach, each turning movement, and for the intersection as a whole. The LOS criteria for signalized intersection control are displayed in **Table 2-2**. The calculations of the average delay and LOS were performed using Synchro 6 software.

**Table 2-2 Level of Service Criteria for Signalized Intersections**

Intersection Control	Level-of-Service	Average Delay (seconds/vehicle)
Signalized	A	≤ 10
	B	> 10-20
	C	> 20-35
	D	> 35-55
	E	> 55-80
	F	> 80

The Kingman Crossing TI was modeled as a tight diamond interchange, and the cross street (Kingman Crossing Boulevard) was analyzed as a 4-lane facility, consistent with the Kingman Area Transportation Plan. The predominant direction of travel was from southbound Kingman Crossing Boulevard, to westbound I-40 in the AM Peak Hour, and the reverse movement in the PM Peak hour. Peak hour operations were analyzed in Synchro 6.0 software, which uses the HCM methodologies. A cycle length of 90 seconds was chosen. The target LOS for 2030 design was LOS D for all traffic movements. Using the turning movement volumes, peak hour LOS analysis was conducted.

The LOS for each of the signalized intersections on Kingman Crossing Boulevard was calculated and the results are shown below in **Table 2-3**. The Kingman Crossing TI will perform adequately as a tight-diamond interchange.

All movements and intersections function at a LOS D or better. The LOS results at these ramp intersections shows acceptable operation at the interchange.

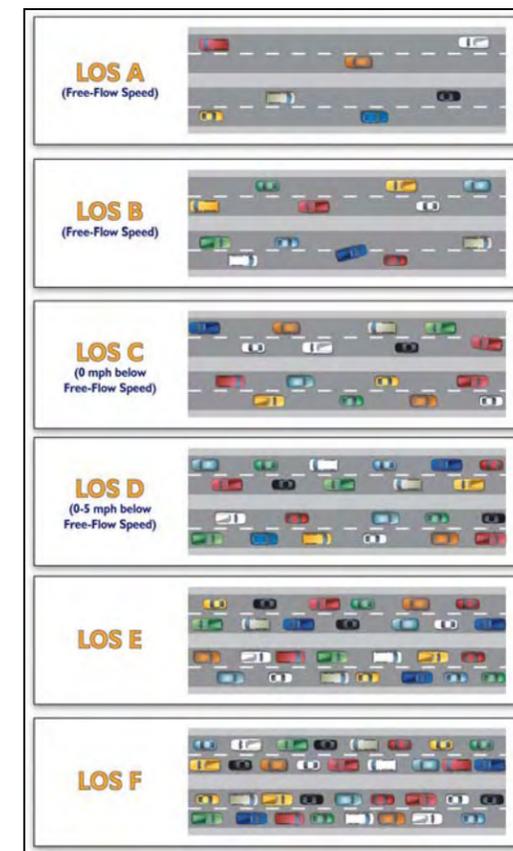
**Table 2-3 Year 2030 AM and PM Peak Hour LOS and Average Delay Results for Build Alternative**

Intersection	AM, by Approach					PM, by Approach				
	EB	WB	NB	SB	Total (LOS/Delay)	EB	WB	NB	SB	Total (LOS/Delay)
Kingman Crossing Boulevard / I-40 Westbound Ramps	-	B	A	B	B / 14.0	-	B	A	A	A / 6.7
Kingman Crossing Boulevard / I-40 Eastbound Ramps	C	-	C	B	B / 24.7	C	-	C	C	C / 26.3
Kingman Crossing Boulevard / Santa Rosa Drive	A	D	C	C	C / 27.6	A	C	C	C	C / 22.3

### 2.5.2 I-40 Freeway Level of Service

Freeway level of service is determined by the density of vehicles in the freeway section area.

**Figure 2-6** illustrates operating characteristics of the freeway at each LOS.



**Figure 2-6 Typical Congestion Levels at Each LOS Grade**

Freeway level of service on I-40 was analyzed for existing conditions and for year 2030 conditions based on the HCM methodology using the HCS+ software.

### 2.5.3 I-40 Level of Service – Existing Conditions

Year 2005 average annual daily traffic (AADT) volumes for I-40 between Stockton Hill Road and DW Ranch Road were obtained from the ADOT website. Using these AADT volumes, the peak hour volumes were determined assuming a directional split of 51 percent westbound in the AM peak hour, a peak-hour to AADT ratio (K) of 9 percent, and a truck factor of 15 percent (based on 2004 Highway Performance Monitoring System [HPMS] data for I-40). Assuming a free-flow speed (FFS) of 65 mph and using the generated peak hour volumes and the procedures outlined in the *Highway Capacity Manual* (HCM) for basic freeways, the mainline I-40 level-of-service (LOS) was determined as shown in **Table 2-4**.

**Table 2-4 I-40 Mainline Level-of-Service (Year 2005)**

I-40 Mainline			2005 AADT <sup>1</sup>	Freeway Peak-Hour Volume <sup>2</sup>	Freeway LOS
From	To	Direction		Pcphpl (AM/PM)	(AM/PM)
Exit 53, SR 66 / SB 40	Exit 59, DW Ranch Road	EB	21,800	543 / 566	A / A
Exit 59, DW Ranch Road	Exit 53, SR 66 / SB 40	WB		566 / 543	A / A
Exit 52, Stockton Hill	Exit 53, SR 66 / SB 40	EB	24,900	601 / 578	A / A
Exit 53, SR 66 / SB 40	Exit 52, Stockton Hill	WB		578 / 601	A / A

(1) Source: <http://tpd.azdot.gov/datateam/documents/SHSAADT0305.xls> (includes both freeway directions)

(2) Assuming a free-flow speed of 65 mph, a directional split of 51 percent westbound in the AM peak hour, a peak-hour to AADT ratio (K) of 9 percent, and a truck factor of 15 percent, based on 2004 Highway Performance Monitoring System data for I-40.

Existing ramp operation for both the merge and diverge conditions during the AM and PM peak hours at the East Kingman TI all operate at LOS B.

During the Year 2005 peak hours, the I-40 mainline between Exit 52 and Exit 59 is operating at LOS A and is experiencing no problems.

### 2.5.4 I-40 Level of Service – Year 2030

2030 Freeway level of service on I-40 was analyzed for both model scenarios based on the HCM using the HCS+ software. The following assumptions were used in the HCS+ software:

- Peak hour factor = 0.95
- Heavy vehicle percentage = 20 percent
- I-40 free-flow speed = 65 mph
- Ramp free-flow speed = 45 mph
- Length of deceleration lane = 1,300 feet
- Distance between interchange ramps (gore to gore)
  - East Kingman (Andy Devine) TI to Kingman Crossing TI = 6,300 feet (westbound), 5,000 feet (eastbound)
  - Kingman Crossing TI to RSFP TI = 5,200 feet
- I-40 number of lanes = 4
- Lane widths = 12 feet
- Shoulder Widths = Ideal

**Figure 2-7** shows the level of service results and corresponding volumes for the Build alternative. The target LOS for design was LOS C. The distance between interchanges was large enough that weaving was not a consideration. Most of the freeway sections work acceptably, with a LOS C or better, except between the Kingman Crossing TI and the East Kingman TI.

All of the RSFP TI ramp junctions and the east side Kingman Crossing TI ramp junctions work acceptably, with LOS C or better. The west side Kingman Crossing ramp junctions operate at LOS D. The East Kingman TI ramp junctions operate at LOS D or E, except the westbound on-ramp which operates at LOS C.

For the Build alternative, the Kingman Crossing TI increases the demand on I-40. West of the Kingman Crossing TI, I-40 operates at LOS E during the AM peak hour westbound, and both peak hours during the PM peak hour eastbound, with the existing interstate configuration. This is due to the large volume entering and exiting on the west side ramps. Freeway and ramp merge/diverge operations improve to LOS C with the addition of an auxiliary lane in both directions, connecting the Kingman Crossing ramps to the ramps at the East Kingman TI, or by the addition of a third through lane in each direction.

For the No Build alternative, freeway and ramp operations on I-40 and at the East Kingman TI ramps operate at LOS C or better. This condition exists because there is no access to I-40 east of the East Kingman TI and mobility is constrained to city streets.

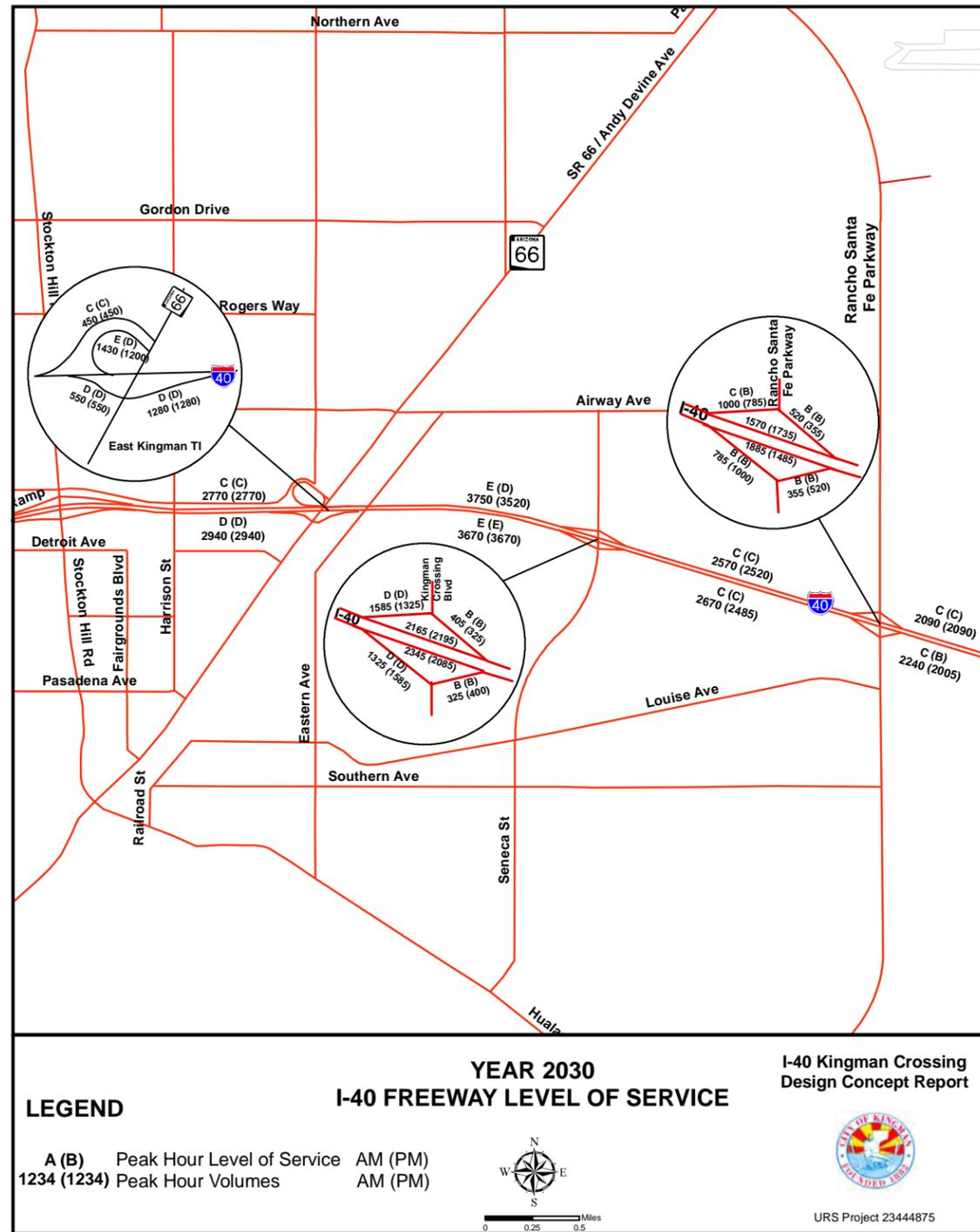


Figure 2-7 Year 2030 I-40 Freeway Level of Service – Build Alternative

### 2.5.5 Projected Future Need for I-40 Improvements

For this project, the analysis revealed that I-40 between Kingman Crossing TI and East Kingman TI is at the threshold LOS E for the 2030 design year. Further analysis was performed in order to identify improvements and a time line for these improvements. The analysis focused on only those freeway segments projected to operate at LOS D or worse. The results of the LOS analysis and the projected target year requiring improvements to achieve LOS C (or better) is shown in **Table 2-5** below.

**Table 2-5 Build Alternative, Projected Improvement Year**

I-40 Segment	AM	PM
East Kingman TI EB Merge	2026	2026
Freeway EB East Kingman TI to Kingman Crossing TI	2026	2026
Kingman Crossing TI EB Diverge	2026	2026
Kingman Crossing TI WB Merge	2026	2026
Freeway WB Kingman Crossing TI to East Kingman TI	2026	2026
East Kingman TI WB Diverge	2026	2026
Freeway EB Stockton Hill to East Kingman TI	2029	2029
East Kingman TI EB Diverge	2029	2029

An estimation of the target year that would require improvements to I-40 west of the Kingman Crossing TI to the East Kingman TI to achieve LOS C is 2026. There was some slight variation in the analysis of the freeway for the east and westbound directions that showed the westbound portion of the freeway will require upgrading first, followed by the eastbound portion of I-40. However, the threshold LOS for both segments is very similar, and will most likely require freeway improvements at the same time.

### 2.5.6 State Planned Improvements for I-40

Based on ADOT's MoveAZ 20-year long-range transportation plan, I-40 will be widened from two lanes to three lanes in each direction within the study area. Prioritization of these planned improvements identified in this report will satisfy the LOS C operational requirement for both mainline and ramps within the study area. The projected target year requiring a third lane in each direction to achieve LOS C (or better) is 2026 for the Build Alternative. **Figure 2-8** shows the Year 2030 LOS with three lanes in each direction.

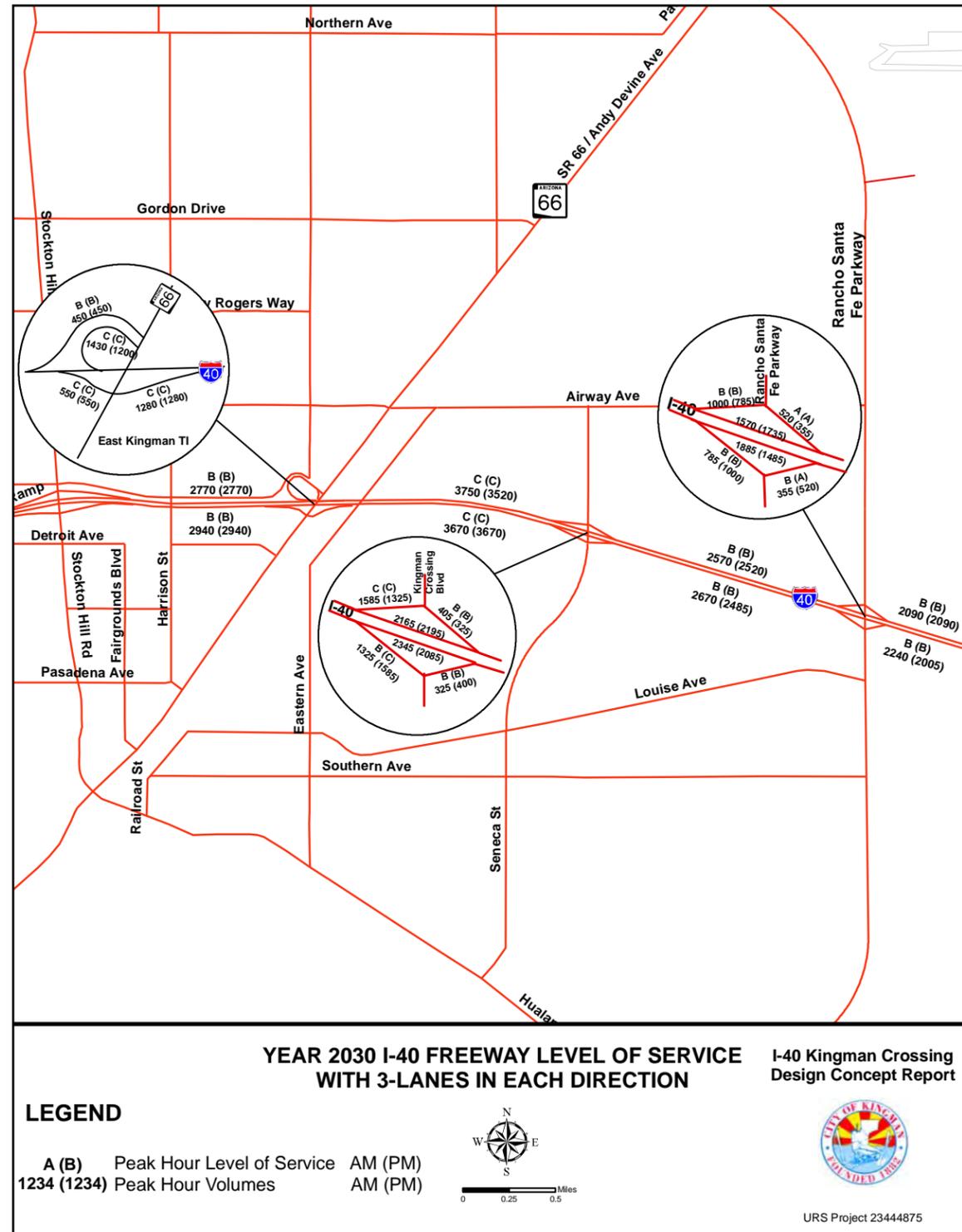


Figure 2-8 Year 2030 I-40 Freeway Level of Service with Three Lanes in Each Direction

## 2.6 ACCIDENT ANALYSIS

Collision data along I-40 from the Andy Devine TI (MP 53) to the DW Ranch TI (MP 59) were obtained from the ADOT Traffic Records Branch for the period from February 1, 2003 to January 31, 2006. These data include the collision manner, collision type, and collision severity. Summaries of the collision type are shown in **Table 2-6**.

Table 2-6 Collision Type Summary

Collision Type	Year			Total	Percent
	2003	2004	2005		
Collision with Other Motor Vehicle	14	2	1	17	42.5%
Overtuning	3	3	5	11	27.5%
Breakage – Part of Vehicle	1	2	1	4	10.0%
Object in Roadway	0	2	0	2	5.0%
Collision with Guardrail	2	0	0	2	5.0%
Collision with Median	1	0	0	1	2.5%
Crossover	0	0	1	1	2.5%
Collision with Curb	0	0	1	1	2.5%
Object Dropped	0	1	0	1	2.5%
<b>Total</b>	<b>21</b>	<b>10</b>	<b>9</b>	<b>40</b>	<b>100.0%</b>

Seventeen (42.5 percent) of the 40 collisions involved other motor vehicles and 11 (27.5 percent) were overturning collisions. These two collision types account for 70 percent of the total collisions over this time period. Summaries of the collision manner are shown in **Table 2-7** below.

Table 2-7 Collision Manner Summary

Collision Manner	Year			Total	Percent
	2003	2004	2005		
Single Vehicle	6	6	7	19	47.5%
Rear End	9	1	1	11	27.5%
Sideswipe (same direction)	3	1	0	4	10.0%
Head-On	2	2	0	4	10.0%
Other	1	0	1	2	5.0%
Angle	0	0	0	0	0.0%
Left-Turn	0	0	0	0	0.0%
Non-Contact (non-motorcycle)	0	0	0	0	0.0%
Sideswipe (opposite direction)	0	0	0	0	0.0%
U-Turn	0	0	0	0	0.0%
<b>Total</b>	<b>21</b>	<b>10</b>	<b>9</b>	<b>40</b>	<b>100.0%</b>

Data from February 1, 2003 to January 31, 2006.  
 Source: ADOT Traffic Records Branch

As shown in **Table 2-7**, Collision Manner Summary, 19 (47.5 percent) of the 40 collisions were single vehicle type collisions and 11 (27.5 percent) were rear-end crashes. These two collision types account for 75 percent of the total collisions/crashes along this 6-mile section of I-40 during this time period. Summaries of the collision severity are shown in **Table 2-8** below.

**Table 2-8 Collision Severity Summary**

Year	Total Collisions	Number of		
		Vehicles	Injuries	Fatalities
2003	21	36	16	4
2004	10	14	5	0
2005	9	11	10	0
<b>Total</b>	<b>40</b>	<b>61</b>	<b>31</b>	<b>4</b>

Data from February 1, 2003 to January 31, 2006.  
Source: ADOT Traffic Records Branch

A total of 61 vehicles were involved in the 40 collisions along I-40 from February 1, 2003 to January 31, 2006. A total of 4 fatalities and 31 injuries occurred during this same time period.

## 2.7 TRAFFIC STUDY RECOMMENDATIONS

### 2.7.1 Kingman Crossing Boulevard

Recommended intersection configurations and number of through lanes were based on the Synchro 6 LOS analysis, and the requirement that intersections function at a LOS of D or better for all movements for the 2030 design year. The analysis indicated that Kingman Crossing Boulevard would require four through lanes (two lanes in each direction) between the I-40 ramps, consistent with the KATS. However, due to the high amount of traffic, Kingman Crossing Boulevard will require three lanes in each direction north of I-40, from the I-40 westbound ramps to Santa Rosa Drive (see **Figure 2-9**).

The interchange demonstrated adequate operations as a tight-diamond interchange. All of the intersections on Kingman Crossing Boulevard operate at LOS D or better. The intersection configurations on Kingman Crossing Boulevard at the Kingman Crossing TI, and at Santa Rosa Drive are shown in **Figure 2-10**.

At Kingman Crossing interchange, two left-turn lanes are recommended for each direction on Kingman Crossing Boulevard at the ramp intersections due to the somewhat large left-turn volumes. Typically, left-turning movement volumes that exceed 300 vehicles per hour warrant an additional lane. In this case, double left-turn lanes are warranted based on the operation of the critical movements within the intersection, and the shared assignments of green time necessary to maintain acceptable operations.

### 2.7.2 Santa Rosa Drive

The recommended intersection configuration and number of through lanes were based on the Synchro 6 LOS analysis, and the requirement that intersections function at a LOS of D or better for all movements for the 2030 design year.

At the intersection of Kingman Crossing Boulevard, northbound to westbound double left-turn lanes will be required on Kingman Crossing Boulevard as shown in **Figure 2-10**, and double left-turn lanes will be required westbound to southbound on Santa Rosa Drive.

Santa Rosa Drive is expected to carry a large amount of traffic to and from Kingman Crossing Boulevard, mostly destined to and from the Kingman Crossing TI. In order to acceptably serve the high amount of turning traffic, Santa Rosa Drive will require two lanes in both the eastbound and westbound directions on each side of its intersection with Kingman Crossing Boulevard. These lanes can be tapered down to one lane in each direction once a local access plan is established to adjacent development on Santa Rosa Drive.

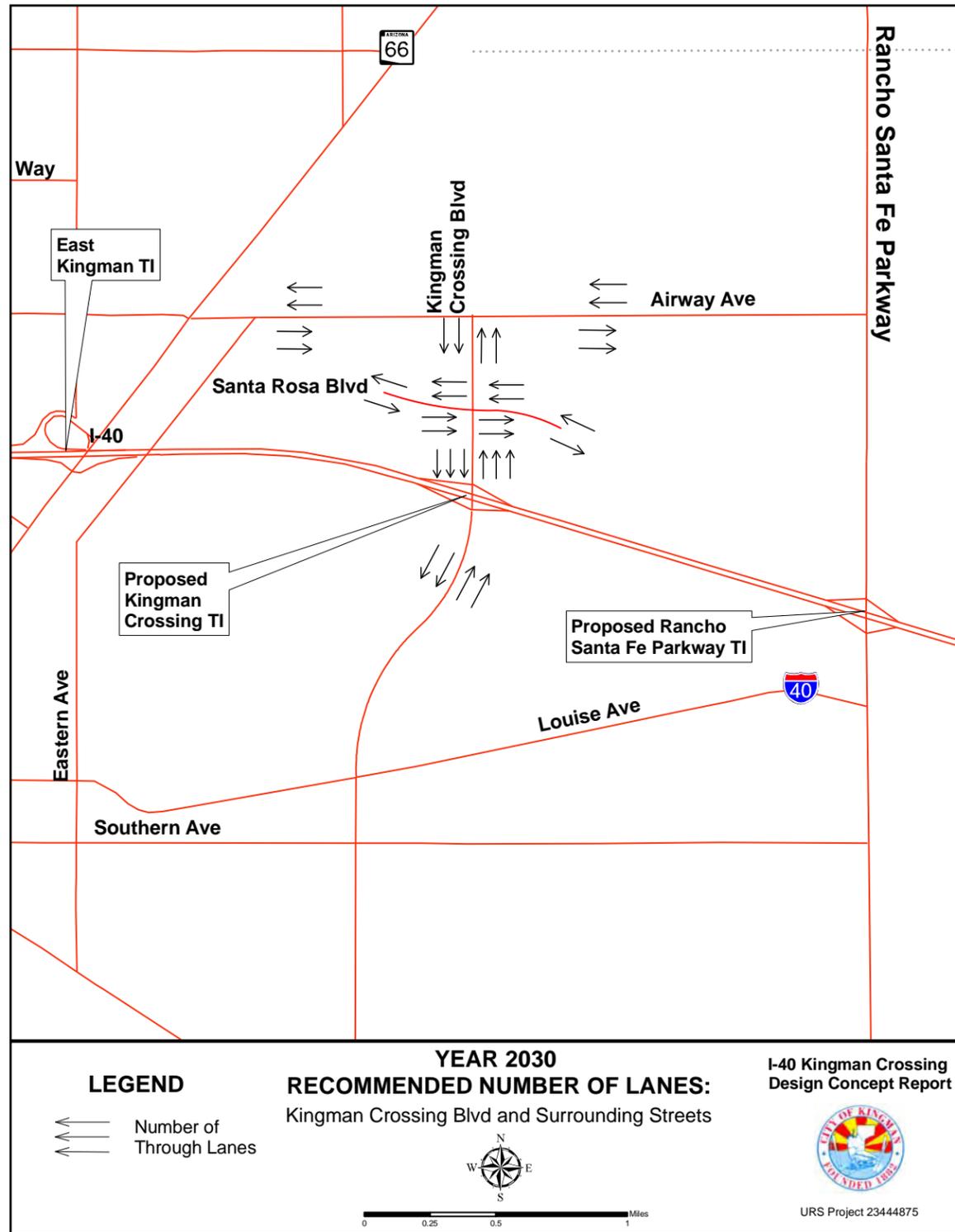


Figure 2-9 Year 2030 Recommended Number of Lanes: Kingman Crossing Boulevard and Surrounding Streets

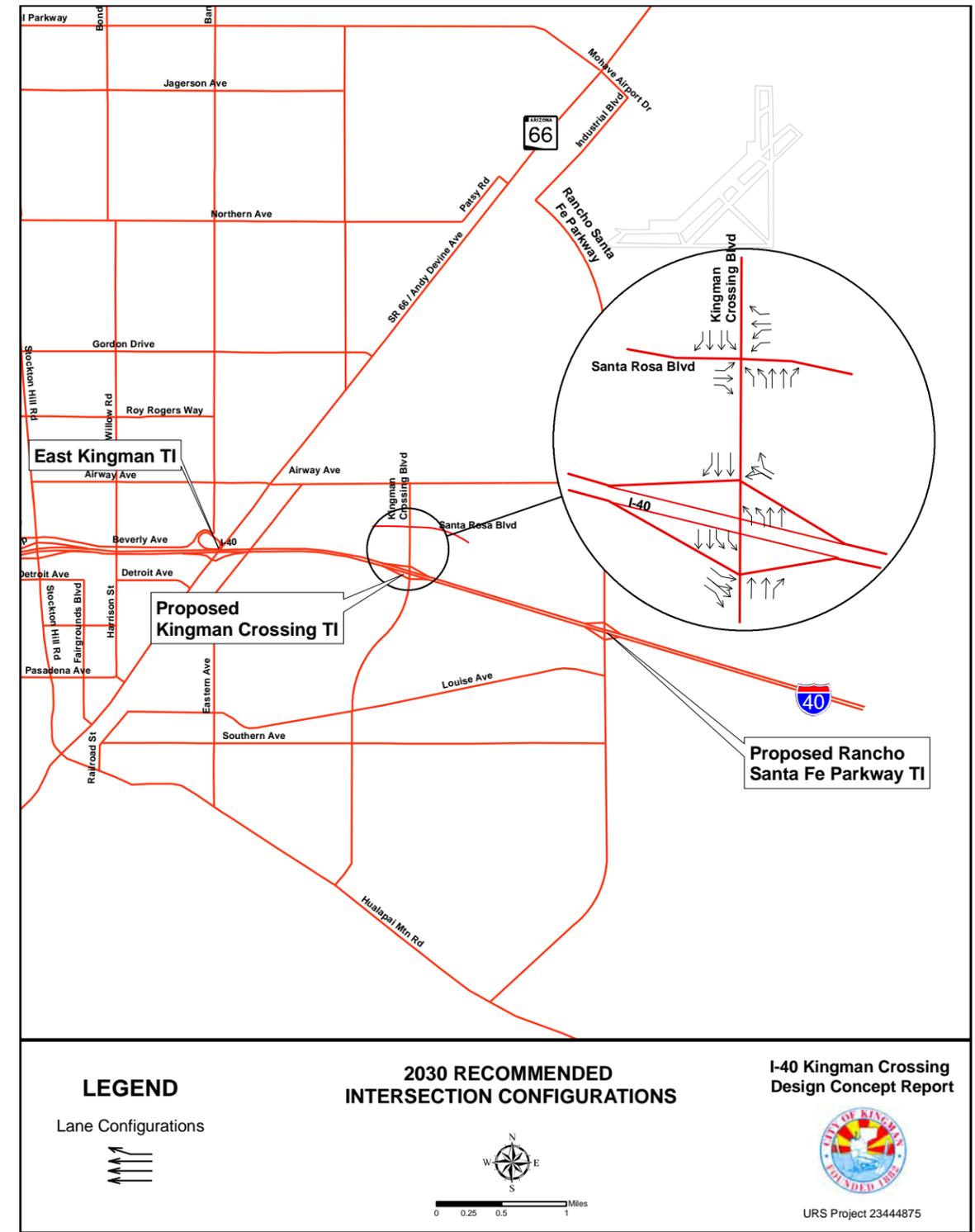


Figure 2-10 Year 2030 Recommended Kingman Crossing Boulevard Intersection Configurations

### 2.7.3 Kingman Crossing Traffic Interchange

The following items summarize the design recommendations for the Kingman Crossing TI:

- Kingman Crossing Boulevard between the I-40 ramps will require two through lanes and two left-turn lanes southbound, and two through lanes with two left-turn lanes northbound.
- Because of the high volume of southbound right-turning traffic at the Kingman Crossing TI westbound ramps, an additional acceleration lane is recommended on the on-ramp to better serve this traffic as a free flow right turn without stopping and then merging into the ramp traffic. Therefore, three lanes will be needed on the ramp, tapering to two lanes, and then one lane prior to the I-40 merge condition.

The length of the turn bays at the Kingman Crossing TI cross street and at the intersection of Kingman Crossing Boulevard and Santa Rosa Drive were estimated based on the length of the 95<sup>th</sup> percentile queue using Synchro 6.0. **Table 2-9** shows the recommended turn bay lengths for the two left-turn lanes on Kingman Crossing Boulevard at the Kingman Crossing TI. **Table 2-10** shows the recommended turn bay lengths for the intersection of Kingman Crossing Boulevard and Santa Rosa Drive.

**Table 2-9 Recommended Turn Bay Lengths at the Kingman Crossing TI**

Movement	AM/PM Peak Hour Volume (vph)	Recommended Length (ft)
NB Left @ EB & WB Ramps	400/290	255
SB Left @ WB & EB Ramps	260/300	200
EB Left (ramp)	860/1140	755
WB Left /Thru (ramp)	130/115	285

**Table 2-10 Recommended Turn Bay Lengths for the Kingman Crossing Boulevard and Santa Rosa Drive Intersection**

Movement	AM/PM Peak Hour Volume (vph)	Recommended Length (ft)
EB Left	105/105	150
WB Left	640/525	350
WB Right	105/105	100
NB Left	530/620	350
SB Left	105/105	150
SB Right	105/105	100

### 2.7.4 I-40 Freeway

Freeway LOS was analyzed in HCS+ based on the peak hour segment volumes developed from the model and assumed directional splits. The model showed large numbers of vehicles entering and exiting on the east side at the East Kingman (Andy Devine) TI, indicating I-40 will be used for both local and regional access. The number of lanes required is shown in **Figure 2-11**. The following discusses the recommended improvements between adjacent TIs.

#### Stockton Hill TI to East Kingman TI Segment:

For the 2030 condition, the eastbound freeway segment between the Stockton Hill TI and the East Kingman TI is expected to experience LOS D. The threshold LOS D operation is projected to occur in the year 2029. In order to maintain LOS C, this portion of I-40 will need to be widened to three lanes in both directions. ADOT will evaluate the need for auxiliary lanes between the Stockton Hill TI and the East Kingman TI when scoping is conducted on the future project to widen I-40 to three lanes.

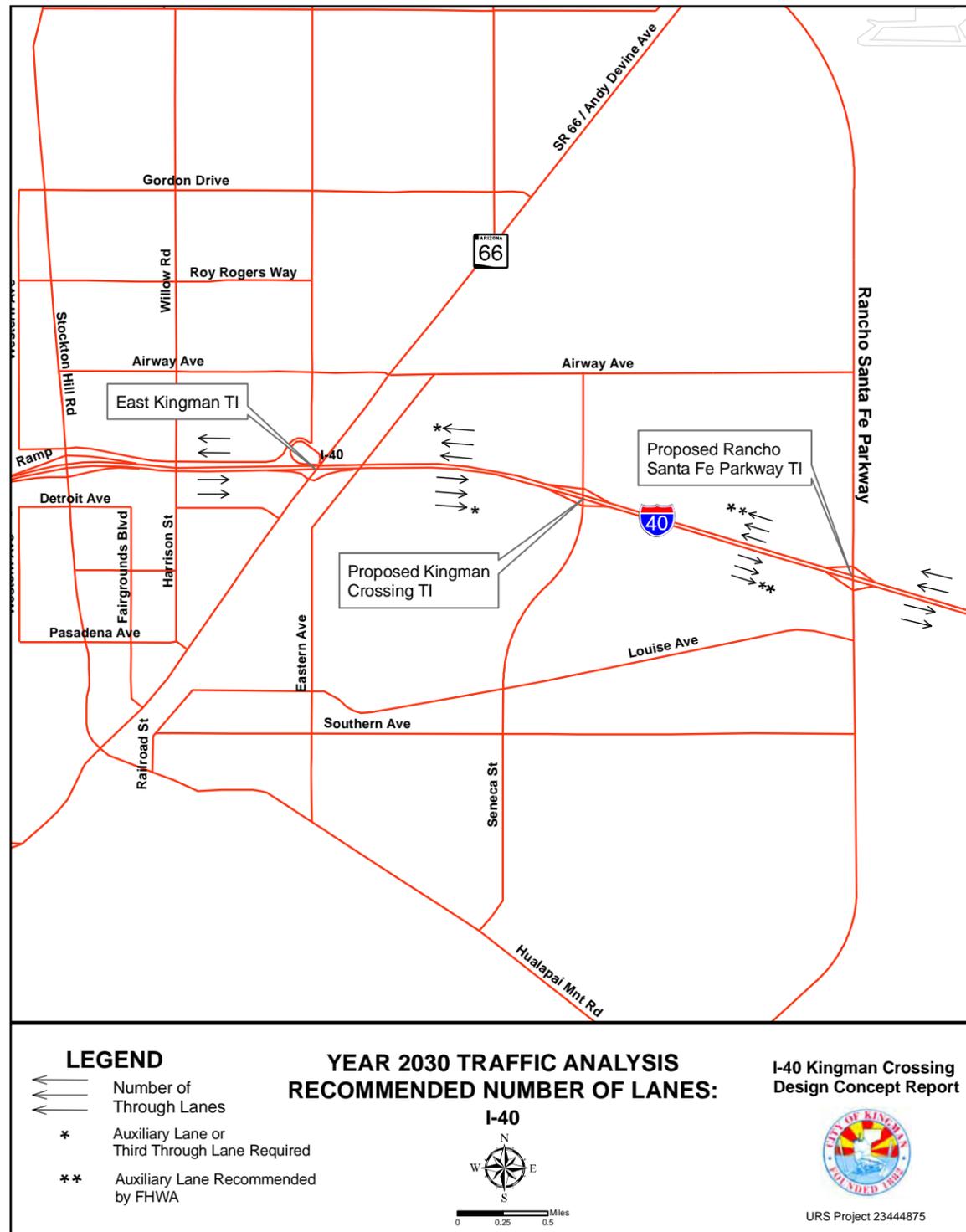
#### East Kingman TI to Kingman Crossing TI Segment:

There is a significant travel demand on I-40 between the East Kingman TI and the Kingman Crossing TI. By year 2025, an additional auxiliary lane providing a ramp-to-ramp connection or a third through lane will be required on I-40 in both directions between the East Kingman TI and the Kingman Crossing TI. Without the addition of the auxiliary lanes or third through lanes, westbound and eastbound I-40 is expected to operate at LOS D, degrading to LOS E by 2028. With these improvements, the freeway segment is expected to operate at LOS C. ADOT and FHWA have agreed that ADOT will evaluate the need for auxiliary lanes in addition to the third through lane between the East Kingman TI and the Kingman Crossing TI when scoping is conducted on the future project to widen I-40 to three lanes, which is based on the MoveAZ 20-year long-range transportation plan that calls for I-40 to be widened to three lanes in each direction.

#### Kingman Crossing TI to Rancho Santa Fe Parkway TI Segment:

There is increased travel demand on I-40 between the Kingman Crossing TI and the RSFP TI. In spite of this volume increase, the freeway segment between the Kingman Crossing TI and the RSFP TI will operate at LOS C. At this point, no improvements are recommended for I-40 for the segment between the Kingman Crossing TI and the RSFP TI.

However, FHWA has recommended that an auxiliary lane between RSFP TI and the Kingman Crossing TI be included as part of this project to further counteract the merge, diverging, and weaving interference between the RSFP TI and the Kingman Crossing TI. Since it is unknown which TI will be constructed first, the Kingman Crossing TI will include elongated parallel entrance and exit ramps that will extend east halfway to the termini of the proposed RSFP west side entrance and exit ramps. This will effectively lay the groundwork for the auxiliary lanes between the RSFP TI and the Kingman Crossing TI; this will allow for a seamless connection during construction of the RSFP west side ramps.



**Figure 2-11 Year 2030 I-40 Recommended Number of Lanes**

### 3.0 DESIGN CONCEPT ALTERNATIVES

#### 3.1 INTRODUCTION

The design concept study developed and evaluated the “No Build” alternative and two build alternatives. The two build alternatives were developed with the COK’s desire to construct a compact diamond TI to minimize right-of-way acquisition and maximize the distance between ramp intersections and the adjacent intersections on Kingman Crossing Boulevard. The two build alternatives were developed as compact diamonds with either an underpass or overpass structure. The underpass alternative would have the crossroad elevated over I-40, and the overpass alternative would have the crossroad depressed under I-40 without changing the grade on I-40. Both of these alternatives would have the ramp intersections spread apart by approximately 470 feet.

The following sections describe the interchange alternatives that have been considered.

#### 3.2 DESIGN CONCEPT ALTERNATIVES

##### 3.2.1 No-Build Alternative

The no-build alternative would not construct any portion of the TI. It is recommended that this alternative be eliminated from further consideration. The alternative is not feasible because it would not provide access to I-40 from the growing East Kingman area.

##### 3.2.2 Compact Diamond Overpass Interchange Alternative

The Overpass alternative would have Kingman Crossing Boulevard depressed under I-40 with two new parallel bridges constructed to carry I-40 over the crossroad. Drainage is always an issue when depressing a roadway. The depressed area can be gravity-drained due to I-40 being slightly above existing grade in this area, and the terrain sloping down to the north at approximately 3.8 percent. Maintaining traffic on I-40 while constructing the new bridges over the crossroad may require using the ramps to detour traffic. An advantage of this alternative would be the earthwork generated by depressing Kingman Crossing Boulevard. This material will be used as embankment for Kingman Crossing Boulevard. This alternative would also generate less noise and have less visual impact to the surrounding area.

##### 3.2.3 Compact Diamond Underpass Interchange Alternative

This alternative would have Kingman Crossing Boulevard elevated over I-40 with a single new bridge constructed to carry the crossroad over the freeway. This alternative would have fewer drainage and constructability challenges, but would require a significant amount of borrow material to construct the roadway embankment. This alternative would also generate more noise and have greater visual impacts.

#### 3.3 EVALUATION OF ALTERNATIVES

An evaluation was made of each of the traffic interchange alternatives based on the ICOs and evaluation factors. A summary of the traffic interchange alternatives evaluation is presented in **Table 3-1**.

**Table 3-1 Traffic Interchange Evaluation Matrix**

Evaluation Criteria	Compact Diamond Underpass Alternative Kingman Crossing Boulevard Elevated	Compact Diamond Overpass Alternative Kingman Crossing Depressed
Construction Costs	<ul style="list-style-type: none"> <li>\$25.7 million (for TI improvements within the access control limits).</li> </ul>	<ul style="list-style-type: none"> <li>\$19.3 million (for TI improvements within the access control limits).</li> </ul>
Roadway Geometry & Safety	<ul style="list-style-type: none"> <li>Adequate roadway geometry is provided.</li> <li>Meets ADOT Design Criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Adequate roadway geometry is provided.</li> <li>Meets ADOT Design Criteria.</li> </ul>
Traffic Operational Impacts	<ul style="list-style-type: none"> <li>TI improvements provide a LOS C on I-40 and LOS B and D on the TI Ramps for the Design Year 2030.</li> </ul>	<ul style="list-style-type: none"> <li>TI improvements provide a LOS C on I-40 and LOS B and D on the TI Ramps for the Design Year 2030.</li> </ul>
Right-of-Way	<ul style="list-style-type: none"> <li>Approximately 29.9 acres of right-of-way is required.</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 27.1 acres of right-of-way is required.</li> </ul>
Earthwork	<ul style="list-style-type: none"> <li>Requires 680,000 CY of borrow material to construct the embankment to the TI.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Requires 420,000 CY of excavation to construct the TI.</li> <li>A portion of the excess material can be used in the construction of Kingman Crossing Boulevard south of the TI.</li> <li>Potential waste sites include the old ADOT borrow pits on City of Kingman land southwest of the TI.</li> </ul>
Drainage	<ul style="list-style-type: none"> <li>TI and ramp improvements impact 14 culverts along I-40 that will need to be extended.</li> <li>Minimal impacts to existing drainage patterns.</li> <li>Requires a less extensive storm drain system.</li> </ul>	<ul style="list-style-type: none"> <li>TI and ramp improvements impact 14 culverts along I-40.</li> <li>Flow to three of the culverts will need to be rerouted through the depressed TI section to maintain existing drainage patterns. This will require 2,200 feet of a large diameter storm drain to intercept flow from the three culverts and route the flow under Kingman Crossing Boulevard through the depressed section under I-40.</li> <li>Requires a more extensive storm drain system.</li> </ul>
Structures	<ul style="list-style-type: none"> <li>The Kingman Crossing Boulevard underpass structure will have a two-span precast-prestressed AASHTO Type VI I-girder superstructure with 133-foot span lengths and a total bridge length of 266 feet. The out-to-out structure width will be 133'-0". Abutment substructures will consist of drilled shaft foundations supporting concrete columns and seat-type abutments.</li> <li>Total area for the new bridge = 35,378 square feet.</li> </ul>	<ul style="list-style-type: none"> <li>The I-40 EB and WB overpasses will consist of two single-span cast-in-place and post-tensioned concrete box girder superstructures with a total span length of 210 feet. The out-to-out width of each structure will be 60'-10" consisting of three lanes of traffic, a 12'-0" inside shoulder and a 12'-0" outside shoulder.</li> <li>Total area for both new bridges = 25,550 square feet.</li> </ul>

Evaluation Criteria	Compact Diamond Underpass Alternative Kingman Crossing Boulevard Elevated	Compact Diamond Overpass Alternative Kingman Crossing Depressed
Impacts to I-40	<ul style="list-style-type: none"> <li>Traffic can be maintained on I-40 with minimal closures.</li> <li>Nighttime closures of I-40 will be required to place the bridge girders. All four ramps will be used as temporary detours and will need to be constructed before placing the bridge girders. Temporary widening of the ramps will not be necessary because only one lane is necessary during nighttime closures due to lower traffic volumes at night.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>All four ramps will be used as temporary detours and will need to be constructed before constructing the EB and WB overpass structures.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>Will require the relocation of the TI carrier line located along the existing north I-40 right-of-way line.</li> </ul>	<ul style="list-style-type: none"> <li>Will require the relocation of the TI carrier line located along the existing north I-40 right-of-way line.</li> </ul>
Environmental Considerations	<ul style="list-style-type: none"> <li>No known adverse impacts.</li> </ul>	<ul style="list-style-type: none"> <li>No known adverse impacts.</li> </ul>

Based on above evaluation, the **Overpass Alternative is recommended for further development**. The Overpass Alternative offers the following advantages:

- **Construction Costs** – The Overpass Alternative is 22 percent less expensive to construct than the Underpass Alternative (\$19.3 million vs. \$25.7 million). The main cost differentiating items are earthwork, drainage culverts and storm drain, and structures.
- **Right-of-way** – The Overpass Alternative requires the least amount of right-of-way, 27.1 acres vs. 29.9 acres for the Underpass Alternative.
- **Earthwork** – The Overpass Alternative requires 420,000 cubic yards of excavation to construct the depress roadway and ramps, whereas the Underpass Alternative requires 680,000 cubic yards of borrow material to construct the roadway embankment, which will need to be hauled in from material pits from as far as 20 miles. This is the main cost differentiating factor between the two alternatives.

The disadvantages of the Overpass Alternative would include a more extensive storm drain system to be constructed and maintained, and it will require long-term detours on I-40 which will have minor disruption to traffic.

## 4.0 MAJOR DESIGN FEATURES OF THE RECOMMENDED ALTERNATIVE

### 4.1 INTRODUCTION

This section describes the recommended design concept for a new traffic interchange on I-40 at MP 55.0, approximately 1.5 miles east of the existing I-40/State Route 66 (East Kingman) TI. The recommended design concept is based on the Traffic Study recommended improvements for the Full Build scenario. The project would also include the construction of a new arterial street along the proposed Kingman Crossing Boulevard alignment between I-40 and Santa Rosa Drive on the north. A total of approximately 0.32 mile of new roadway will be constructed.

### 4.2 DESIGN CONTROLS

The new interchange 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	I-40/Ramps
Design Year:	2030	2030
Design Vehicle:	WB-67	WB-67
Design Speed:	45 mph (ADOT & COK)	75 mph (I-40) 70 mph (Exit Ramp Gore) 65 mph (Entrance Ramp Gore) 50 mph (Ramp Body) 35 mph (Ramp Terminal) 50 mph (Ramp Detour)
Superelevation:	0.04 ft/ft max (ADOT)	0.06 ft/ft max
Maximum Horizontal Curve:	8°04' (within access control limits – ADOT) 1,040' (w/o super) (AASHTO)	2°18' (I-40) 6°53' (Ramps)
Maximum Gradient:	6.5% (within access control limits – ADOT) 6.0% (AASHTO)	3% (I-40) 4% upgrade, 5% downgrade (Ramps) 3% for 400 ft before traffic signals
Travel Lane Width:	12 ft	12 ft
Inside Shoulder Width:	2 ft (with median curb)	4 ft + 2 ft offset to barrier (I-40, 2-lane) 12 ft + 0 ft offset to barrier (I-40, 3-lane) 2 ft + 2 ft offset to barrier (On Ramp) 6 ft + 2 ft offset to barrier (Off Ramp)
Outside Shoulder Width:	4 ft (ADOT) 6.5 ft (COK)	10 ft + 2 ft offset to barrier (I-40, 2-lane) 12 ft + 0 ft offset to barrier (I-40, 3-lane) 2 ft + 2 ft offset to barrier (On Ramp) 10 ft (Off Ramp)
Normal Cross-Slope:	0.02 ft/ft	0.02 ft/ft
Vertical Clearance:	16.5 ft 16 ft to falsework over traffic	16.5 ft 16 ft to falsework over traffic
Type of Access Control:	Desired minimum access control line is 1,320 ft (300 feet minimum) beyond ramp pavement radius at the intersection of the ramp and crossroad.	Full access control (I-40 & Ramps)

Description	Kingman Crossing Boulevard	I-40/Ramps
Slope Standards:	3H:1V	4H:1V desirable (Ramp) 3H:1V max for landscaping (Ramp) Std C-2.10 (I-40)
Minimum Vertical Curve Length:	3 x design speed = 135 ft	200 ft (at crossroad) 400 ft (ramp body)
Auxiliary Lanes	—	“Interim” Auxiliary Lane Design Guidelines

### 4.3 HORIZONTAL AND VERTICAL ALIGNMENTS

Improvements would construct two I-40 overpass structures with full access and arterial connections to Santa Rosa Drive to the north. Preliminary typical sections and plan and profile sheets were prepared for the recommended alternative and are shown in **Appendix A**.

The configuration of the new overpass traffic interchange will be a compact diamond interchange and will be comprised of standard one-lane entrance and exit ramps. Both entrance and exit ramps will be designed as parallel type ramps. Ramp A should be a one-lane Entrance Parallel Type Fringe-Urban Freeway Ramp with Dual Lane Ramp Metering per RDG Figures 504.8A, Sheet 1 of 2 and Figure 504.8B. Some temporary pavement may be required in the gore area to provide adequate width to function as a two-lane detour during construction. Ramps B and C should be constructing as an Interim End of Freeway 28 ft – Two-Lane Exit Ramps without auxiliary lane per RDG Figure 504.7, Sheet 3 of 3. Ramp D should be a One-Lane Entrance Parallel Type with Auxiliary Lane Urban Freeway Ramp with Dual Lane Ramp Metering per RDG Figures 504.8A, Sheet 2 of 2 and Figure 504.8B. Some temporary pavement may be required in the gore area to provide adequate width to function as a two-lane detour during construction.

The Kingman Crossing Boulevard crossroad will be depressed under I-40 with I-40 remaining at grade. Based on the traffic analysis recommendations, Kingman Crossing Boulevard between the ramp intersections will provide two through lanes and two left-turn lanes southbound and northbound. Between the traffic interchange ramps and Santa Rosa Drive, three through lanes in each direction would be constructed. The Kingman Crossing Boulevard improvements will include curb and gutter, sidewalks, and a raised concrete curbed median.

In the future, Kingman Crossing Boulevard will be extended south to Louise Avenue and north to Airway Avenue. Santa Rosa Drive, which was recently constructed as part of the Hualapai Medical Center, will provide the arterial connection from the TI to Airway Avenue until Kingman Crossing Boulevard is constructed to Airway Avenue.

The Kingman Crossing Boulevard improvements will include a minimum 16-foot-wide raised median with concrete curb between traffic interchange ramps and Santa Rosa Drive to aid in the control of access along Kingman Crossing Boulevard and to provide a greater separation between opposing traffic. New ADOT Type D (C-5.10) curb and gutter will be used along the on the outside edge on Kingman Crossing Boulevard. For non-irrigated median islands ADOT Type G (C-5.10) vertical curb will be used for the median curb on Kingman Crossing Boulevard and ADOT Type G (C-5.10) curb and gutter will be required

along the low side of the superelevated section south of the interchange. If irrigated median islands are to be constructed, ADOT Type A-1 (C-5.10) vertical curb will be used for the median curb on Kingman Crossing Boulevard and ADOT Type D (C-5.10) curb and gutter will be required along the low side of the superelevated section south of the interchange. The Type A-1 curb extends 18 inches below the pavement surface to minimize or prevent moisture migration to subgrade soils.

If medians within the ADOT right-of-way are to be irrigated, ADOT will not maintain the landscaping and irrigation facilities. An intergovernmental agreement (IGA) addressing maintenance responsibility will be required with the COK.

The existing I-40 typical section consists of two 12-foot lanes in each direction with 4-foot median shoulders and 10-foot outside shoulders. The two roadway centerlines are separated by 108 feet. The future ultimate I-40 typical section includes three 12-foot lanes in each direction with the additional lanes to be added to the outside of the existing roadways. The ultimate section also includes 12-foot median shoulders and 12-foot outside shoulders. The new overpass structures will be constructed to the ultimate section width.

The alignment of Kingman Crossing Boulevard crosses perpendicular to the I-40 centerline at the mid-section line. South of the ramp returns the alignment curves to the south to be perpendicular to the section line beginning at Airfield Avenue. North of the ramp returns the alignment curves to the north ending at Santa Rosa Drive.

Traffic signals will be provided at the two TI ramp intersections and at the Santa Rosa Drive and Kingman Crossing Boulevard intersection. Street lighting will be provided along Kingman Crossing Boulevard and at the ramp freeway entrance and exit locations.

A break in the access control line along Kingman Crossing Boulevard between the TI and Santa Rosa Drive will be provided to allow for future right-in/right-out driveways to provide access for future development. The distance to the break in access control along Kingman Crossing Boulevard shall be a minimum of 300 feet beyond the end of the ramp curb radius return as per RDG Section 506. Separate right-turn lanes will be provided for each right-in/right-out driveway.

#### 4.4 ACCESS CONTROL

Access control along the crossroad is necessary to promote safe and efficient traffic operations in the proximity of the ramp intersection. On Kingman Crossing Boulevard, it is recommended that full access control be extended to Airfield Avenue on the south and to Santa Rosa Drive on the north. However, Kingman Crossing Boulevard to the south will be terminated just south of the south ramp intersection with the access control line extending across the south leg of Kingman Crossing Boulevard. FHWA has given approval for the interim one-sided TI with the stipulation that access to parcels south of I-40 will not be allowed until the COK prepares a second COAR for approval once the connecting roadway at Louse Avenue or Southern Avenue is constructed at some time in the future. On the north side, the access control distance from the north ramp radius return to Santa Rosa Drive would be approximately 803 feet. Two exceptions would provide for right-in/right-out access drives 300 feet north of the ramp radius return to provide access to the parcels of land north of the TI on each side of Kingman Crossing Boulevard.

An agreement between ADOT and the COK will need to be developed to determine the limits of the ADOT maintenance within the access control limits and ownership. ADOT is currently developing an Access Control Model for Crossroads on Controlled Access Highways, which provides ADOT's desired access control criteria of interchanges. The guidelines state that ADOT will own the access control rights for a minimum distance of 300 feet beyond the radius return of the ramp terminals. Beyond this point, access control will need to be obtained, implemented, and preserved by local agencies with a written agreement and/or through the local agency permitting process.

#### 4.5 RIGHT-OF-WAY

The land to the south of I-40 within the project limits is owned by the City of Kingman, and the land north of I-40 is privately owned.

The existing right-of-way width along I-40 is 308 feet within the project limits. There is no existing right-of-way along the Kingman Crossing Boulevard alignment.

The proposed right-of-way for Kingman Crossing Boulevard varies from 307 feet near the ramp intersection to 180 feet at Santa Rosa Drive. The right-of-way width varies because the roadway width varies due to the varying median width to provide dual turn lanes at the ramp intersections. Drainage easement will be required at the outlet of the storm drain located at the northwest corner of the Kingman Crossing Boulevard and Santa Rosa Drive intersection. A new 10-foot utility easement along the north I-40 right-of-way lane from approximate Station 2659+70 to 2902+35 will be required to relocate Frontier Communications TI carrier line. The proposed new right-of-way, drainage and utility easements are shown in the plan sheets in **Appendix A. Table 4-2** summarizes the parcels and new right-of-way requirements.

**Table 4-2 Right-of-Way Requirements for the Recommended Alternative**

Parcel Number	Area of New Right-of-Way (acres)	Temporary Drainage Easement (acres)	10-Foot Utility Easement (acres)
322-06-015	14.55	1.36	0.92
322-06-010	12.54	-	-
Totals	27.09	1.36	0.92

#### 4.6 DRAINAGE

##### 4.6.1 Drainage Area Description

The project site watershed ranges in elevation from 3,502 to 4,691 feet above sea level. The southern (upper) portion of the watershed has a north-sloping piedmont with defined high desert arroyos down to I-40. South of Airfield Avenue, there is existing residential development. The existing I-40 roadway bisects the watershed from east to west. The slope of the road is from east to west, as well. To the north of I-40, the piedmont flattens and the streambeds become significantly less defined. There is existing residential development immediately north of I-40, just west of the project limits and south of Airfield Avenue, but west of the project area. The topography surrounding the project site slopes generally from south to north and rainfall runoff collects in several poorly defined natural streambeds.

#### 4.6.2 I-40 Drainage Structures

There are 14 existing cross-culverts under I-40 within the project site: six pipe culverts and eight concrete box culverts. The culverts range from Culvert A at the west end of the project site, to Culvert N at the east end of the project. Note that this report follows the naming convention for the culverts previously presented in the Conceptual Hydrology Study (Culverts A through J, in that report). Culverts K through N were not previously studied, but are added for this Kingman Crossing Preliminary Drainage Report.

#### 4.6.3 Regional Retention Basins

The two existing ADOT borrow pits function as regional retention basins that capture the runoff from approximately two-thirds of the project watershed.

- Retention Basin A discharges into an unlined channel that is oriented along the west section line of Section 9.
- Retention Basin B is large enough to effectively reduce flows that previously would have reached Culverts B, C, D, and E.

#### 4.6.4 Drainage Design Criteria

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

#### City of Kingman Standards

The following standards 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 standard of the 50-year storm for culvert barrel design will govern.
- 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).

- Finished floors of buildings shall have a minimum of one foot of freeboard above the 100-year water surface.
- The 100-year flow shall be contained within the street right-of-way.
- Building setbacks of up to 100 feet may be needed. (The State Standard SSA 5-96 will be used, where applicable.)

The flows from some existing culverts or streambeds had 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 were no 100-year flow diversions, all of the new drainage structures were designed for the 100-year flows.

See **Table 4-3** for COK drainage criteria and design storm frequencies:

**Table 4-3 COK Design Storm Criteria Outside ADOT Access Control Limits**

Drainage Feature	Description of Criteria
Conveyance:	“Drainage Systems shall be designed to convey nuisance runoff from the more frequent minor storm of 10 years and to minimize major damage from the 100 year storm event.”
Storage:	“When storage is utilized, the facilities shall be sized to limit downstream flows for the 10 and 100 year storms, to the greater of historic levels, or the capacity of the downstream conveyance system.”
Drainageways:	“Major drainageways shall be designated on the Kingman Area Master Drainage Plan.” “Major Drainageways generally serve areas greater than 150 acres. For the Kingman Area the major drainageways have been identified in the Kingman Area Master Drainage Plan.”
Cross Street Flow:	“Regardless of the size of the culvert, bridge or dipped section, the street crossing is to be designed to convey the 100-year storm runoff under and/or over the road to an area downstream of the crossing to which the flow would have gone in the absence of the street crossing.” For the 100-year event the maximum flow depth is “1.0 feet of depth at crown.” For 10-year flow event, “No flow across streets except at designated dip crossings.”
Longitudinal Street Flow:	“Runoff from the 10 year storm shall be contained within the street section with no curb overtopping.” “For 4 or more laned streets at least 1 traffic lane free of water in each direction.” “Where no curb exists, the maximum depth of water shall be 0.5 feet over the crown.” “Runoff from the 100 year storm shall not enter buildings and when flowing along streets, shall be contained within the street right-of-way.” For the 100-year storm event, “Flow to be calculated assuming contained in right-of-way with top water elevation within 1 foot of lowest finished floors.”

Source: Boyle Engineering Corporation, *Design and Administrative Manual, Kingman Area Master Drainage Plan*, June 1988.

#### ADOT Standards

The ADOT hydrologic modeling standards are presented in the Highway Drainage Design Manual, 1993 (English Version). ADOT has established drainage design standards in the Roadway Design Guidelines, Chapter 600 — Drainage (December, 2005). The Drainage Frequency Class for I-40 roadway is Class 1, while Kingman Crossing Boulevard is a Class 2.

Per Table 603.2A in the ADOT Roadway Design Guidelines, for a Drainage Class 1, reconstruction project, the design storm is 50-year frequency. However, a higher standard is recommended for the following reason: The flows through three existing I-40 culverts will be diverted into a storm drain along Kingman Crossing Boulevard. To significantly reduce the possibility of overtopping of new interchange cut slopes, the drainage facilities used to divert these flows should be designed for the 100-year flow.

Refer to **Table 4-4** for ADOT drainage criteria and design storm frequencies:

**Table 4-4 ADOT Design Storm Criteria within Access Control Limits**

Roadway (Name)	Operational Drainage Frequency Class (Drainage Class)	Design Storm Frequency <sup>(2)</sup> (yr)	Freeboard			Culverts <sup>(5)</sup>						Roadway Drainage			
			Bridges <sup>(3)</sup> (ft)	Flood Control Channels <sup>(4)</sup>		Box Height (H)		Diameter (D)		Headwater		Ditches <sup>(6)</sup>		Curbed Roadway	
				Non-leveed (ft)	Leveed (ft)	Minimum (ft)	Desirable (ft)	Minimum (in.)	Desirable (in.)	Maximum NA	Project Desirable NA	Roadway Runoff Only (yr)	Offsite Flow Interception (yr)	Design Storm Frequency (yr)	Pavement Spread <sup>(7)</sup> (ft)
I-40	1	50	3	1	2	4	6	18	24	1.5H or 1.5D	H or D	10	50	10	NA
Kingman Crossing @ TI	2	50	1	1	2	4	6	18	24	1.5H or 1.5D	H or D	10	50	10	13.5

Notes: <sup>(1)</sup> ADOT's Design Philosophy: "Generally, the minimum drainage facility would be one which perpetuates the existing drainage conditions (for the 100-year event) as nearly as possible."

<sup>(2)</sup> Design storm frequencies may be controlled by other considerations, i.e., Federal Emergency Management Agency regulations.

<sup>(3)</sup> Freeboard should not be less than the design freeboard of the approach channel.

<sup>(4)</sup> Minimum freeboard should be the larger of the table value or  $F=0.20(y+(v^2/2g))$ , where y is depth of flow (ft), v is mean velocity (fps), and g is acceleration due to gravity (32.2 ft/sec<sup>2</sup>). Additional height shall be provided on the outside of bends for the additional rise in the water surface due to centrifugal force.

<sup>(5)</sup> For the design flood, the headwater level should be no higher than 3 inches below the pavement.

<sup>(6)</sup> Channel depth of flow shall be limited to preclude saturation of the roadway pavement structural section at a 10-year frequency storm.

<sup>(7)</sup> For a multi-lane roadway, the allowable spread width is 1/2 lane + shoulder, turn lane, parking lane, and/or distress lane. Allowable ponding depth shall not exceed the top of curb.

Source: Arizona Department of Transportation, Highways Division, *Roadway Design Guidelines, Chapter 600-Highway Drainage Design*, December 2, 2005 (Draft).

#### 4.6.5 Hydrology

##### Offsite Watershed

The overall watershed was modeled originally in the Kingman Area Master Drainage Plan (KAMDP, July 1988; Boyle Engineering). Civiltec produced the report: Conceptual Hydrology Study for APN 322-06-010 (February 13, 2006). A range of flows for the 2-year through 100-year were calculated using PondPack hydrologic modeling software. The results this model were used as a reference to create a HEC-1 model that produced the same results.

The original areas were used per the Conceptual Hydrology Study. The best available mapping was used to delineate the sub-basin A watershed boundary. The stage-storage-outflow relationships for the existing retention basins A and B were also taken from the Conceptual Hydrology Study. The HEC-1 SCS curve numbers were varied until the 100-year runoff flows approximately matched the results of the Conceptual Hydrology Study.

The Existing Case HEC-1 model calculates the runoff flows at I-40 crossings, and at stream confluences located downstream (north) of I-40. The flows at downstream concentration points were used as a baseline for comparison with the proposed case analysis.

The Proposed Case HEC-1 model was created from the existing case model, but the routing was altered to reflect rerouting of flows through the proposed Kingman Crossing Interchange. It was necessary to add an offline detention basin in the model to attenuate the flows that reach the downstream concentration points. The storm runoff flows are summarized in **Table 4-5** and the watershed delineation maps are shown in **Appendix B**.

##### Drainage Field Visit

A field visit in August 2007 was performed to field verify the vegetation, development, existing flow patterns, document culvert conditions, and any apparent drainage problems.

**Table 4-5 Summary of Offsite Flows**

Conc Point (notes 1,2,3)	EB Station	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
A	2843+01	75	263	356
B	2852+14	47	425	717
C	2860+86	7	14	18
D	2866+00	9	19	24
E	2875+00	17	35	44
F	2883+61	24	45	55
G	2887+31	9	18	23
H	2893+31	141	278	344
I	2897+39	13	27	34
J	2901+81	72	169	217
K	2905+31	Note 4		
L	2911+14	Note 4		
M	2915+00	Note 4		
N	2923+50	Note 4		

Notes:

- 1) Concentration points are for rational sub-basins unless prefix is SB or CP.
- 2) SB prefix is HEC-1 single sub-basin.
- 3) CP prefix is HEC-1 concentration point (summation of flows).
- 4) Culverts K, L, M, and N were not modeled hydrologically and will only be extended at the inlet and outlet.

##### Onsite Watershed

The Rational Method was used to model onsite sub-basins that would discharge directly into the proposed storm drain system. The longest onsite watershed sub-basin was used to determine the longest onsite time of concentration. That value was less than 10 minutes, so the minimum Tc value of 10 minutes was used for all onsite sub-basins.

The StormCad software was used to model the proposed onsite storm drain system. The sub-basin area, runoff coefficient, and Time of Concentration were input directly into the StormCad input data. This facilitated the superposition of individual runoff hydrographs to calculate the peak flow in any given pipe reach of the storm drain network.

#### 4.6.6 Drainage Design

Preliminary offsite and onsite drainage systems have been developed for the recommended alternative. The following sections describe the proposed drainage systems, and they are also shown on the preliminary plan sheets in **Appendix A**.

##### I-40 TI Drainage Offsite Design

Four culvert crossings (A-D) along I-40 located to the west of the new TI will be extended to accommodate the roadway widening of I-40 and the new west side ramps. Culvert A will only be extended on the south (inlet) side. Culverts B and C will each be extended at both ends. No changes are anticipated for the existing median drains that discharge into these culverts. **Table 4-6** summarizes the proposed culvert sizes and extensions.

The downstream portion of Culvert D (north of the median) will be kept in service, along with the median drain. The existing outlet wingwall will be removed and the existing outlet barrel extended. A new CBC wingwall will be installed with an outlet riprap spreading apron. The upstream portion of the culvert will be abandoned in place under the existing freeway lanes. The existing inlet wingwall and a portion of the inlet culvert barrel will be removed to accommodate the new eastbound off-ramp (Ramp B).

Seven culvert crossings (I-N) along I-40 located to the east of the new TI will each be extended at both ends. No changes are anticipated for the existing median drains that discharge into these culverts.

Culvert H must be removed and a longer, lower culvert will be constructed to provide sufficient clearance under Ramps C and D.

For cost estimating purposes in this study, pipe culverts 42 inches or smaller are assumed to require a 10-foot x 10-foot dumped riprap spreading apron at each extended outlet. The larger pipe culverts and box culverts are assumed to require a riprap plunge basin (30 feet long x the width of the CBC concrete outlet apron).

The new TI will have the crossroad depressed under I-40. The entrance and exit ramps will rise from below existing ground, and then match existing I-40 grade. Three culvert crossings that will be cut off by the new ramps are:

- Culvert E, Station 2953+00 — Flow to be diverted via a new V-ditch (crown ditch) into new 24-inch storm drain lateral. The pipe size can be reduced because approximately half of the flow will be diverted to an offline detention basin on the east side of the TI. The existing culvert was also oversized for the existing flow.
- Culverts F and G — Culvert inflows will be diverted into a 6-foot bottom width, 2:1 side slope, riprap lined collector channel. The channel will be constructed south and above the new cut slope for Ramp D. The channel will discharge into a drop inlet for a new 48-inch diameter storm drain lateral.

Several of the existing culverts along I-40 contain minor sedimentation and debris and should be cleared as part of this project.

#### Offline Detention Basins

##### *Detention Basin R3*

Upstream of the existing Culvert F, an offline detention basin will be used to attenuate the combined Culverts F and G flows. The basin will have a 20-foot bottom width and 2:1 side slopes that will be constructed immediately south of the new collector channel. The basin will include a flow splitter to divert peak flows from the channel into the detention basin. The stored runoff (132,000 cubic feet) will be dissipated through a 12-inch pipe that bleeds off back into the channel, downstream of the splitter.

A new 48-inch storm drain lateral will be constructed at the outlet for the channel/detention basin.

##### *Detention Basin R4*

The existing runoff that reaches Culvert D will be diverted into a collector channel that flows westward to the Culvert C extended inlet. An offline detention basin will be used to attenuate the combined Culverts C and D flows. The detention basin will be constructed using a flow splitter that is similar in concept to the aforementioned Detention Basin R3. The Basin R4 will have a triangular bottom that is 75 feet wide by 240 feet long, set at elevation 3526. The basin will be positioned with the longer side parallel to the C-D collector channel. The basin will detain a portion of the 100-year peak runoff (18,300 cubic feet). The basin overall depth will be 4 feet to provide at least 2 feet of freeboard above the 100-year water surface. The stored volume will be dissipated through a 12-inch pipe that bleeds off back into the collector channel, downstream of the splitter.

##### I-40 TI Onsite Drainage Design

A new storm drain trunk line along Kingman Crossing Boulevard will start at the aforementioned 48-inch lateral and drain northward. The trunk line will increase up to a 60-inch diameter at the south ramp intersection. This pipe reach will have a uniform slope where it will be constructed under the existing freeway.

Collector storm drains from each new TI ramp will discharge into the trunk line. Catch basins along Kingman Crossing Boulevard will discharge into the trunk line, via 24-inch diameter laterals.

At the northern ramps, the trunk line diameter will increase to 72 inches and will continue north to the outlet northwest of the new intersection with Santa Rosa Drive.

The storm drain outfall will connect into the existing 72-inch storm drain pipe that was constructed as part of the Hualapai Medical Center project.

**Table 4-6 Existing Culvert Hydraulic Summary**

WTRSHD CONC POINT	Existing WB Station (ft)	Existing EB Station (ft)	Existing Case		Existing CMP Pipe Dia (in.)	Existing CBC (# barrels) W x H (ft)	Skew Angle (deg)	Roadway Centerline Elev	AHW (ft)	50-Year	50-Year	100-year		Recommended Improvement
			Q50 (cfs)	Q100 (cfs)						WSEL (ft)	Adequacy (y/n)	WSEL (ft)	Overtop Depth (ft)	
<b>INTERSTATE 40</b>														
A	2842+90	2843+01	263	356	54		15 Lt	3502.81	3502.23	not modeled				no change
B	2851+76	2852+14	425	717		(2) 8 x 4	30 Lt	3514.42	3513.84	3512.27	YES	3514.44	0.02	extend inlet and outlet
C	2860+14	2860+86	14	18	24		45 Lt	3526.27	3525.69	3524.44	YES	3526.27	NO	extend inlet and outlet, add end sections
D	2865+38	2866+00	19	24		6 x 3	30 Lt	3532.79	3532.21	3528.61	YES	3528.81	NO	insert 2-30" RCP's, extend inlet & outlet, new end sctn
E	2875+00	2875+00	35	44		10 x 8	0	3545.02	3544.44	3535.94	YES	3536.15	NO	divert flows into storm drain
F	2882+99	2883+61	45	56		6 x 5	30 Lt	3556.72	3556.14	3550.66	YES	3550.99	NO	divert flows into storm drain
G	2886+69	2887+31	18	23	36		30 Lt	3561.75	3561.17	3557.35	YES	3557.71	NO	divert flows into storm drain
H	2892+69	2893+31	278	340		(2) 8 x 4	30 Lt	3569.91	3569.33	3567.03	YES	3567.56	NO	Remove and replace 2-8'x4' CBC with CBC at lower elevation
I	2897+10	2897+39	27	34	42		15 Lt	3575.47	3574.89	3569.77	YES	3570.17	NO	extend inlet and outlet, add end sections
J	2901+19	2901+81	169	217		6 x 5	30 Lt	3581.76	3581.18	3578.71	YES	3579.64	NO	extend inlet and outlet, new wingwalls
K	2904+69	2905+31	Note 1		54		30 Lt	3586.97	3586.39	not modeled				extend inlet and outlet, new wingwalls
L	2910+85	2911+14	Note 1		24		15 Lt			not modeled				
M	2915+00	2915+00	Note 1			6 x 3	0			not modeled				
N	2923+50	2923+50	Note 1			12 x 10	0			not modeled				extend inlet and outlet, new wingwalls

**NOTES**

- 1) Flows for Culverts B-J were taken from the Appendix of Conceptual Hydrology Study for APN 322-06-010 (February 13, 2006). Flows for Culverts K, L, M, and N were not modeled hydrologically.
- 2) Basin B flow is the outflow from the existing Retention Basin B designated in the report listed above.
- 3) Culverts B through J were evaluated for hydraulic adequacy using the Q50 flow and CulvertMaster software. Culverts A, K, L, M, and N were not evaluated hydraulically. These culverts will be extended using the existing barrel size.
- 4) Existing WB and EB stationing, invert elevations and culvert slopes were taken from the as-built profile sheets: I-40-2(36).
- 5) Overtopping weirs not considered, to emulate worst case scenario for each culvert.  
Tailwater channel configurations were assumed. Channel slope approximately equals the typical culvert slope, per as-builts.  
Actual conditions: Inlet dikes used at all culverts. Westward flow-by would actually occur along south side of EB lanes.
- 6) Allowable Head Water: AHW = 0.25 foot below calculated EP (edge of pavement) adjacent the culvert inlet.  
EP = CL elev - 0.015 x 22 feet = CL elev - 0.33' (no superelevation).
- 7) 50-Year WSEL = Water surface at the culvert inlet for the Q50 flow.

## Kingman Crossing Boulevard Drainage Design

Roadside runoff from the new cut slopes will drain over the curb and gutter along the new roadway. The gutter flow will be intercepted by new freeway catch basins at the locations with curb and gutter. During final design, the need for slotted drain will be determined on a case by case basis. A sag curve is located at the north ramp intersection. Therefore, catch basins are recommended on both the north and south approaches to that intersection. Slotted drains are also highly recommended at this location.

## Ramp Drainage Design

The ramps will each have roadside V-ditches that drain toward the ramp intersections with Kingman Crossing Boulevard. Area inlet catch basins are recommended at the downstream ends of each V-ditch. Where appropriate, the area inlets will be used as deflection points for the storm drain laterals.

## Median Drainage Design

At the locations Culvert E, F, and G, there are existing median drains immediately east of the existing culverts. Since these culverts are being decommissioned, the median drains will no longer have outlets. To remedy this situation, the median flows for Culvert F and G will be directed to a new median dike catch basin that will be installed just east of the new interchange cut slope. That new median drain will discharge via a lateral into the storm drain network.

The existing median drain for Culvert E will be removed and the median graded to drain to the median inlet at Culvert D.

## 4.7 EARTHWORK

The earthwork for this project will consist of approximately 420,000 cubic yards of roadway excavation.

### 4.7.1 Material Sources

Material sources were researched via files at the ADOT Materials Section in Phoenix, Arizona and through interviews with ADOT Kingman District. Currently, no non-commercial sources were recognized in the vicinity of the project corridor. ADOT approved commercial borrow pits identified in the vicinity of the site are presented in **Table 4-7**.

**Table 4-7 Borrow Pits**

Commercial Pit Number	Name of the Pit	Operator	Highway and Milepost	Approximate Distance from the Site
PS2012	Cofer Material Pit	Mr. Clinton Cofer	US 93 @ MP 96	21 miles
CM0021	Hualapai Pit	Desert Construction, Inc.	SR-66 @ MP 55	4 miles
CM0022	McConnico Pit	Desert Construction, Inc.	I-40 @ MP 45	12 miles
CM0292	McCall Material Sources	McCall Construction	I-40 @ MP 51	6 miles
CM0428	Kingman Pit	TRI-R Construction, Inc.	I-40 @ MP 59	3 miles

Commercial Pit Number	Name of the Pit	Operator	Highway and Milepost	Approximate Distance from the Site
CM0438	Mineral Park Decorative Rock – Cedar Hill	Red Mountain Mining, Inc.	I-40 @ MP 66	10 miles
CM0440	J.D.I. Enterprises, LLC.	J.D.I. Enterprises, LLC	I-40 @ MP 59	3 miles
CM 2044	Kingman Pit	Sunshine Concrete and Materials, Inc.	I-40 @ MP 46	10 miles

Materials source information available from past projects in the vicinity of the project corridor indicate the majority of the sources are no longer available. Currently, ADOT has no plans to license other new pits.

The preliminary recommendations presented in this report are based on our review of pertinent data, our field observations, and our experience on similar projects. These preliminary recommendations are not suitable for final design and are subject to change as additional information is obtained. In general, the design and construction means and methods should be in accordance with ADOT standards as outlined in the Preliminary Engineering and Design Manual (PEDM), unless specifically noted.

### 4.7.2 General Suitability of Site Soils

It is anticipated that the engineering characteristics of on-site soils would not preclude the construction and performance of the proposed roadway and the associated traffic interchange. Our background review and visual observations indicate that the on-site soils contain varied proportions of caliche clays, sands, silts, and gravels. The properties of these materials may also vary along the extent of the project corridor. The on-site soil should be suitable for both common and structural fill. All areas to receive fill, and areas of structures and pavements, should be stripped of vegetation, organic matter, debris, rubble, and other unsuitable materials. Stripped soils should not be used as engineered fill, but may be used in landscape areas.

The presence of clayey soils that exhibit R-values of less than 20 may define the utilization of comprehensive earthwork operations and may need reinforcement using geogrids or similar geosynthetics. Further, clayey soils may provide poor subgrade support, may be expansive under some moisture and loading conditions, and may be corrosive to ferrous metals. Corrosive characteristics of the onsite soils may impact the integrity of steel and concrete structures that are in contact with the onsite soils. Therefore, we recommend that a geotechnical evaluation consisting of subsurface exploration, laboratory testing, and engineering analyses be performed in general accordance with ADOT's PEDM guidelines for this proposed alignment.

### 4.7.3 Excavation, Rippability, and Trenching

Based on the results of the preliminary site reconnaissance, it is possible that rock outcrop may be encountered and some cobbles and boulders could also be possibly encountered during excavation. These materials could be more difficult to excavate depending on the actual size of the materials encountered during excavation and could slow the rate of excavation and/or necessitate the use of more aggressive techniques. A detailed study consisting of test pits and/or seismic refraction surveys should be performed to assess the excavatability of onsite materials.

#### 4.7.4 Cut Slopes and Embankments

Based on our visual observations, for planning purposes, Unprotected permanent cut and fill slopes should be designed no steeper than 3H:1V (Horizontal: Vertical). This assumes that the groundwater level is below the toe of the slope naturally. It is possible that rock outcrop may be encountered during excavation. Slopes cut into rock, if any, should range between 1:1 (H:V) and 1.5:1 (H:V) depending on the degree of fracturing.

Unprotected slopes may rill and erode if exposed to running water. Silty sands and soils containing fine sand are more susceptible in this regard. Adequate drainage control and temporary erosion control covering could minimize erosion and promote post-construction vegetation. Plating the slopes with gravelly material will reduce precipitation impact and slow the rate of erosion. Along longer slopes, brow ditches should be considered to reduce the amount of surface flow on the slope face.

#### 4.7.5 Earthwork Factors

Significant earthwork is expected for the final configuration of the project. Earthwork factors are estimated based on the observed densities of the in-place materials and an assumed compacted dry density. Based on this estimation a shrinkage factor of up to 20 percent may be used over the project length for estimating earthwork volumes; however, some soils may exhibit more or less shrinkage. For rock material, a swell factor of 10 percent may be estimated for planning purposes. A ground compaction of 0.2 to 0.3 feet can be estimated for planning purposes.

#### 4.7.6 Foundation Design

Foundation systems that are typically considered for bridges include shallow spread footings and deep foundations such as drilled shaft foundations. In current practice in Arizona, pile foundations are no longer in common use due to the development of high-torque auger drilling equipment that is used to rapidly construct cost effective drilled shaft foundations.

Drilled shaft foundations can be constructed with minimal disturbance to existing developed areas and are suitable for construction through fill and/or native soils. Drilled shaft foundations may be considered to support bridge piers at the traffic interchange proposed for this project. A combination of drilled shaft foundations and shallow spread footing foundations may be considered to support bridge abutments at the traffic interchange. Shallow spread footings are typically considered to be more cost effective than drilled shafts, especially in depressed roadway segments and where near surface medium dense to dense soil is present, which allows for relatively shallow excavation depths. However, depressed roadway sections are also susceptible to flooding and the foundation soils may become waterlogged for an extended period of time. Accordingly, use of spread footings in depressed roadway sections will require careful evaluation of foundation soils to determine if they are sensitive to moisture induced settlement or volume change.

The onsite soils along the proposed corridor and at the traffic interchange should be generally suitable for supporting shallow and deep foundations and for any retaining walls that are required. Overexcavation, recompaction, and subgrade preparation will likely be needed to avoid potential problems to the shallow foundations. The bearing pressures should be further evaluated based on the equivalent uniform bearing pressure distribution.

#### 4.8 CONSTRUCTABILITY AND TRAFFIC CONTROL

It will be necessary to maintain traffic on I-40 during construction of the grade separation structures for the proposed traffic interchange and storm drain system along Kingman Crossing Boulevard. Given that the new eastbound (EB) and westbound (WB) I-40 overpasses will be constructed at grade on the existing alignments, temporary detours will be required during construction. One alternative is to construct one bridge at a time leaving I-40 open for traffic in one direction and providing a detour in the median for the opposing traffic. With a median width of 69'-0" this alternative can easily provide two lanes of traffic with sufficient shoulder widths. Another alternative will be to first construct all four ramps for use as temporary detours before constructing the EB and WB overpass structures.

Using the new ramps as the detours would be safer than the median crossover alternative because there would be no undivided two-way traffic condition. Also, using the ramps instead of constructing median crossovers would likely be more cost effective because it would result in less throw-away pavement, shorter time traffic detoured, and both bridges can be built simultaneously. The entrance ramps would be designed as two-lane ramps to the gore areas with temporary two-lane striping to tie into the I-40 traffic lanes. The exit ramps would be designed as single-lane ramps with wider shoulders to accommodate two lanes of detour traffic. Temporary pavement will be needed through the ramp intersections with Kingman Crossing Boulevard to provide a smooth transition across the intersections. A Preliminary Detour Plan and Profile Sheet is contained in **Appendix D**. Utilizing the ramps as temporary detours would require the storm drain system to be in-place before the ramps can be constructed. This will require a 60-inch diameter pipe to be jacked under I-40.

#### 4.9 INTERSECTIONS

##### 4.9.1 Kingman Crossing Boulevard and I-40 Ramps

Both ramp TI intersections will be signalized. For the south side ramp TI intersection, the eastbound off-ramp approach would contain a combination through lane with dual left turns and a single right-turn lane. A minimum of 750 feet of left-turn storage would be provided. The southbound Kingman Crossing Boulevard approach would contain dual left turns and two through lanes. A minimum of 200 feet of northbound left-turn storage would be provided. The northbound Kingman Crossing Boulevard approach would contain dual left-turn lane extension and two through lanes. A minimum of 250 feet of southbound left-turn storage would be provided.

For the north side ramp TI intersection, the westbound off-ramp approach would contain a combination through lane with a single left-turn lane and a single right-turn lane. A minimum of 150 feet of left-turn storage would be provided. The southbound Kingman Crossing Boulevard approach would contain dual left-turn lane extensions, two through lanes, and a right-turn only lane. Because of the high volume of southbound right-turning traffic, an additional acceleration lane is recommended on the WB on-ramp to better serve this traffic as a free flow right turn. The northbound Kingman Crossing Boulevard approach would contain dual left-turn lane and two through lanes. A minimum of 200 feet of left-turn storage would be provided.

#### 4.9.2 Kingman Crossing Boulevard and Santa Rosa Drive

The Kingman Crossing Boulevard and Santa Rosa Drive intersection will be constructed as a four-way intersection and will be signalized. Intersection improvements and signals were recently constructed by the Hualapai Medical Center project.

The northbound Kingman Crossing Boulevard approach would contain dual left turns and two through lanes and a right-turn only lane. A minimum of 350 feet of left-turn storage would be provided.

The southbound Kingman Crossing Boulevard approach would contain a left-turn lane, two through lanes, and a right-turn-only lane. A minimum of 150 feet of left-turn storage and 100 feet of right-turn storage would be provided.

The eastbound approach of Santa Rosa Drive would contain a left-turn lane, one through lane, and a right-turn lane. A minimum 150 feet of left-turn storage would be provided.

The westbound approach of Santa Rosa Drive would contain a dual left-turn lane, one through lane, and a right-turn lane. A minimum 350 feet of left-turn storage and 100 feet of right-turn storage would be provided.

#### 4.10 UTILITIES

**Table 4-8 Existing Utilities**

Utility Owner	Utility Type	Location	Conflicts
Frontier Communication	T1 Carrier Line	Within a 10-foot easement along the north I-40 right-of-way line	Will have to be relocated along the new ramp right-of-way and adjusted where it crosses Kingman Crossing Boulevard. Frontier Communications will be responsible for relocating their facility prior construction of the TI
City of Kingman	12" sewer line	Located 7 feet south of the Airfield section line	Outside of the project limits.

Utilities that run parallel to Kingman Crossing Boulevard must be in accordance to “ADOT Guide for Accommodating Utilities on Highway Right-of-Way.” Maintenance facilities must be located outside of the ramp curb returns.

#### 4.11 STRUCTURES

##### 4.11.1 I-40 Overpass Structure

Two new overpass structures will need to be constructed along I-40 to span over Kingman Crossing Boulevard, which will be depressed under I-40. The proposed structures will carry two through lanes in each direction. The proposed structures will be constructed with adequate width to provide for a future third through lane and a wider shoulder when I-40 is widened in the future.

The primary factors that govern the selection of structure type for Kingman Crossing TI Overpass are as follows:

**Maximum Span Length** – The roadway geometry at Kingman Crossing Boulevard dictates a span length of approximately 210 feet. Feasible structure types for a single-span structure are (1) cast-in-place post-tensioned box girders, and (2) steel plate girders. A two-span structure is also feasible but was not considered due to the following reasons:

- 1) Risk of impacting the pier in median
- 2) Sight distance and visibility would be impaired by the piers
- 3) Limits flexibility of changing lane configurations for future widening of Kingman Crossing Boulevard if needed in the future.

**Constructability** – The overpass alternative will be constructed at-grade. Since the surrounding area is relatively undeveloped, the range of feasible construction techniques for this bridge will not be limited by the ability to obtain access to the area beneath and surrounding the new structures.

#### Recommended Structure Type

The required span length is too great for precast-prestressed I-girders and the relatively high cost of steel plate girders is not justified. Therefore, a cast-in-place post-tensioned box girder is recommended. A top-down construction method is recommended as described below.

#### Construction Sequence:

- 1) Excavate to the depth required for placement of a “waste slab”
- 2) Construct the abutment foundations (drilled shafts/spread footings)
- 3) Construct the abutment cap beams/stem walls
- 4) Construct a waste slab to form the soffit of the superstructure
- 5) Form, cast, and post-tension the superstructure
- 6) Excavate beneath the bridge to the level of the Kingman Crossing Boulevard subgrade

#### Superstructures

The EB and WB overpasses will consist of two single-span cast-in-place and post-tensioned concrete box girder superstructures with a total span length of 210 feet. The out-to-out width of each structure will be 60'-10" consisting of three lanes of traffic, a 12'-0" inside shoulder and a 12'-0" outside shoulder. The superstructures will have a depth of 9'-3". The overpass structure is shown on the General Plan and Elevation plan sheet in **Appendix C**.

## Substructures

The substructures will consist of medium height abutments supported by either drilled shafts or spread footings depending on the geotechnical recommendations. ADOT standard cantilever retaining walls aligned parallel to I-40 will serve as wingwalls to retain the approach fills.

### 4.12 PAVEMENT DESIGN

The preliminary design presented should be utilized for planning purposes only. This design is not suitable for final design. The final design should be performed with the data collected through a geotechnical study consisting of subsurface exploration, laboratory testing programs, and engineering analyses performed in general accordance with ADOT's PEDM guidelines.

The traffic loads as presented in **Table 4-9** were used in the design of preliminary pavement sections for this project. A growth rate of 4 percent was used for this project. The pavement sections as presented herein have been designed assuming an R-value of 20 and Resilient Modulus (Mr) of 8,800 for soils in accordance with ADOT's PEDM guidelines for planning purposes.

**Table 4-9 Design Traffic Loads**

Roadway Section	Maximum Average Daily Traffic Volume*	Lane Distribution Factor	Estimated Rigid One-Way 18-kip ESALs	Estimated Flexible One-Way 18-kip ESALs
Kingman Crossing Boulevard, 300 feet south of I-40 south ramp intersection to I-40 south ramp intersection	20,300 (Two-way)	0.9	18,078,100	17,528,700
Kingman Crossing Boulevard between ramp intersections	26,200 (Two-way)	0.9	23,331,400	22,622,400
Kingman Crossing Boulevard, I-40 north ramp intersections to Santa Rosa Drive	36,000 (Two-way)	0.9	32,058,400	31,084,200
I-40 TI Ramps – West	15,000 (One-way)	1.0	24,735,100	23,983,400
I-40 TI Ramps – East	4,000 (One-way)	1.0	6,598,000	6,397,600

\* Maximum ADT Volumes for Year 2030.

For planning purposes, the preliminary pavement sections for rigid pavements as presented in **Table 4-10** can be used for this project. We recommend using AC (base mix) in lieu of AB in depressed and/or at grade locations for the rigid pavements constructed for this project.

**Table 4-10 Preliminary Rigid Pavement Structural Sections**

Roadway Section	Portland Cement Concrete Pavement (PCCP) (inches)	Aggregate Base (AB) (inches)
Kingman Crossing Boulevard, 300 feet south of I-40 south ramp intersection to I-40 south ramp intersection	7.5	4
Kingman Crossing Boulevard between ramp intersections	7.5	4

Kingman Crossing Boulevard, I-40 ramp intersection to 300 feet north of I-40 north ramp intersection	8.0	4
I-40 TI Ramps – West	10.5	4
I-40 TI Ramps – East	8.5	4

The Portland Cement Concrete Pavement (PCCP) pavement limits should extend to 300 feet from the farthest-out crossroad radius return on the exit ramps and 100 feet on the entrance ramps. The PCCP limits should extend to the ADOT access control right-of-way on Kingman Crossing Boulevard.

For planning purposes, the preliminary pavement sections for flexible pavements as presented in **Table 4-11**, can be used for this project.

**Table 4-11 Preliminary Flexible Pavement Structural Sections**

Roadway Element	Asphaltic Concrete (AC) (inches)	Aggregate Base (AB) (inches)
Kingman Crossing Boulevard, 300 feet south of I-40 south ramp intersection to I-40 south ramp intersection	9	10
Kingman Crossing Boulevard between ramp intersections	9	12
Kingman Crossing Boulevard, I-40 north ramp intersections to Santa Rosa Drive	10	12
I-40 TI Ramps – West	10	14
I-40 TI Ramps – East	9	10

The pavement will likely be covered with 1/2-inch of AR-ACFC. Either hot-mix or rubberized asphaltic concrete (AR-AC) could be used for the surface course. The AR-AC should extend to the edge of pavement. The AR-AC tends to be more flexible and can retard reflection cracking better than hot-mix asphalt. The AR-AC also has a tendency to provide a smooth ride and reduce traffic-related noise. In lieu of AR-AC, an AR-ACFC may be used for final surfacing over an AC overlay over new pavement, and should not be placed over PCC pavement.

### 4.13 DESIGN EXCEPTIONS

No roadway features will require AASHTO or ADOT design exceptions.

## 5.0 SOCIAL, ECONOMIC, AND ENVIRONMENTAL CONCERNS

### 5.1 INTRODUCTION

Coordination with federal, state, and local agencies and the public was conducted to obtain information about the environmental resources in the general project area. Specific information was also obtained to define the existing social, economic, and environmental characteristics of the project area and assist the study team in identifying particular constraints to be considered in the development and preliminary analysis of alternatives. Future analyses will address environmental considerations in detail, and specific mitigation measures will be identified as part of those analyses and documentation.

Based on a review of the project area, there are no prime and unique farmlands, sole source aquifers, wetlands, designated critical habitat, wilderness areas, recreational resources, or wild and scenic rivers present in the project area. FHWA has determined that a CE document is the appropriate level of National Environmental Policy Act (NEPA) documentation needed for this project. The following sections summarize current information and identify the level of concern or sensitivity for each environmental issue. A copy of the FHWA approved CE document is included in Appendix F.

### 5.2 BIOLOGICAL RESOURCES

#### 5.2.1 Biological Community

The project area lies between approximately 3,520 feet and 3,560 feet elevation above mean sea level on gently northwest-sloping terrain on the lower bajada of the Hualapai Mountains within the Hualapai Valley. The Hualapai Mountains lie approximately 5 miles south of the project area, with the Cerbat Mountains 10 miles northwest and the Peacock Mountains 15 miles northeast. Davis Dam at Lake Mohave on the Colorado River is approximately 30 miles west of the project area. Hoover Dam at Lake Mead on the Colorado River is approximately 60 miles northwest of the project area. The project is located within the city limits of Kingman, Mohave County, Arizona, with the business district being approximately 1.5 miles to the west.

Northwest-flowing, unnamed ephemeral washes originating on the lower bajada of the Hualapai Mountains pass to the east and west of the project area or drain into a depression, a former borrow site at the southern end of the project. Rattlesnake Wash, an ephemeral wash draining the northern end of the Hualapai Mountains, passes approximately 1.5 miles to the east. The combined flows of these drainages generally dissipate onto the nearly flat terrain within the Hualapai Valley, ultimately draining into Red Lake, an ephemeral closed-basin lake approximately 45 miles north of the project limits. No surface water or wetlands occur in the project area.

Native vegetation of the project area is Lehmann lovegrass (*Eragrostis lehmanniana*)–big galleta (*Pleuraphis rigida*)–dominated semi-desert grassland (Brown 1994), which has been substantially disturbed by livestock grazing. Common shrubs and grasses of the area include catclaw acacia (*Acacia greggii*), fourwing saltbush (*Atriplex canescens*), Colorado buckhorn cholla (*Cylindropuntia acanthocarpa* var. *coloradensis*), turpentine bush (*Ericameria laricifolia*), flat-top buckwheat (*Eriogonum fasciculatum*), joint-fir (*Ephedra* sp.), creosote bush (*Larrea tridentata*), grizzlybear pricklypear (*Opuntia polyacantha* var. *erinacea*), whitestem paperflower (*Psilostrophe cooperi*), banana yucca (*Yucca baccata*), purple threeawn (*Aristida purpurea*), and bush muhly (*Muhlenbergia porter*). Scientific and common names follow the US Department of Agriculture (USDA) Natural Resources Conservation Service plant checklist (USDA 2006). However, when a regional common name is better known in the state, it is also listed and is the name used in the text.

Soils in the area are of the Anthony-Vinton-Agua association. These are deep, well-drained, medium to coarse-textured soils on nearly level to gently sloping floodplains and low alluvial fans of intermountain valleys, formed in recent mixed alluvium, and derived from granite and other rocks (Hendricks 1985; Richard et al. 2000).

#### 5.2.2 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) list of endangered, threatened, proposed, and candidate species for Mohave County (USFWS 2007) was reviewed by a qualified biologist to determine which listed species may occur in the project vicinity. **Table 5-1** summarizes this list and identifies habitat requirements and potential effects on each species. No habitat for federally listed species occurs in the project vicinity. No federally protected species were observed during a general site survey on December 26, 2006. No designated or proposed critical habitat occurs in the project area.

#### 5.2.3 Wildlife of Special Concern in Arizona

The Arizona Game and Fish Department was contacted for a list of special status species that occur near the project area. No Wildlife of Special Concern in Arizona (WSCA) were identified as a result of this effort. No WSCA were observed during the December 26, 2006, general site survey.

**Table 5-1 USFWS Listed Species in Mohave County and Evaluation of Effects**

Common Name	Scientific Name	Status	Suitable Habitat Present?	Occupied Habitat Present?	Critical Habitat Present?	Species Affected?	Critical/ Suitable Habitat Affected?
Arizona cliffrose	<i>Purshia subintegra</i>	E	No	No	No	No	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	No	No	No	No	No
Bonytail chub	<i>Gila elegans</i>	E	No	No	No	No	No
California brown pelican	<i>Pelecanus occidentalis californicus</i>	E	No	No	No	No	No
California condor	<i>Gymnogyps californianus</i>	E	No	No	No	No	No
Desert tortoise, Mohave population	<i>Gopherus agassizii (Xerobates)</i>	T	No	No	No	No	No
Fickeisen plains cactus	<i>Pediocactus peeblesianus var. fickeiseniae</i>	C	No	No	No	No	No
Holmgren (Paradox) milk vetch	<i>Astragalus holmgreniorum</i>	E	No	No	No	No	No
Hualapai Mexican vole	<i>Microtus mexicanus hualapaiensis</i>	E	No	No	No	No	No
Humpback chub	<i>Gila cypha</i>	E	No	No	No	No	No
Jones' cycladenia	<i>Cycladenia humilis var. jonesii</i>	T	No	No	No	No	No
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T	No	No	No	No	No
Razorback sucker	<i>Xyrauchen texanus</i>	E	No	No	No	No	No
Relict leopard frog	<i>Rana onca</i>	C	No	No	No	No	No
Siler pincushion cactus	<i>Pediocactus sileri</i>	T	No	No	No	No	No
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	No	No	No	No	No
Virgin River chub	<i>Gila seminuda</i>	E	No	No	No	No	No
Woundfin	<i>Plagopterus argentissimus</i>	E	No	No	No	No	No
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C	No	No	No	No	No
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	E	No	No	No	No	No

C = Candidate, DL = Delisted, E = Endangered, T = Threatened (USFWS 2007)

**5.2.4 Protected Native Plants**

The project area was surveyed by a qualified biologist for the presence of protected native plants on December 26, 2006. The survey included a general pedestrian survey of the proposed TI location, and north and south of I-40 along the route of the proposed arterial street. The Arizona Department of Agriculture list of protected native plants (Arizona Department of Agriculture 2006) was also reviewed by a qualified biologist. The following protected native plants were found within the project limits.

**Table 5-2 Protected Native Plants in Project Study Area**

Common Name	Scientific Name	Occurrence
<b>Salvage Assessed Protected Native Plants</b>		
Colorado buckhorn cholla	<i>Cylindropuntia acanthocarpa var. coloradensis</i>	Common
Grizzlybear pricklypear	<i>Opuntia polyacantha var. erinacea</i>	Common
Banana yucca	<i>Yucca baccata</i>	Common
<b>Harvest Restricted Protected Native Plants</b>		
Banana yucca	<i>Yucca baccata</i>	Common

Source: Arizona Department of Agriculture 2006

Protected native plants within the project limits will be impacted by the project; therefore, the ADOT Roadside Development Section will notify the Arizona Department of Agriculture at least 60 days prior to the start of construction to afford commercial salvagers the opportunity to remove and salvage these plants.

**5.2.5 Invasive Species**

An evaluation for the presence of invasive species was not conducted for this EO but will be addressed in the environmental document prepared for this study.

**5.3 CULTURAL RESOURCES/SECTION 4(F) PROPERTIES**

Intensive surveys of the project area identified a single isolated occurrence (a fragmentary ground stone artifact) and no cultural properties. ADOT determined that the project should proceed with a finding of “no historic properties affected,” and the State Historic Preservation Office concurred.

**5.4 FLOODPLAINS**

A review of the Federal Emergency Management Agency Flood Insurance Rate Maps for the project vicinity indicated that no portion of the project area is located within a 100-year floodplain. Therefore, no impacts to floodplains are anticipated.

**5.5 WATER QUALITY**

There are no perennial surface waters in the project area. All runoff from ephemeral flows discharges into Red Lake, a closed basin approximately 20 miles north of the project area. Because there are no tributary connections to the Colorado River, neither Clean Water Act Section 404 permitting nor Section 401 certification are required for project construction. However, Arizona Pollutant Discharge Elimination System permits per Section 402(p) of the Clean Water Act would be required during final design from the Arizona Department of Environmental Quality.

## 5.6 AIR QUALITY

This project is not anticipated to have an adverse effect on the air quality of the area. Some deterioration of air quality would be expected due to the operation of construction equipment and the slower traffic speeds through construction zones. However, this localized condition would be discontinued when the project is completed. Fugitive dust generated from construction activities would be controlled in accordance with the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.08 (2000 Edition), special provisions, and local rules or ordinances.

The project is in an area that complies with all other national ambient air quality standards. The applicability of the federal conformity procedures to this project will be addressed during the detailed environmental impact analysis of viable alternatives.

## 5.7 NOISE IMPACTS

This project was evaluated using the ADOT's "Noise Abatement Policy," December 5, 2005. The policy was written to conform to the federal policy and guidelines as stated in "Title 23, Code of Federal Regulations, Part 772." Due to the nature of the work this project involves, this project will not increase current noise levels or present a negative impact. Construction noise will be controlled in accordance with the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.08 (2000 Edition), special provisions, and local rules or ordinances.

## 5.8 HAZARDOUS MATERIALS

A Preliminary Initial Site Assessment (PISA) was conducted for the project area. The PISA consisted of a review of the construction project work scope, on-site reconnaissance of the project area, a review of historical aerial photos, an evaluation of the regulatory database search report prepared by research firm All Lands, and the preparation of a PISA form. The purpose of the PISA was to evaluate and identify the presence of hazardous materials or similar environmental concerns.

The site reconnaissance revealed mostly minor scattered and dumped refuse, and windblown trash, mostly within 1/2 mile north and south of I-40 in the desert areas. No areas of hazardous materials or similar environmental concerns were identified during site reconnaissance.

A review of federal and state databases in accordance with American Society for Testing and Materials standards for Phase I Environmental Site Assessments E 1527-05 was conducted for the subject property and vicinity. No areas of hazardous materials or similar environmental concerns were reported for the subject property.

Based on the field reconnaissance, the surface of the Kingman Crossing alignment contained only minor scattered refuse and windblown trash. No areas of hazardous materials or similar environmental concerns were identified within the subject property.

This overview did not include any inspection or analysis of concrete materials for asbestos, lead paint, or related hazardous materials. These analyses will need to be conducted as part of the detailed environmental clearance document.

## 5.9 SOCIOECONOMIC CONSIDERATIONS

The study area has been evaluated with regard to Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act, and Executive Order 12898 on Environmental Justice. Residential or commercial development adjacent to the I-40 corridor is limited to the City of Kingman, located south and east of the proposed new TI. Unincorporated county land is located immediately north and northeast of the proposed TIs.

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* directs that programs, policies, and activities identify and address as appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations.

The study area for this project is encompassed by Census Tract (CT) 9509 and CT 9510 from the 2000 US Census. These CTs have been divided into more specific Block Groups (BGs) to more accurately depict socioeconomic conditions in the project area. All of the relevant data for this project can be found in BG 1 of each CT. Demographic data were collected from the US Census Bureau Web site on September 19, 2007 ([www.census.gov](http://www.census.gov)). The data were evaluated to assess the demographic composition within the project study limits (**Table 5-3**). The City of Kingman was selected for comparative purposes because the project area is located within the planning area of this municipality. Mohave County and the State of Arizona were also selected for more comparative purposes.

Data from the 2000 Census indicate that minority populations occur within the project study area (**Table 5-4**); however, neither of the BGs exhibit percentages of minorities that are substantially higher than the City of Kingman, Mohave County, or State of Arizona percentages of 13.94%, 15.96%, and 36.22%, respectively.

Female Head of Household is another population protected under Title VI of the Civil Rights Act of 1964. For this study, Female Head of Household is defined as a household with children less than 18 years of age where no husband is present. 2000 Census data indicate that occurrences of these households within BG 1 and BG 2 are consistent with, or below, City of Kingman, Mohave County, or State of Arizona percentages of 2.6%, 2.18%, and 2.42%, respectively.

**Table 5-3 2000 Racial and Ethnic Demographics**

Area	Total Population	White		African American		Native American		Asian		Pacific Islander		Other Race		Two or More		Hispanic <sup>a</sup>	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
CT 9509; BG 1	1,936	1,603	82.80	80	4.13	64	3.31	0	0.00	0	0.00	0	0.00	10	0.52	179	9.25
CT 9510; BG 1	2,608	2,235	85.70	7	0.27	28	1.07	0	0.00	0	0.00	9	0.35	42	1.61	287	11.00
<b>Total Tracts (Study Area)</b>	<b>4,544</b>	<b>3,838</b>	<b>84.46</b>	<b>87</b>	<b>1.91</b>	<b>92</b>	<b>2.02</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.00</b>	<b>9</b>	<b>0.20</b>	<b>52</b>	<b>1.14</b>	<b>466</b>	<b>10.26</b>
City of Kingman	19,755	17,001	86.06	162	0.82	315	1.59	71	0.36	12	0.06	9	0.05	378	1.91	1,807	9.15
Mohave County	155,032	130,287	84.04	753	0.49	3,239	2.09	842	0.54	79	0.05	109	0.07	2,724	1.76	16,999	10.96
State of Arizona	5,130,632	3,272,065	63.78	146,183	2.85	233,352	4.55	88,856	1.73	5,396	0.11	6,175	0.12	83,288	1.62	1,295,317	25.25

Source: US Census Bureau. Census 2000, Summary File 3

BG = Block Group, CT = Census Tract, # = Number, % = Percentage

<sup>a</sup> "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race; i.e., it is calculated differently from the other columns in this table.

**Table 5-4 2000 Total Minority, Age 60 Years and Over, Below Poverty Level, Disabled, and Female Head of Household Populations**

Area	Total Population	Total Minority		Age 60 and Older		Disabled		Below Poverty Level		Female Head of Household	
		#	%	#	%	#	%	#	%	#	%
CT 9509; BG 1	1,936	333	17.20	401	20.71	660	34.09	252	13.02	59	3.05
CT 9510; BG 1	2,608	373	14.30	496	19.02	328	12.58	192	7.36	26	1.00
<b>Total Tracts (Study Area)</b>	<b>4,544</b>	<b>706</b>	<b>15.54</b>	<b>897</b>	<b>19.74</b>	<b>988</b>	<b>21.74</b>	<b>444</b>	<b>9.77</b>	<b>85</b>	<b>1.87</b>
City of Kingman	19,755	2,754	13.94	4,360	22.07	4,443	22.49	2,207	11.17	513	2.60
Mohave County	155,032	24,745	15.96	42,131	27.18	37,799	24.38	21,252	13.71	3,381	2.18
State of Arizona	5,130,632	1,858,567	36.22	870,065	16.96	902,252	17.59	698,669	13.62	124,158	2.42

Source: US Census Bureau. Census 2000, Summary File 3

BG = Block Group, CT = Census Tract, # = Number, % = Percentage

<sup>a</sup> "Total Minority" is composed of all people who consider themselves Non-White racially plus those who consider themselves White Hispanic.

The percentage of residents within CT 9509 BG 1 with disabilities (34.09%) is notably higher than the percentages for the City of Kingman (22.49%), Mohave County (24.38%), and the State of Arizona (17.59%). The percentage of residents within CT 9510 BG 1 with disabilities is less than the percentages for the City of Kingman, Mohave County, and the State of Arizona. Based on these data, a relative concentration of disabled residents was identified in CT 9509 BG1.

Age discrimination is also protected by Title VI of the Civil Rights Act of 1964. For this study, an adverse impact according to age is considered for residents 60 years old and above. Census 2000 data indicate that there are elderly residents within the BGs that encompass that project area (**Table 5-4**); however, these occurrences are below the percentages of the City of Kingman (22.07%), Mohave County (27.18%), and consistent with the percentage for the State of Arizona (16.96%).

The *Department of Transportation Order on Environmental Justice* defines low income as a median household income at or below the US Department of Health and Human Services poverty guideline, which was \$16,700 for a family of four in 1999. Data from the 2000 Census indicate that the project study area includes populations below the poverty level; however, the occurrence of these populations within the project study area are below or consistent with the percentages for the City of Kingman (11.17%), Mohave County (13.71%), and the State of Arizona (13.62%) (**Table 5-3**).

Impacts on Title VI protected populations must be addressed in the CE for this study.

### 5.10 VISUAL RESOURCES

Foreground and midground views within the project limits consist of mostly overgrazed grassland on northwesterly sloping terrain within the Hualapai Valley. I-40 bisects the center of the project area. The remainder of the project limits north and south of I-40 is undeveloped. Vegetation is sparse, with scattered shrubs, forbs, and grasses throughout the project area. Background views include undeveloped grassland, the Kingman Airport, and the outskirts of Kingman. In the distance are the Hualapai Mountains to the south, the Cerbat Mountains to the northwest, and the Peacock Mountains to the northeast.

Because this project would construct approximately 0.5 mile of new roadway, the existing visual character of the project area would be altered. There is existing unpaved roadway along portions of the Airfield Avenue alignment, but the new roadway, Kingman Crossing Boulevard, would be paved and include a median, sidewalks, and curb and gutter. However, changes in the viewshed would be limited to the foreground and midground views; background views from the Kingman Crossing Boulevard alignment would be unchanged.

### 5.11 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

**Table 5-5** is a list of public and agency meetings conducted for this project.

**Table 5-5 Public and Agency Meetings**

Type	Date	Time	Location	Number of Attendees (excluding consultants)
Kick-off meeting	November 14, 2006	1:00 PM	City of Kingman City Complex	19
Public Meeting	January 10, 2007	5:30 PM	Hualapai Elementary School	126
Public Meeting	November 18, 2008	5:30 PM	Mohave County Board of Supervisors Room	50

### 5.12 LITERATURE CITED

- Arizona Department of Agriculture. 2006. Protected Native Plants. <http://www.azda.gov/ESD/protplantlst.htm>. Accessed December 21, 2006.
- Brown, D.E. 1994. Desert plants, Biotic communities of the American Southwest–United States and Northwestern Mexico. Vol. 4, Nos. 1–4.
- Hendricks, D.M. 1985. Arizona soils. University of Arizona Press, Tucson, Arizona.
- Richard, S.M., S.J. Reynolds, J.E. Spencer, and P.A. Peachtree. 2000. Geologic map of Arizona. Arizona Geological Survey, Tucson, Arizona.
- USDA. 2006. Natural Resources Conservation Service plant checklist. <http://plants.usda.gov/checklist.html>. Accessed December 21, 2006.
- USFWS. 2007. Arizona Ecological Services Field Office Web site, <http://arizonaes.fws.gov/>. Arizona federally listed species, by county. Accessed September 25, 2007.

## 6.0 ITEMIZED COST ESTIMATE

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Preliminary cost estimates were prepared for improvements and are summarized in **Table 6-1**. The Detailed Itemized Cost Estimates are shown on the following pages. Costs are based upon unit prices obtained from recent ADOT bid tabulations and assume construction will commence in calendar year 2010 (measured in 2010 dollars).

**Table 6-1 Summary of Project Costs**

Total Construction Costs	Design Costs	Right-of-way Costs	Utility Relocation Costs	Pavement Incentive Costs	Total Project Costs
\$17,950,000	\$1,257,000	0	\$300,000	\$64,000	\$19,571,000

CITY OF KINGMAN  
**ITEMIZED ESTIMATE**  
I-40 Kingman Crossing TI  
Design Concept Report and Environmental Studies

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2010011	CLEARING AND GRUBBING	ACRE	33	\$1,000.00	\$33,400.00
2020029	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT	SQ.YD.	4,850	\$5.00	\$24,250.00
2020048	REMOVAL OF STRUCTURE (HEADWALL)	EACH	15	\$1,000.00	\$15,000.00
2020101	REMOVE FENCE	L.FT.	8,575	\$2.00	\$17,150.00
2030301	ROADWAY EXCAVATION	CU.YD.	380,000	\$4.00	\$1,520,000.00
2030451	CHANNEL EXCAVATION	CU.YD.	3,600	\$5.00	\$18,000.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	22,113	\$28.00	\$619,162.46
4010010	PORTLAND CEMENT CONCRETE PAVEMENT (10")	SQ.YD.	26,302	\$50.00	\$1,315,100.00
4040111	BITUMINOUS TACK COAT	TON	16	\$400.00	\$6,234.16
4040116	APPLY BITUMINOUS TACK COAT	HOURL	29	\$150.00	\$4,282.47
4040270	ASPHALT BINDER (PG 70-10)	TON	1,294	\$500.00	\$647,117.13
4060006	ASPHALTIC CONCRETE (3/4" MIX)	TON	24,891	\$40.00	\$995,622.31
4060026	MINERAL ADMIXTURE (FOR 3/4" MIX)	TON	249	\$90.00	\$22,401.50
4140040	ASPHALTIC CONCRETE FRICTION COURSE (ASPHALT-RUBBER)	TON	1,381	\$45.00	\$62,130.98
4140042	ASPHALT RUBBER MATERIAL (FOR AR-ACFC)	TON	124	\$750.00	\$93,196.47
4140044	MINERAL ADMIXTURE (FOR AR-ACFC)	TON	14	\$90.00	\$1,242.62
5010107	PIPE, CORRUGATED METAL, SLOTTED, 18"	L.FT.	180	\$100.00	\$18,000.00
5012524	STORM DRAIN PIPE, 24"	L.FT.	1,100	\$70.00	\$77,000.00
5012530	STORM DRAIN PIPE, 30"	L.FT.	430	\$80.00	\$34,400.00
5012536	STORM DRAIN PIPE 36"	L.FT.	250	\$110.00	\$27,500.00
5012542	STORM DRAIN PIPE, 42"	L.FT.	0	\$120.00	\$0.00
5012548	STORM DRAIN PIPE, 48"	L.FT.	320	\$180.00	\$57,600.00
5012560	STORM DRAIN PIPE, 60"	L.FT.	390	\$200.00	\$78,000.00
5012572	STORM DRAIN PIPE, 72"	L.FT.	1,200	\$250.00	\$300,000.00
5012924	PIPE CULVERT, 24"	L.FT.	30	\$80.00	\$2,400.00
5012930	PIPE CULVERT, 30"	L.FT.	820	\$100.00	\$82,000.00
5012942	PIPE CULVERT, 42"	L.FT.	175	\$100.00	\$17,500.00
5012954	PIPE CULVERT, 54"	L.FT.	45	\$180.00	\$8,100.00
5014024	FLARED END SECTION, 24" (C-13.25)	EACH	2	\$350.00	\$700.00
5014054	FLARED END SECTION, 54" (C-13.25)	EACH	3	\$800.00	\$2,400.00
5014142	FLARED END SECTION (42") (C-13.20)	EACH	4	\$700.00	\$2,800.00
5014330	FLARED END SECTION, 30" (DOUBLE)	EACH	2	\$500.00	\$1,000.00

CITY OF KINGMAN  
**ITEMIZED ESTIMATE**  
I-40 Kingman Crossing TI  
Design Concept Report and Environmental Studies

Item No	Item Description	Unit	Quantity	Unit Price	Amount
5030001	CONCRETE CATCH BASIN (C-15.10) SINGLE, H=8' OR LESS	EACH	12	\$2,500.00	\$30,000.00
5030141	CONCRETE CATCH BASIN (MEDIAN)	EACH	8	\$3,500.00	\$28,000.00
5030152	CONCRETE CATCH BASIN (MEDIAN DIKES) (STD C-15.90)	EACH	3	\$4,000.00	\$12,000.00
5050001	MANHOLE (C-18.10) (NO. 1) (FOR PIPES 6" TO 36")	EACH	2	\$400.00	\$800.00
5050002	MANHOLE (C-18.10) (NO. 1) (FOR PIPES OVER 36")	EACH	5	\$5,500.00	\$27,500.00
6010003	STRUCTURAL CONCRETE (CLASS S) (F'C = 3,500)	CU.YD.	878	\$500.00	\$439,000.00
6050002	REINFORCING STEEL	LB.	136,617	\$1.00	\$136,617.00
606X005	CANTILEVER SIGN STRUCTURE (	EACH	2	\$25,000.00	\$50,000.00
606X008	FOUNDATION FOR CANTILEVER SIGN STRUCTURE (	EACH	2	\$10,000.00	\$20,000.00
608XX01	SIGNING(	COST	1	\$40,000.00	\$40,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	76,925	\$0.30	\$23,077.50
7040073	PAVEMENT LEGEND (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	16	\$75.00	\$1,200.00
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	16	\$75.00	\$1,200.00
7060001	PAVEMENT MARKER, RAISED (REFLECTIVE)	EACH	7,325	\$8.00	\$58,600.00
733X001	TRAFFIC SIGNAL (	EACH	2	\$100,000.00	\$200,000.00
736X007	ROADWAY LIGHTING	L.SUM	1	\$150,000.00	\$150,000.00
807X001	LANDSCAPING ESTABLISHMENT (LANDSCAPE AND IRRIGATION)	LSUM	1	\$50,000.00	\$50,000.00
9020028	CHAIN LINK FENCE (	L.FT.	8,964	\$10.00	\$89,640.00
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	1,000	\$20.00	\$20,000.00
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	5	\$3,000.00	\$15,000.00
9050040	GUARD RAIL, END TERMINAL ASSEMBLY	EACH	5	\$700.00	\$3,500.00
9050404	GUARD RAIL TRANSITION,W-BEAM TO CONCRETE HALF BARRIER	EACH	4	\$2,500.00	\$10,000.00
9080031	CONCRETE CURB (C-05.10) (TYPE G)	L.FT.	2,709	\$15.00	\$40,635.00
9080084	CONCRETE CURB AND GUTTER (C-05.10) (TYPE D)	L.FT.	3,734	\$20.00	\$74,680.00
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	27,886	\$4.00	\$111,544.00
9080288	CONCRETE WHEEL CHAIR RAMP	EACH	12	\$1,500.00	\$18,000.00
9130053	RIPRAP (DUMPED) (D50=12")	CU.YD.	300	\$80.00	\$24,000.00
9190001	CONCRETE GORE PAVING	SQ.YD.	737	\$40.00	\$29,480.00
9201006	CONCRETE CHANNEL LINING (6")	SQ.YD.	1,145	\$30.00	\$34,350.00
999X001	NEW BRIDGE (KINGMAN CROSSING BLVD AT I-40)	SQ.FT.	25,550	\$110.00	\$2,810,500.00
	<b>SUBTOTAL 1</b>				<b>\$10,653,013.62</b>
934XX01	MISCELLANEOUS WORK (15%)	COST	15%		\$1,597,952.04

CITY OF KINGMAN  
**ITEMIZED ESTIMATE**  
 I-40 Kingman Crossing TI  
 Design Concept Report and Environmental Studies

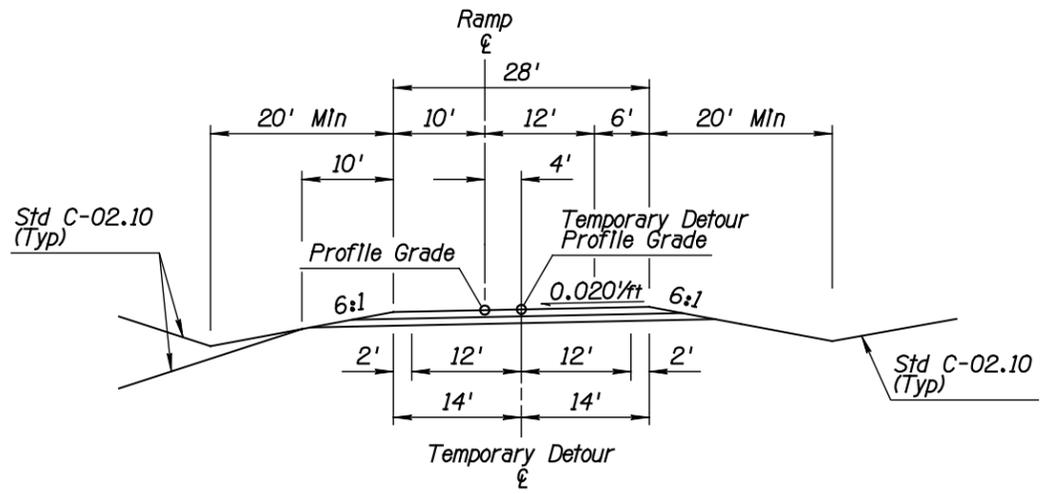
Item No	Item Description	Unit	Quantity	Unit Price	Amount
	<b>SUBTOTAL 2</b>				<b>\$12,250,965.67</b>
207XX01	DUST PALLIATIVE (	COST	1%		\$122,509.66
209XX01	FURNISH WATER (	COST	1%		\$122,509.66
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (	COST	1%		\$122,509.66
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	4%		\$480,038.63
924XX02	CONTRACTOR QUALITY CONTROL	COST	2%		\$245,019.31
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (	COST	2%		\$245,019.31
	<b>SUBTOTAL 2</b>				<b>\$13,598,571.89</b>
901XX01	MOBILIZATION	COST	10%		\$1,359,857.19
	<b>SUBTOTAL 3</b>				<b>\$14,958,429.08</b>
	CONTINGENCIES	COST	5%		\$747,921.45
	CONSTRUCTION ENGINEERING	COST	15%		\$2,243,764.36
	<b>TOTAL CONSTRUCTION COST</b>				<b>\$17,950,114.89</b>
	PCCP QUALITY INCENTIVE	SQ. YD.	26,302	\$1.00	\$26,302.00
	AC QUALITY INCENTIVE	TON	24,891	\$1.50	\$37,335.84
	DESIGN ENGINEERING	COST	7%		\$1,256,508.04
7320714	UTILITY RELOCATION WORK (	L.SUM	1	\$300,000.00	\$300,000.00
			<b>TOTAL PROJECT COST =</b>		<b>\$19,570,260.77</b>

**APPENDIX A**

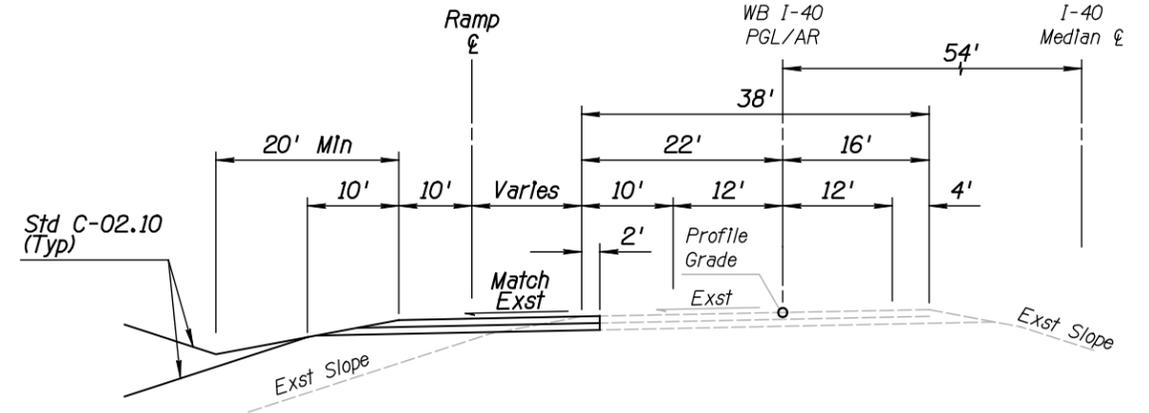
**TYPICAL SECTIONS AND PLAN AND PROFILE SHEETS FOR RECOMMENDED ALTERNATIVE**

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

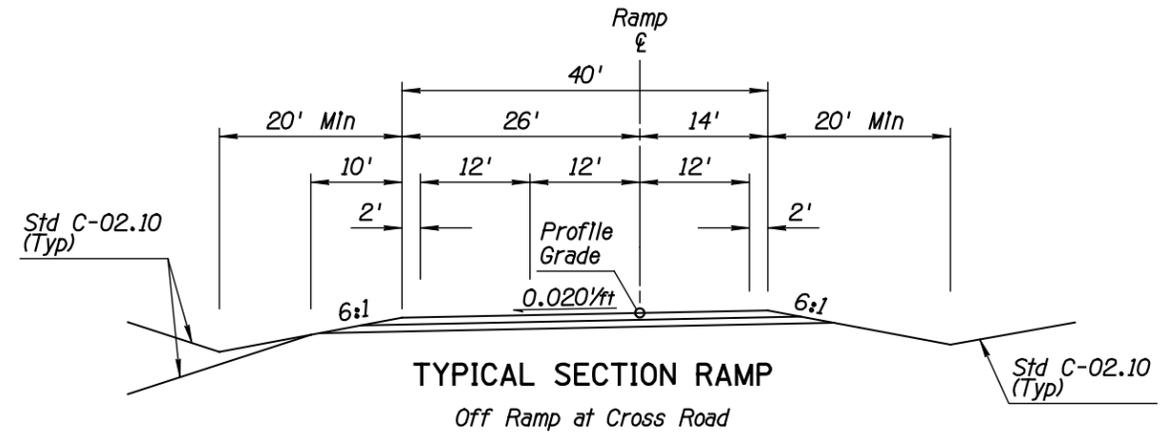
040 MO XX



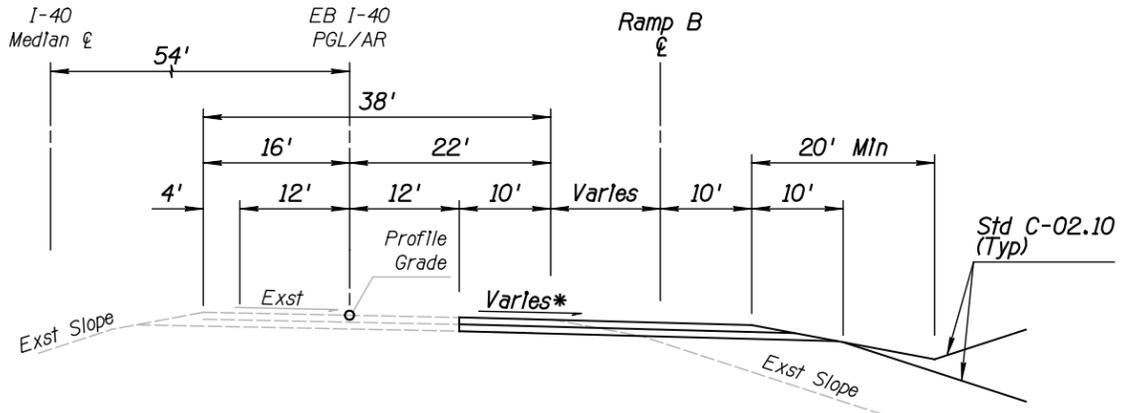
**TYPICAL SECTION RAMP**  
Off Ramp



**TYPICAL SECTION I-40**  
Ramp Accel/Decel Lane  
EB Similar

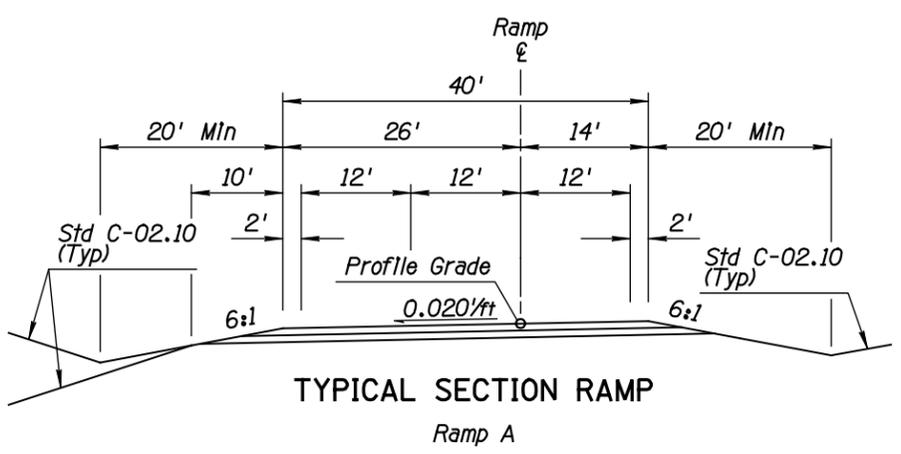


**TYPICAL SECTION RAMP**  
Off Ramp at Cross Road

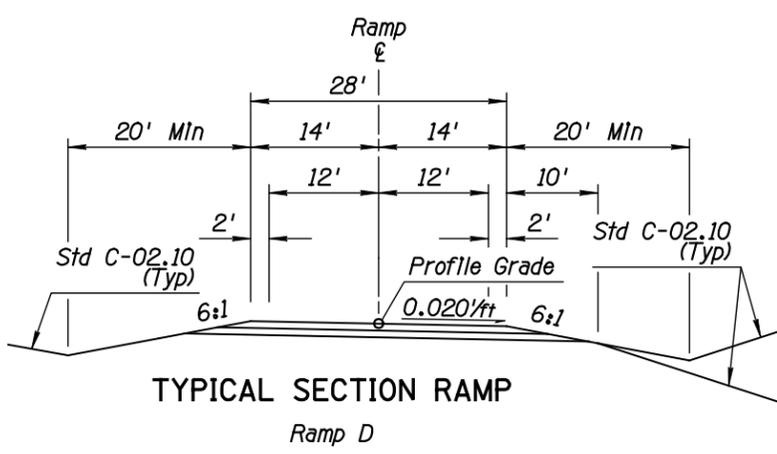


**TYPICAL SECTION I-40**  
Ramp B Decel Lane

\* I-40 Median  $\epsilon$   
 Sta 2840+00 to 2851+26 - Match Exst  
 Sta 2851+26 to 2851+74 - Varles  
 Sta 2851+74 to 2856+00 - 2.6%



**TYPICAL SECTION RAMP**  
Ramp A



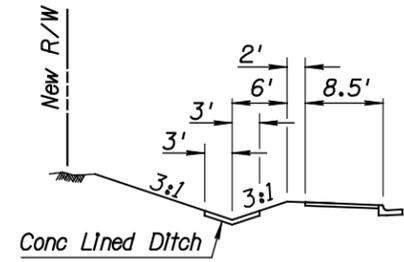
**TYPICAL SECTION RAMP**  
Ramp D

DESIGN	R HOOKEY	DATE	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	K THOMAS	DATE	8/07		
CHECKED	D WIGGINS	DATE	8/07		
<b>URS</b>				<b>RAMP &amp; I-40 TYPICAL SECTIONS</b>	
ROUTE	I-40			LOCATION	KINGMAN CROSSING TI - KINGMAN
TRACS NO.	H7147			DWG NO.	1 OF 19

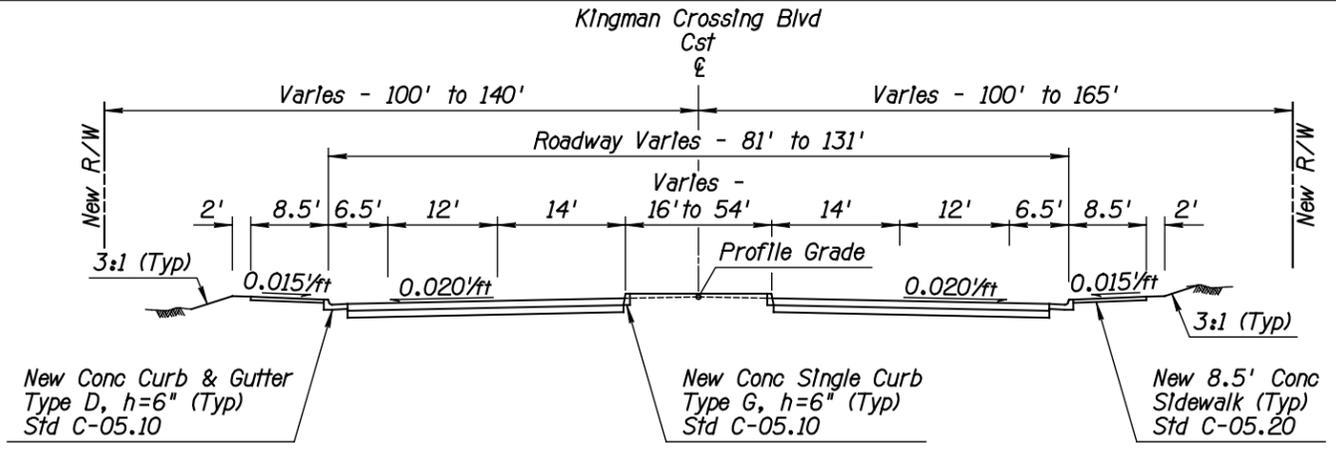
DATE- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

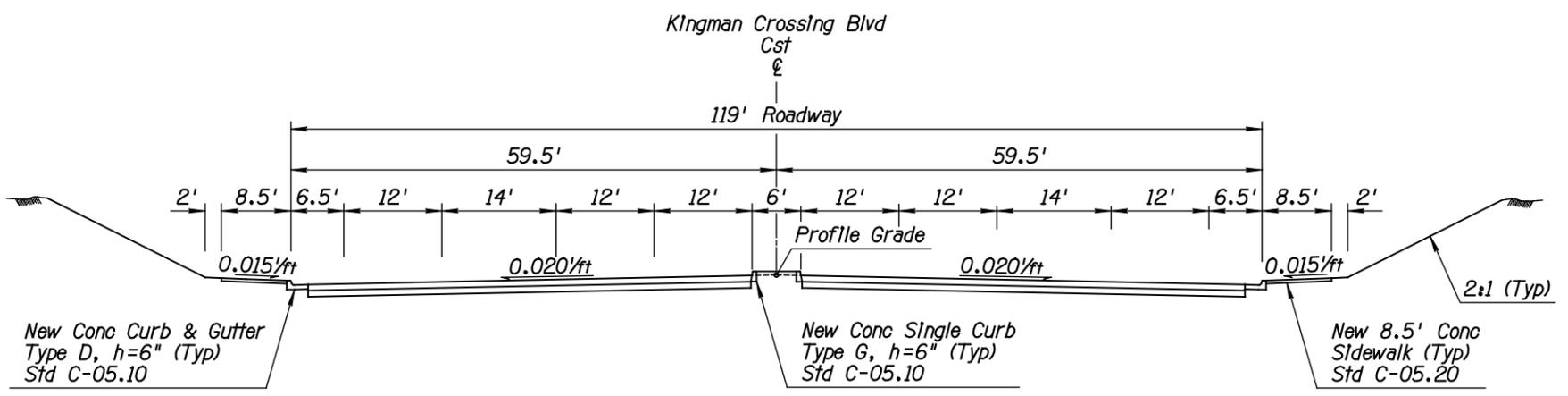
040 MO XX



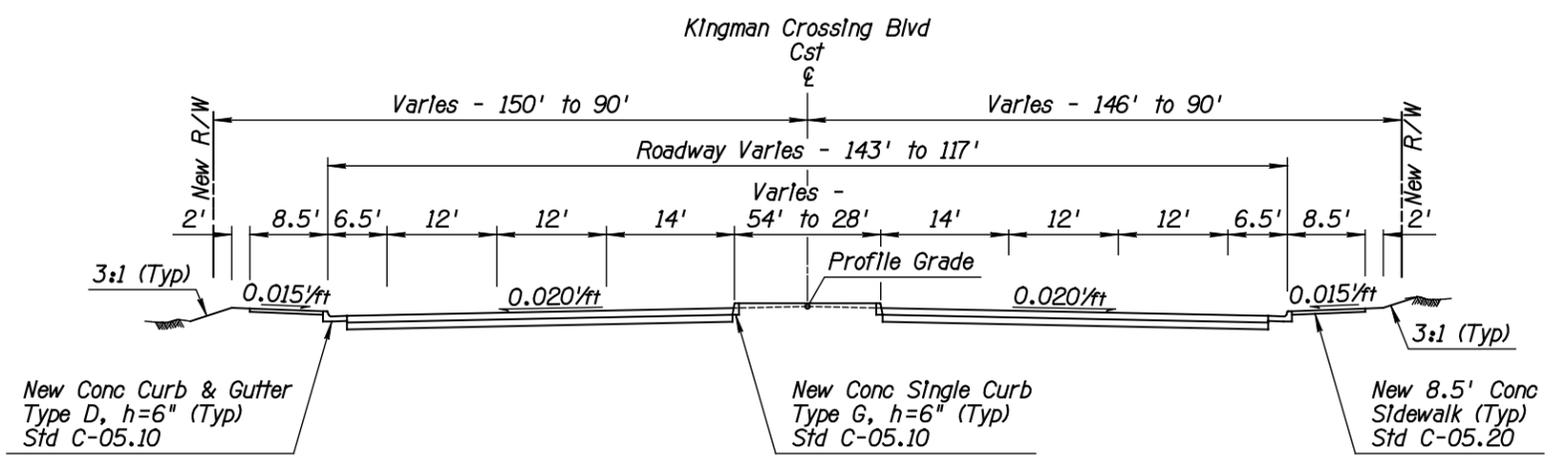
**DITCH SECTION**  
Sta 41+00 to 46+70



**TYPICAL SECTION: 4-LANE w/ CURBED MEDIAN**  
Airfield Avenue to I-40 (Future)



**TYPICAL SECTION: 8-LANE w/ CURBED MEDIAN**  
At I-40 w/In Interchange



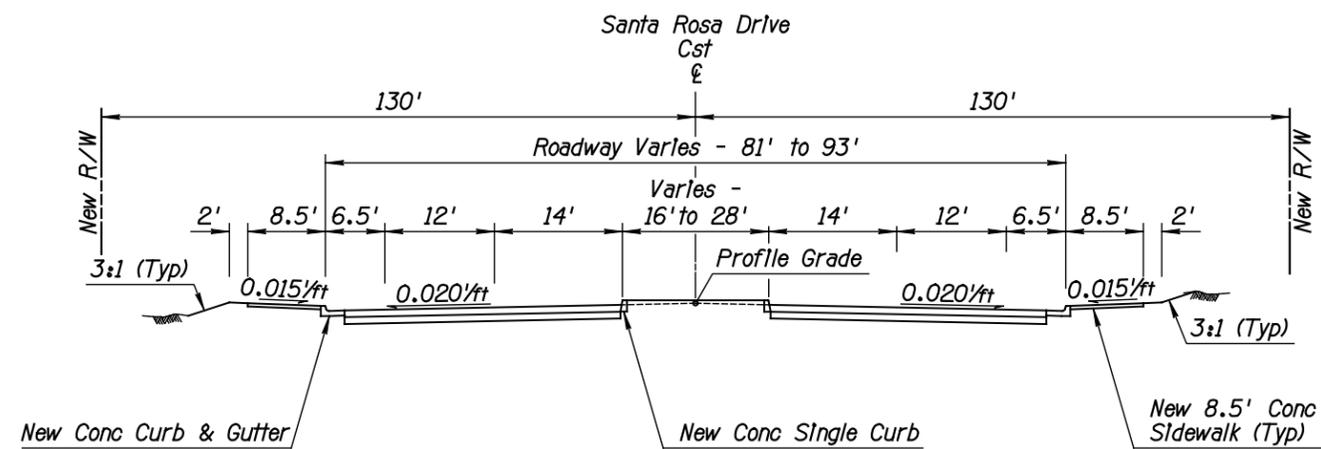
**TYPICAL SECTION: 6-LANE w/ CURBED MEDIAN**  
I-40 to Santa Rosa Avenue

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	K THOMAS	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING TYPICAL SECTIONS	DWG NO <b>2 OF 19</b>
ROUTE	I-40	LOCATION		
TRACS NO.	H7147			

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



**TYPICAL SECTION: 4-LANE w/ CURBED MEDIAN**

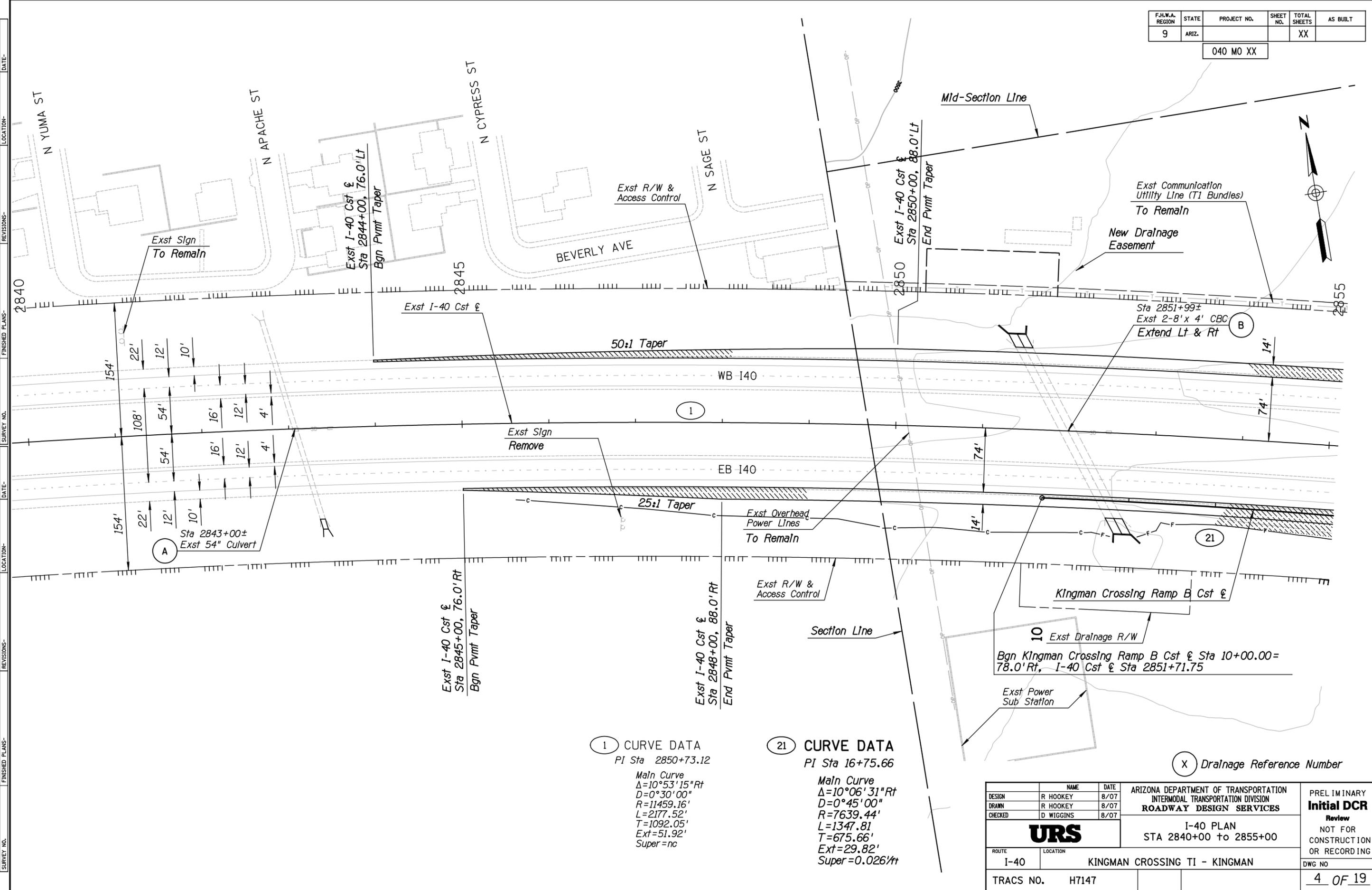
*Santa Rosa Drive (Not Part of this Project)*

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	M WILLIAMS	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			SANTA ROSA DRIVE TYPICAL SECTIONS	
ROUTE	LOCATION		DWG NO	
I-40	KINGMAN CROSSING TI - KINGMAN		3 OF 19	
TRACS NO.	H7147			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



SURVEY NO. FINISHED PLANS LOCATION DATE REVISIONS LOCATION DATE FINISHED PLANS SURVEY NO.

**1 CURVE DATA**  
 PI Sta 2850+73.12  
 Main Curve  
 $\Delta=10^{\circ}53'15''$  Rt  
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=2177.52'$   
 $T=1092.05'$   
 $Ext=51.92'$   
 $Super=nc$

**21 CURVE DATA**  
 PI Sta 16+75.66  
 Main Curve  
 $\Delta=10^{\circ}06'31''$  Rt  
 $D=0^{\circ}45'00''$   
 $R=7639.44'$   
 $L=1347.81'$   
 $T=675.66'$   
 $Ext=29.82'$   
 $Super=0.026'/ft$

(X) Drainage Reference Number

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2840+00 to 2855+00	DWG NO
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147			4 OF 19

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.		040 MO XX	XX	

**11 CURVE DATA**

PI Sta 13+26.01  
 Main Curve  
 $\Delta=3^{\circ}15'33''$  Lt  
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=651.84'$   
 $T=326.01'$   
 $Ext=4.64'$   
 Super=nc

**1 CURVE DATA**

PI Sta 2850+73.12  
 Main Curve  
 $\Delta=10^{\circ}53'15''$  Rt  
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=2177.52'$   
 $T=1092.05'$   
 $Ext=51.92'$   
 Super=nc

Bgn Kingman Crossing Ramp A Cst @ Sta 10+00.00=  
 78.0' Lt I-40 Cst @ Sta 2857+15.23

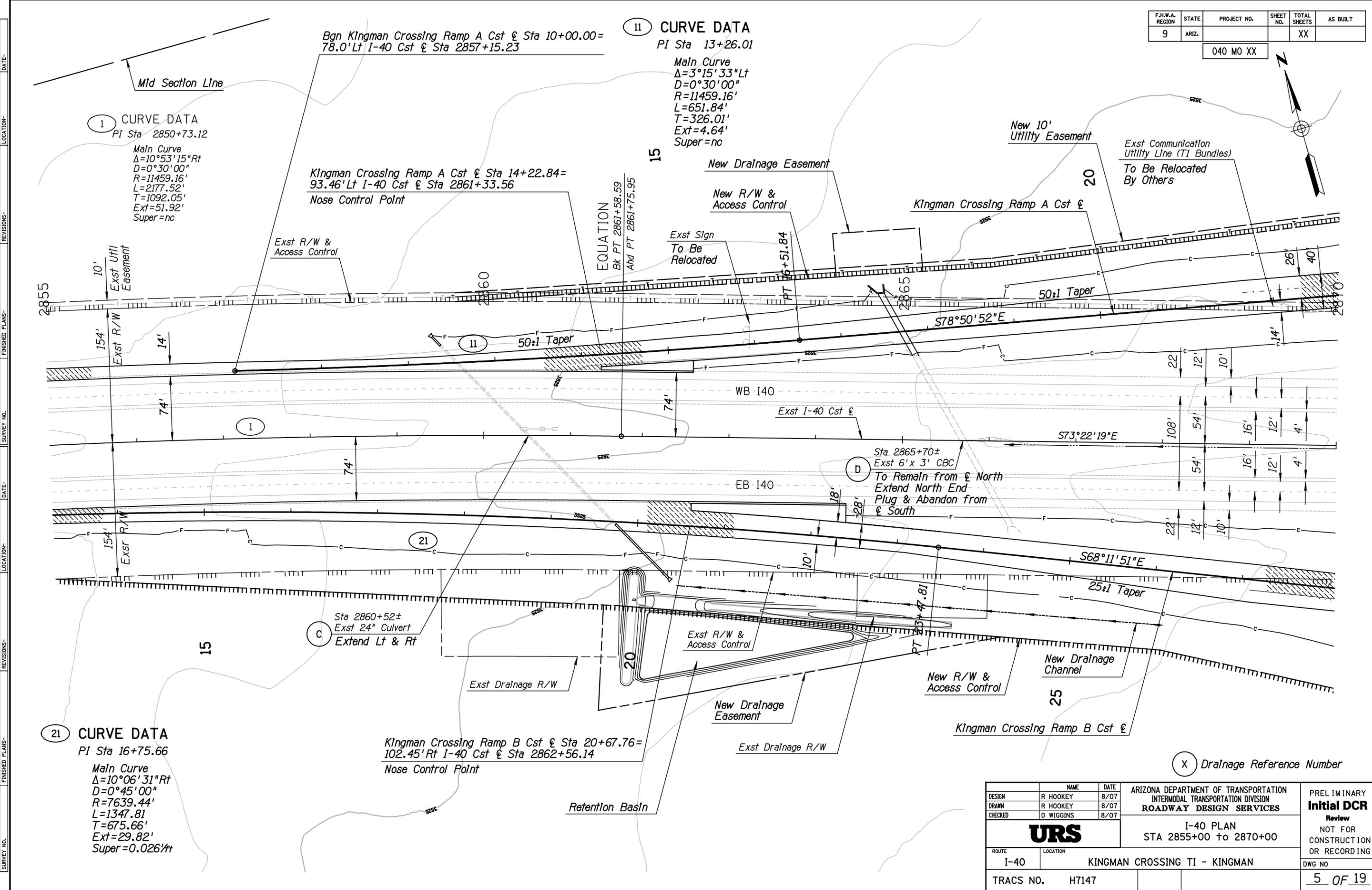
Kingman Crossing Ramp A Cst @ Sta 14+22.84=  
 93.46' Lt I-40 Cst @ Sta 2861+33.56  
 Nose Control Point

Sta 2860+52±  
 Exst 24" Culvert  
 Extend Lt & Rt

Kingman Crossing Ramp B Cst @ Sta 20+67.76=  
 102.45' Rt I-40 Cst @ Sta 2862+56.14  
 Nose Control Point

**21 CURVE DATA**

PI Sta 16+75.66  
 Main Curve  
 $\Delta=10^{\circ}06'31''$  Rt  
 $D=0^{\circ}45'00''$   
 $R=7639.44'$   
 $L=1347.81'$   
 $T=675.66'$   
 $Ext=29.82'$   
 Super=0.026/ft



DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2855+00 to 2870+00	
ROUTE	LOCATION			DWG NO
I-40	KINGMAN CROSSING TI - KINGMAN			5 OF 19
TRACS NO.	H7147			

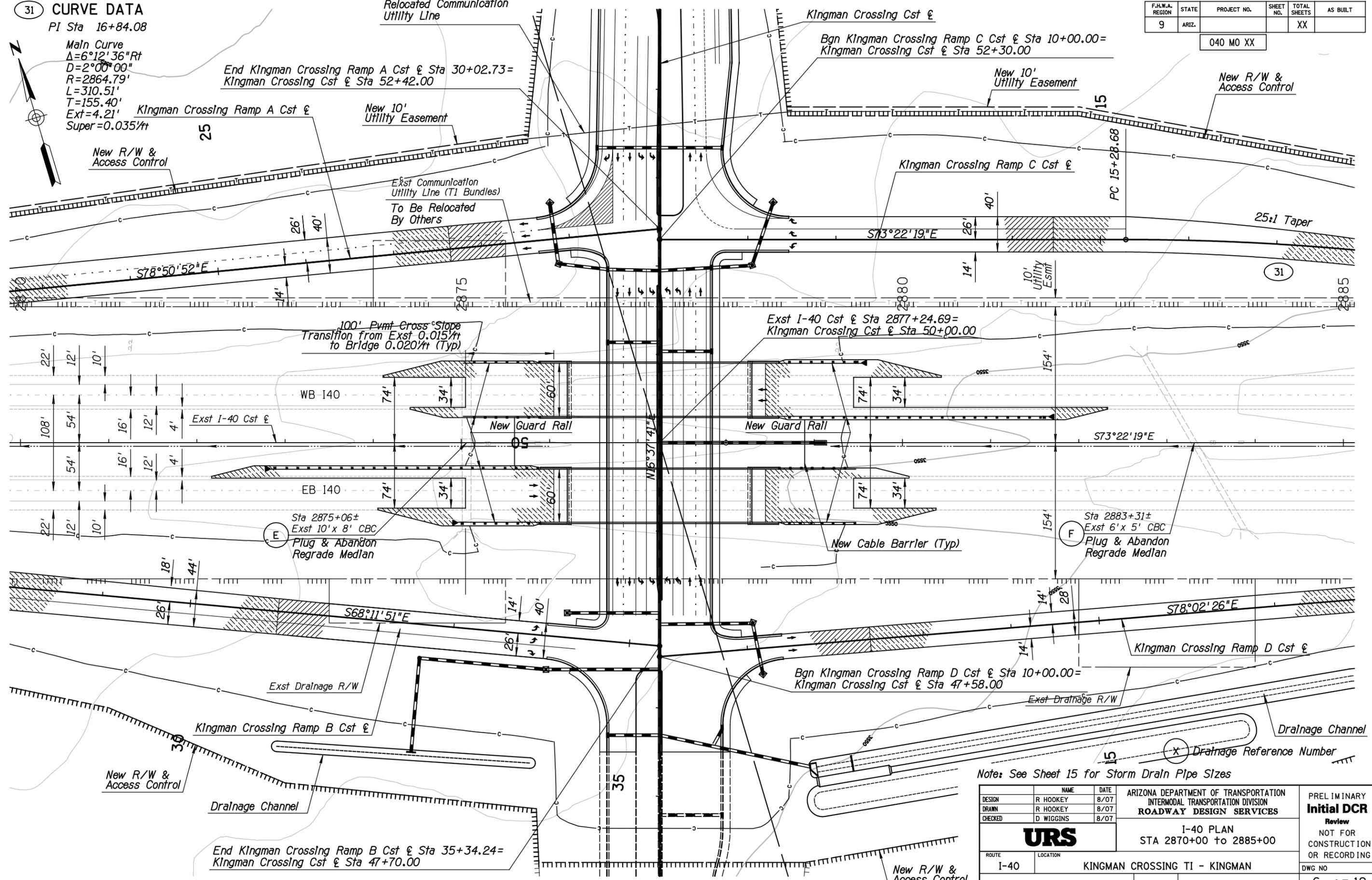
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.		XX		

040 MO XX

**31 CURVE DATA**

PI Sta 16+84.08

Main Curve  
 $\Delta=6^{\circ}12'36''Rt$   
 $D=2^{\circ}00'00''$   
 $R=2864.79'$   
 $L=310.51'$   
 $T=155.40'$   
 $Ext=4.21'$   
 $Super=0.035'/ft$



DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_ DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_

Note: See Sheet 15 for Storm Drain Pipe Sizes

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2870+00 to 2885+00	
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147		DWG NO <b>6 OF 19</b>	

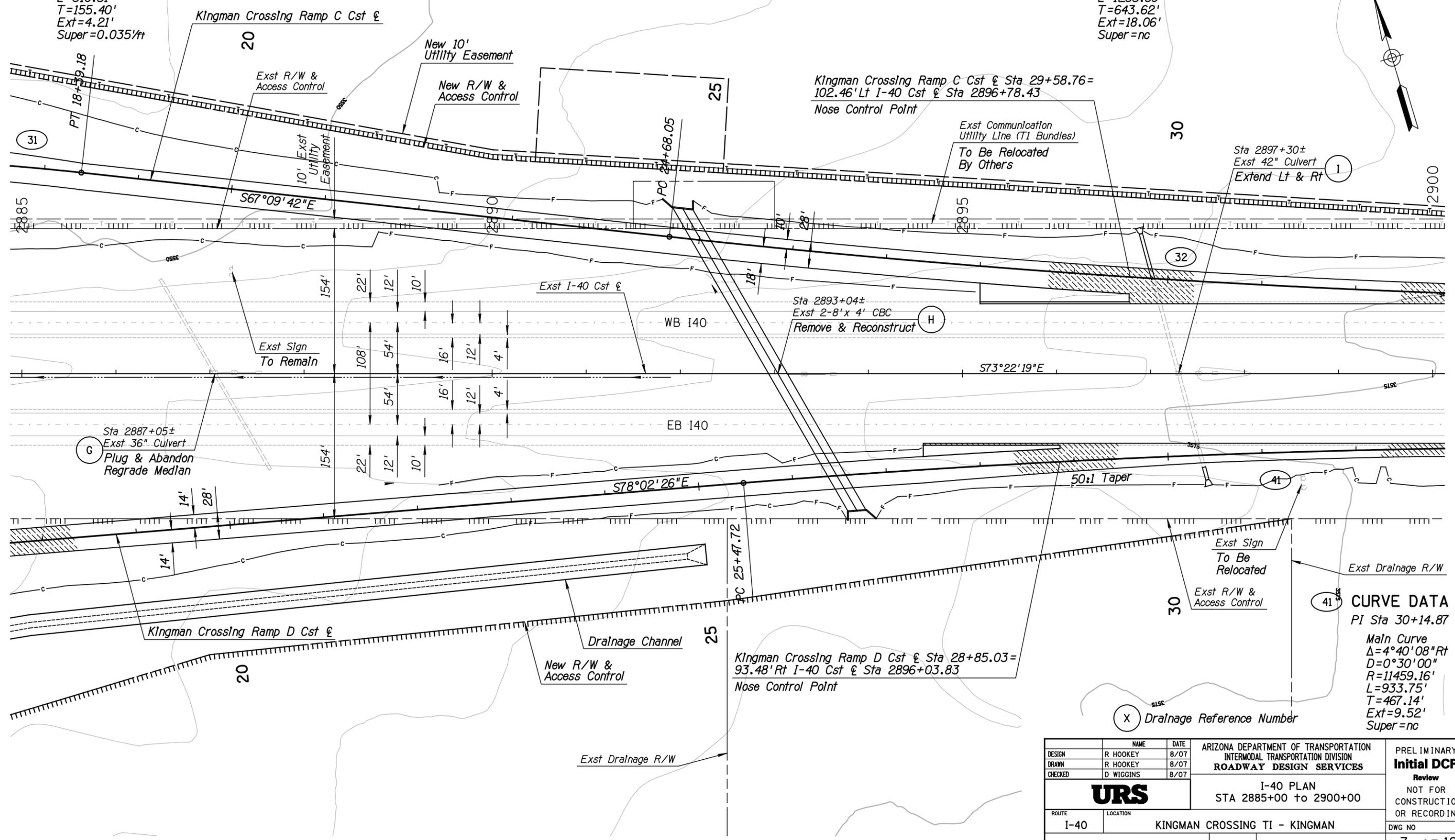
DATE: LOCATION: REVISIONS: SURVEY NO. DATE: LOCATION: REVISIONS: SURVEY NO.

**31 CURVE DATA**  
 PI Sta 16+84.08  
 Main Curve  
 $\Delta=6^{\circ}12'36''Rt$   
 $D=2^{\circ}00'00''$   
 $R=2864.79'$   
 $L=310.51'$   
 $T=155.40'$   
 $Ext=4.21'$   
 $Super=0.035/ft$

**32 CURVE DATA**  
 PI Sta 31+11.67  
 Main Curve  
 $\Delta=6^{\circ}25'46''Lt$   
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=1285.89'$   
 $T=643.62'$   
 $Ext=18.06'$   
 $Super=nc$

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



**41 CURVE DATA**  
 PI Sta 30+14.87  
 Main Curve  
 $\Delta=4^{\circ}40'08''Rt$   
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=933.75'$   
 $T=467.14'$   
 $Ext=9.52'$   
 $Super=nc$

(X) Drainage Reference Number

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2885+00 to 2900+00	
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147	DWG NO.	7 OF 19	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX

**32 CURVE DATA**  
 PI Sta 31+11.67  
 Main Curve  
 $\Delta=6^{\circ}25'46''$  Lt  
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=1285.89'$   
 $T=643.62'$   
 $Ext=18.06'$   
 Super=nc

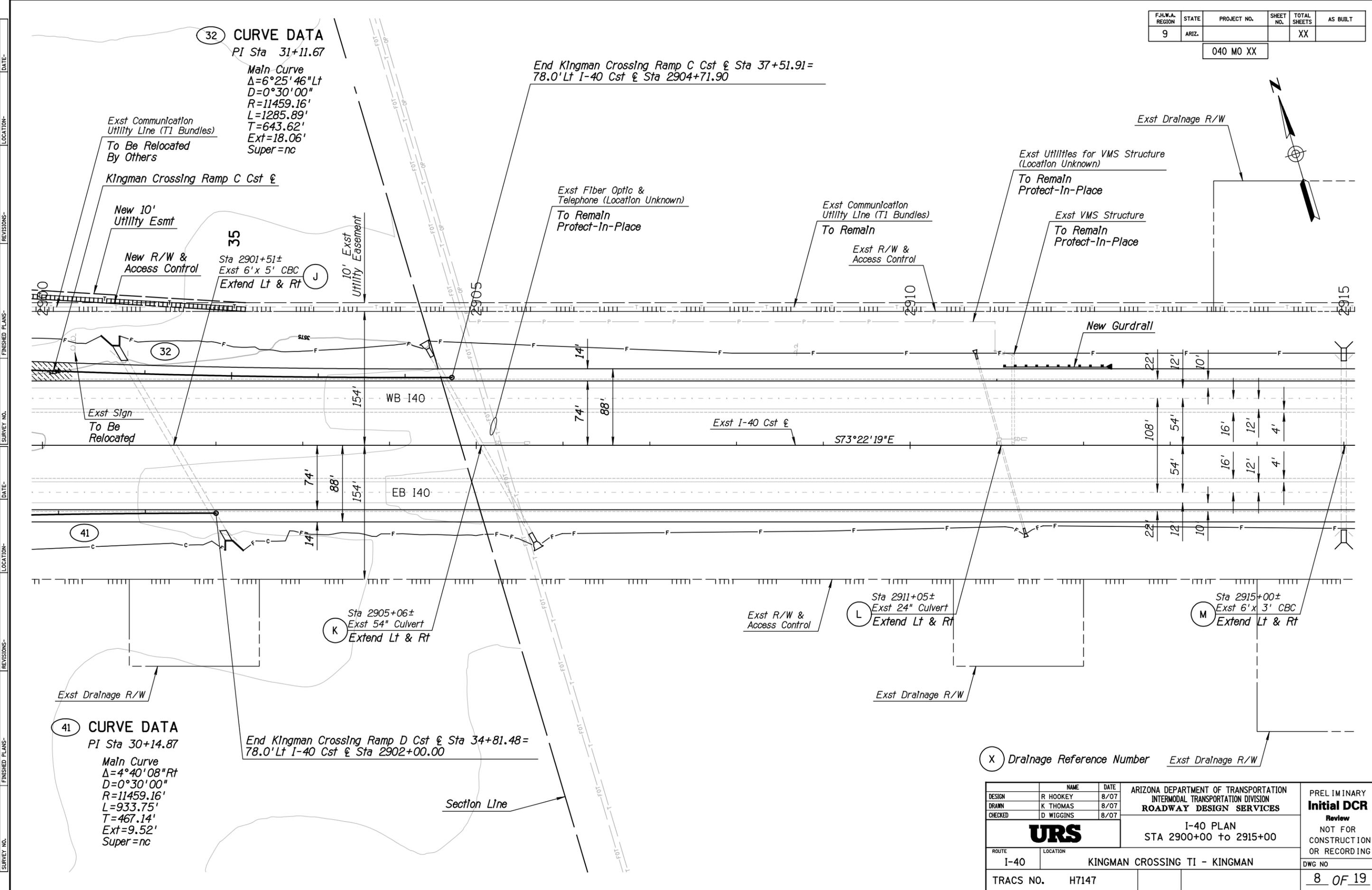
End Kingman Crossing Ramp C Cst @ Sta 37+51.91=  
 78.0'Lt I-40 Cst @ Sta 2904+71.90

**35 CURVE DATA**  
 Sta 2901+51±  
 Ext 6' x 5' CBC  
 Extend Lt & Rt

**41 CURVE DATA**  
 PI Sta 30+14.87  
 Main Curve  
 $\Delta=4^{\circ}40'08''$  Rt  
 $D=0^{\circ}30'00''$   
 $R=11459.16'$   
 $L=933.75'$   
 $T=467.14'$   
 $Ext=9.52'$   
 Super=nc

End Kingman Crossing Ramp D Cst @ Sta 34+81.48=  
 78.0'Lt I-40 Cst @ Sta 2902+00.00

(X) Drainage Reference Number Exst Drainage R/W

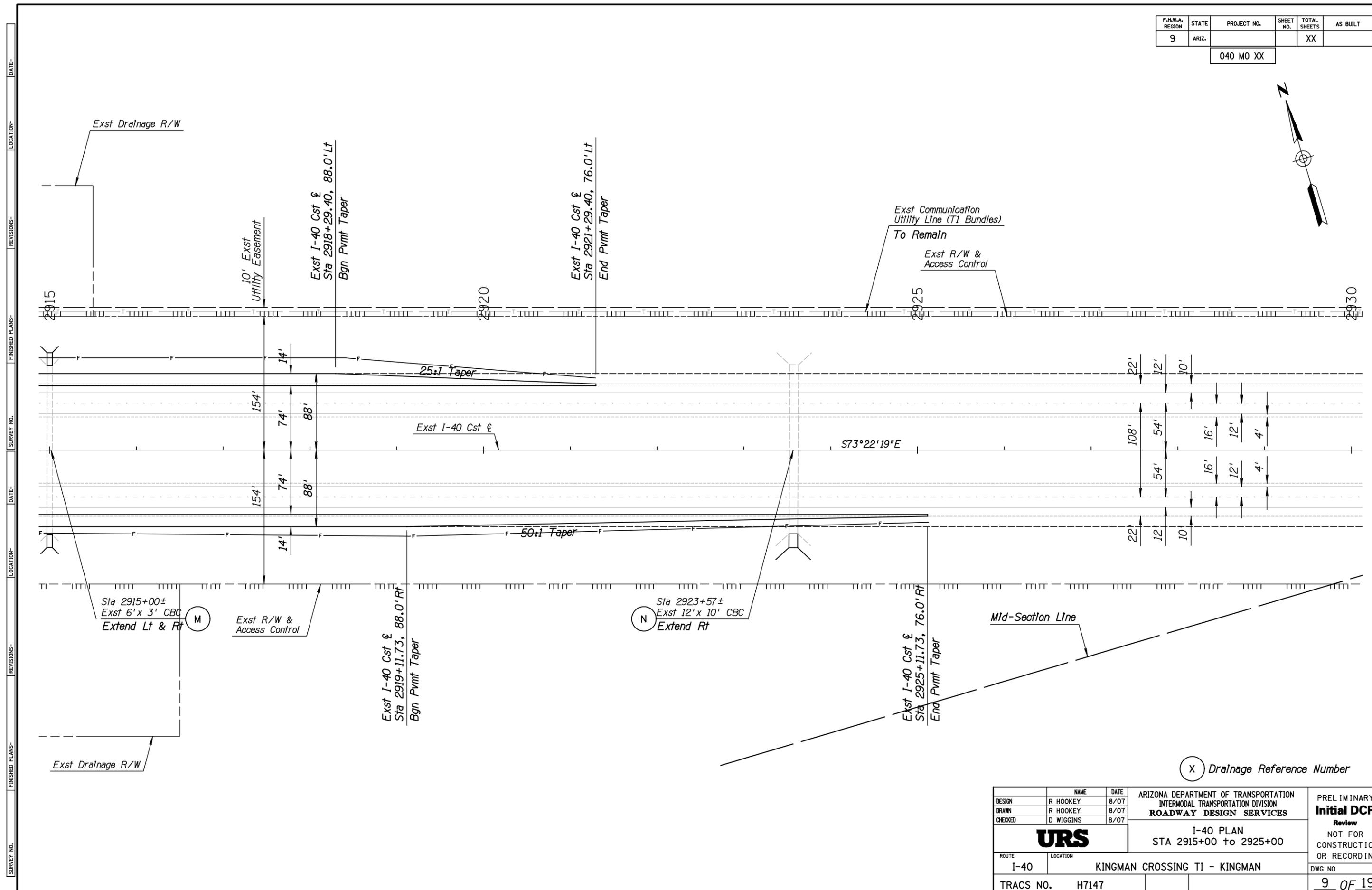


DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO. DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	K THOMAS	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2900+00 to 2915+00	DWG NO
ROUTE	I-40		KINGMAN CROSSING TI - KINGMAN	8 OF 19
TRACS NO.	H7147			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



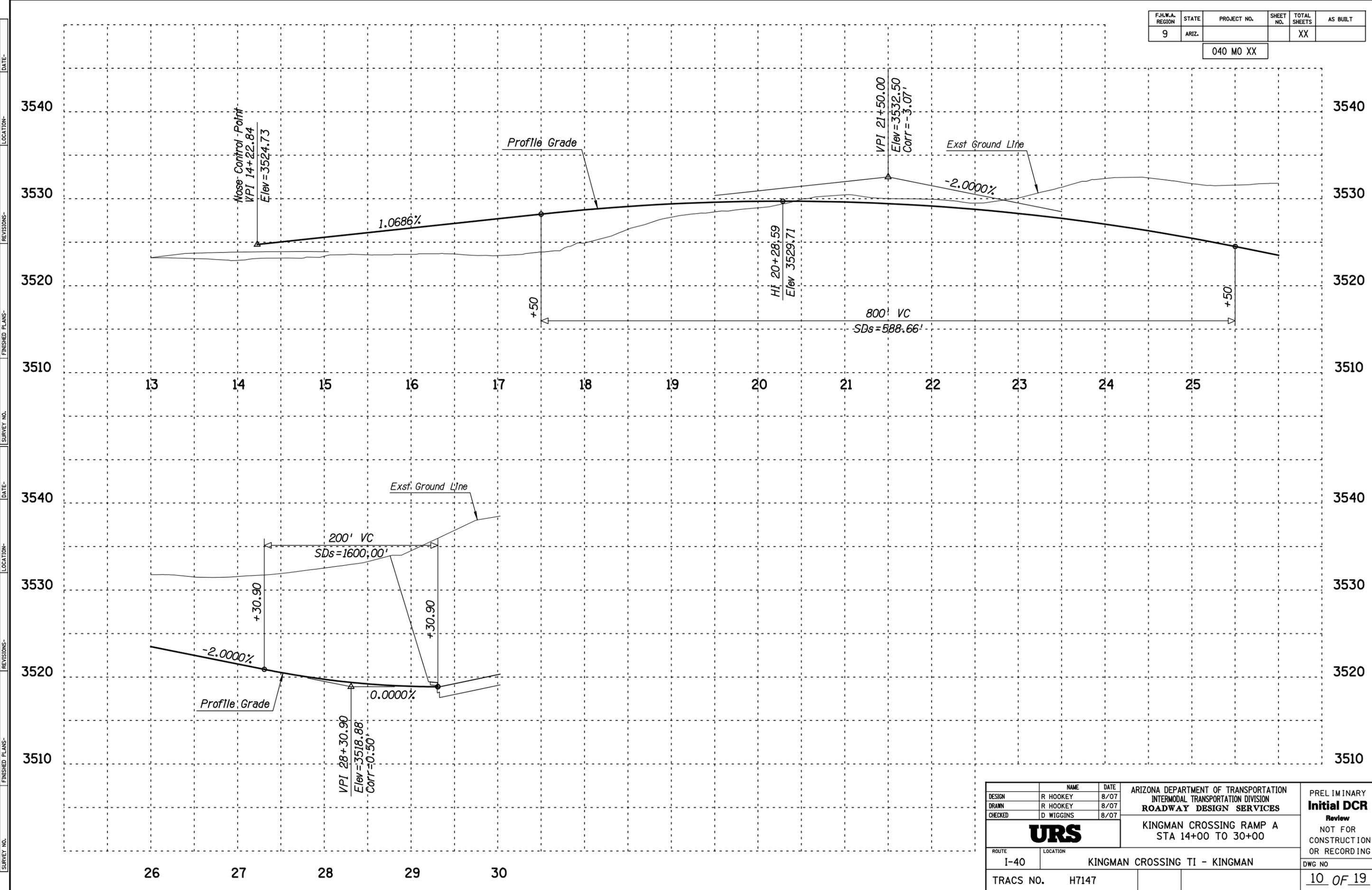
(X) Drainage Reference Number

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			I-40 PLAN STA 2915+00 to 2925+00	
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	DWG NO
TRACS NO.	H7147			<u>9</u> OF <u>19</u>

SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- FINISHED PLANS- SURVEY NO. DATE- REVISIONS- LOCATION- DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

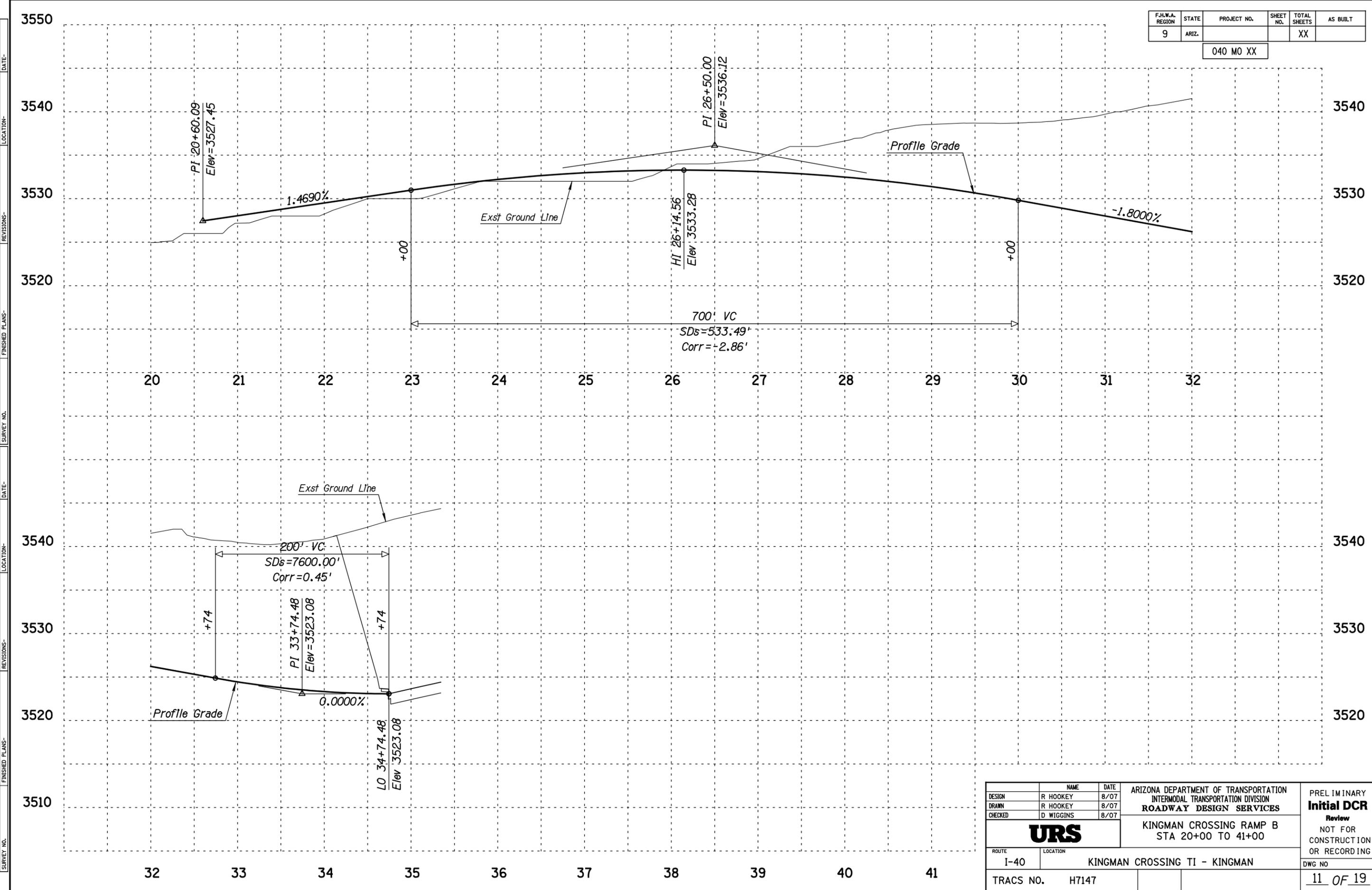
040 MO XX



DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING RAMP A STA 14+00 TO 30+00	
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147	DWG NO.	10 OF 19	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX

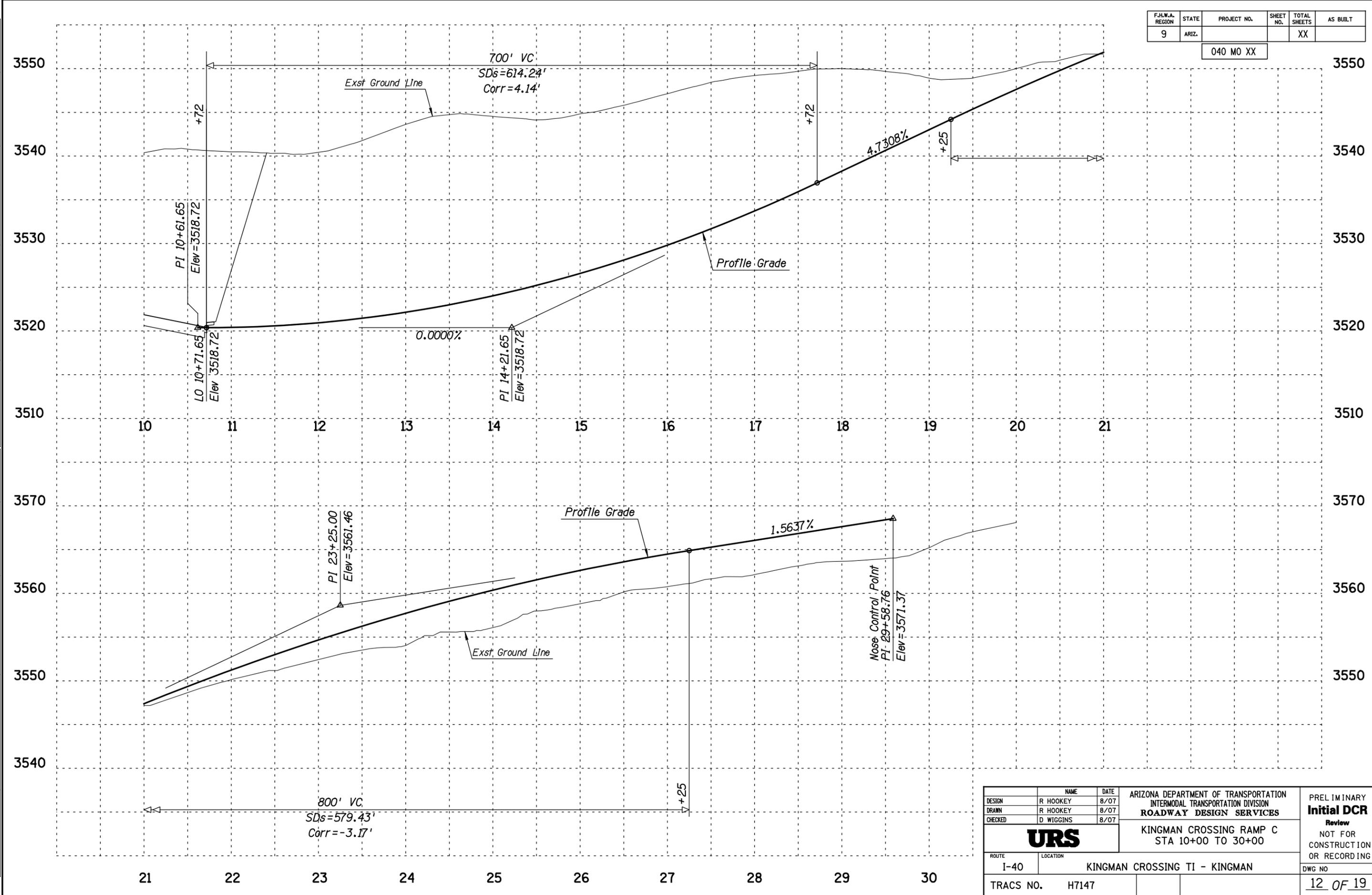


DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING RAMP B STA 20+00 TO 41+00	DWG NO
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147			11 OF 19

SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX

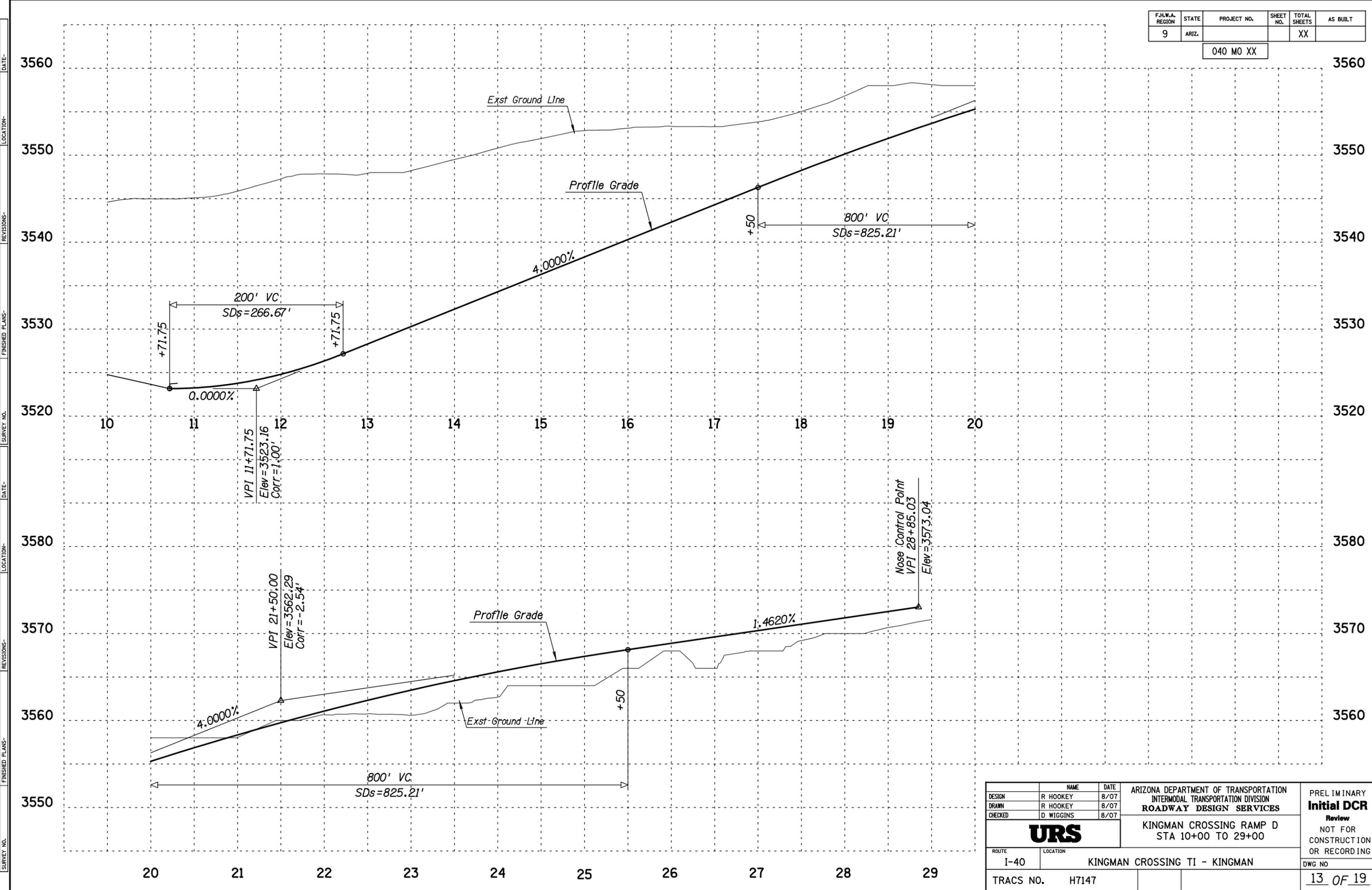


DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING RAMP C STA 10+00 TO 30+00	DWG NO
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	
TRACS NO.	H7147			12 OF 19

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



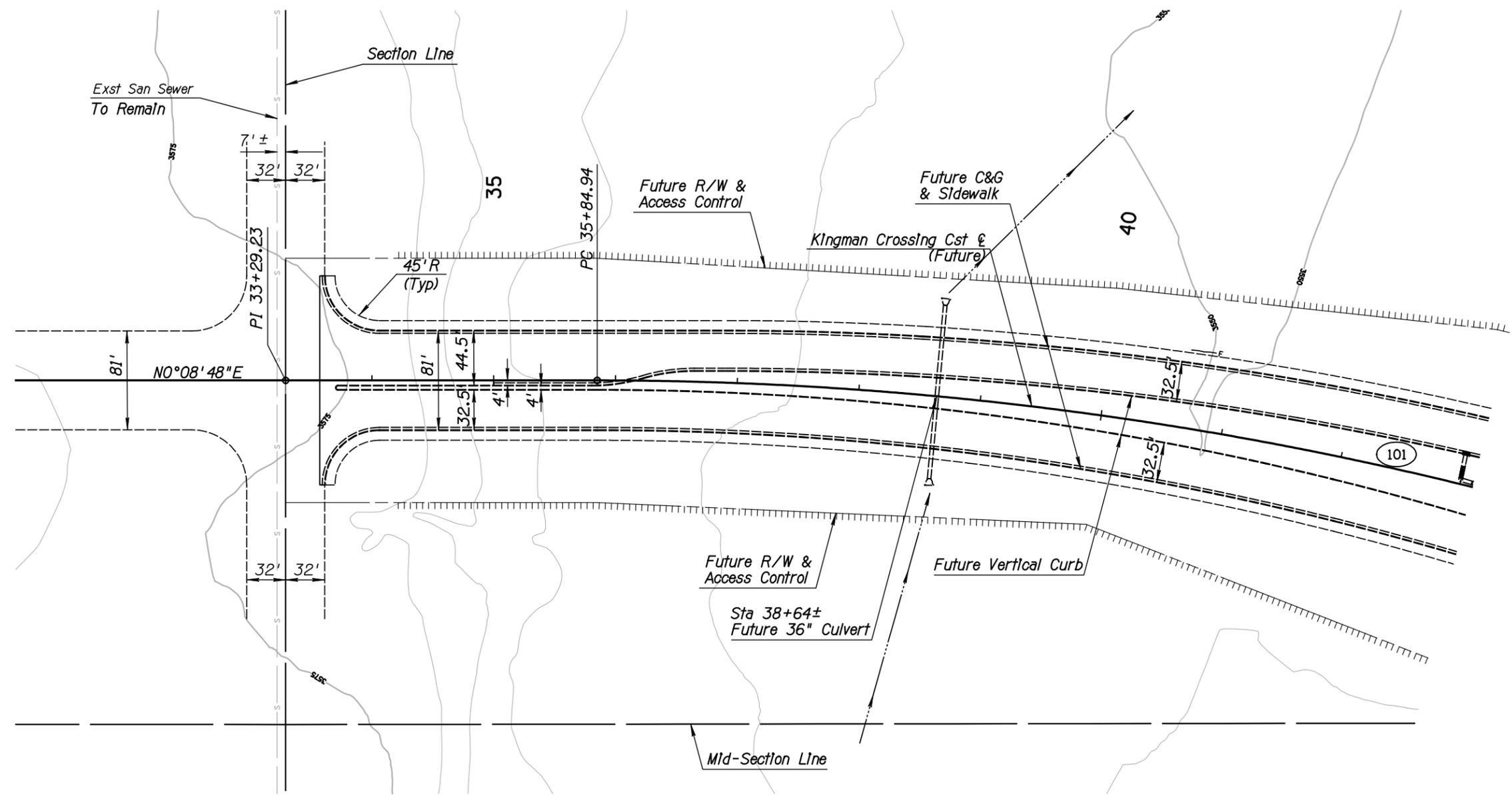
DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING RAMP D STA 10+00 TO 29+00	DWG NO
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN	13 OF 19
TRACS NO.	H7147			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



**(101) CURVE DATA**  
 PI Sta 40+19.42  
 Main Curve  
 $\Delta = 16^\circ 28' 54'' \text{ Rt}$   
 $D = 1^\circ 54' 35''$   
 $R = 3000.00'$   
 $L = 862.98'$   
 $T = 434.49'$   
 $\text{Ext} = 31.30'$   
 $\text{Super} = 0.024/\text{ft}$



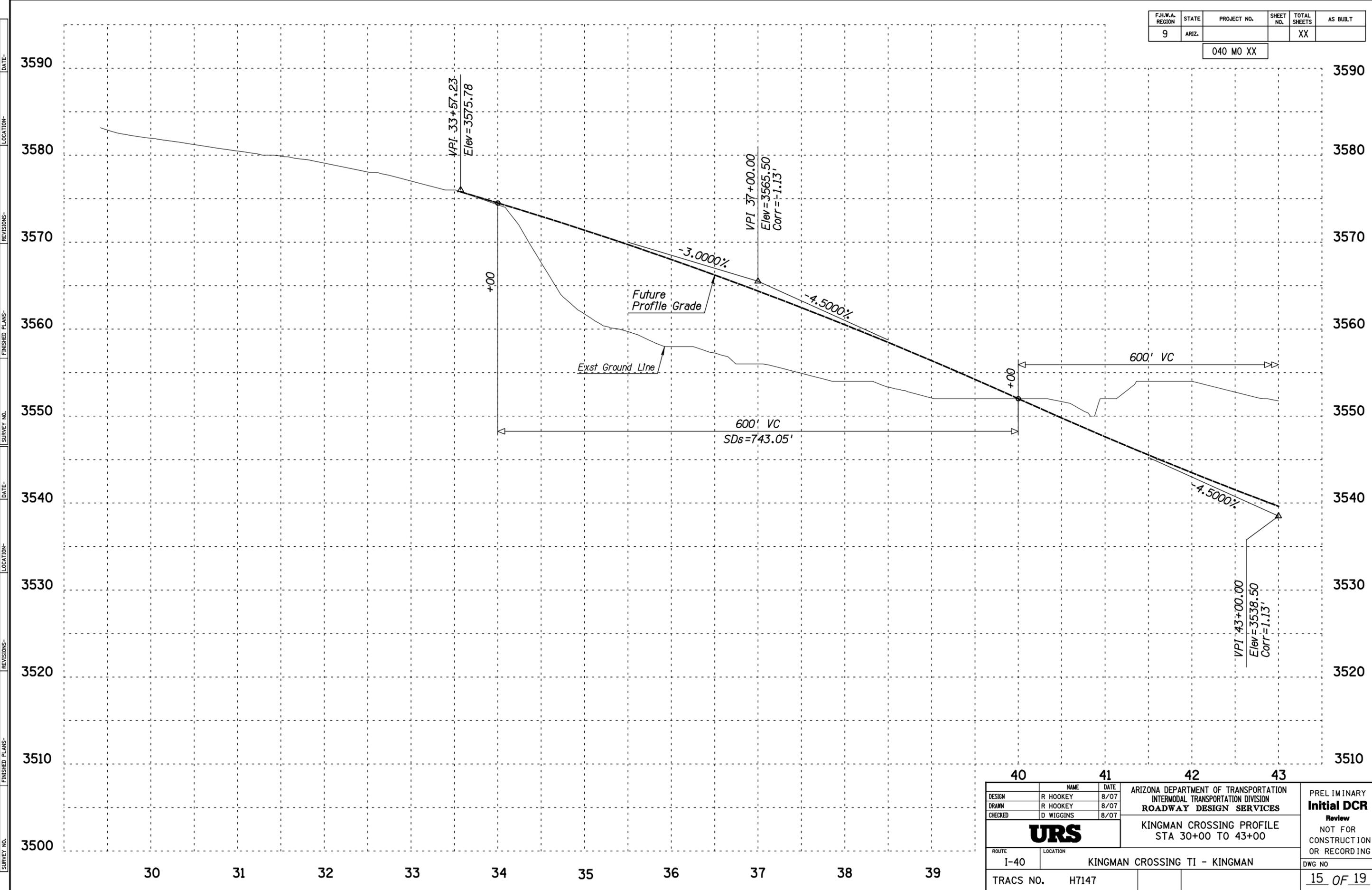
Note: Storm Drain 24" Dia Unless Notes Otherwise

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DESIGN	R HOOKEY	8/07		
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07	KINGMAN CROSSING - PLAN STA 33+72 to 43+00	DWG NO
<b>URS</b>				
ROUTE	LOCATION		KINGMAN CROSSING TI - KINGMAN	14 OF 19
I-40				
TRACS NO.	H7147			

SURVEY NO. FINISHED PLANS- REVISIONS- DATE- LOCATION- FINISHED PLANS- REVISIONS- DATE- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

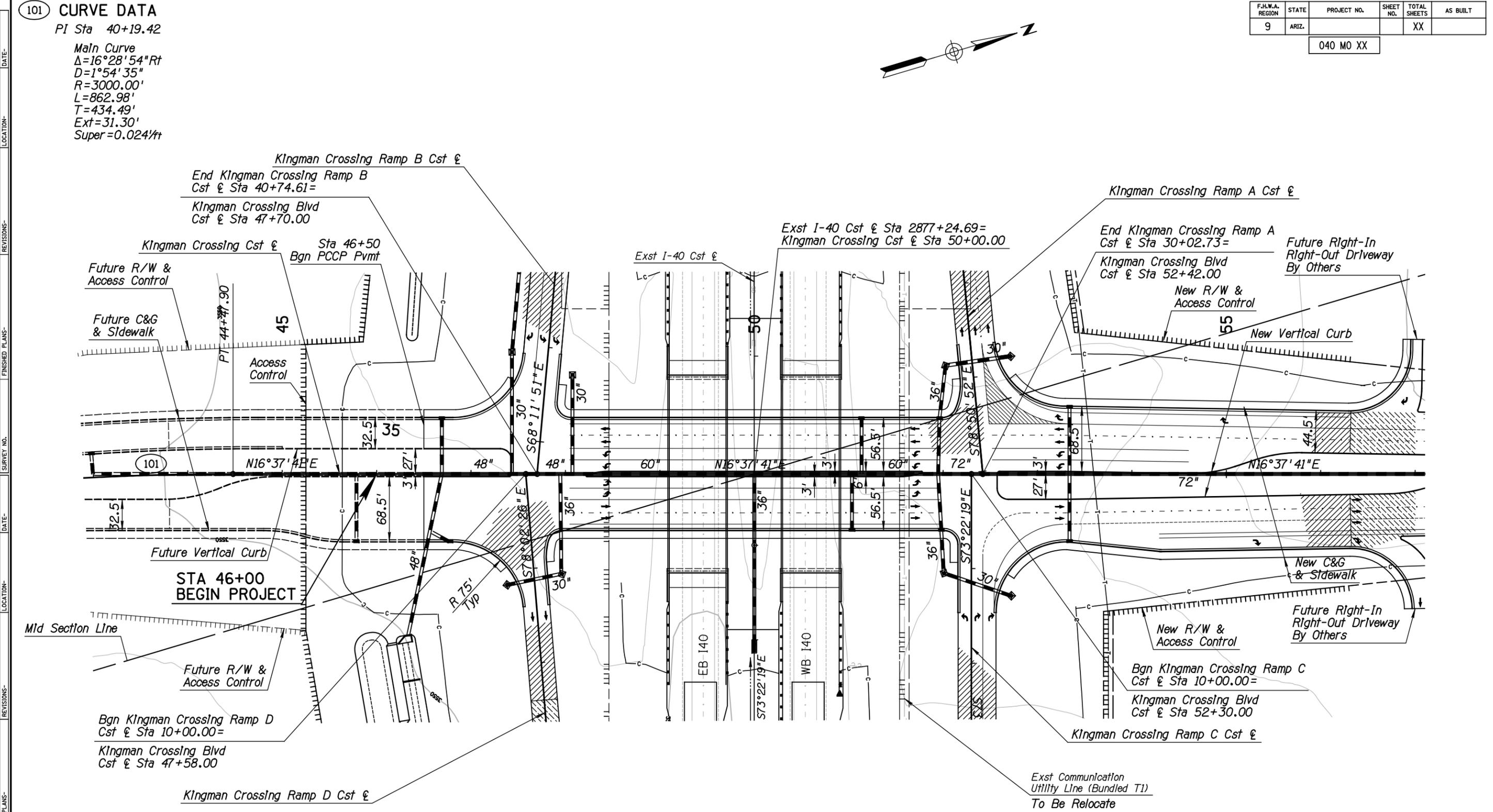
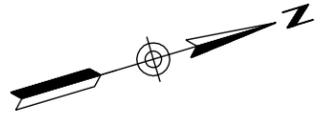
DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING PROFILE STA 30+00 TO 43+00	
ROUTE	I-40		LOCATION	KINGMAN CROSSING TI - KINGMAN
TRACS NO.	H7147		DWG NO.	15 OF 19

**101 CURVE DATA**

PI Sta 40+19.42  
 Main Curve  
 $\Delta = 16^\circ 28' 54" Rt$   
 $D = 1^\circ 54' 35"$   
 $R = 3000.00'$   
 $L = 862.98'$   
 $T = 434.49'$   
 $Ext = 31.30'$   
 $Super = 0.024/ft$

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX



Note: Storm Drain 24" Dia Unless Noted Otherwise

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING - PLAN STA 43+00 to 57+00	DWG NO
ROUTE	I-40		KINGMAN CROSSING TI - KINGMAN	16 OF 19
TRACS NO.	H7147			

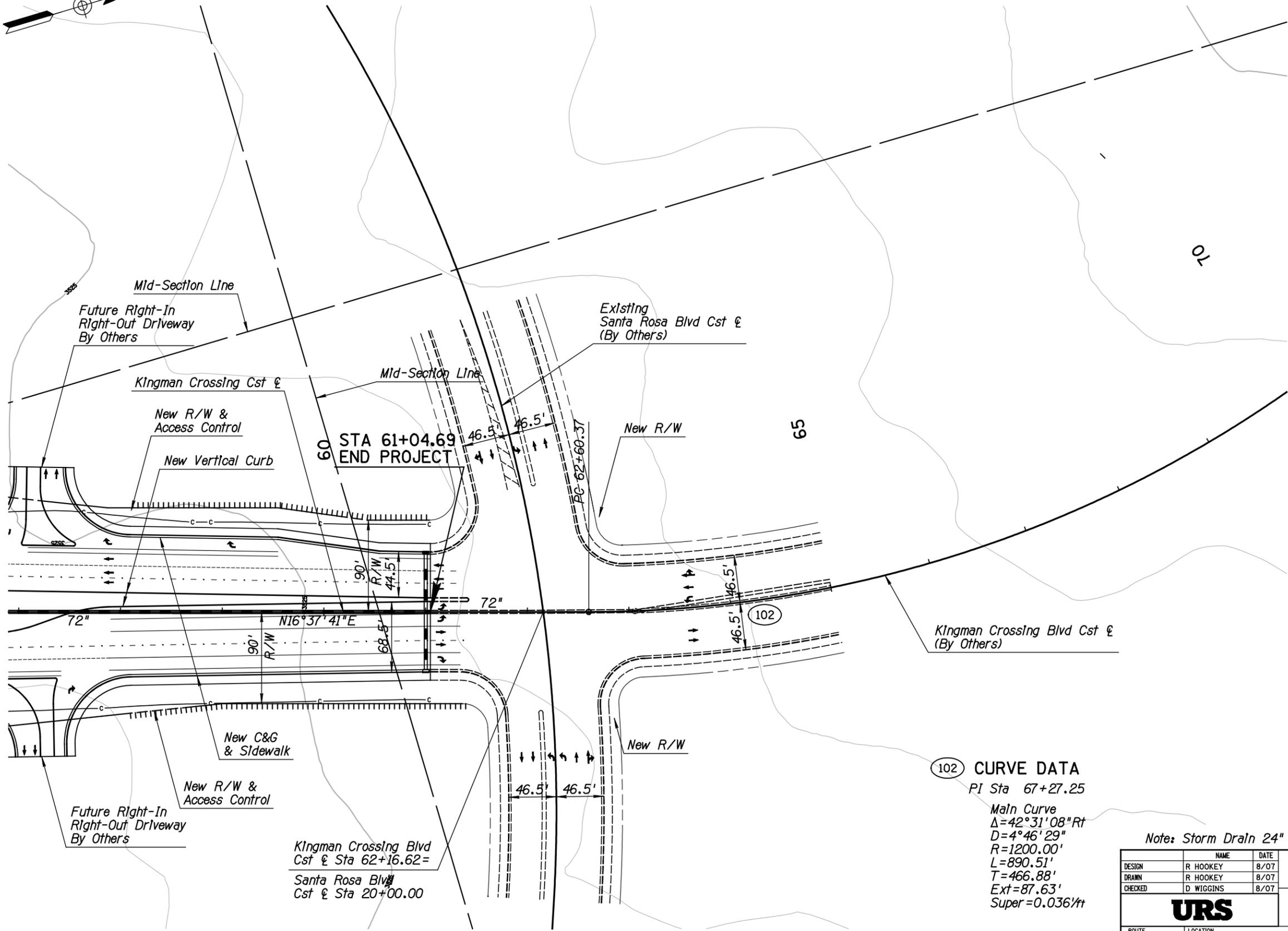
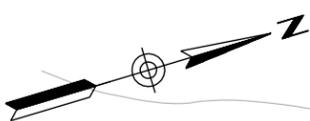
DATE: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_  
 FINISHED PLANS: \_\_\_\_\_  
 SURVEY NO.: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_  
 FINISHED PLANS: \_\_\_\_\_  
 SURVEY NO.: \_\_\_\_\_



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.



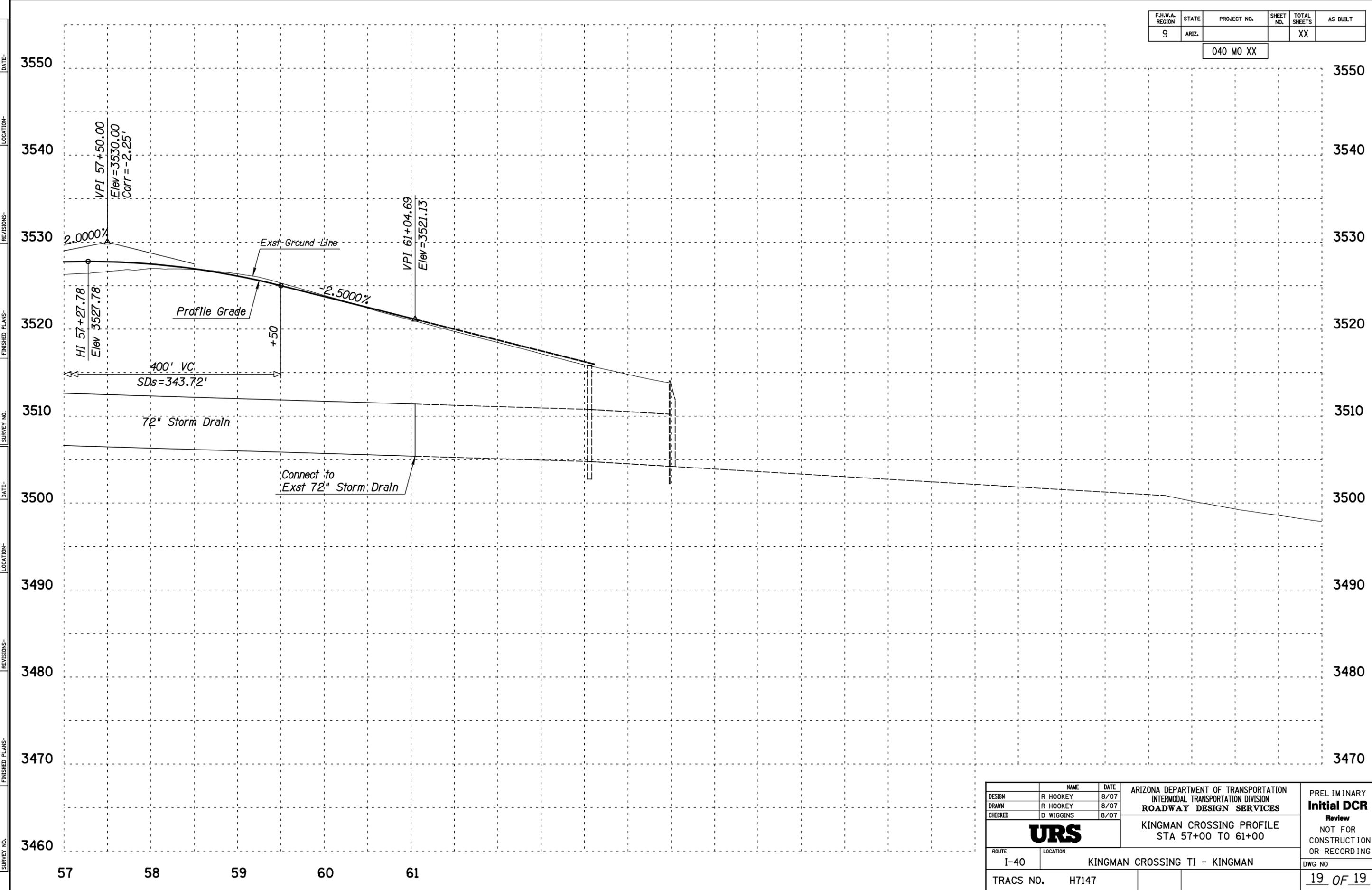
**102 CURVE DATA**  
 PI Sta 67+27.25  
 Main Curve  
 $\Delta = 42^\circ 31' 08'' \text{ Rt}$   
 $D = 4^\circ 46' 29''$   
 $R = 1200.00'$   
 $L = 890.51'$   
 $T = 466.88'$   
 $Ext = 87.63'$   
 $Super = 0.036/\text{ft}$

Note: Storm Drain 24" Dia Unless Noted Otherwise

DESIGN	R HOOKEY	DATE	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	DATE	8/07		
CHECKED	D WIGGINS	DATE	8/07		
<b>URS</b>		KINGMAN CROSSING - PLAN STA 57+00 to 63+12.5		DWG NO <b>18 OF 19</b>	
ROUTE	I-40	LOCATION	KINGMAN CROSSING TI - KINGMAN		
TRACS NO.	H7147				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

040 MO XX

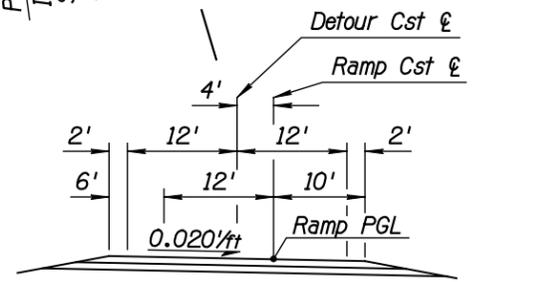
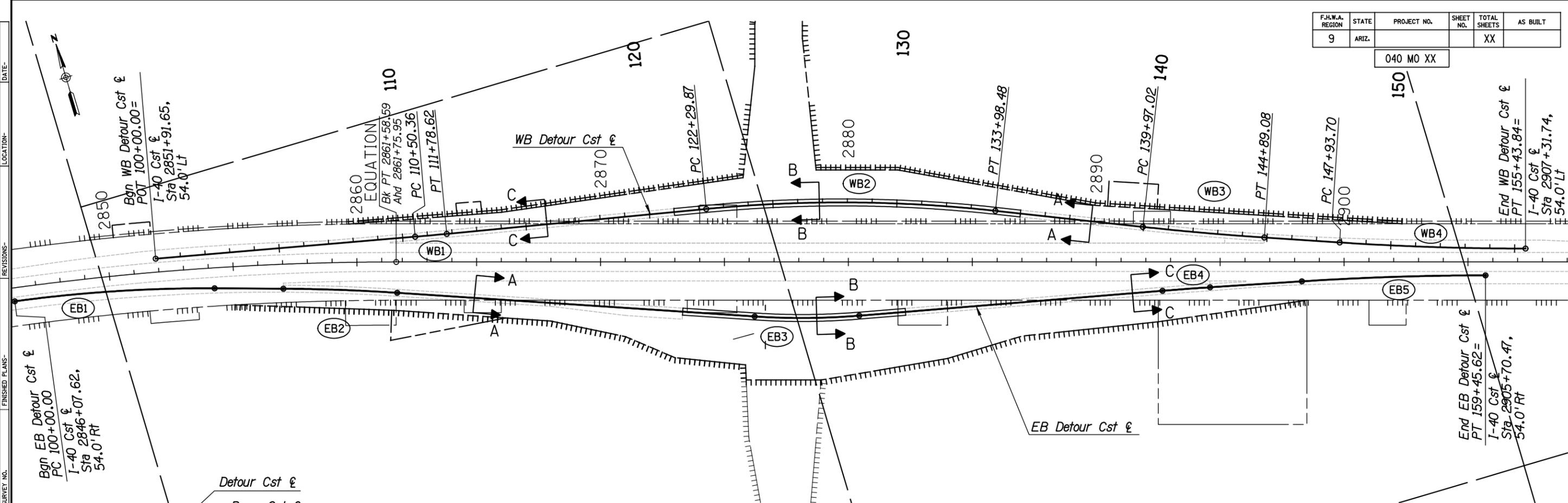


SURVEY NO. FINISHED PLANS REVISIONS LOCATION DATE  
 SURVEY NO. FINISHED PLANS REVISIONS LOCATION DATE  
 SURVEY NO. FINISHED PLANS REVISIONS LOCATION DATE

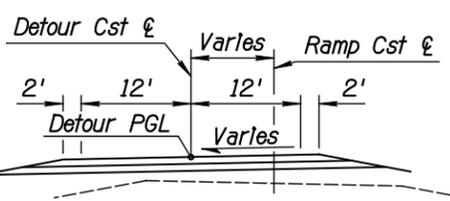
DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			KINGMAN CROSSING PROFILE STA 57+00 TO 61+00	
ROUTE	LOCATION			DWG NO
I-40	KINGMAN CROSSING TI - KINGMAN			19 OF 19
TRACS NO.	H7147			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

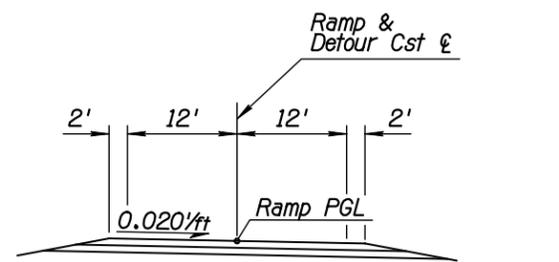
040 MO XX



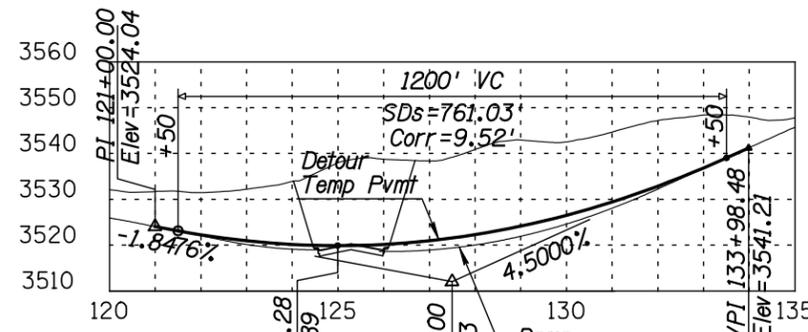
**DETOUR SECTION A-A**  
Looking Direction of Travel



**DETOUR SECTION B-B**  
Looking Direction of Travel

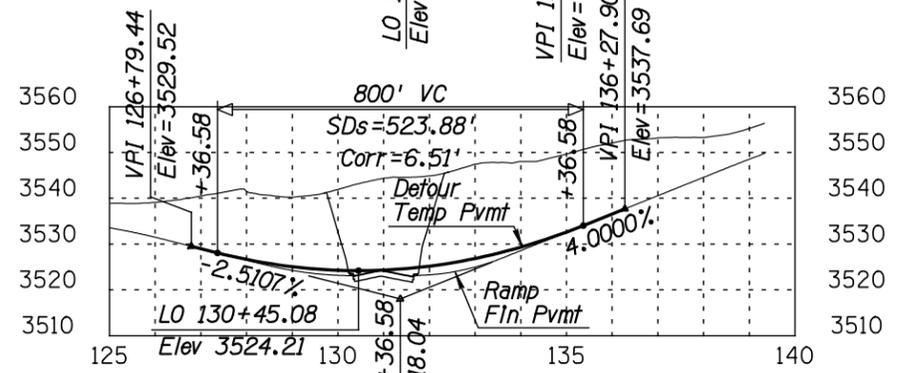


**DETOUR SECTION C-C**  
Looking Direction of Travel



**(WB2) CURVE DATA**  
PI Sta 128+16.21  
Main Curve  
 $\Delta=11^{\circ}41'10''Rt$   
 $D=1^{\circ}00'00''$   
 $R=5729.58$   
 $L=1168.61$   
 $T=586.34$   
 $Ext=29.92$   
Super = NC

**(WB1) CURVE DATA**  
**(WB3)** Main Curve  
 $D=0^{\circ}30'00''$   
 $R=11459.16$   
Super = NC  
**(WB4)**  
**(EB5)**  
**(EB4)**



**(EB1) CURVE DATA**  
PI Sta 104+04.99  
Main Curve  
 $\Delta=8^{\circ}05'11''Rt$   
 $D=1^{\circ}00'00''$   
 $R=5729.58$   
 $L=808.64$   
 $T=404.99$   
 $Ext=14.30$   
Super = Match Mainline

**(EB2) CURVE DATA**  
PI Sta 113+15.86  
Main Curve  
 $\Delta=3^{\circ}26'35''Lt$   
 $D=0^{\circ}44'59''$   
 $R=7643.44$   
 $L=459.31$   
 $T=229.72$   
 $Ext=3.45$   
Super = Match Ramp

**(EB3) CURVE DATA**  
PI Sta 132+02.45  
Main Curve  
 $\Delta=8^{\circ}26'36''Rt$   
 $D=1^{\circ}30'00''$   
 $R=2864.79$   
 $L=422.17$   
 $T=211.47$   
 $Ext=7.79$   
Super = 3.5%

DESIGN	R HOOKEY	8/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	R HOOKEY	8/07		
CHECKED	D WIGGINS	8/07		
<b>URS</b>			<b>140 WB &amp; EB DETOUR PLAN &amp; PROFILE</b>	
ROUTE	I-40		LOCATION	KINGMAN CROSSING TI - KINGMAN
TRACS NO.	H7147		DWG NO.	1 OF 1

**APPENDIX B**  
**WATERSHED DELINEATION MAPS**



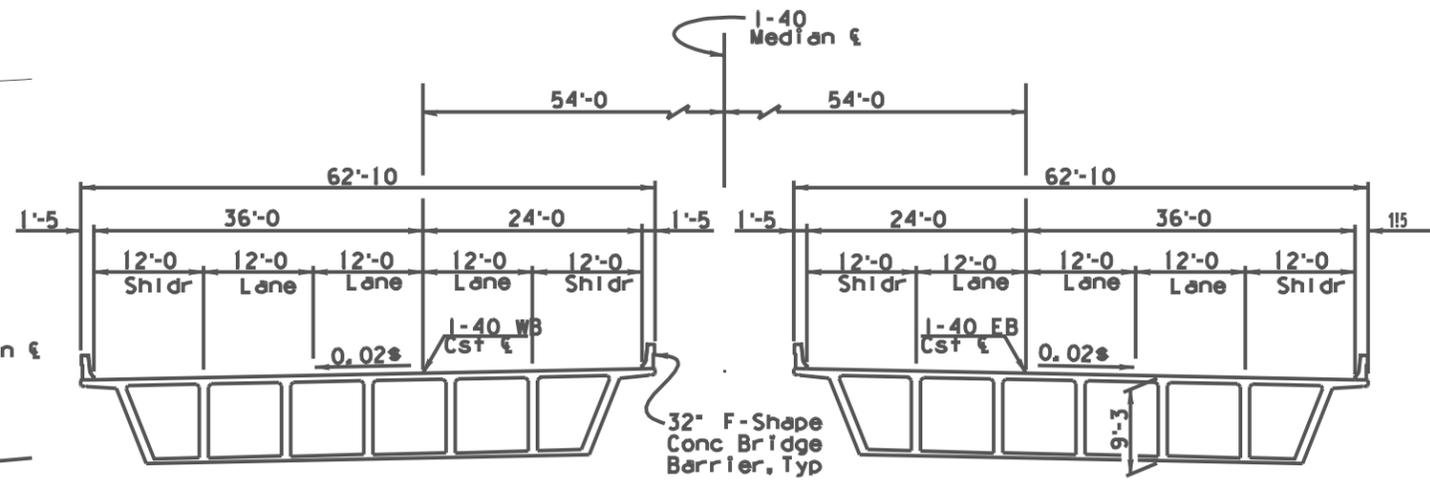
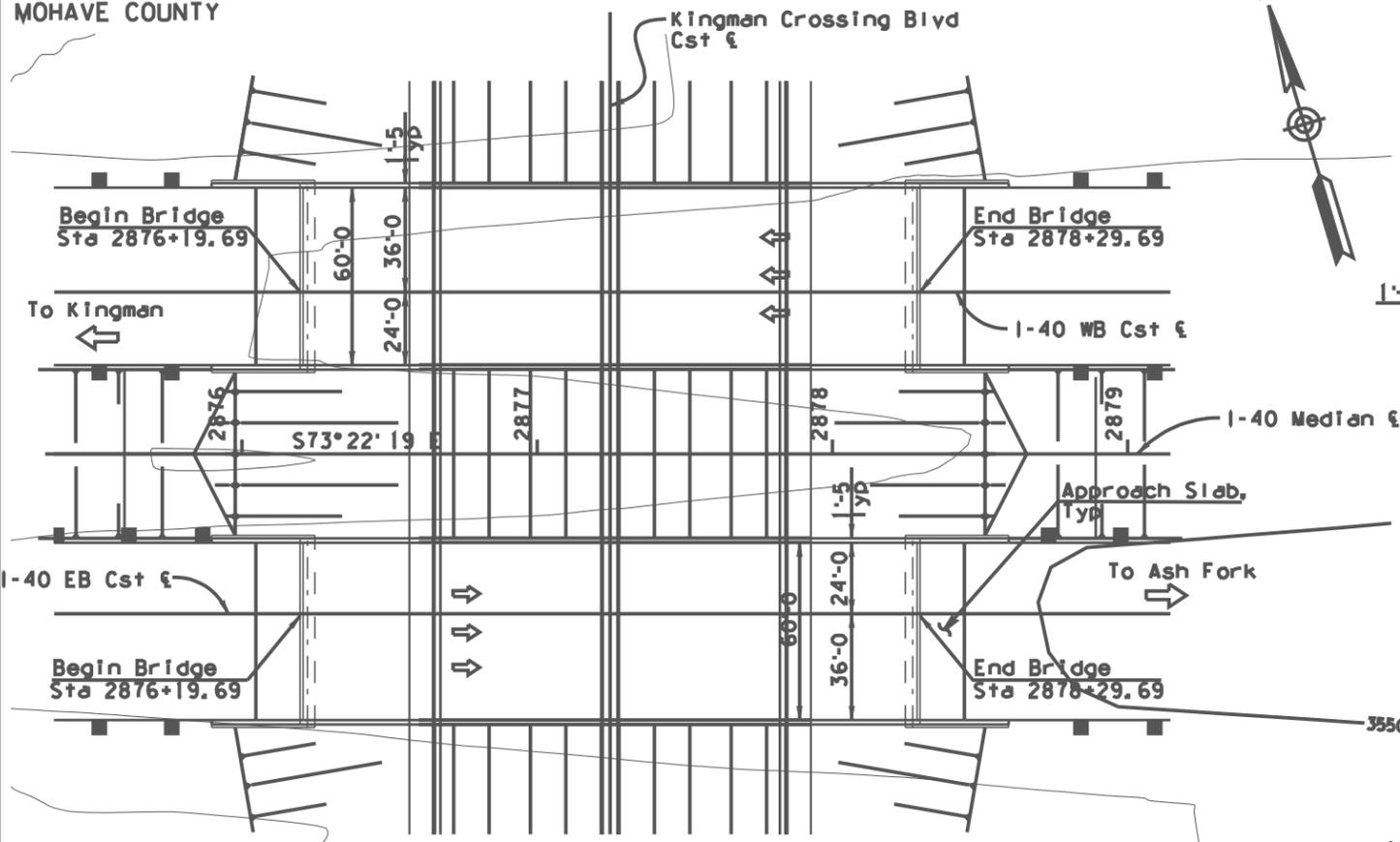


**APPENDIX C**  
**STRUCTURE GENERAL PLAN AND ELEVATION**

KINGMAN - WILLIAMS HIGHWAY (I-40)  
KINGMAN CROSSING T.I.  
MOHAVE COUNTY

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

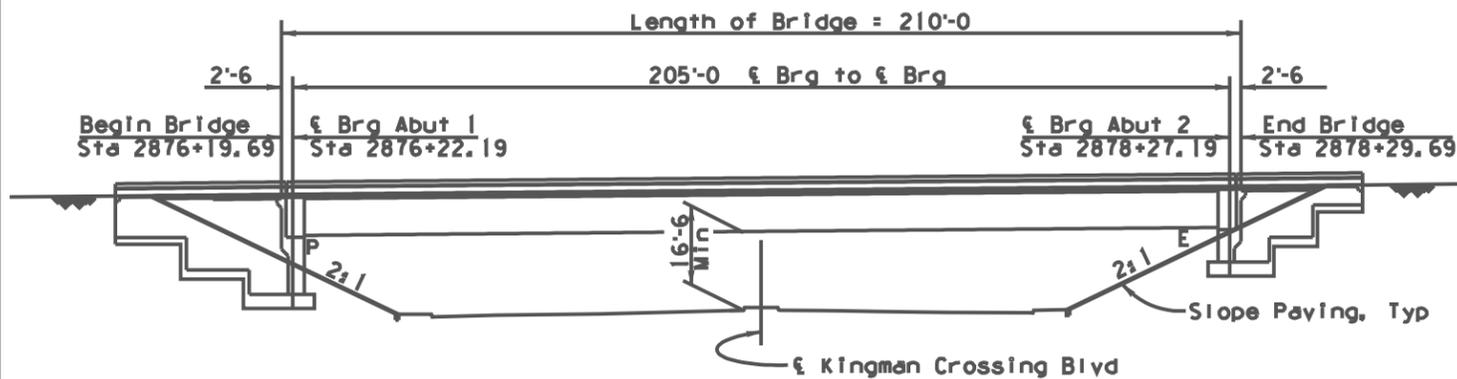
40 MO 57



TYPICAL SECTION  
Scale: 1" = 20'-0"

LOCATION PLAN

2 - New Single Span Cast-in-Place Post-Tensioned  
Box Girder Bridges  
No Skew  
Scale: 1" = 60'-0"



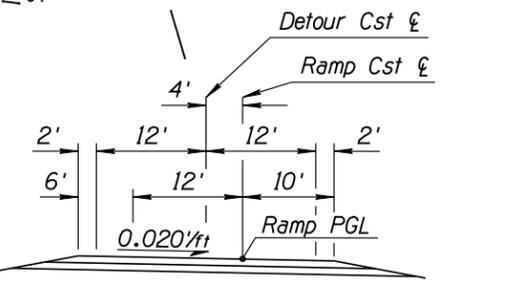
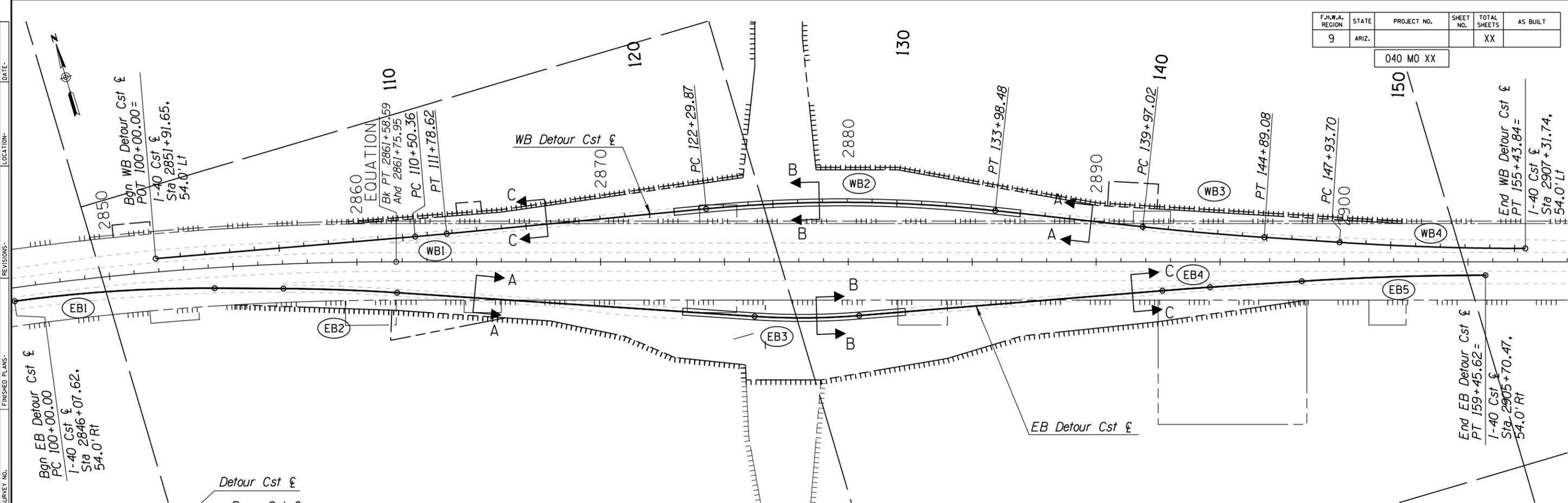
ELEVATION  
Scale: 1" = 40'-0"

DESIGN	K RUFFENACH	10/06	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION	PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	A GONZALEZ	10/06		
CHECKED	R STUART	10/06		
<b>URS</b>			STA 2876+ KINGMAN CROSSING T.I.O.P. GENERAL PLAN	
ROUTE	POST MILE	STRUCTURE NO.	KINGMAN CROSSING TI - KINGMAN	
I-40	55.0	XXXX	DWG. NO. S-1.01	
TRACS NO. H6814 01L			OF	

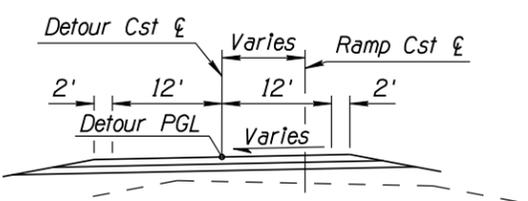
**APPENDIX D**  
**PRELIMINARY DETOUR PLAN SHEET**

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.			XX	

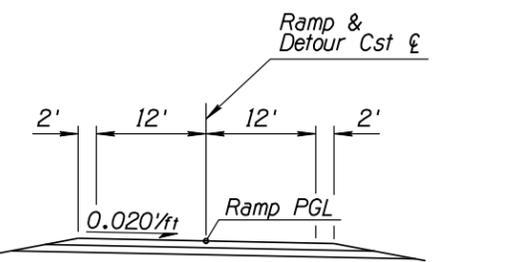
040 MO XX



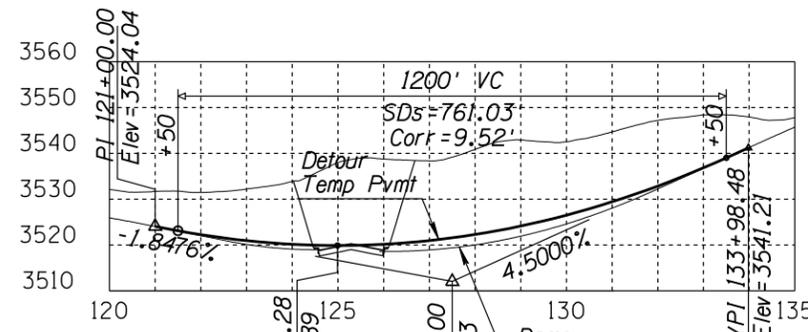
**DETOUR SECTION A-A**  
Looking Direction of Travel



**DETOUR SECTION B-B**  
Looking Direction of Travel

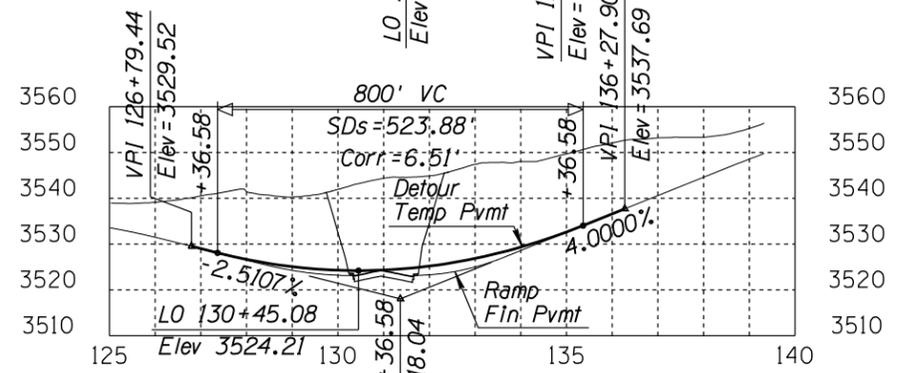


**DETOUR SECTION C-C**  
Looking Direction of Travel



**WB2 CURVE DATA**  
PI Sta 128+16.21  
Main Curve  
 $\Delta = 11^\circ 41' 10''$  Rt  
 $D = 1^\circ 00' 00''$   
 $R = 5729.58$   
 $L = 1168.61$   
 $T = 586.34$   
 $Ext = 29.92$   
Super = NC

**WB1 CURVE DATA**  
WB3 Main Curve  
 $D = 0^\circ 30' 00''$   
 $R = 11459.16$   
Super = NC



**EB1 CURVE DATA**  
PI Sta 104+04.99  
Main Curve  
 $\Delta = 8^\circ 05' 11''$  Rt  
 $D = 1^\circ 00' 00''$   
 $R = 5729.58$   
 $L = 808.64$   
 $T = 404.99$   
 $Ext = 14.30$   
Super = Match Mainline

**EB2 CURVE DATA**  
PI Sta 113+15.86  
Main Curve  
 $\Delta = 3^\circ 26' 35''$  Lt  
 $D = 0^\circ 44' 59''$   
 $R = 7643.44$   
 $L = 459.31$   
 $T = 229.72$   
 $Ext = 3.45$   
Super = Match Ramp

**EB3 CURVE DATA**  
PI Sta 132+02.45  
Main Curve  
 $\Delta = 8^\circ 26' 36''$  Rt  
 $D = 1^\circ 30' 00''$   
 $R = 2864.79$   
 $L = 422.17$   
 $T = 211.47$   
 $Ext = 7.79$   
Super = 3.5%

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES		PRELIMINARY <b>Initial DCR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DESIGN	R HOOKEY	8/07	<div style="text-align: center;"><b>URS</b></div> 140 WB & EB DETOUR PLAN & PROFILE		
DRAWN	R HOOKEY	8/07			
CHECKED	D WIGGINS	8/07			
ROUTE	LOCATION		KINGMAN CROSSING TI - KINGMAN		DWG NO
TRACS NO.			H7147		1 OF 1

**APPENDIX E**

**FEDERAL HIGHWAY ADMINISTRATION CHANGE OF ACCESS REPORT APPROVAL LETTER**



ARIZONA DIVISION

February 24, 2010

4000 North Central Avenue,  
Suite 1500  
Phoenix, Arizona 85012-3500  
602-379-3646  
602-382-8998  
<http://www.fhwa.dot.gov/azdiv/index.htm>

In Reply Refer To:  
STP-040-B(AUE)  
040 MO 054 H7147 01C  
I-40, Kingman Crossing Traffic Interchange  
Change of Access

Ms. Mary Viaparina, P.E.  
Assistant State Engineer  
ADOT Intermodal Transportation Division  
Roadway Engineering Group  
206 South 17<sup>th</sup> Avenue  
Phoenix, Arizona 85007-3213

Dear Ms Viaprina:

This letter supersedes the letter sent by the Federal Highway Administration (FHWA) dated February 11, 2010.

We have received the request from the Arizona Department of Transportation (ADOT) for the Change of Access (COA) for the Interstate 40 (I-40) Kingman Crossing Traffic Interchange (TI), dated November 25, 2008. We understand this project will construct a new TI at milepost (MP) 55.0, with an arterial connection to Santa Rosa Drive to the north of I-40. We also understand that in the future, Kingman Crossing Boulevard will extend south to Louise Avenue and north to Airway Avenue.

A National Environmental Protection Act (NEPA) of 1969 study has been completed and a Nonprogrammatic Categorical Exclusion was cleared by the FHWA on December 5, 2009.

It is FHWA's expectation that ADOT will evaluate the need for auxiliary lanes between East Kingman (Andy Devine Ave) TI and Kingman Crossing based on ADOT's MoveAZ 20-year long term transportation plan to widen I-40. In order to accommodate future widening, FHWA recommends including an elongated acceleration westbound on ramp and elongated deceleration eastbound off ramp as part of the TI configuration.

It is understood that an auxiliary lane between Kingman Crossing TI and Rancho Santa Fe TI may also be included; the auxiliary lanes as part of the Kingman Crossing TI project are dependent on whether Kingman Crossing TI or Rancho Santa Fe TI is constructed first. Since it is unknown which TI will be constructed first, an elongated eastbound deceleration lane and



westbound acceleration lane will be acceptable in the interim. The elongated acceleration/deceleration lanes will provide added length to the Kingman Crossings parallel on/off ramps allowing a seamless connection to the on/off ramps of Rancho Santa Fe TI.

During the development of this project, ADOT has coordinated with local jurisdictions to ensure that proper long range transportation planning has been accomplished. FHWA acknowledges that the Kingman Area Transportation Study (KATS) addresses local transportation infrastructure improvements. However, it must be reiterated that the connection to public roadways is an absolute requirement for the approval of any new Interstate interchange. It is a FHWA expectation, and a condition for approval that upon completion of the Kingman Crossing TI, it will connect to public roads (via an arterial connection to Santa Rosa Drive to the north of I-40 and extend south to Louise Avenue and north to Airway Avenue). Additionally, future COA to extend the arterial connection to Louise Avenue will be subject to proper access control distances along Kingman Crossing Boulevard.

After reviewing the report and accompanying environmental documentation, we hereby approve of your request for Change of Access to I-40 at MP 55.0, in order to accommodate the new proposed Kingman Crossing TI.

If you have any questions or concerns, please do not hesitate to contact Manuel E. Sánchez or myself at 602.379.3646.

Sincerely,

for Robert E. Hollis  
Arizona Division Administrator

**APPENDIX F**  
**CATEGORICAL EXCLUSION ENVIRONMENTAL CLEARANCE DOCUMENT**



Janice K. Brewer  
Governor  
John S. Halikowski  
Director

**Arizona Department of Transportation**  
**Intermodal Transportation Division**  
206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

October 27, 2009

Floyd Roehrich Jr.  
State Engineer

Mr. Robert E. Hollis  
Division Administrator  
Federal Highway Administration  
4000 N. Central Ave., Suite 1500  
Phoenix, AZ 85012-1906

Attn: Steve Thomas, Environmental Program Manager

Re: STP-040-B(AUE)  
040 MO 54 H7147 01L  
I-40, Kingman Crossing Traffic Interchange

Dear Mr. Hollis:

In accordance with Chapter 1, Title 23 USC and 23 CFR 771.117(d), the enclosed Categorical Exclusion for the referenced project is submitted for your approval. This project features construction of a new traffic interchange on Interstate 40 at milepost 55.0 in Kingman, Mohave County, Arizona. The project requires a change of access report from the Federal Highway Administration and is therefore considered nonprogrammatic.

Based on environmental studies and early coordination, it has been determined that (1) the proposed project will not create any significant impacts to the environment and (2) the action is classified as a nonprogrammatic Categorical Exclusion, which is the appropriate environmental document for the proposed project.

Your approval of the Categorical Exclusion will constitute concurrence with this determination.

Sincerely,

Thor Anderson  
Manager  
Environmental Planning Group

Enclosure

c: Jerry Monks, ADOT Environmental Planning Group  
Greg Martinsen, EcoPlan Associates, Inc.

ARIZONA DEPARTMENT OF TRANSPORTATION  
Intermodal Transportation Division  
Environmental Planning Group  
1611 W. Jackson St., Mail Drop EM02  
Phoenix, AZ 85007

Categorical Exclusion

for

I-40, Kingman Crossing Traffic Interchange

Mohave County, Arizona

STP-040-B(AUE)  
040 MO 54 H7147 01L

Approved by: Thor Anderson Date: 11/30/09  
THOR ANDERSON  
Manager  
Environmental Planning Group

Approved by: Robert E. Hollis Date: 12/3/09  
ROBERT E. HOLLIS  
Division Administrator  
Federal Highway Administration

*This Categorical Exclusion has been prepared in accordance with provisions and requirements of Chapter 1, Title 23 USC and 23 CFR 771.117(d) relating to the implementation of the National Environmental Policy Act of 1969.*

STP-040-B(AUE)  
040 MO 54 H7147 01L  
I-40, Kingman Crossing Traffic Interchange

Arizona Department of Transportation  
Environmental Planning Group  
Categorical Exclusion

<b>STP-040-B(AUE)</b> <b>040 MO 54 H7147 01L</b> <b>I-40, Kingman Crossing Traffic Interchange</b> <b>County:</b> Mohave <b>Route:</b> I-40 <b>Limits:</b> MP 54.3 to MP 55.9 <b>Nearest landmark:</b> Kingman, Arizona <b>Estimated project cost:</b> \$22,879,000	<b>Federal projects:</b> Local Government/Enhancement Project: <input type="checkbox"/> Categorical Exclusion Group: 2 Programmatic: <input type="checkbox"/> Nonprogrammatic: <input checked="" type="checkbox"/> STIP Item No.: 39 Date: 07/07/2009 <b>State-funded projects:</b> Environmental Determination <input type="checkbox"/> <b>ADOT NEPA Planner:</b> Jerry Monks
--	---

Clearance

Prepared By: Greg Martinsen Date: 08/25/2009  
Greg Martinsen  
EcoPlan Associates, Inc.

GAR:gm

Reviewed By: Jerry Monks Date: 9/4/2009  
Jerry Monks  
Environmental Planner II

TA:dd

Attachments

- SHPO cultural concurrence letter
- Hopi cultural concurrence letter
- AGFD On-line Environmental Review Tool results (Page 1 of 5)
- AGFD scoping response letter
- USFWS scoping response letter
- Public meeting handouts and summaries

## ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
AZ	Arizona
AZPDES	Arizona Pollutant Discharge Elimination System
BE	Biological Evaluation
BR	Biological Review
CAA	Clean Air Act
CBC	concrete box culvert
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
Corps	US Army Corps of Engineers
EJ	Environmental Justice
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
I-40	Interstate 40
MP	milepost
MSAT	Mobile Source Air Toxics
NA	not applicable
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
No.	Number
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PISA	Preliminary Initial Site Assessment
RCRA	Resource Conservation and Recovery Act
R/W	right-of-way
SHPO	State Historic Preservation Office
SR	State Route
STIP	State Transportation Improvement Plan
TI	traffic interchange
US	United States
USFWS	US Fish and Wildlife Service
VMT	Vehicle Miles Traveled
Waters	Waters of the United States

## Project Description

### 1. Need

The city of Kingman is currently experiencing a surge in residential development, with the largest concentration of growth occurring in east Kingman. This area is physically separated from the remainder of the city by I-40 and the Burlington Northern Santa Fe railroad tracks. The only access to east Kingman is via the Hualapai Mountain Road bridge over the railroad tracks (south of I-40) and an underpass crossing at Airway Avenue (north of I-40). Limited access and increased population size creates congestion at these access points and at the I-40/SR 66 (East Kingman) TI. Traffic congestion results in slower speeds, increased trip times, and longer queues.

### 2. Purpose

The purpose of the project is to provide access and accommodate future traffic volumes generated by the rapidly growing east Kingman area and to relieve congestion at the existing East Kingman TI.

### 3. Scope of Work

- Constructing a new TI on I-40 at MP 55.0, approximately 1.5 miles east of the existing East Kingman TI. The new TI will be a tight diamond, with eastbound and westbound bridges constructed at grade and the crossroad, Kingman Crossing Boulevard, depressed under I-40. The bridges will consist of two single-span cast-in-place and post-tensioned concrete box girder superstructures with a total span length of 210 feet. West of the TI, the eastbound off-ramp and the westbound on-ramp will extend approximately 2,500 feet. East of the TI, the eastbound on-ramp and the westbound off-ramp will extend approximately 2,600 feet.
- Constructing two-lane on- and off-ramps first and using them as detours until construction of the overpass bridges and Kingman Crossing Boulevard is completed.
- Extending Kingman Crossing Boulevard to connect to the proposed Airfield Avenue to the south and the proposed Santa Rosa Boulevard to the north. A total of approximately 0.6 mile of new roadway north and south of the TI will be constructed. The new roadway will include 12-foot-wide lanes, a 6.5-foot-wide bicycle lane, sidewalk, curb, and gutter, and a 16-foot-wide median.
- Constructing the following drainage improvements:
  - Extending 11 culvert crossings along I-40 at MP 54.4, MP 54.5, MP 54.7, MP 54.8, MP 55.3, MP 55.4, two at MP 55.5, two at MP 55.7, and MP 55.9.
  - Replacing one existing culvert with a storm drain lateral MP 55.0. Replacing two existing culverts with a riprap-lined collector channel at MP 55.1 and at MP 55.2.
  - Constructing a detention basin immediately south of the collector channel.
  - Constructing a storm drain trunk line along Kingman Crossing Boulevard.

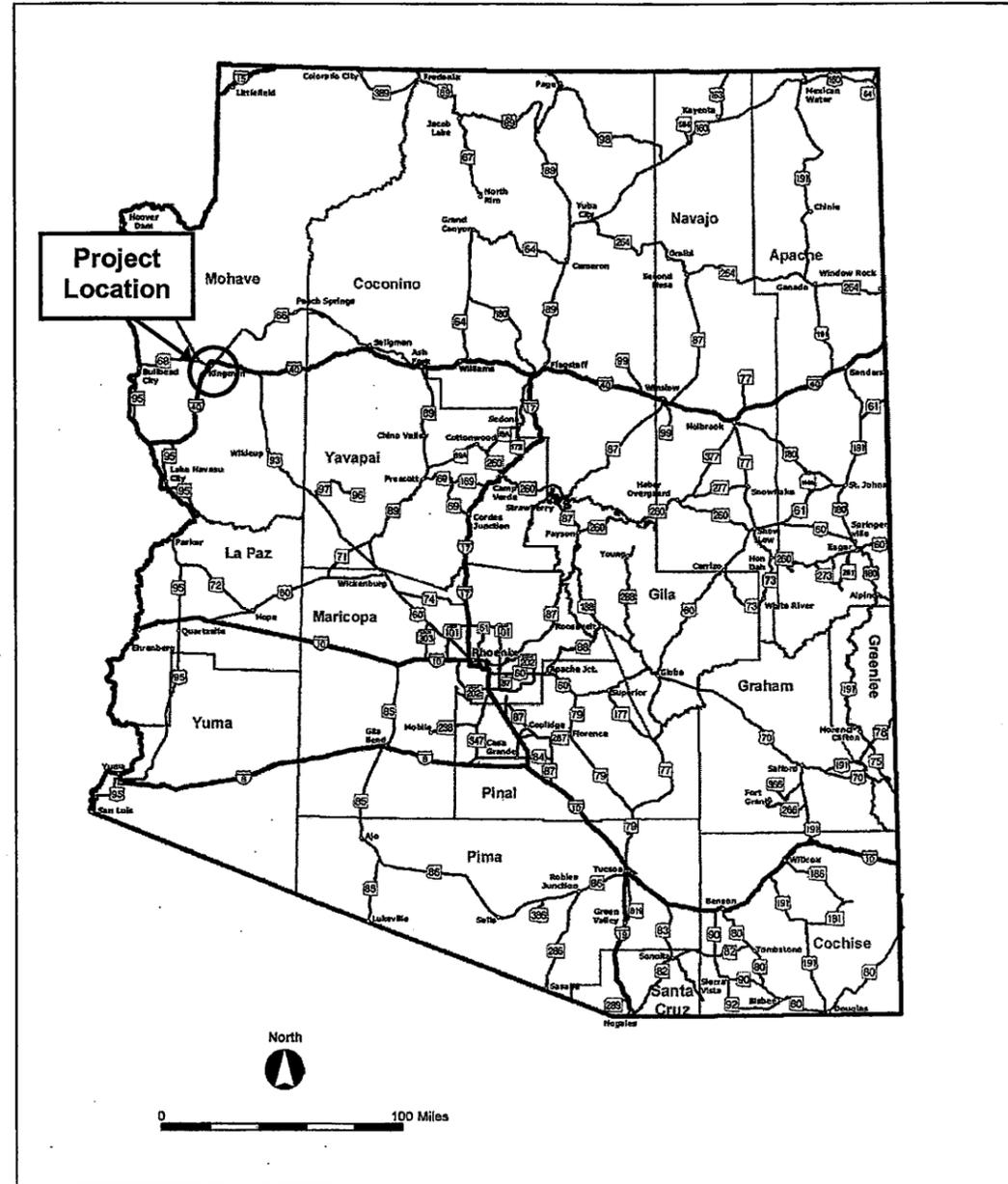


Figure 1. Project location.

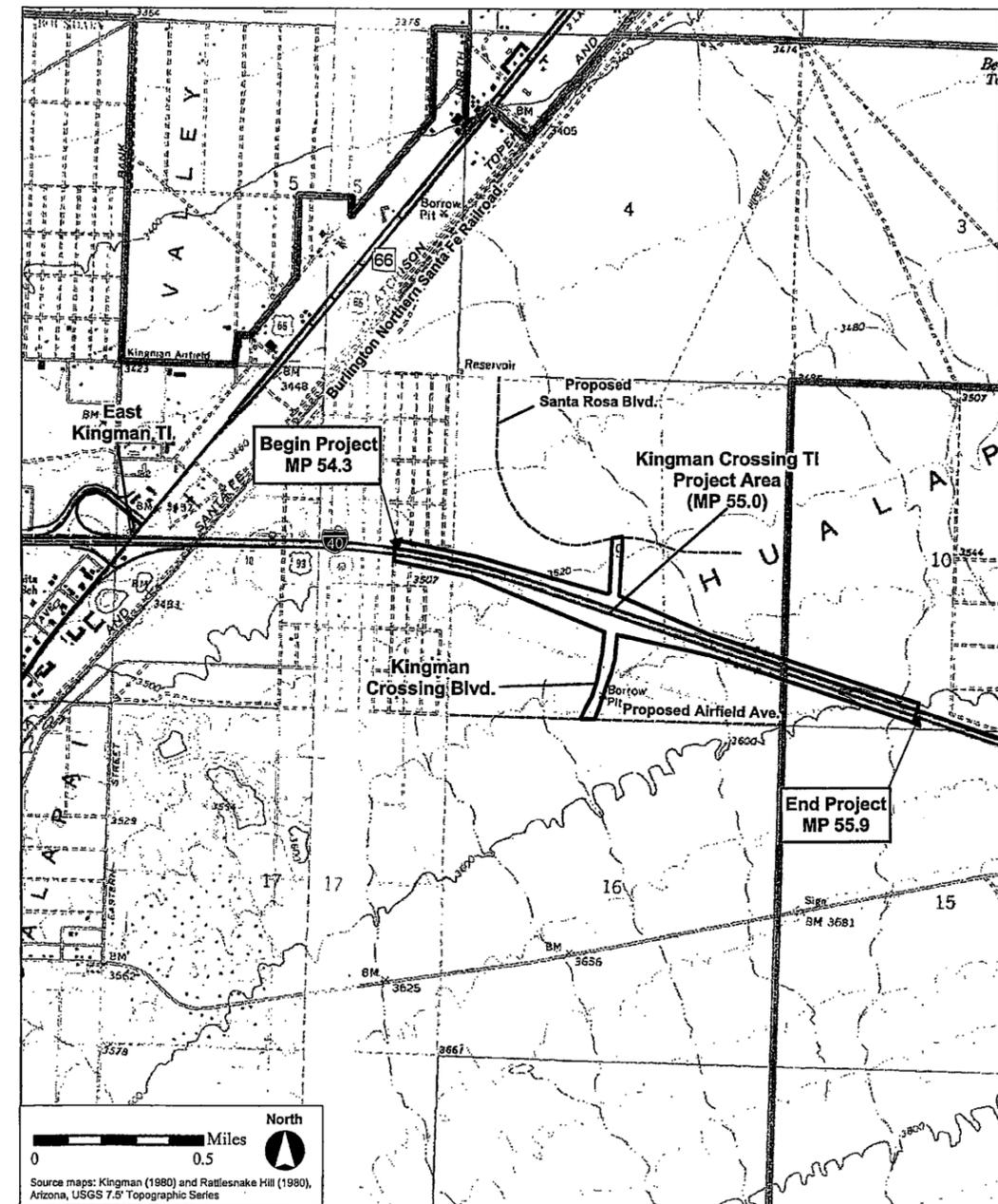


Figure 2. Project vicinity.

4. Existing Conditions

Item	Present	Not Present	Location	Description
Through lanes	X		Throughout project	No.: 4 lanes; width: 12 feet
Right-turn lanes		X		
Left-turn lanes		X		
Shoulders	X		Throughout project	Paved <input checked="" type="checkbox"/> ; width: 4 feet inside, 10 feet outside
Landscaping		X		
Guardrail		X		
Culverts	X		MP 54.4 MP 54.5 MP 54.7 MP 54.8 MP 55.0 MP 55.1 MP 55.2 MP 55.3 MP 55.4 MP 55.5 MP 55.5 MP 55.7 MP 55.7 MP 55.9	Number: 1; size: 54" CMP Number: 2; size: 8' x 4' CBC Number: 1; size: 42" CMP Number: 1; size: 6' x 3' CBC Number: 1; size: 10' x 8' CBC Number: 1; size: 6' x 5' CBC Number: 1; size: 36" CMP Number: 2; size: 8' x 4' CBC Number: 1; size: 42" CMP Number: 1; size: 6' x 5' CBC Number: 1; size: 54" CMP Number: 1; size: 24" CMP Number: 1; size: 6' x 3' CBC Number: 1; size: 12' x 10' CBC
Noise walls		X		
Crosswalks		X		
Cattle guards		X		
Frontage roads		X		
Curb and gutter		X		
Lighting		X		
Center medians	X			
Raised		X		
Paved		X		
Painted		X		
Landscaped		X		
Other	X		Throughout project area	I-40: 84 feet wide; natural vegetation
Traffic controls		X		
Signals		X		
Stop signs		X		
Flashing lights		X		
Bikeways		X		
Independent pathway for bikes		X		
Bike lanes striped on roadway pavement		X		
Bike lanes on canal bank		X		
Other pathway		X		
Sidewalks		X		
Adjacent to street/highway		X		Width:
Set back from street/highway feet		X		Width: Setback:
Other sidewalk		X		Width:

Item	Present	Not Present	Location	Description
Fencing	X			<input checked="" type="checkbox"/> R/W <input type="checkbox"/> Other
Game fence		X		
Standard barbed-wire fence	X		Throughout project area	48-inch; 4-strand
Chain-link fence		X		
Other fencing		X		
Bridges				
Over watercourse		X		Structure No.: Name of watercourse:
Over highway/street/road		X		No. of spans: Name of street/road: Highway route No.:
Over railroad		X		No. of spans: Name of railroad:
Over canal		X		No. of spans: Name of canal:
Over other		X		No. of spans: Name:

5. Land Ownership and Land Use

a) Existing R/W or Easement				
Location	R/W or Easement	Owner/Manager	Land Use	Width
MP 54.3-MP 55.9	R/W	ADOT	Transportation	308 feet
b) Adjacent Land				
Location	Owner/Manager	Land Use		
MP 54.3-MP 55.9	Private/municipal	Undeveloped		
Kingman Crossing Boulevard	Private/municipal	Undeveloped		

6. Right-of-Way/Easements

- No new R/W or easement is required for construction of this project.
- New R/W or easement is required for construction of this project.
  - 33.23 acres of new R/W from private landowners for construction of the TI and Kingman Crossing Boulevard.
  - 1.36 acres of new drainage easement from private landowners for construction of the TI and Kingman Crossing Boulevard.
  - 0.92 acre of utility easement from private landowners for construction of the TI and Kingman Crossing Boulevard.
  - \_\_\_\_\_ of temporary \_\_\_\_\_ easement from \_\_\_\_\_ for \_\_\_\_\_.
  - Other: \_\_\_\_\_.

7. Funding

This project is  Federally /  State- /  Locally funded, with an estimated cost of \$22,879,000.

This project will be designed and constructed using federal transportation enhancement funds. The estimated cost is \_\_\_\_\_.

8. Administration

This project will be bid and administered by ADOT.

Environmental Impact Summary			
Land Management Agency			
	Present	Not Present	Comment
Tribal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tribe:
Federal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Agency:
State	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Agency:
County	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Agency:
Local	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Agency: City of Kingman
Natural Environment			
	Present	Not Present	Comment
Sensitive Biological Resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Biology Memo: <input type="checkbox"/> BR: <input checked="" type="checkbox"/> BE: <input type="checkbox"/> (date ADOT approved: 08/16/2007) Refer to <i>Sensitive Biological Resources Analysis Sheet</i>
1. Threatened/Endangered Species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Federal Sensitive Species/Habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date federal agency approved:
3. Tribal Sensitive Species/Habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date federal agency/Tribe approved:
4. AZ Species of Concern/Habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Native Plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Date of survey: 12/26/2006 Refer to <i>Sensitive Biological Resources Analysis Sheet</i>
6. Other Wildlife and Habitat Concerns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Agency commenting and date of comment:
Invasive Species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetland Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Riparian Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
100-Year Floodplain	<input type="checkbox"/>	<input checked="" type="checkbox"/>	FEMA FIRM map Nos.: 0400582350C effective 03/01/1982, revised 03/15/1983 0400600005C effective 12/22/1981 Floodplain not delineated <input type="checkbox"/>
Section 404 Waters	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If Waters impacted, permit type and/or No.: Corps file No.:
Section 401 Water Quality Certification	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Certification type:
Prime or unique farmland	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCS map: Mohave County, Arizona, Central Part (AZ697)
Farmland of statewide or local importance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Sole Source Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wild and Scenic Rivers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Navigable Waters	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Environmental Impact Summary				
Cultural Resources				
	Present	Not Present	Comment	
Archaeological/Historic Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reports: <ul style="list-style-type: none"> <li>A Cultural Resources Inventory of Portions of the Interstate 40 Right-of-Way, Mileposts 3.4 to 8.3, 16.0 to 48.6, 49.3 to 52.0, 52.6 to 86.23, 110.49 to 139, and 144.3 to 146.2, Between Topock and Ash Fork, Mohave and Yavapai Counties, Arizona (Spalding and Weaver 2000)</li> <li>A Cultural Resources Survey of Land Disposal N. D-#-128 on Interstate 40, Kingman, Mohave County, Arizona (Garcia 1999)</li> <li>A Cultural Resource Survey in Support of the Proposed I-14 Kingman Crossing Traffic Interchange, Mohave County, Arizona (Bryce 2007)</li> </ul> Concurrence dates: SHPO 09/28/2007 Tribal consultation: Hopi 10/08/2007	
Section 4(f)/6(f) Resources				
	Present	Not Present	Not Applicable	Comment
Section 4(f) Wildlife/Waterfowl	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Section 4(f) Historic site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Section 4(f) Recreational site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Section 4(f) Park	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Section 6(f) Resource	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Visual Resources				
	Yes	No	Comment	
Change in the existing visual character as a result of the project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Refer to <i>Visual Resources Analysis Sheet</i>	
Project's postconstruction visual quality meets land-managing agency's specific visual resource management objectives	<input type="checkbox"/>	<input type="checkbox"/>	Name of management agency: NA Date of agency concurrence: NA	
Project is along a designated Scenic Road/Byway	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Scenic Road/Byway name:	

**Environmental Impact Summary**

<b>Socioeconomic Resources</b>			
	<b>Present</b>	<b>Not Present</b>	<b>Comment</b>
Existing Development	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Other:
Planned Development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Other:
Displacements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Other:
Temporary/Permanent Access Concerns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Benefits: Improved access to east Kingman area—east of SR 66 north and south of I-40. Currently, access is limited to either Hualapai Mountain Road or Airway Avenue. Project construction will result in beneficial impacts on access for existing and planned development.
Neighborhood Continuity and Community Cohesion Concerns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	There is planned development in the project area; therefore, the new TI and roadway will contribute to neighborhood continuity and community cohesion.
Title VI/EJ Populations	<input type="checkbox"/>	<input type="checkbox"/>	The presence of Title VI/EJ populations was not determined because the project will have no new effects on the surrounding area.

**Environmental Impact Summary**

<b>Physical/Construction</b>			
	<b>Present</b>	<b>Not Present</b>	<b>Comment</b>
Construction-related Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Refer to <i>Construction-Related Impacts Analysis Sheet</i>
Utilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Refer to <i>Utilities Analysis Sheet</i>
Hazardous Materials	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Date ADOT approved: 01/23/2007 Refer to <i>Hazardous Materials Evaluation Analysis Sheet</i>
	<b>Yes</b>	<b>No</b>	
Increase capacity or alter alignment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Qualitative Analysis: <input type="checkbox"/> Quantitative Analysis: Refer to <i>Noise Analysis Sheet</i>
Noise receivers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	<b>Required</b>	<b>Not Required</b>	<b>Comment</b>
AZPDES/NPDES Permit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> < 1 acre of disturbance <input checked="" type="checkbox"/> ≥ 1 acre of disturbance <input type="checkbox"/> Within 0.25 mile of water. Refer to the <i>AZPDES/NPDES Permit Analysis Sheet</i>
	<b>Attainment</b>	<b>Non-attainment</b>	<b>Maintenance</b>
Air Quality/Mobile Source Air Toxics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<p>The purpose of the project is to provide access and accommodate future traffic volumes generated by the rapidly growing east Kingman area and to relieve congestion at the existing East Kingman I-40/SR 66 TI by constructing a new TI at MP 55.0. This project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for CAA criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs.</p> <p>Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in VMT, FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project.</p>		

**Agency Coordination/Public Involvement Analysis Sheet**

	Date contacted	Method of notification	Comment	Response
<b>Agency Scoping</b>				
AGFD	01/31/2007	Letter	(02/08/2007 letter attached) Acknowledges that ADOT has the correct list of special status species.	None necessary.
<b>Mohave County</b>				
Department of Public Works	12/14/2006	E-mail		
<b>Kingman</b>				
Department of Public Works	12/14/2006	E-mail		
Engineer	12/14/2006	E-mail		
Community Development	12/14/2006	E-mail		
Development Services	12/14/2006	E-mail		
Economic Development	12/14/2006	E-mail		
USFWS	01/31/2007	Letter	(02/05/2006 letter attached) States that no further review of the project is required.	None necessary.
<b>Public Scoping/Coordination</b>				
632 people contacted	12/14/2006	Letter		

**Public Meetings**

- Public meeting not held.  
 Public meeting was held.
- Date and location: 01/10/2007, Hualapai Elementary School; 11/18/2009, Mohave County Board of Supervisors Room
  - No. of attendees: 111; 50
  - Methods of notification: letter, e-mail, press release, newspaper
  - Handout materials:  
 No     Yes—see attached
  - Comments/Responses: see attached public comment reports.

**Mitigation Measures**  
 None.

**Sensitive Biological Resources Analysis Sheet**

**1. Threatened and Endangered Species**

A BR was prepared and an "effects" determination was made for each species.

- The project will not affect listed, threatened, endangered, proposed, or candidate species or designated critical habitat.

Species analyzed in detail	Reason for "no effect"

- The project may affect but is not likely to adversely affect; is not likely to jeopardize the continued existence of the species or its habitat; or may impact individuals of species, but is not likely to result in a trend toward federal listing or loss of viability for the following listed, threatened, endangered, proposed, or candidate species or designated critical habitat.

Species analyzed in detail	Determination and reason

1. Date of USFWS concurrence letter:
2. Statement of "no effect" on other species:

- The project may affect and is likely to adversely affect; is likely to jeopardize the continued existence of species; or is likely to result in the destruction or adverse modification of habitat; or is likely to result in a trend toward federal listing or loss of viability for the following listed, threatened, endangered, proposed, or candidate species or designated critical habitat.

Species analyzed in detail	Determination and reason

1. Date of USFWS Biological Opinion:
2. Statement of "no effect" to other species:

**2. Federal Sensitive Species**

- Sensitive species on the land managing agency's list were analyzed in the \_\_\_\_\_.

Species analyzed in detail	Anticipated effects/Determination and reason

- Coordination with \_\_\_\_\_ has been completed.

The agencies were given a copy of the \_\_\_\_\_ for review, and their representatives signed a review letter on \_\_\_\_\_, indicating that the documentation was adequate.

- Land managing agency declined to review the \_\_\_\_\_, but a courtesy copy of the document was submitted.

**3. Tribal Sensitive Species**

- The project occurs on \_\_\_\_\_ tribal lands.

Species analyzed in detail	Anticipated effects/Determination and reason

1. Required mitigation measures:
2. Date of Tribal reviews:
3. Other Tribal coordination:

- The Tribe declined to review the \_\_\_\_\_, but a courtesy copy of the document was submitted.

**4. Arizona Species of Concern**

- Project occurs on \_\_\_\_\_ land; therefore, no coordination with AGFD was required.

AGFD coordination

- AGFD sent a Sensitive Species list.
- AGFD requested \_\_\_\_\_.
- AGFD did not respond or did not respond with a Sensitive Species list.

Sensitive Species

Sensitive species AGFD requested specific consideration for, or species that ADOT has determined a need to address:  
 Greater western bonneted bat (*Eumops perotis californicus*)  
 Banded Gila monster (*Heloderma suspectum cinctum*)

**5. Native Plants** (Arizona Department of Agriculture's list of protected native plants)

- There are existing protected native plants within the project limits that will not be impacted because \_\_\_\_\_.

Native plant impacts

Federal Land

- There are existing protected native plants on \_\_\_\_\_ lands in the project limits that will be impacted. The Arizona Department of Agriculture has no jurisdiction on federal lands.

- The \_\_\_\_\_ has requested that the project follow the Arizona Native Plant Law, and \_\_\_\_\_.

Nonfederal Land

- Protected native plants on nonfederal land within the project limits will be impacted by this project; therefore, the Department Roadside Development Section will determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Department Roadside Development Section will send the notification at least 60 calendar days prior to the start of construction.

**6. Other Wildlife and Habitat Concerns**

Item	Issue	No issue	Mitigation
Riparian	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetland	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Game species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wildlife connectivity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Migratory birds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Mitigation Measures**

Roadside Development Responsibility

- Protected native plants within the project limits will be impacted by this project; therefore, the Department Roadside Development Section will determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Department Roadside Development Section will send the notification at least 60 calendar days prior to the start of construction.

### Visual Resources Analysis Sheet

- Change in the existing visual character as a result of the project.

Foreground and midground views within the project limits consist of mostly overgrazed grassland on northwesterly sloping terrain within Hualapai Valley. I-40 bisects the center of the project area. The remainder of the project limits north and south of I-40 is undeveloped. Vegetation is sparse, with scattered shrubs, forbs, and grasses throughout the project area. Background views include undeveloped grassland, the Kingman Airport, and the outskirts of Kingman. In the distance are the Hualapai Mountains to the south, the Cerbat Mountains to the northwest, and the Peacock Mountains to the northeast.

Because this project will construct approximately 0.6 mile of new roadway (Kingman Crossing Boulevard), the existing visual character of the project area, in which commercial and residential development is planned, will be slightly altered. There is existing unpaved roadway along portions of the Airfield Avenue alignment, but the new roadway will be paved and include a median, sidewalk, curb, and gutter. Minor changes in the viewshed will be limited to foreground and midground views; background views from the Kingman Crossing Boulevard alignment will be unchanged.

- Project is along a designated Scenic Road/Byway. Name of Scenic Road/Byway:
- A visual resource quality analysis has been completed. Title and date:
  - The project will not impact the overall visual quality rating of the roadway.
  - The project will impact the overall visual quality of the roadway, but post project conditions will meet criteria to retain its scenic road designation. Concurrence date:
- Project is located in an area with specific visual resource management objectives.
- The project meets the land-management agency's specific visual resource management objectives. Concurrence date:
  - The project does not meet the land-management agency's specific visual resource management objectives. Coordination and mitigation:

---

#### Mitigation Measures

None.

### Construction-Related Impacts Analysis Sheet

- Traffic control measures required.  
Lane closure will be necessary during construction. Motorists traveling within the project limits may experience traffic congestion, delays, and speed reductions.

- Detours necessary.  
As part of the construction of the Kingman Crossing TI, detours will be necessary during construction of the overpass bridges on I-40. Two-lane on- and off-ramps will be constructed first, with eastbound and westbound traffic being diverted to them once they are completed. At that point, the I-40 mainline will be closed until the new bridges and Kingman Crossing Boulevard are constructed. Traffic will then be switched back onto the mainline, and the TI will be operational.

- Other.

Traffic control will be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the US Department of Transportation, FHWA, including any revisions or additions, and/or associated provisions in the project plans, as determined by:

- The ADOT Traffic Design Section during design.
- The City of Kingman during the certification acceptance or self-bid and administer process.

---

#### Mitigation Measures

None.

### Utilities Analysis Sheet

Utilities present: City of Kingman 12-inch sewer line, Frontier Communications T1 carrier line

- Utility work is not anticipated.
- Utilities are involved with the project.
- Type of work involved:
- Relocation     Temporary disconnection of service     Other \_\_\_\_\_
- Frontier Communications
- The work will be performed by:
- ADOT     Contractor     Utility company     Other \_\_\_\_\_
- Frontier Communications
- The utility customers affected by utility work will be notified \_\_\_\_\_ days prior to the start of construction by:
- ADOT     Contractor     Utility company     To be determined
- No utility work is anticipated as part of this railroad project; however \_\_\_\_\_ will investigate utility involvement during the project design phase.

#### Mitigation Measures

None.

### Hazardous Materials Evaluation Analysis Sheet

- Load-bearing structures will be modified or altered on the project.  
Date asbestos survey completed: 08/21/2008  
Findings: all samples negative  
 NESHAP notification required.
- Work will occur on existing structures that have been previously painted.  
Date test for RCRA metals or lead completed:  
Findings:
- Paint striping will be obliterated.  
Date test for RCRA metals or lead completed: 03/24/2008  
Findings: yellow stripe positive for lead-based paint; white stripe negative
- Records check of ADEQ and EPA databases was conducted.  
Date completed: 12/23/2006  
Findings: No hazardous materials or similar environmental concerns were found in the project area.
- Tribes were contacted regarding their records.  
Date completed:  
Findings:
- PISA was conducted.  
Date completed: 01/23/2007, updated 12/23/2008  
Findings: No hazardous materials or similar environmental concerns were found in the project area.
- Phase I study was conducted.  
Date completed:  
Findings:
- Findings of hazardous materials assessment: The yellow stripe in the project area tested positive for lead-based paint. No other hazardous materials or similar environmental concerns were found in the project area.

#### Mitigation Measures

##### Design Responsibility

- The Department project manager will contact the Department hazardous materials coordinator (602.712.7767) 30 days prior to bid advertisement to determine the need for additional site assessment.

##### Kingman District Responsibilities

- No paint stripe obliteration will occur until the lead-based paint abatement plan is approved and implemented.
- The Engineer will review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.

Contractor Responsibilities

- For pavement yellow striping obliteration (i.e., striping removal only):
  - An approved contractor shall develop and implement a lead-based paint abatement plan for the removal of the lead-based paint, Toxicity Characteristic Leaching Procedure testing of the generated waste stream, and proper disposal of the waste stream derived from yellow paint stripe obliteration within the project limits. A list of approved lead-based paint abatement contractors is attached to the special provisions. The contractor shall follow all applicable federal, state, and local codes and regulations, including Department Standard Specifications, related to the treatment and handling of lead-based paint.
  - The contractor shall submit a lead-based paint removal and disposal plan for the removal of yellow paint striping within the project limits to the Engineer and the Department hazardous materials coordinator (602.712.7767) for review and approval at least 10 working days prior to paint stripe obliteration.
  - No paint stripe obliteration shall occur until the lead-based paint abatement plan is approved by the Department hazardous materials coordinator and implemented.
  - Visible fugitive dust emissions from paint removal shall be controlled through wet or dry (e.g., vacuum) means during the removal process. If the liquid waste stream generated by a water-blasting obliteration method passes the Toxicity Characteristic Leaching Process analysis, it may be used as a dust palliative or for compaction on the project. If the water is not used on the project, it shall be properly disposed of in accordance with all applicable federal, state, and local regulations.
- The contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with concrete box culvert extensions and submit it to the Engineer for review. After Engineer approval, the notification shall be submitted to the Department hazardous materials coordinator (602.712.7767) for a 5-working-day review and approval. Upon approval by the Department hazardous materials coordinator, the contractor shall file the notification with the Arizona Department of Environmental Quality at least 10 working days prior to demolition/rehabilitation associated with the concrete box culverts (see Department policy-SAF-6.01, February 23, 2004). The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.

**Noise Analysis Sheet**

- Quantitative analysis required
  - Project adds capacity or alters alignment and
  - Receivers/customers are present
- Results of quantitative analysis
  - Noise report completed on \_\_\_\_.
  - Findings and mitigation.
- Qualitative analysis required
  - Project does not add capacity or alter alignment and/or
  - Receivers/customers are not present
- Qualitative analysis

This project was evaluated using the "Arizona Department of Transportation's Noise Abatement Policy," December 5, 2005, as amended August 24, 2007. The policy was written to conform to the federal policy and guidelines as stated in "Title 23, Code of Federal Regulations, Part 772." Due to the nature of the work this project involves, this project will not increase current noise levels or present a negative impact. Construction noise will be controlled in accordance with the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.08 (2008 Edition), special provisions, and local rules or ordinances.

**Mitigation Measures**

None.

### AZPDES/NPDES Permit Analysis Sheet

- The project involves the ground disturbance of 1 or more acres and a general AZPDES permit will be required.
- The project is located within 0.25 mile of \_\_\_\_\_, \_\_\_\_\_, water
- The project is located in \_\_\_\_\_, a designated MS4.
- The project is federally funded; therefore, \_\_\_\_\_, in accordance with 23 CFR 650(b), shall determine if design features to reduce erosion and minimize sedimentation during and after construction are required.

#### Mitigation Measures

##### Kingman District Responsibility

- The Engineer will submit the contractor's Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Kingman District environmental coordinator.

##### Contractor Responsibility

- The contractor, in association with the Kingman District, shall submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the Kingman District has reviewed and approved the Stormwater Pollution Prevention Plan.

### Mitigation Measures

#### Design Responsibilities

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.
- The Department project manager will contact the Department hazardous materials coordinator (602.712.7767) 30 days prior to bid advertisement to determine the need for additional site assessment.

#### Roadside Development Responsibility

- Protected native plants within the project limits will be impacted by this project; therefore, the Department Roadside Development Section will determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Department Roadside Development Section will send the notification at least 60 calendar days prior to the start of construction.

#### Kingman District Responsibilities

- The Engineer will submit the contractor's Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Kingman District environmental coordinator.
- No paint stripe obliteration will occur until the lead-based paint abatement plan is approved and implemented.
- The Engineer will review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.

#### Contractor Responsibilities

- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.
- The contractor, in association with the Kingman District, shall submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the Kingman District has reviewed and approved the Stormwater Pollution Prevention Plan.
- For pavement yellow striping obliteration (i.e., striping removal only):
  - An approved contractor shall develop and implement a lead-based paint abatement plan for the removal of the lead-based paint, Toxicity Characteristic Leaching Procedure testing of the generated waste stream, and proper disposal of the waste stream derived from yellow paint stripe obliteration within the project limits. A list of approved lead-based paint abatement contractors is attached to the special provisions. The contractor shall follow all applicable federal, state, and local codes and regulations, including Department Standard Specifications, related to the treatment and handling of lead-based paint.
  - The contractor shall submit a lead-based paint removal and disposal plan for the removal of yellow paint striping within the project limits to the Engineer and the Department hazardous materials coordinator (602.712.7767) for review and approval at least 10 working days prior to paint stripe obliteration.
  - No paint stripe obliteration shall occur until the lead-based paint abatement plan is approved by the Department hazardous materials coordinator and implemented.
  - Visible fugitive dust emissions from paint removal shall be controlled through wet or dry (e.g., vacuum) means during the removal process. If the liquid waste stream generated by a water-blasting obliteration method passes the Toxicity Characteristic Leaching Process analysis, it may be used as a dust palliative or for compaction on the project. If the water is not used on the project, it shall be properly disposed of in accordance with all applicable federal, state, and local regulations.

STP-040-B(AUE)  
040 MO 54 H7147 01L  
I-40, Kingman Crossing Traffic Interchange

- The contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with concrete box culvert extensions and submit it to the Engineer for review. After Engineer approval, the notification shall be submitted to the Department hazardous materials coordinator (602.712.7767) for a 5-working-day review and approval. Upon approval by the Department hazardous materials coordinator, the contractor shall file the notification with the Arizona Department of Environmental Quality at least 10 working days prior to demolition/rehabilitation associated with the concrete box culverts (see Department policy-SAF-6.01, February 23, 2004). The contractor cannot start work associated with concrete box culvert extensions until 10 working days have passed since the submittal of the notification to the regulatory agencies.



Janet Napolitano  
Governor

Victor M. Mendez  
Director

**Arizona Department of Transportation**  
**Intermodal Transportation Division**  
206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Sam Eilers  
State Engineer

September 25, 2007

Dr. David Jacobs, Compliance Specialist  
State Historic Preservation Office  
Arizona State Parks  
1300 W Washington Street  
Phoenix, Arizona 85007

RE: STP-040-B(AUE)  
040 MO 57 H7147 01L  
I-40 Kingman Crossing Blvd Traffic Interchange and Auxiliary Lanes  
Section 106 Consultation  
"no historic properties affected"

Dear Dr. Jacobs:

The City of Kingman, Mohave County, Arizona, in conjunction with a private development partner, plans to construct a new highway traffic interchange (TI) at the proposed Kingman Crossing Boulevard and two new auxiliary traffic lanes between the new TI and the existing State Route 66 (East Kingman) TI on Interstate 40 (I-40). This project would occur on private, municipal, and Arizona Department of Transportation (ADOT) lands. Federal Highway Administration (FHWA) review and approval of a change of access to I-40 would constitute a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act. Consulting parties for this project include FHWA, ADOT, the State Historic Preservation Office (SHPO), San Carlos Apache Tribe, Hualapai Tribe, Hopi, Fort Mohave Tribe, and the Yavapai-Apache Nation.

The purpose of the project is to provide access to and accommodate future traffic volumes generated by the rapidly growing East Kingman area. This area is physically separated from the main portion of Kingman by I-40 and the southwest-to-northeast alignment of the Burlington Northern Santa Fe railroad tracks. At this time, new residential development is underway on the north side of I-40 but lands adjacent to the freeway are undeveloped and slated for commercial and retail construction. Lands to the south of I-40 are undeveloped and owned by the City of Kingman. Future uses are expected to include a mixture of retail, commercial, residential, and civic development.

The proposed project would involve the construction of the new Kingman Crossing TI at milepost (MP) 55.1, approximately 1½ miles of eastbound and westbound auxiliary traffic lanes within the existing I-40 right-of-way between the new TI and the existing East Kingman TI between MP 55.1 and 53.8, and the construction of Kingman Crossing Boulevard, a new arterial street connecting to the proposed alignments of Airfield Avenue, located on the section line south of I-40, and Santa Rosa Boulevard located on the mid-section line north of I-40. The project would require construction of two new I-40 overpass structures over Kingman Crossing Boulevard and construction of on- and off-ramps between MP 54.5 and 55.5. Several alternatives for the alignment of Kingman Crossing Boulevard are currently under consideration. New right-of-way would be required in order to accommodate the new TI.

Jacobs  
040 MO 57 H7147 01L  
I-40 Kingman Crossing Blvd Traffic Interchange and Auxiliary Lanes  
September 25, 2007  
Page 2 of 2

The area of potential effects (APE) is defined as the existing and future right-of-way for I-40 between MP 53.8 and 55.5 and for Kingman Crossing Boulevard between Airfield Avenue alignment and Santa Rosa Boulevard. No lasting visual, auditory, or atmospheric impacts are anticipated.

Portions of the APE were previously surveyed for cultural resources. Plateau Mountain Desert Research (PMDR) surveyed the existing I-40 right-of-way between MP 53.8 and 55.5 and reported the results in "A Cultural Resources Inventory of Portions of the Interstate 40 Right-of-Way, Mileposts 3.4 to 8.3, 16.0 to 48.6, 49.3 to 52.0, 52.6 to 86.23, 110.49 to 139, and 144.3 to 146.2, Between Topock and Ash Fork, Mohave and Yavapai Counties, Arizona" (Spalding and Weaver 2000). No cultural resources were reported. SHPO previously concurred with the adequacy of the report (Miller [SHPO] to Hollis [FHWA] SHPO concurrence 21 September 2000).

Areas of the APE south of and beyond the existing right-of-way between MP 54.5 and 55.5 were previously surveyed by EcoPlan Associates, Inc. (EcoPlan) and are reported in "A Cultural Resources Survey of Land Disposal No. D-3-128 on Interstate 40, Kingman, Mohave County, Arizona" (Garcia 1999). No cultural resources were reported. SHPO previously concurred with the adequacy of the report (Miller [SHPO] to Lindauer [ADOT] SHPO concurrence 26 November 1999).

The remainder of the APE was recently surveyed by EcoPlan and results of this survey are reported in "A Cultural Resource Survey in Support of the Proposed I-40 Kingman Crossing Traffic Interchange, Mohave County, Arizona" (Bryce 2007). A single isolated occurrence of archaeological material was identified in a disturbed context, and no cultural resources were identified. The report is submitted for your review and comment.

Based on the above, FHWA/ADOT have determined that a finding of "no historic properties affected" is appropriate for this project. Please review the enclosed report and the information provided in this letter. If you find the report adequate and agree with FHWA/ADOT's determination of project effect, please indicate your concurrence by signing below. If you have any questions or concerns, please feel free to contact me at (928) 779-7569 or by e-mail at [cdongoske@azdot.gov](mailto:cdongoske@azdot.gov).

Sincerely,

  
Cindy Dongoske  
Historic Preservation Specialist  
Environmental Planning Group  
1801 South Milton Road, Mail Drop F-500  
Flagstaff, Arizona, 86001

  
Signature for SHPO Concurrence

Enclosure

cc: SThomas (FHWA)

25 SEPT 07  
Date



US Department  
of Transportation  
Federal Highway  
Administration

ARIZONA DIVISION

September 27, 2007

400 East Van Buren Street,  
Suite 410  
Phoenix, Arizona 85004-0674  
602-379-3646

In Reply Refer To:  
HOP-AZ

STP-040-B(AUE)  
040 MO 57 H7147 01L  
I-40 Kingman Crossing Blvd Traffic Interchange and Auxiliary Lanes  
Section 106 Consultation  
"no historic properties affected"

Mr. Leigh Kuwanwisiwma, Director  
Hopi Cultural Preservation Office  
P.O. Box 123  
Kykotsmovi, Arizona 86039

Dear Mr. Kuwanwisiwma:

The City of Kingman, Mohave County, Arizona, in conjunction with a private development partner, plans to construct a new highway traffic interchange (TI) at the proposed Kingman Crossing Boulevard and two new auxiliary traffic lanes between the new TI and the existing State Route 66 (East Kingman) TI on Interstate 40 (I-40). This project would occur on private, municipal, and Arizona Department of Transportation (ADOT) lands. Federal Highway Administration (FHWA) review and approval of a change of access to I-40 would constitute a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act. Consulting parties for this project include FHWA, ADOT, the State Historic Preservation Office (SHPO), San Carlos Apache Tribe, Hualapai Tribe, Hopi, Fort Mojave Tribe, and the Yavapai-Apache Nation.

The purpose of the project is to provide access to and accommodate future traffic volumes generated by the rapidly growing East Kingman area. This area is physically separated from the main portion of Kingman by I-40 and the southwest-to-northeast alignment of the Burlington Northern Santa Fe railroad tracks. At this time, new residential development is underway on the north side of I-40 but lands adjacent to the freeway are undeveloped and slated for commercial and retail construction. Lands to the south of I-40 are undeveloped and owned by the City of Kingman. Future uses are expected to include a mixture of retail, commercial, residential, and civic development.

The proposed project would involve the construction of the new Kingman Crossing TI at milepost (MP) 55.1, approximately 1½ miles of eastbound and westbound auxiliary traffic lanes within the existing I-40 right-of-way between the new TI and the existing East Kingman TI between MP 55.1

**MOVING THE  
AMERICAN  
ECONOMY**

and 53.8, and the construction of Kingman Crossing Boulevard, a new arterial street connecting to the proposed alignments of Airfield Avenue, located on the section line south of I-40, and Santa Rosa Boulevard located on the mid-section line north of I-40. The project would require construction of two new I-40 overpass structures over Kingman Crossing Boulevard and construction of on- and off-ramps between MP 54.5 and 55.5. Several alternatives for the alignment of Kingman Crossing Boulevard are currently under consideration. New right-of-way would be required in order to accommodate the new TI.

The area of potential effects (APE) is defined as the existing and future right-of-way for I-40 between MP 53.8 and 55.5 and for Kingman Crossing Boulevard between Airfield Avenue alignment and Santa Rosa Boulevard. No lasting visual, auditory, or atmospheric impacts are anticipated.

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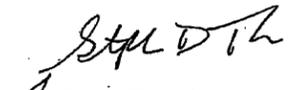
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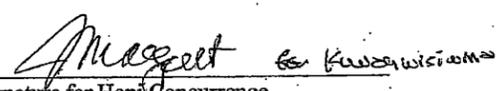
The remainder of the APE was recently surveyed by EcoPlan and results of this survey are reported in "A Cultural Resource Survey in Support of the Proposed I-40 Kingman Crossing Traffic Interchange, Mohave County, Arizona" (Bryce 2007). A single isolated occurrence of archaeological material was identified in a disturbed context, and no cultural resources were identified. The report is submitted for your review and comment.

Based on the above, the FHWA has determined that a finding of "no historic properties affected" is appropriate for this project. Please review the enclosed report and the information provided in this letter. If you find the report adequate and agree with FHWA's determination of project effect, please indicate your concurrence by signing below. At this time, FHWA is also inquiring whether you have any concerns regarding historic properties of religious or cultural importance to your community within the project area. If you have such concerns, any information you might provide within 30 days of receipt of this letter would be considered in the project planning. If your office opts to participate in cultural resource consultation at a later date, FHWA would make a good faith effort to address any concerns. However, such consultation would not necessitate a

reconsideration of this determination of project effect. If you have any questions or concerns, please feel free to contact Cindy Dongoske at 928-779-7569 or e-mail [cdongoske@azdot.gov](mailto:cdongoske@azdot.gov).

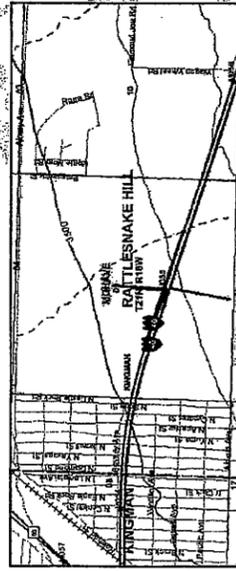
Sincerely yours,

  
Robert E. Hollis  
Division Administrator

 for Kwanwitswina 10-8-07  
Signature for Hopi Concurrence Date

Arizona's On-line Environmental Review Tool  
 Search ID: 20070726003451  
 Project Name: 06-918 Kingman Crossing TI REVISION  
 Date: 7/26/2007 10:01:05 AM

**Project Location**



The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

**Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:**

Common Name	ESA USES	BLM State
Eumeces inornatus californicus	SC	
Heloderma suspectum oregonum	SC	
Crotalus wislizeni	SC	
Batrachoseps monstrosus	SC	

**Project Name:** 06-918 Kingman Crossing TI REVISION

**Submitted By:** Patrick Dockens

**On behalf of:** ADOT

**Project Search ID:** 20070726003451

**Date:** 7/26/2007 10:00:49 AM

**Project Category:** Transportation & Infrastructure/Road construction (including staging areas, interchanges/ramps)

**Project Coordinates (UTM, Zone 12-NAD 83):** 228391.360, 3900788.037 meter

**Project Length:** 2411.568 meter

**County:** MOHAVE

**USGS 7.5 Minute Quadrangle ID:** 652

**Quadrangle Name:** RATTLESNAKE HILL

**Project locality is not anticipated to change**

**Location Accuracy Disclaimer**

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus, the correctness of the Project Review Receipt content.



THE STATE OF ARIZONA  
**GAME AND FISH DEPARTMENT**

2221 WEST GREENWAY ROAD  
 PHOENIX, AZ 85023-4399  
 (602) 942-3000 • AZGFD.GOV

**GOVERNOR**  
 JANET NAPOLITANO  
**COMMISSIONERS**  
 CHAIRMAN, MICHAEL H. GOUGHTLY, FLAGSTAFF  
 WILLIAM H. McLEARN, GOLD CANYON  
 BOB HERNBRODE, TUCSON  
 JENNIFER L. MARTIN, PHOENIX  
 JOE MELTON, YUMA  
**DIRECTOR**  
 DUANE L. SHROUFE  
**DEPUTY DIRECTOR**  
 STEVE K. FERRELL



February 8, 2007

Mr. Don Smith  
 EcoPlan Associates, Inc.  
 701 West Southern Avenue, Suite 203  
 Mesa, Arizona 85210

Re: I-40, Kingman Crossing Traffic Interchange  
 TRACS No.: To be determined  
 Project No.: STP-040-B(AUE)

Dear Mr. Smith:

The Arizona Game and Fish Department (Department) has reviewed the letter dated January 31, 2007, regarding the proposed new traffic interchange on Interstate 40 (I-40) at milepost 55.1 in Mohave County, Arizona. The Department understands the proposed project would include the construction of new eastbound and westbound bridges at-grade plus entrance and exit ramps that will connect I-40 to a new four-lane arterial street, which will be constructed under I-40. The new arterial street will extend approximately 0.25 mile north and south of I-40 to connect into local arterial streets. In your letter it was also noted that you obtained a project receipt from the On-Line Environmental Review Tool on December 21, 2006, which shows the special status species documented as occurring in the project vicinity (3-mile buffer). Currently, based on the information we received in your letter, we do not have more project specific recommendations beyond those provided on your project receipt.

The Department appreciates the opportunity to review your project. If you have any questions regarding this letter, please contact me at (602) 789-3486.

Sincerely,

*Alicia Sweezer*

Alicia Sweezer  
 Project Evaluation Specialist

AGFD #20061221001849



United States Department of the Interior  
 U.S. Fish and Wildlife Service  
 Arizona Ecological Services Field Office  
 2321 West Royal Palm Road, Suite 103  
 Phoenix, Arizona 85021-4951  
 Telephone: (602) 242-0210 Fax: (602) 242-2513



In Reply Refer to:  
 AESO/SE  
 22410-2007-SL-0164

February 5, 2006

Mr. Donald C. Smith  
 EcoPlan Associates, Inc.  
 701 West Southern Avenue, Suite 203  
 Mesa, Arizona 85210

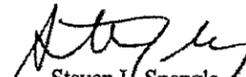
Dear Mr. Smith:

This letter documents our recommendations regarding the I-40 Kingman Crossing Traffic Interchange, Mohave County, in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 et seq.), in response to a letter from the Arizona Department of Transportation (ADOT) dated January 31, and received in our office February, 2007. Based on the information that you have provided, we believe that no endangered or threatened species or critical habitat will be affected by this project; nor is this project likely to jeopardize the continued existence of any proposed species or adversely modify any proposed critical habitat.

No further review, in compliance with section 7 of the ESA as amended, is required for this project at this time. Should project plans change or if additional information on the distribution of listed or proposed species becomes available, this determination may need to be reconsidered. We encourage you to coordinate review of this project with the Arizona Game and Fish Department.

Should you require further assistance or if you have any questions, please contact John Nystedt (x104) or Brenda Smith (x101) of our Flagstaff Suboffice at (928) 226-0614. Thank you for your continued efforts to conserve endangered species.

Sincerely,

  
 Steven L. Spangle  
 Field Supervisor

cc: Josh Avery, Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
 Jessica Walsh, ADOT Environmental Planning Group, Phoenix, AZ

W:\John Nystedt\ADOT\40kingmanInterX.doc:egg



**I-40, Kingman Crossing Traffic Interchange**  
 Design Concept Report and Environmental Study

**Public Meeting**

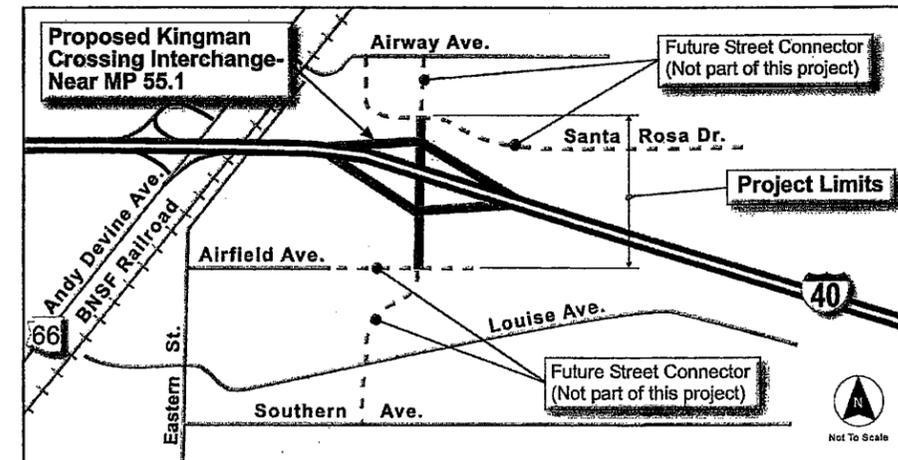
**Welcome** to the Public Meeting for Interstate 40 (I-40), Kingman Crossing Traffic Interchange (TI). Tonight, you will meet the study team, hear about the highway development process, and have an opportunity to express your ideas about issues, concerns and opportunities for the proposed new traffic interchange on I-40.

**Tonight's Agenda:**

- Open House Meeting Format
- Project Presentation (6 PM)
- One-on-One Discussions at Displays

**What's a Design Concept Study?**

The Kingman Crossing TI Design Concept Study and environmental analysis is part of a collaborative project between the City of Kingman, Arizona Department of Transportation (ADOT), Federal Highway Administration (FHWA) and private developers to identify alternatives that will improve access to east Kingman and relieve congestion at the East Kingman TI (Andy Devine Avenue). The project would provide a new I-40 TI with an underpass or overpass near milepost 55.1, located approximately 1.5 miles east of Andy Devine Avenue. The proposed project will ultimately connect to Airway Avenue and







**Summary of Public Meeting Comments**  
**I-40 Kingman Crossing TI**  
**Design Concept Report & Environmental Studies**  
**City of Kingman**  
**URS Project Number: 23444875**

Subject: Public Meeting  
Date: January 10, 2007  
Time: 5:30 PM to 7:30 PM  
Location: Hualapai Elementary School, Kingman, AZ  
Prepared by: Sunny Bush

On Wednesday, January 10, 2007, a public meeting to discuss the Proposed Kingman Crossing Traffic Interchange on I-40 was held at Hualapai Elementary School, 350 Eastern St, Kingman, AZ. The meeting was held from 5:30 P.M. to 7:30 P.M. with a presentation at 6:00 pm. Representatives from the City of Kingman, Arizona Department of Transportation and Federal Highway Administration were in attendance, and the presentation was given by Dale Wiggins, URS Corporation.

The purpose of the meeting was to present information on the proposed Kingman Crossing Traffic Interchange and to gather comments and concerns from the members of the public. The primary concern expressed at the meeting was related to development of arterial streets outside the boundaries of the Kingman Crossing Interchange Project. Most attendees were not in favor of the project, largely because they felt that development of the interchange would result in development of major arterial roadways on existing roadways, diminishing the quality of life for those who live on those streets. Others were in favor of the project, stating that the City of Kingman is experiencing rapid growth, and greater access from I-40 is necessary to relieve traffic congestion. Because development of arterial streets beyond the project boundaries was the major concern expressed at the meeting, attendees were encouraged to attend the City of Kingman Transportation Planning Meeting scheduled for January 24, 2007, where decisions regarding these issues would be discussed. Comments were recorded at the public meeting, and written comments were collected. Approximately 30 verbal comments were recorded, and about 20 written comments were received (16 from persons attending the meeting, 3 via U.S. mail, and 1 via email).

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URS Job No. 23444699, File 4.5

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**The following comments and questions were recorded at the public meeting (1/10/07):**

Comment #1:  
Even though this project does not include planning for the arterial streets that will be developed as a result of the TI, we object to the use of residential streets as connector streets. If we don't voice our opinions about the connector streets, we are as much as giving you authorization to go forward with these streets by agreeing to the TI.

Comment #2:  
Is the connection between Airfield and Southern called Seneca Drive? That's the problem and what we object to.

Comment #3:  
The City of Kingman representatives are not listening to our comments.

Comment #4:  
Where are you in the planning process? Can this be stopped?

Comment #5:  
Is part of the planning process to take into consideration Kingman Crossing vs. Rattlesnake Wash or is it to develop both interchanges?

Comment #6:  
If it's more expensive to do an overpass over the Kingman Crossing traffic interchange, why not go under? A study needs to be done.

Comment #7:  
Why do Kingman Crossing TI in addition to Rattlesnake Wash TI? Why do we need two Traffic Interchanges?  
(answer: The regional traffic study indicated that 2 Traffic Interchanges would be needed to accommodate anticipated traffic flow)

Comment #8:  
Where is the funding coming from?  
(answer: The funding for the Kingman Crossing TI is coming from the City of Kingman and a private developer)

Comment #9:  
What's the benefit of having an offramp going south of I-40? There's nowhere to go. To go anywhere, you have to hit Airway Avenue or Hualapai Mountain Road. The traffic in the area has doubled since the City closed Louise.

Comment #10:

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Most people would not be in favor of Kingman Crossing TI. The Rattlesnake Wash TI would be much more useable.

Comment #11:  
Will the January 24, 2007 City of Kingman Planning Meeting address what roads will be created or left open going south from the TI?

Comment #12:  
Why did the City close Louise?  
(answer: Louise was closed at Andy Devine Boulevard as part of an agreement with the railroad for safety reasons)

Comment #13:  
Does Airfield Avenue have a 100-foot Right of Way that could be an arterial?

Comment #14:  
Is it Kingman's intention to funnel traffic from a major highway into a residential area?

Comment #15:  
Was the Kingman Crossing TI added to the general plan after the general plan was completed?  
(answer: No, Kingman Crossing TI was identified in the Kingman Area Transportation Study which was incorporated into the General Plan).

Comment #16:  
Is the City ignoring Rattlesnake Wash TI in order to develop the Kingman Crossing TI so that the developer will pay for it?

Comment #17:  
When is the Rattlesnake Wash TI scheduled to be built?  
(answer: it is programmed into the 2013 5-year Plan).

Comment #18:  
Could the traffic only be directed north from the interchange?  
(answer: no, because it would not meet FHWA requirements)

Comment #19:  
What is the approval process timeline for the Kingman Crossing TI?  
(answer: design will be completed this year and construction will begin in 2008).

Comment #20:  
Why will the Rattlesnake Wash TI take so much longer than Kingman Crossing TI?  
(answer: there's no ADOT funds involved with the Kingman Crossing project, so there are fewer requirements)



Comment #21:  
If we could see all the road plans together, we could make a better assessment.

Comment #22:  
As they bring new roads through the area from the Kingman Crossing TI, all the traffic to accommodate the newer phases of the development will pass through the currently developed areas.

Comment #23:  
Has anyone considered the new legislation that was recently passed reimbursing owners for property value loss due to right of way issues. Has anyone thought about that cost?

Comment #24:  
There are at least 50 homes that would be impacted along Seneca Boulevard by a 4-lane highway.

Comment #25:  
Why don't you consider the Rattlesnake Wash TI instead of the Kingman Crossing TI?

Comment #26:  
Why don't you get the developer to put money into the Rattlesnake Wash TI and connect the roadways

Comment #27:  
The Rattlesnake Wash TI hurts far fewer people. There's nothing out there.

Comment #28:  
Who has requested an amendment for the General Plan? (answer: City of Kingman)

Comment #29:  
What is the purpose of the January 24<sup>th</sup> Planning Meeting?  
(answer: to get public input on future arterial roadways)

**The following written comments were received at and after the public meeting:**

Ben and Kim Gross:  
Arterial streets should not be placed in existing neighborhoods. Is it possible to run a frontage road from Kingman Crossing up to Rattlesnake Wash proposed exist, then create an arterial road from there to Haulapai Mountain Road. This would be placed in an area where there is no current residential developments.

Natalie Ponusky:



We do not need this interchange! There will be an interchange at Rattlesnake Wash. There is only 3 miles between that interchange and the one at Andy Devine. That is close enough. If you have to put this in, make it an access road for business with NO access to the residential areas.

Shawn Burgess:

In the immediate term it seems the Rattlesnake Wash TI would better serve the growing traffic demands of Eastern Kingman (before Kingman Crossing). City government should lobby to accelerate Rattlesnake Wash completion based on critical growth acceleration.

Lou and Judy Semke:

Kingman's population will increase. We need to plan now for the expansion. We cannot have bottlenecks.

George Rapoport:

Forget this project and concentrate on Rattlesnake Wash. This Kingman Crossing has no merit and no worth to the community.

Jeanne Taylor:

This project adversely affects property values in a negative way. This project does not project traffic issues. This project does not effectively communicate to the public why access must run south.

Sylvia and John Farinelli:

(1) I (SF) object 100% to 4-laning of Seneca (AT ANY TIME). There are 50+ homes, almost all of them facing right on Seneca, some with double driveways. How are the residents supposed to back out (and turn in) to their driveways on a 4-lane heavily traveled highway? Use your expertise to place a 4-lane highway at Rattlesnake Wash instead. What's the matter with you? Look at the mess you've created on Eastern to Airway - how sad!!

(2) there are children riding bikes, elderly walking every day and night, some with dogs, etc. Speeders daily in a 25-mile zone. Trucks (Desert Construction, Thunderbird Construction, J.W. Schritter, and D&H among others) tear up and down Seneca hauling huge loads of rock, dirt, etc. Are you going to wait til someone gets killed?

Karen Lynne:

The moderator got off agenda by conversing with the front rows; we couldn't hear the questions he was answering.

Who will own the interchange upon completion?

I'm all for it. Let's go forward.

The relevant point, that this interchange is being put in for the mall. The elephant is in the room.

Ray Jones:

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Forget about Kingman Crossing. Study Rattlesnake Wash. People will support you on this, not Kingman Crossing.

Harley Pettit:

We do not need. It's 2 miles apart. The city is committed to Rattlesnake Wash, not the Kingman Crossing Proposal.

Penny Cross:

Costwise Rattlesnake should be developed first. By-pass Seneca go up further beyond Santa Fe - come around to Hualapai Mountain Road. No 4 lane on Seneca, run a 4 lane from above all the development around Foothill Estates and Santa Fe.

Marianne Cavanaugh:

I feel the residents are about to get the shaft again. It seemed to all present at the meeting Rattlesnake Wash would be the most acceptable.

Rick Angle:

I like it. It leaves a lot to be determined on the south side of I-40, but I say let's do it! I think that overall this will be a positive thing in our community. People voiced concern about increasing traffic to Hualapai Mountain Road. Is very little, if any reason to go over to Hualapai Mountain Road. Is there a Costco or Target being built there? No. People will use Airway, I-40 (greatly underused resource), Eastern and Airfield to access Stockton Hill Rd. The commercial property, businesses, school, etc. at the Kingman Crossing TI will help alleviate congestion in other parts of the city.

Bonnie Tomlin:

My concern is not so much the interchange, but it's affect on the surrounding area. It seems that by only addressing the interchange, in the future, the tail will be wagging the dog. People living in the area south of the proposed TI need to know the total, long-term plan in specifics. I am not opposed to the TI in general, but question the placement and how the City can make it work without messing with established neighborhoods. Good luck!

James F. Turner:

One thing not mentioned at the meeting was the potential for homes that will be built eventually along Southern and Louise plus side streets from Eastern to the other side of Rancho Santa Fe clear down to I-40. This area is about 30% developed and another 30,000 people could easily be absorbed except for their vehicles. When this happens, Kingman Crossing TI will become a very dangerous interchange. Can you imagine the number of old people using this for a cross-town street and in 75 mph truck/car traffic? I believe the developers involved are the usual Kingman Good-ol-boys. They would chase a dollar somewhere else if the pot was rich enough. I believe that Rattlesnake TI could be made very appealing with the right carrot being dangled: i.e. Forget Kingman Crossing; Give them some city property for home development plus frontal road access from Rattlesnake Wash with property for commercial ventures. That would be about 3 miles on each side of I-40 with connection to Airway. Very few residences would be involved. A cross-

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blvd could also be developed in "virgin dirt" along Castle Rock or Sage to put more traffic on Airway instead of Hualapai Mountain Road or/and the connection to Hualapai Mountain Road could bring those residents down to the proposed frontal road shopping areas. I just feel that the Kingman Crossing TI will ultimately be more grief than you bargained for especially when those old grey heads start showing up in 18 wheeler radiators. This would also open up a project to connect the airport to I-40.

Irving J. Olson:

When I voted for the General Plan for Kingman in April, 2004 there was nothing about Kingman Crossing. It was all about Rattlesnake Wash being a new interchange. It's my understanding that Kingman Crossing was added to the General Plan in late 2004 - it was not passed by the voters. Show me how traffic will get to Louise, Southern and Airway, and make that a part of Kingman Crossing TI and I may support it.

John and Gwen Gillman:

Very opposed to disrupting established neighborhoods, i.e. Hualapai Foothill Estates, Rancho Santa Fe, Kingman Estates. City should have been more proactive in planning future through roads rather than let the developers build, put up block walls (Southern near Seneca) which makes a 4-lane road impossible.

Charles R. Wilmarth:

I feel that a good share of the people at the Jan. 10 meeting were for the Kingman Crossing. They just weren't as vocal as the Seneca Road group. Someone should point out that an easy access to the freeway may reduce the traffic on Seneca. If Kingman Crossing were to be built the City could sell their 169 acres of land and use the money to pay for th4ere share of the cost of Rattlesnake Wash Crossing. I would like to see either or both crossings built.

Gary and Linda Overson:

We are opposed to this proposal. From the information available, it seems as if the plan is ill-conceived and incomplete with no regard to access and exit routes taken into consideration. There is no justification that this crossing is even needed or how many people would even use it. The Rattlesnake Wash access should be pursued instead.

James and Ruth Simpson:

This project should be scrapped. Reasons:

- 1) It is a major amendment to the General Plan we voted to approve
- 2) It does not meet one of the requirements of ADOT that specifies the presence of arterial streets for ingress and egress. These streets are phantoms.
- 3) We do not want semi trailers cruising our residential streets while looking for a place to park on turn around.

Comment received via email (1/12/07)

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I was at the Kingman Crossing TI meeting last night. I'm all for this, we need a mall and roads to access East Kingman but I do feel for the people who live on Seneca Street and other side streets. We cannot use residential neighborhoods as access roads. There must be another way to divert traffic from these areas. Concentrating on Rattlesnake Wash TI first the city could divert the money use to widen Seneca to connecting roads including Southern Avenue to Hualapai Mountain Road. No one wants to travel the back streets not when we could take Airway all the way down to the new road Mohave Drive then down to the connecting streets of Louise, Southern or like me go to Hualapai Mountain Road and void all the congestion. There must be a way to get legislature to approve funds for Rattlesnake Wash TI before the schedule date in 2013.

Thank you Mr. Wiggins for your time in this matter.

Sincerely,

Mary & Roscoe Gray  
4496 E. Mule Shoe Dr.  
Kingman, AZ 86401-8704  
[ROSCOEGRAY@FRONTIERNET.NET](mailto:ROSCOEGRAY@FRONTIERNET.NET)

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## I-40, Kingman Crossing Traffic Interchange Design Concept Report and Environmental Study

### Public Meeting

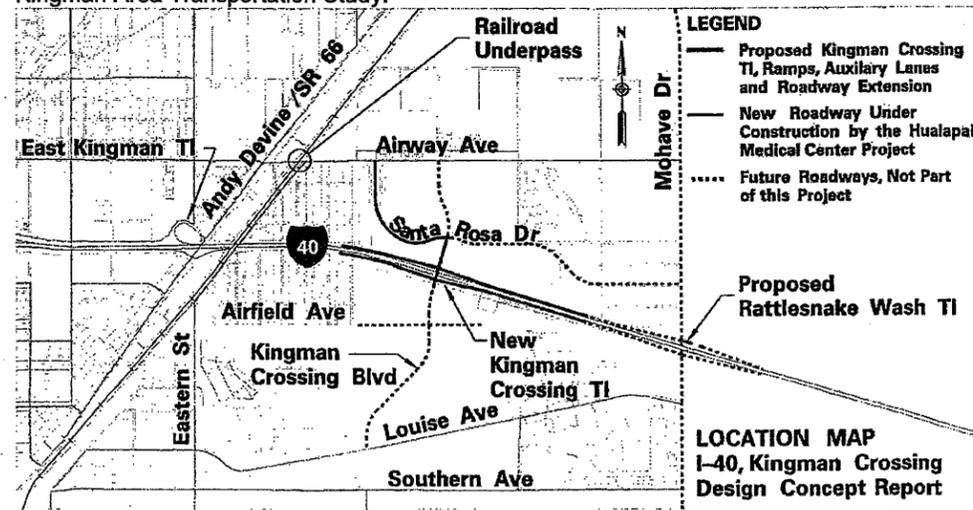
**Welcome** to the Public Meeting for Interstate 40 (I-40), Kingman Crossing Traffic Interchange (TI). Tonight, you will meet the study team, hear about the highway development process, and have an opportunity to express your ideas about issues, concerns and opportunities for the proposed new traffic interchange on I-40.

#### Tonight's Agenda:

- Open House Meeting Format
- Project Presentation (6 PM)
- One-on-One Discussions at Displays

#### What's a Design Concept Study?

The Kingman Crossing TI Design Concept Report and Environmental Study is part of a collaborative project between the City of Kingman, Arizona Department of Transportation (ADOT), Federal Highway Administration (FHWA) and private developers to identify alternatives that will improve access to east Kingman and relieve congestion at the East Kingman TI (Andy Devine Avenue). The project would provide a new I-40 TI with an overpass near milepost 55.1, located approximately 1.5 miles east of Andy Devine Avenue. The proposed project will ultimately connect to Airway Avenue and Louise Avenue with future arterial street connections that will be constructed by future improvement projects. These improvements were previously identified in the City of Kingman General Plan and the Kingman Area Transportation Study.



## I-40, Kingman Crossing Traffic Interchange Design Concept Report and Environmental Study

#### What are the Project Goals?

The I-40 Kingman Crossing TI Design Concept and Environmental Study will investigate alternatives to improve access to the east Kingman area. Goals for this project include:

- Perform design concept and environmental studies to evaluate a new I-40 TI structure with full access control and arterial street connection to Santa Rosa Drive to the north, which is under construction by the Hualapai Medical Center project.
- Improve access to the rapidly growing east Kingman area.
- Complete improvements that were previously identified in the City of Kingman General Plan and the Kingman Area Transportation Study.

#### Why is this Project Needed?

The City of Kingman is an important regional center for northwestern Arizona and is a major hub of transportation, commerce and government administration. Residential and commercial development is occurring in Kingman with the largest concentration of growth occurring on the east side of Kingman. Currently, the only access to this project area is provided by the Hualapai Mountain Road bridge over the BNSF tracks and the new underpass crossing of the BNSF tracks at Airway Avenue. Because of the inhibited mobility to the proposed development areas, a new arterial roadway connecting to I-40 with a new TI is proposed.

#### Recommended Alternative

Based on the evaluation results from the design concept and environmental study, the recommended alternative for a new traffic interchange at Kingman Crossing Boulevard will involve constructing a new compact diamond service overpass interchange on I-40 at MP 55.1, with an arterial connection to Santa Rosa Drive to the north of I-40. The Hualapai Medical Center and the portion of Santa Rosa Drive from Kingman Crossing Boulevard to Airway Avenue is currently under construction and will be completed prior to the construction of the Kingman Crossing TI. Santa Rosa Drive will provide the arterial connection from the TI to Airway Avenue until Kingman Crossing Boulevard is constructed between Santa Rosa Drive and Airway Avenue by a future development project.

The Kingman Crossing Boulevard cross road will be depressed under I-40 with I-40 remaining at grade. Based on the traffic analysis recommendations, Kingman Crossing Boulevard between the ramp intersections will provide two through lanes and two left-turn lanes southbound and northbound. Between the traffic interchange ramps and Santa Rosa Drive, three through lanes in each direction would be constructed. The Kingman Crossing Boulevard improvements will include curb and gutter, sidewalks and a raised concrete curbed median between TI ramps and Santa Rosa Drive.

Traffic signals will be provided at the two TI ramp intersections and at the Santa Rosa Drive and Kingman Crossing Boulevard intersection. Street lighting will be provided along Kingman Crossing Boulevard and at the ramp freeway entrance and exit locations.





**I-40, Kingman Crossing Traffic Interchange**  
Design Concept Report and Environmental Study

A break in the access control line along Kingman Crossing Boulevard between the TI and Santa Rosa Drive will be provided to allow for future right-in/right-out driveways to provide access for future development.

**Long Range Planning**

In the future, Kingman Crossing Boulevard will be extended south to at least Louise Avenue and north to Airway Avenue. Extending Kingman Crossing Boulevard will be dependant on when future development occurs on the state land to the south and when the Kingman Crossing neighborhood development is completed to the north.

**Where Do We Go From Here?**

Following tonight's meeting, the project team will address the comments received and develop the Final Design Concept Report and final environmental document, which should be completed winter 2008/2009. These documents will be distributed to various Federal, State and local agencies for review and comment and to obtain agency acceptance.

**How Can You Help?**

After listening to the presentation tonight, we would like to receive your comments on the recommended alternative. Please take the time to make your comments in writing on the Comment Sheet and either return it to a City of Kingman or consultant representative tonight, place it in the comment box, or mail/fax it to the address listed on the form no later than December 2<sup>nd</sup>, 2008

**Whom to Contact?**

For additional information about the project, please contact the following:

**City of Kingman Special Projects Manager, Rob Owen**  
City of Kingman  
310 N. 4<sup>th</sup> Street  
Kingman, AZ 86401  
928-753-8133 Fax: 928-753-7747  
E-mail: rowen@cityofkingman.gov

**Consultant Project Manager, Dale Wiggins**  
URS Corp  
7720 N. 16<sup>th</sup> Street, Suite 100  
Phoenix, AZ 85020  
602-371-1100 Fax: 602-371-1615  
E-mail: dale\_wiggins@urscorp.com

**Where Can a Copy of DCR be Obtained?**

A copy of the Kingman Crossing Draft Final Design Concept Report can be reviewed and downloaded from the City of Kingman website at the following ULR address:  
[http://engineering.cityofkingman.gov/studies\\_reports.asp](http://engineering.cityofkingman.gov/studies_reports.asp)



**I-40, Kingman Crossing Traffic Interchange**  
Design Concept Report and Environmental Study

**Comment Sheet**

**Tuesday, November 18<sup>th</sup>, 2008, 5:30 p.m. to 7:30 p.m.**  
**Mohave County Board of Supervisors Room,**  
**700 West Beale Street, Kingman, AZ**

City of Kingman would like to receive input from you regarding issues, concerns, or questions you may have concerning the preferred alternative for this project. By providing this information, you will be taking part in determining the future improvements for the Kingman Crossing TI. Please list your name and address below. We will contact you at a later date to discuss your comments, if needed. You may submit your comments here tonight, or send your comments by December 2, 2008 to:

Dale Wiggins  
URS Corp  
7720 N. 16<sup>th</sup> Street, Suite 100  
Phoenix, AZ 85020

Phone: 602-371-1100  
Fax: 602-371-1615  
Email: dale\_wiggins@urscorp.com

**(PLEASE PRINT)**

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Email Address or Fax No. \_\_\_\_\_

Comments:  
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**Public Information Meeting  
Meeting Minutes**

**I-40, Kingman Crossing Traffic Interchange  
Design Concept Report and Environmental Studies  
ADOT TRACS No. H7147  
Federal No. STP-040-B(AUE)**

Meeting Date: November 18, 2008  
Meeting Time: 5:30 p.m. to 7:30 p.m.  
Meeting Location: Mohave County Board of Supervisor Room  
700 West Beale Street  
Kingman, AZ

**Team and Agency Members in attendance:**

Rob Owen, City of Kingman  
Jack Kramer, City of Kingman  
Gregory Henry, City of Kingman  
Gary Jeppson, City of Kingman  
John Salem, City of Kingman  
Tom Duranceau, City of Kingman  
Coral Lloyd, City of Kingman  
Michele Beggs, ADOT  
George Wallace, ADOT  
Roxanne Turner, ADOT  
Mike Kondelis, ADOT  
Dale Wiggins, URS  
Roy Hookey, URS  
Sunny Bush, URS  
Greg Martinsen, EcoPlan

Approximately 50 people attended the meeting, including team members, agency personnel, consultants, and members of the public. All attendees and contact information are listed on the attached sign-in sheets.

The public information meeting convened at 5:30 p.m. with open discussion between attendees and project team members. Attendees viewed the presentation boards and asked questions. The formal presentation began at 6:00 p.m. with Rob Owen, City of Kingman, welcoming attendees and introducing the team members. Rob explained that the draft final Design Concept Report (DCR) is complete and the document is available for review on the City of Kingman web site. Mayor John Salem then spoke, offering his thanks to all for attending and recognizing the team for their hard work.

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Following the Mayor's comments, Dale Wiggins provided a Power Point presentation outlining the project progress and the recommended alternative for the proposed Kingman Crossing Traffic Interchange. Dale reviewed the project features, traffic forecast results, and anticipated costs. He explained that the team would appreciate any and all comments, and the comment period will extend until December 2, 2008. At that point, comments will be addressed and incorporated into the document as appropriate and the DCR and environmental documents will be finalized. Design and right-of-way acquisition will follow finalization of the DCR pending direction from the City Council.

A question and answer period followed the presentation. Questions and comments were submitted on pre-distributed cards prior to and during the meeting and are as follows:

- Q: (Robert D. Cordero) What road will be used to reach Airway? What is the name and where will it contact Airway?  
A: Santa Rosa Boulevard will be used to reach Airway Avenue until the connection to Airway Avenue via Kingman Crossing Boulevard is constructed some time in the future.
- Q: (Barbara Hall) Forget Kingman Crossing! Build out Rattlesnake Wash and from there build frontage roads to Kingman Crossing. Rattlesnake Wash would also be a better choice to go to the Kingman Airport and Industrial Center and the Hualapai Mountain Road.  
A: According to the study, both interchanges are needed.
- Q: (Tom Reynolds – Question 1) Will you be dumping freeway traffic on to Louise – a 2-lane road and street running through a residential area?  
A: Initially, traffic from I-40 will not be able to access Louise Avenue. In the future, Kingman Crossing Boulevard will be extended to at least Louise Avenue when the State Land parcel is sold and developed. It is anticipated that the traffic volumes will not be significantly increased over what exists today.
- Q: (Tom Reynolds – Question 2) What is the distance between Kingman Crossing and Rattlesnake Wash?  
A: The distance between Kingman Crossing traffic interchange (TI) and the Rattlesnake Wash TI is 1.5 miles and the distance between Rattlesnake Wash TI and Andy Devine Avenue is 3 miles.
- Q: (Jim Kress – Question 1) What is the average population required to support a typical urban interchange?  
A: There are no Federal Highway Administration guidelines related to population limits when establishing a TI. The criterion is based traffic needs that are based on current and projected population forecasts.

## URS

- Q: (Jim Kress –Question 2) What will be the economic impact on Beale Street/Andy Devine and the Stockton Hall economic communities?
- A: Construction of the interchange would alleviate congestion at Andy Devine. How this would impact commercial development is unknown, and would be an issue to be considered by the Kingman City Council.
- Q: (Jim Kress –Question 3) Where will people come from in the east that will require an interchange to support this level of convenience?
- A: The traffic analyses used population forecast data that assumed future development of County land to the east.
- Q: (name omitted) I believe Santa Rosa Drive was stated would be 6 lanes. Is the current Santa Rosa Drive 6 lanes? And, if not, how could you possibly widen the current portion since there are housing developments on both sides (south of Airway).
- A: The intersection of Santa Rosa Boulevard is currently a 4-lane roadway and continues as such from Airway Avenue to the Kingman Crossing TI.
- Q: (name omitted) What is the approximate time for construction on the TI is approved and construction Begins?
- A: The final DCR will be completed in spring, 2009. Design will take 12 to 16 months, and construction will take 1 to 1.5 years. In all, the process will take about 3 years. However, approval for the design and construction must first be obtained from the City Council.
- Q: (Billie Dickmeyer) Who will build the TI, and could it be put out for bid?
- A: This is a public project, so it must be put out to bid. If it were being constructed by a private developer without FHWA funds, it would be different. Future negotiations will involve I-40 interaction, so it could have to go through the Arizona Department of Transportation, as well.
- Q: (Jay A.) Could the Kingman Crossing interchange be restricted to cars only?
- A: Zoning on the property to the north would not allow for truck-related uses, but federal highways cannot restrict the type of traffic using the roadways.
- Q: (Rose – question 1) Will this new TI be lead to access the Kingman Airport? Is the airport going to expand? Is this new TI any improvement to the industrial area?
- A: The Rattlesnake Wash TI will have direct access to the airport. Kingman Crossing will have indirect access to the airport by using the street network. There is room for the airport to expand. Any expansion will need to go through Federal Aviation Agency review.

## URS

- Q: (Rose – question 2) How will this new TI affect the new residential area on Airway Avenue?
- A: There will be some adjustment to what was shown on the original plat, but no acquisitions appear to be affected.
- Q: (Ray Brante) Why do we need Kingman Crossing? Rattlesnake Wash TI would serve the same purpose.
- A: The Kingman Area Transportation Study showed a need for both interchanges.
- Q: (Doug) Will commercial trucks be able to drive both north and south from the interchange through residential areas?
- A: Currently there is no access to the south under this design. The ultimate connection to Louise could be considered at a later date, but the process must be repeated if a southern connection is to be considered. Commercial trucks will be allowed to exit to the north, and to the south in the future.
- Q: (Bob Trader) Will there be a new signal light at Santa Rosa and Airway?
- A: Yes, there will be new signal lights at the Santa Rosa and Kingman Crossing Boulevard intersection.
- Q: (Rose) It is my understanding that a new school will be built in the Bella Vista area, with the new TI on Kingman Boulevard. How will this be a safe traffic area for the children and staff of the new school?
- A: There is a new middle school planned at Prospector and Airway, however this is not sited on Airway frontage. The school district will do improvements to ensure safety when the time comes.

At the conclusion of the question/answer period, Rob Owen indicated appreciation for the questions and comments and thanked everyone for coming. He indicated that staff would be available to answer any other questions following the meeting. He also stated that comments would be accepted by mail or email until December 2, 2008. The meeting was adjourned at 7:15 p.m.

### Post-meeting summary:

Three comment forms were submitted during the public information meeting. They are as follows:

### Comment #1:

Submitted by: Wayne DeLong  
4053 Monte Moro Ct.  
Kingman, AZ 86401  
[wdelong@empire-cat.com](mailto:wdelong@empire-cat.com)

# URS

I believe this is a much needed convenience to our Kingman area. It's time we take advantage of I-40 and add more commercial properties besides Stockton Hill road. I feel this would be nothing but good for the City of Kingman. Mayor Salem is on the right track with his "growth" comments.

**Comment #2:**

Submitted by: John Iwanicki  
3138 Rainbow St.  
Kingman, AZ 86401  
[jewan143@yahoo.com](mailto:jewan143@yahoo.com)

This project would not only be a big "shot in the arm" to the area, it would also be a source of sustainable long term growth to the east Kingman area. Growth to our town is inevitable and this project is a progressive move to meet this growth. I support this project totally.

**Comment #3:**

Submitted by: James D. Kress  
2922 Mountain Trail Dr.  
Kingman, AZ 86401  
[jimmiedean@frontiernet.net](mailto:jimmiedean@frontiernet.net)

1. What is the population needed to support an interchange typical for a community of Kingman's size? Please keep in mind that we already have 3 interchanges.
2. What will be the economic impact on the (A) Beal Street/Andy Devine downtown and (B) Stockton Hill north and south of I-40?
3. Who will come from the east to use this interchange?
4. What are the land acquisition costs associated with the project?
5. How much business development (in \$) will take place in the Kingman Crossing area and how much in taxes will be generated in tax and sales tax?

No additional formal responses were made to the comments submitted at the public information meeting, since they either expressed opinions or the questions were addressed during the question/answer portion of the meeting. No additional comments were received after the meeting by mail or email during the comment period.

Attachments: Meeting advertisement  
Sign-in Sheets  
Completed Question/Comment cards  
Post-meeting completed comment forms  
Fact Sheet/Comment Form

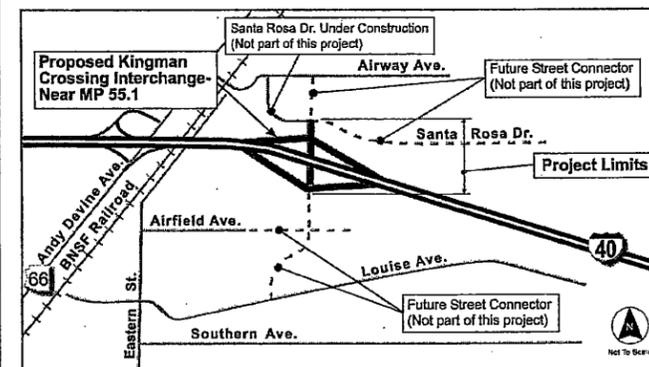
## CITY OF KINGMAN PUBLIC INFORMATION MEETING

Your Input is Needed  
Proposed Kingman Crossing  
Traffic Interchange on I-40

Tuesday, November 18, 2008  
Mohave County Board of Supervisors Room,  
700 West Beale Street, Kingman, AZ

5:30 P.M. to 7:30 P.M.  
Presentation Time - 6 P.M.

The public is invited to attend an information meeting on Tuesday, November 18, 2008. The City of Kingman, in cooperation with the Arizona Department of Transportation and the Federal Highway Administration, will present its final recommendations for the interchange, and request public feedback about elements and details of the project. The proposed project would provide a new I-40 traffic interchange with an overpass near milepost 55.1, located approximately 1.5 miles east of Andy Devine Avenue. The proposed project will ultimately connect to Airway Avenue and Louise Avenue with future arterial street connections that will be constructed by upcoming development projects. These improvements were previously identified in the City of Kingman General Plan and the Kingman Area Transportation Study. The project will improve access to the rapidly growing east Kingman area and relieve congestion at the Andy Devine Avenue interchange.



Representatives from the City of Kingman's Study Team will be present to answer your questions and address your concerns during the public meeting. Project information in the form of map displays will be available for viewing. A brief project presentation will begin at 6 P.M.

For additional technical and project information or to submit comments in writing, please contact Dale Wiggins, URS Corporation, 7720 North 16<sup>th</sup> Street, Suite 100, Phoenix, Arizona 85020, Phone: (602) 648-2458, Fax: (602) 371-1615, e-mail: [dale\\_wiggins@urscorp.com](mailto:dale_wiggins@urscorp.com). Written comments should be submitted by December 2, 2008.

Americans with Disabilities Act (ADA): This notice may be available in alternative format, and persons with a disability may request a reasonable accommodation such as a sign language interpreter, by contacting Sunny Bush, URS Corporation, (602-861-7440). Requests should be made as early as possible to allow time to arrange the accommodation.