NMDOT

CN: LC00270 PHASE 1 A/B REPORT
US 70 ROADWAY IMPROVEMENT SERVICES

Las Cruces, New Mexico (MP 149.23 to MP 150.85) | March, 2018

SMITH ENGINEERING

In Association with Consulting Team:

AEROTECH MAPPING, INC. | BOHANNAN HUSTON, INC. | DEL SUR SURVEYING, LLC | MARRON & ASSOCIATES | TERRACON CONSULTANTS, INC.

PHASE 1 A/B:
DETAILED EVALUATION OF ALTERNATIVES REPORT

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SUBMITTED TO:

NMDOT

SUBMITTED BY:

SMITH ENGINEERING

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US 70 ROADWAY IMPROVEMENTS SERVICES

Phase 1-A/1-B: Detailed Evaluation of Alignment

Las Cruces, New Mexico
Project Number: CN LC00270

Prepared for:

New Mexico DEPARTMENT OF TRANSPORTATION

Prepared by:

SMITH ENGINEERING

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EXECUTIVE SUMMARY

The US 70 (Main Street) Roadway Improvements are located within the City of Las Cruces, Doña Ana County, New Mexico. The corridor is being studied between milepost (MP) 149.23 and MP 150.85; approximately from Solano Drive to the US 70 merge lane at the Del Rey Boulevard overpass. The roadway runs through a developed section on the north end of the City of Las Cruces.

The first portion of this report examines the existing features within the existing right-of-way (ROW), operational status of various roadway segments, intersections, and the Interstate 25 (I-25) Interchange; as well as the environmental and cultural aspects expected to be encountered herein. Some of the deficiencies identified along the corridor include: turning movements at signalized intersections (specifically the Main Street/Elks Drive intersection), congestion at existing driveways throughout the study limits, non-accessible roadside amenities, and safety issues.

Next, public involvement and coordination is discussed in detail. Including an extensive summary of each of the public meetings held to date (Public Information Meeting #1-June 14, 2016 at Jornada Elementary School and various stakeholder meetings with business owners, the City of Las Cruces, and the NMDOT were held). Interested parties had an opportunity to express their concerns and ideas at these meetings as well as in writing during the 30-day comment period surrounding each respective meeting. Some of the main discussion points included: impacts to area businesses during construction, phasing of construction, and multimodal facilities within and along the corridor. The coordination efforts continued with all facility operators/providers within the ROW including: utility providers (City of Las Cruces, El Paso Electric, Roadrunner Transit, etc) and various governmental bodies (New Mexico Department of Transportation [NMDOT], Doña Ana County, City of Las Cruces, Mesilla Valley Metropolitan Planning Organization, etc) amongst a variety of other stakeholders.

Following the examination of existing conditions and feedback from interested parties a Purpose and Need Statement for the project was established. This statement establishes the purpose of the project while incorporating as many of the identified needs insomuch as possible within the anticipated timeframe and budget. The Purpose and Need Statement for US 70 (Main Street) Roadway Improvements is shown below:

"The purpose of the proposed improvements is to correct existing physical deficiencies, facilitate traffic flow and operations, improve traffic safety conditions, manage access to adjoining properties, and develop appropriate facilities for bicyclists and pedestrians."

From there potential alternatives were developed for further analysis on their respective ability to satisfy the purpose and need, address deficiencies, and adhere to the established guidelines governing their development and subsequent construction. Three (3) primary potential roadway section scenarios were studied as well as some other design considerations that affect all alternatives:

- No-Build Scenario
- Alternative #1 – Six Lane Access Management per State Access Management Manual (SAMM) Requirements with At-Grade Intersections
- Alternative #2 – Six Lane Access Management per SAMM Requirements with a Grade Separation at the US 70/Elks Drive/Triviz Drive Intersection
- Design Considerations:
    - Bridge versus Concrete Box Culverts crossing the Alameda Arroyo; including connections to the existing Alameda Arroyo multiuse path and Corps of Engineer's drainage channel.
    - Mill and Inlay of US 70 east of the Interstate 25 Interchange – to be completed in current NMDOT project.
    - Bike lanes along Main Street
    - Left-in/right-in/right-out (LIRIRO) at Scanlon Drive
    - Left-in/right-in/right-out (LIRIRO) at Temple Street
    - Frontage Road System at the shopping center and at the Elks Drive/Triviz Drive intersection. As well as the frontage roads presented within Alternate 2 from Alameda Arroyo crossing structure to Scanlon Drive
    - Multitude of lane configurations at each major intersection

The potential alternatives listed above were evaluated against the following criteria:

- Meets the Purpose of Need
- Engineering Factors
    - Business Access
    - Multimodal
    - Level of Service (LOS) Improvements
    - Safety
    - Constructability
    - Utility Impacts
    - Right-of-Way (ROW) Requirements
    - Stakeholder Support
- Estimated Costs
- Environmental Factors

A second public involvement meeting was held June 11, 2018 at the Elks Lodge to present study findings and recommendation. The public voiced their opinions and asked questions regarding the alternatives. Their comments were considered and incorporated into this report.

Ultimately, the highest ranking (preferred) alternative (Alternate 2-Six Lane Access Management per SAMM Requirements with a Grade Separation at the US 70/Elks Drive/Triviz Drive Intersection) with phased construction and the No-Build Scenario shall advance to the Phase C Study as the recommended alternatives within this study.

Based on the evaluations of each respective alternate and its functionality presented in **Section VI**, the best solution to accommodate the multitude of movement types and improvements is

Alternate 2. Alternate 2 (Six-Lanes with Grade Separation adhering to the spacing requirements in the State Access Management Manual) best adheres to all suggested selection criteria. The roadway would be built symmetrically about the existing street, utilizing the existing roadway and medians as much as possible.There would be geometric improvements at the existing intersections – El Camino Real/Camino Del Rex, Temple, Amigo and Scanlon. A grade separation would be built at the Elks/Triviz intersection. Frontage roads would be added to accommodate the grade separation from Temple to Scanlon. Other improvements would be two additional lanes, bicycle lanes, sidewalk improvements, lighting, and upgrading traffic signals. The bridge/culvert section across Alameda Arroyo would be widened to accommodate bicycle lanes and sidewalks on each side as well as the additional two lanes.

The grade separation at Elks/Triviz is the only alternate that will provide an improvement to the intersection due to the high volumes and their turning movements from the side street of Elks and Triviz. The at grade alternate at this intersection provides no benefit returning only a level of service (LOS) of D or E for the intersection with turning movements being LOS E or F. The east-west (U.S. 70) movements are impeded by the north-south movements of Elks and Triviz. The turning movements from Elks and Triviz are LOS F. The grade separation allows for U.S. 70 to remain at two lanes in each direction at this intersection and provide a LOS of B. Because the grade separation will provide the greatest benefit to the LOS on Elks and Triviz, and because the north/south traffic volume is primarily generated from local City streets, the City's participation in funding is imperative for the successful implementation of the preferred alternative of the project.

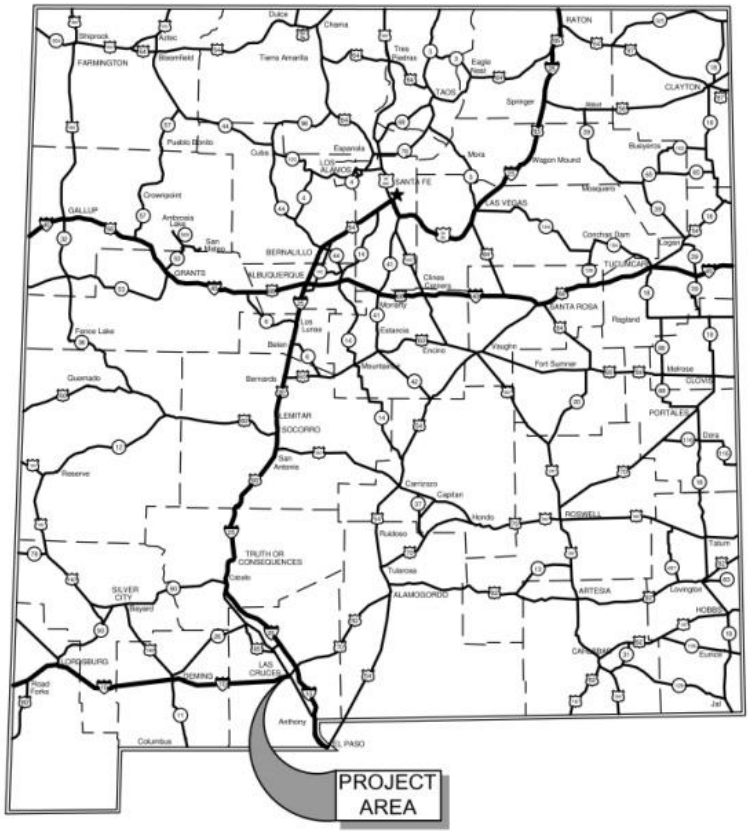
The recommended alternate with these suggested improvements offers users both an efficient and pleasant driving experience. The level of service, functional capacity and safety of the roadway are improved by these recommendations. The residents of Las Cruces will benefit from on-street bicycle facilities and accessible sidewalks and these facilities will be separated from the through traffic for much of the corridor. Access to businesses will be improved by the frontage roads, though motorists and businesses will have to get used to the change. Access from Solano to Temple will be improved by driveway spacing and the addition of the third lane on each side.

The estimated cost of the total project from the BOP at Solano Drive to the signal at the south bound off ramp at I-25 is **$56 million** including right of way acquisition. Due to the high cost of the single project, it is recommended the project be built in two phases. The first phase would be a six-lane section from the BOP to Temple Avenue including concrete box culverts to replace the Alameda bridge and a concrete intersection at El Camino Real/Camino Del Rex. No additional right of way is expected for the first phase of construction for this alternate. Phase A would also include a mill and inlay from Temple to the Elks/Triviz intersection to match the current mill and inlay project from Elks/Triviz east. The second phase would be from Temple to the SB off ramp from I-25 and include the grade separation at Elks/Triviz and frontage roads from Temple to Scanlon. Additional right of way will be required along Elks and Triviz to accommodate additional driving lanes, sidewalk and bicycle lanes. Right of way will also be required for a proposed flyover from east bound US 70 to south bound I-25. Phase 1 has an estimated cost of **$22 million** and phase 2 is estimated at **$32 million**.

SECTION I: INTRODUCTION

The project is located in the City of Las Cruces, Doña Ana County, New Mexico. The subject section of US 70 (Main Street) runs northeastward from Solano Drive/Spitz Avenue intersection through the northern portions of the City of Las Cruces (see **Figure 1**) to the termini at the Del Rey Boulevard overpass. The study limits are MP 149.23 to MP 150.85. For the purposes of this study, the evaluation extends from MP 149.23 to MP 150.85 and includes the intersections, bridge, I-25 interchange, driveways, and access points along its ROW.

Figure 1: US 70 Location Map



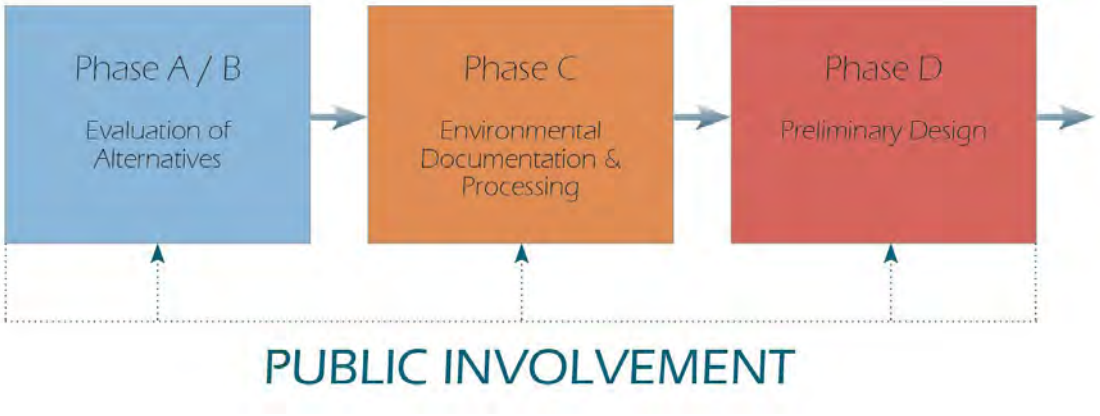
A. Background

The subject section of US 70 was initially constructed in its current configuration (4 lane divided roadway) in the late 1950s. Two (2) previous phases of US 70 (Main Street) have been designed and constructed (Chestnut Avenue to the west side of the Solano Drive/Spitz Avenue intersection and the next subsequent phase-the Solano Drive/Spitz Avenue intersection [not constructed yet]) in recent years as part of a phased implementation of improvements along US 70 within the City of Las Cruces. These aforementioned improvements have provided for accessibility and geometric improvements as well as benefits to capacity and traffic flow.

SECTION II: PROJECT SCOPE AND OBJECTIVE

A. Phase A/B Study Process

This study was conducted in accordance with the *Location Study Procedures, A Guidebook for Planning and Environmental Linkages, Alignment Studies, and Corridor Studies*, (Update 2015). The procedures outlined in the aforementioned guidebook establish three (3) phases for completion of the study.



Phase A is characterized as the initial evaluation of alternatives. This entails determination of needs, development of potential alternatives, and elimination of alternates that are clearly not feasible within the existing constraints.

Phase B is a detailed evaluation of the remaining alternatives established in A. During Phase B conceptual engineering plans/layouts are developed and further evaluated against social, environmental, cost, and performance data.

Phase C includes the development of the Environmental Impact Statement (EIS) or an Environmental Assessment (EA) followed by a review and comment session(s) for parties (agencies, stakeholders, and the general public) affected by the proposed alternative.

Phase D is the development of preliminary design including; preparation of plans, details, specifications, and estimates.

For this study the NMDOT selected to combine the Phase A & B. Therefore, a number of alternates will be examined, evaluated, and narrowed down to a recommended alternative.

B. Study and Project Limits

As mentioned previously, the study limits are US 70 from MP 149.23 to MP 150.85. More specifically, the limits of this US 70 study are bounded on the southwest by Three Crosses Avenue and to the northeast by Del Rey Boulevard. The limits for the study are those areas within the road right-of-way (ROW), except for the drainage analysis which will be an all encompassing evaluation of the contributory area; including the Las Cruces Dam outfall channel. The Elks Drive/Triviz Drive/US 70 intersection also extends outside the ROW of US 70 as shown on the figure on the following page.

The study limits will identify the impacts of the proposed improvements on the study limits, but improvements will only be provided within the project limits (ROW) insomuch as possible. **Figure 2** (following page) identifies the project and study limits discussed herein.

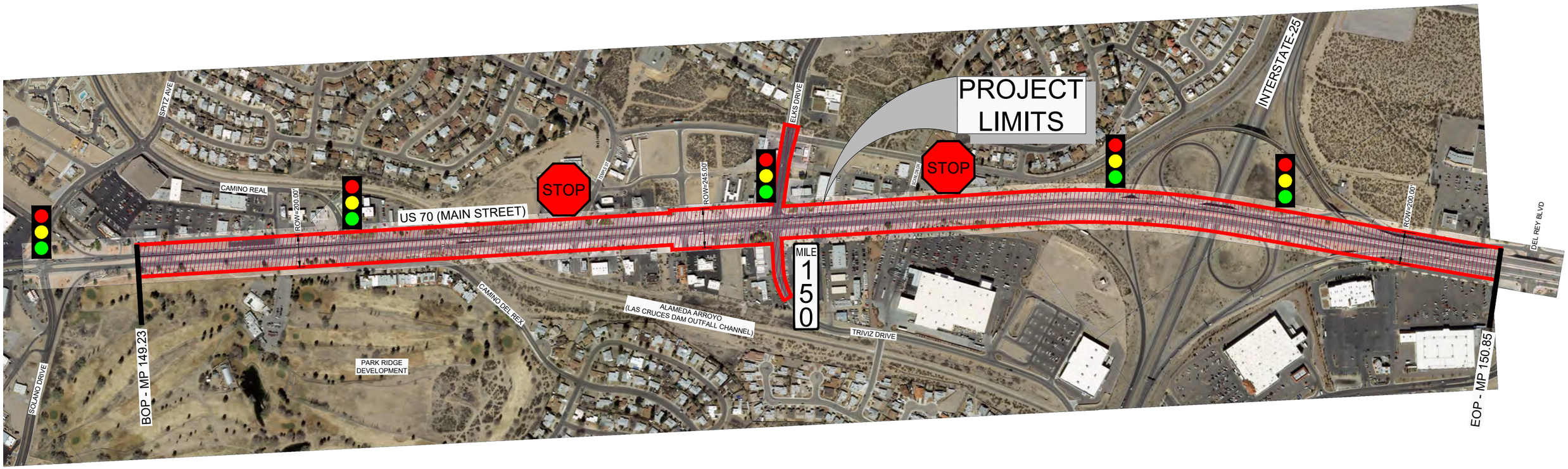


FIGURE 2 - PROJECT & STUDY LIMITS

FIGURE 2
PROJECT & STUDY LIMITS
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270

SECTION III: EXISTING CONDITIONS

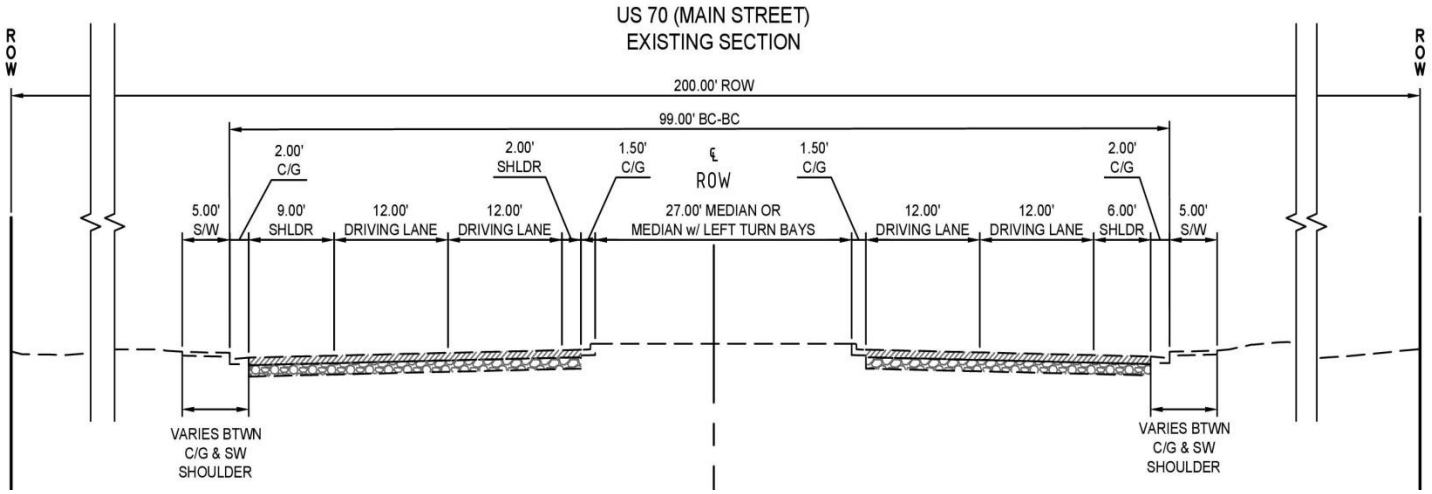
A. Physical Condition of the Existing Facility

Existing conditions along US 70 (MP 149.23 to MP 150.85) have been identified, reviewed, and assessed. The primary goal of this assessment is to identify potential physical and operational deficiencies along the subject corridor. In conjunction with these assessments any environmental, cultural, and community conditions are also examined. These evaluations are based upon field surveys and observations; as well as a thorough review of existing planning documents, As-Built drawings, and potential developments known at the time of this report. The findings are presented herein.

1. Existing Transportation System Inventory

US 70 (Main Street-Primary Urban Arterial) – "runs from the Arizona/New Mexico state line, southeastward to Junction Business Loop 21 in Lordsburg, then subordinate to Interstate-10 up to Las Cruces, where it becomes dominant as Picacho Drive. Then northeastward to Alamogordo where it's subsidiary to US 54 until Tularosa, where it again becomes dominant. US 70 then continues via Mescalero, Ruidoso and Portales, until it joins with US 60 in Clovis. It is US 60 as it continues eastward to Texico, where it continues up to the New Mexico/Texas state line". US 70 stretches across the southern states before its termini in North Carolina. The subject section of US 70 being studied within this report is from Milepost (MP) 149.23 (just east of Three Crosses Avenue) to MP 150.85 (just west of Del Rey Boulevard). This stretch lies completely within NMDOT District 1 and within the incorporated city limits of Las Cruces, Doña Ana County, New Mexico. The existing roadway within the project limits is characterized by a few typical sections (shown herein). The speed limit on US 70 at the study area onset is 35 miles per hour (MPH), and the speed limit increases to 45 MPH at the Camino Real/Camino Del Rex signalized intersection headed eastbound.

Looking northeast on US 70 near the beginning of the project



EL CAMINO REAL ROAD (Major Collector) – collects a large volume of traffic from residential developments north of US 70 from as far as the community of Doña Ana. El Camino Real Road adjoins US 70 with a dedicated left turn lane and a combination through/right turn lane. The developer is in the planning stages of reconfiguring this leg of the intersection to include an additional dedicated left turn lane to accommodate the turning volumes onto US 70 eastbound. The posted speed limit on El Camino Real Road is 35 MPH. It forms the north leg of the intersection with Camino Del Rex forming the south leg.

CAMINO DEL REX/PARK RIDGE BOULEVARD (Local Road) – is a local road that parallels US 70 (approximately 600-feet) and adjoins the subject roadway at a signalized intersection. Camino Del Rex abuts US 70 with a dedicated left turn lane and a combination through/right turn lane. Camino Del Rex is naturally buffered from US 70 (approximately 60-feet) by native vegetation and provides access to roughly 18 residences before veering northeast (away from US 70) into the more densely populated portion of the residential neighborhood. The posted speed limit along Camino Del Rex is 25 MPH. The former Las Cruces Country Club property is being redeveloped as the Park Ridge Medical Center. This property will reconfigure the existing Camino Del Rex intersection to serve the 110-acre parcel. This reconfiguration is currently underway. The initial development will be a 34-acre medical center complex (hospital, medical offices and assisted living facility), and is currently seeking approval from the City and NMDOT. Future phases of the development will expand the hospital and assisted living facility, and also anticipates office uses, residential and retail uses. The development will create a new access to Solano Drive, as well as improving the intersection with US 70.

US 70 BRIDGE – the bridge crosses the Alameda Arroyo (administered by the Army Corps of Engineers) which is a controlled release channel via the Las Cruces Dam upstream (east of I-25). The bridge crosses the dam outfall channel, Triviz multimodal path, a vehicular maintenance access road, as well as a number of city utilities. The bridge was originally designed and constructed in the late 1950s.

Detailed information for the existing bridge structures of US 70 over the Alameda Arroyo (bridge numbers 5723 and 5724) is presented in **Table 1**. Additionally, the most recent NMDOT bridge inspection reports for bridge numbers 5723 and 5724 are presented in **Appendix D**. Refer to **Figure 3** for the location of the existing bridge structures.

Figure 3: Bridge Location Map

Bridge Ratings

Bridges are required to be inspected regularly. With each inspection report, a series of ratings is provided based on the bridge conditions observed during the inspection. These ratings include an overall Sufficiency Rating, Condition Rating, and Appraisal Rating.

Sufficiency Rating

Vehicular bridges are inspected, rated, and assigned a sufficiency rating. The Sufficiency rating is indicative of a bridge's sufficiency to remain in service. The sufficiency rating is also used to define the eligibility for federal funding available for a bridge; in general, the lower the rating, the higher the priority. A bridge typically must have a sufficiency rating of 80 or less to qualify for federal funds for rehabilitation and a rating of 50 or less for replacement funds.

Sufficiency ratings are determined using the Sufficiency Rating Formula. This formula is defined in the U.S. Department of Transportation's report titled "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges". The numeric value is a percentage in which 100 percent represents an entirely sufficient bridge and zero percent represents a totally insufficient bridge. The Sufficiency Rating Formula utilizes the following four components to calculate the overall Sufficiency Rating for a bridge. The four components of the sufficiency rating listed in descending order of importance are:

- Structural Adequacy and Safety
- Serviceability and Functional Obsolescence
- Essentiality for Public Use
- Special Reductions

Condition Rating

Condition Ratings are used to describe the existing, in-place bridge as compared to the as-built condition. Three elements characterize the overall existing physical condition of the bridge: the condition ratings of the deck, superstructure and substructure components of the bridge. The condition rating is one of several values used to calculate the overall Sufficiency Rating. The condition rating is a numerical value ranging from zero to nine with a zero representing a failed condition and a nine representing an excellent condition. The rating is determined by the bridge inspector based on field observations during the inspection. The condition ratings of the superstructure and substructure have a much greater influence on the overall sufficiency rating than the condition rating of the deck.

Table 1: Bridge Data

Bridge No.		5723	5724
Year Built		1957	
County		Doña Ana	
Location		1.6 Mi E of NM-185	
Feature Intersected		Alameda Arroyo	
Facility Carried		US 70-EBL	US 70-WBL
Mile Pose		149.51	
Structure Length	(ft)	202.6	
Lanes On		2	2
Lanes Under		N/A	N/A
Skew	(deg)	45	45
Span	Span 1 (ft)	33.4	33.4
	Span 2 (ft)	33.4	33.4
	Span 3 (ft)	33.4	33.4
	Span 4 (ft)	33.4	33.4
	Span 5 (ft)	33.4	33.4
	Span 6 (ft)	33.4	33.4
Width Curb to Curb	(ft)	28.1	28
Width Out to Out	(ft)	31.8	31.8
Deck	Deck Type	Concrete Cast-in-Place	
	Wearing Surface	None	
Superstructure	Structure Type	Slab	
Substructure	Pier Cap Type	Concrete Cap, Steel Columns	
	Abutment Type	Full Height Concrete Abutment	
	Foundation Type	Driven Steel Piles	
Sufficiency Rating		66.5	66.5
Deficiency Status		Functionally Obsolete	Functionally Obsolete
Traffic Safety Features		Meets Standards	
Condition Rating	Deck	6	6
	Superstructure	6	6
	Substructure	5	5
	Channel/Channel Protection	7	7
Appraisal (Structural Evaluation) Rating		5	5
Inventory Rating		HS20	HS20
Operation Rating		HS31	HS31

Appraisal Rating

Appraisal ratings are used to evaluate the level of service a bridge provides in relation to the highway system of which it is a part. The structure is compared to a new one built to current standards for that particular type of road. Appraisal ratings are assigned (where applicable) for structural evaluation, deck geometry, waterway adequacy, approach alignment, under clearances, and scour. Appraisal rating values range from zero to nine. A rating of zero is used for bridges that are closed. A rating of two indicates that the bridge is far below the current standards and should have a high priority for replacement. A rating of nine indicates that the bridge is superior to present desirable criteria.

The Structural Evaluation Appraisal Rating is determined using the Condition Rating of the substructure and superstructure. Horizontal and vertical under clearances are evaluated for sufficiency for current traffic loads and rated accordingly. The Deck Geometry Rating is determined using the current ADT and/or the number of lanes on the roadway.

Bridge 5723 Ratings

The eastbound US 70 structure crossing the Alameda Arroyo consists of two, three-span continuous cast-in-place concrete slabs. The sufficiency rating of Bridge 5723 is 66.5, which indicates it has intolerable deck geometry although it does not have any structural elements in poor condition.

Deficiency Status – Bridge 5723

In addition to the Sufficiency Rating, the Federal Highway Administration (FHWA) classifies bridges as deficient or not deficient using a formula that considers both structural capacity and geometric configuration. Bridges classified as deficient may be structurally deficient or functionally obsolete. A bridge that is in poor condition due to deterioration or damage to the substructure, superstructure or deck is considered structurally deficient. The classification of functionally obsolete refers to a bridge with a configuration that is not adequate for the traffic it serves or a bridge with geometric characteristics such as clearances, widths and roadway alignment that no longer meet current geometric design standards. Thus a bridge that is classified as deficient may be in good condition and have adequate structural capacity if it is classified as functionally obsolete rather than structurally deficient. The sufficiency rating bridge 5723 is inadequate and was rated as “Functionally Obsolete” due to intolerable deck geometry and requires remedial action in order to accommodate future service.

Inventory and Operating Ratings – Bridge 5723

The inventory rating of a bridge reflects the safe load carrying capacity of the bridge for normal service conditions. The operating rating of a bridge is a measurement of the maximum permissible load of a bridge for occasional use. The structure satisfies requirements and does not require load restriction posting. The structure has an inventory load rating of HS20.0 and an operating load rating of HS31.0.

Bridge 5724 Ratings

The westbound US 70 structure crossing the Alameda Arroyo consists of two, three-span continuous cast-in-place concrete slabs. The sufficiency rating of Bridge 5724 is 66.5, which indicates it has intolerable deck geometry although it does not have any structural elements in poor condition.

Deficiency Status – Bridge 5724

The sufficiency rating bridge 5723 is inadequate and was rated as "Functionally Obsolete" due to intolerable deck geometry and requires remedial action in order to accommodate future service.

Inventory and Operating Ratings – Bridge 5724

The inventory rating of a bridge reflects the safe load carrying capacity of the bridge for normal service conditions. The operating rating of a bridge is a measurement of the maximum permissible load of a bridge for occasional use. The structure satisfies requirements and does not require load restriction posting. The structure has an inventory load rating of HS20.0 and an operating load rating of HS31.0.

Structural Conditions

Both bridge number 5723 and number 5724 have considerable maintenance including exposed reinforcing, delamination, rust staining and rusting of the pier columns.

Traffic Safety Features

The bridges have adequate traffic safety features; all railing in the approaches and throughout the spans meet current standards. Minor traffic damage is evident to the barrier railings of both bridge structures.

Joints

The bridge joints for both structures have no reported deficiencies and require only intermittent cleaning.

Concrete Distress

On Bridge 5723, the top of deck has been sealed with a polymer overlay reportedly in good repair. The deck edges exhibit minor vertical cracking up to 1/32" with minor scaling, minor to moderate peeling of the cementitious coating and numerous areas of exposed reinforcing due to inadequate cover. The underside of the deck has longitudinal cracking up to 1/8" along the construction joint as well as diagonal and map cracking up to 1/32" with leaching and rust staining. Delamination totaling 38 square feet and exposed reinforcing exists in all spans. The concrete pier caps exhibit vertical and map cracking up to 1/32" in addition to horizontal cracking up to 1/16" with scaling, honeycombing, leaching and intermittent areas of delamination. Abutment wingwalls have vertical, horizontal and map cracking up to 1/32" with minor leaching, spalling and honeycombing.

On Bridge 5724, the top of deck has been sealed with a polymer overlay in good condition with isolated areas of peeling. The deck edges exhibit minor vertical, diagonal and map cracking up to 1/32" with honeycombing, scaling, leaching and minor peeling of the cementitious coating. The underside of the deck has longitudinal cracking up to 1/16" as well as diagonal and map cracking up to 1/32" with leaching and rust staining, scaling and honeycombing. Delamination totaling 107 square feet exists in spans 1 through 5 and span 6 with and exposed reinforcing in span 6. The concrete pier caps exhibit horizontal, vertical and map cracking up to 1/8" with moderate leaching, honeycombing, and isolated areas of delamination. Abutment wingwalls have vertical and map cracking up to 1/32" with honeycombing and minor spalling.

Columns

On Bridge 5723, the pier columns and braces have minor to moderate surface rusting with fire damage to the columns of piers 5 and 6.

The pier columns and braces of Bridge 5724 have minor to moderate paint peeling and pitting with heavy surface rusting.

Utilities

At the time of this report there are no known utilities carried by the existing bridge structures.

Deck Geometry

The deck geometry appraisal of both structures is 3, basically intolerable requiring high priority of corrective action.

TEMPLE STREET (Local Road) – is a local two lane roadway with curb and gutter (38-feet back-of-curb to back-of-curb) providing access to the residential neighborhood due north of US 70. Temple Street tees into US 70 on the north side and is stop controlled.

ELKS DRIVE/TRIVIZ DRIVE (Minor Arterials) – each of these roadways act as major conveyances of residential traffic dispersing across the City via US 70. Elks Drive abuts US 70 at a slight angle and consists of a dedicated left turn lane, through lane, and a dedicated right turn lane. The Elks Drive section is 64-feet BC-BC and has a posted speed limit of 35 MPH. Triviz Drive adjoins US 70 with a dedicated left turn lane, a through lane, and a dedicated right turn lane. The Triviz Drive section is 50-feet BC-BC and has a posted speed limit of 35 MPH.

SCANLON DRIVE (Local Road) – is a local two lane roadway with curb and gutter (36-feet BC-BC) providing access to the residential neighborhood north of US 70. Scanlon Drive tees into US 70 on the north side and is stop controlled. The City of Las Cruces has mentioned they are looking at reconfiguring the stop controlled access to limit the access to right in/right out only from US 70.

INTERSTATE 25/US 70 INTERCHANGE – The I-25/US 70 interchange is a partial system interchange that provides direct access to I-25 southbound from westbound US 70. Free-flow ramps also provide access from I-25 and US 70 to the eastbound Bataan Memorial Frontage Road, and from the westbound Bataan Memorial Frontage Road onto northbound and southbound I-25 and westbound 70. Cloverleaf loop ramps provide direct access from eastbound and westbound US 70 onto southbound and northbound US 70, respectively. Eastbound and westbound US 70 also have direct access to southbound I-25 and northbound I-25 respectively, via on-ramp junctions. Traffic signals on US 70 provide access for northbound-to-eastbound/westbound and southbound-to-eastbound/westbound traffic.

TRANSIT

Roadrunner Transit (operated by the City of Las Cruces) offers transit bus services within the corridor. Roadrunner Transit provides services Monday through Saturday. Route 10 serves the subject section of US 70, and there are four (4) stops within the study limits (as shown on the route map following, Figure 4).

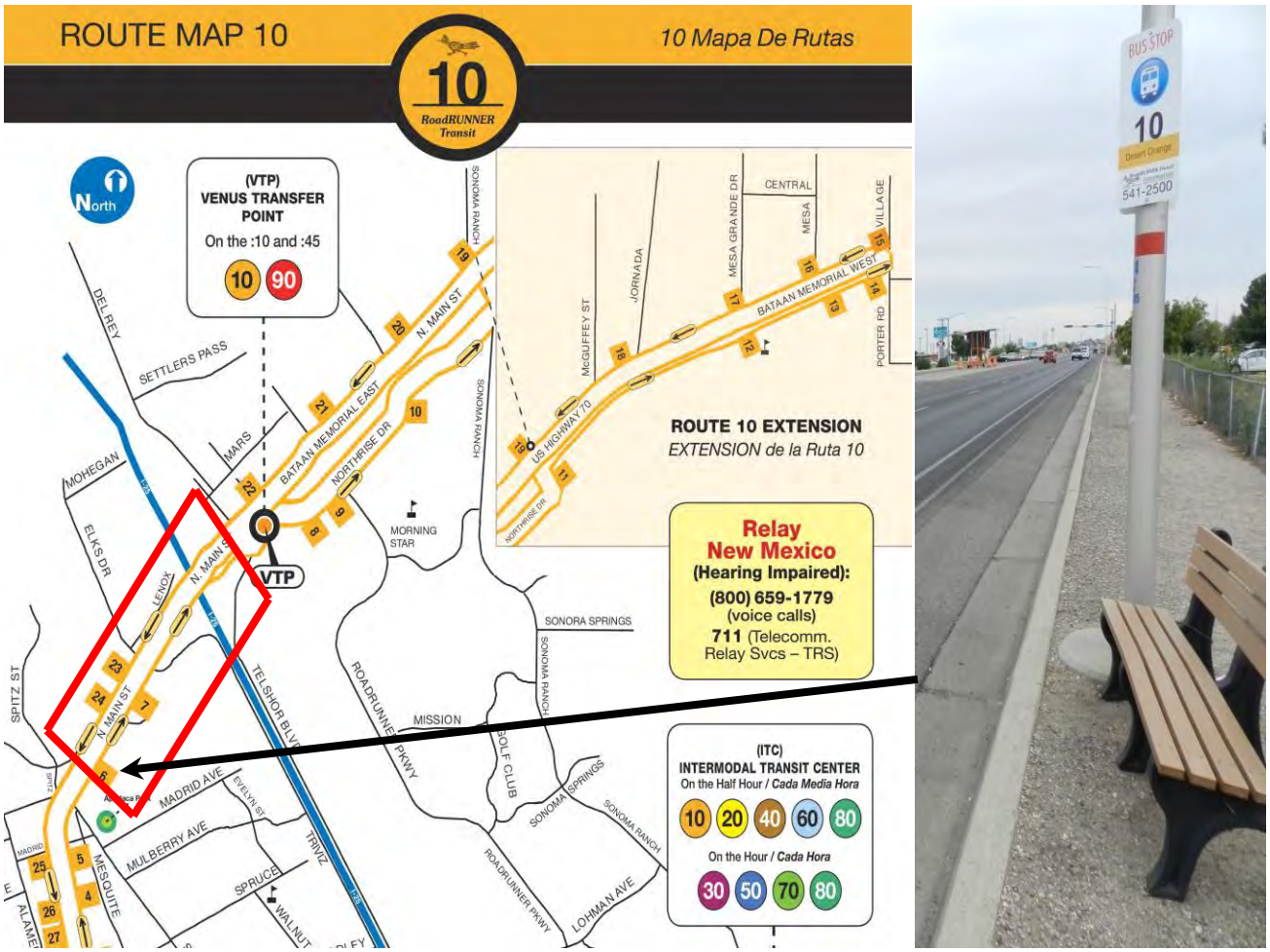


Figure 4: Roadrunner Transit Route Map 10 - US 70

2. Pavement Condition

US 70 was originally constructed in the current divided four lane configuration in the late 1950s but has been reconstructed and overlaid several times. The majority of the existing pavement is in fair condition.

Figure 5: US 70 Pavement Conditions

Pavement recommendations are based on the observations and evaluation of the existing pavement, as follows:

- Moderate to high severity transverse cracking
- Low to moderate severity rutting
- Low to moderate severity large block cracking
- Moderate to high severity longitudinal cracking
- Perceived ride quality (smoothness) is low to moderately rough

The existing conditions are detailed within **Appendix E**; containing existing core data as well as pavement recommendations. The pavement rehabilitation (Pavement Surface Restoration) and total pavement reconstruction sections (designed by NMDOT) are provided below:

Rehabilitation (Pavement Surface Restoration)

- Pavement Surface Restoration as per specification, full width of existing roadway:
  - Cold/mill inlay the top 3-inches of existing surface.
- Place 3-inches HMA SP-III, full width of roadway in one lift simultaneously with the top lift of reconstruction.

Reconstruction

Flexible Pavement

- Excavate existing roadway to accommodate new surfacing.
- Place 6-inches UTBC Type I, full width of roadway in one lift.
- Place 6-inches of HMA SP-III, full width of roadway in two equal lifts.
- Place 2-inches of HMA SP-IV, full width of roadway in one lift.

Rigid Pavement

- Excavate existing roadway to accommodate new surfacing.
- Place 6-inches UTBC Type I, full width of roadway in one lift.
- Place 10.5-inches of PCCP with tie bars at all longitudinal joints and with dowel bars on all transverse joints. Seal all joints with silicone-formulated sealant. Perform all PCCP related operations in accordance with the current design policy.

3. Roadway Lighting

The US 70 (Main Street) corridor is currently lit along the subject stretch. The existing lighting is laid out in a staggered manner. Depending on the preferred alternative recommended later within this report, the lighting improvements may mimic this staggered layout or may need to be offset or possibly located within the median complete with dual head luminaires for appropriate lighting coverage. The roadway lighting is owned and maintained by the City of Las Cruces (CLC).

4. Pedestrian & Cyclist Roadside Amenities

The subject corridor suffers from intermittent sidewalk throughout as well as a lack of dedicated bicycle facilities. There is an existing multimodal path along the Alameda Arroyo crossing under the existing bridge on US 70; however, the path lacks interconnection to the US 70 corridor. Approximately 75% of the existing roadway corridor lacks sidewalk all together. The remaining 25% of existing sidewalk suffers from non-compliant ADA driveways and ramps.

Non-Compliant ADA Ramps

B. Intersection Geometry

There are seven (7) intersections within the Project Limits; El Camino Real Road/Camino Del Rex (Park Ridge Boulevard), Temple Street, Amigo Road, Elks Drive/Triviz Drive, Scanlon Drive, southbound I-25 off ramp, and the northbound I-25 off ramp. Site distances at each of the aforementioned intersections are adequate.

The intersections of El Camino Real Road/Camino Del Rex and Elks Drive/Triviz Drive are characterized by narrow ROW. Each of these intersections is hampered by an unbalanced (highest volume) left turn movement. Right turning movements at these intersections are difficult maneuvers for commercial trucks and transit vehicles due to geometric deficiencies as well as entering the through facility on right-turn-on-red movements.

1. Traffic Signals

The signals are in good operating condition albeit an older standard. The City of Las Cruces (CLC) recently installed wiring for interconnection of signals along the subject corridor. The City also services and times the subject signals as part of their maintenance agreement with the NMDOT.

C. Connectivity

As a US Route, connectivity is of key importance on this project. US 70 (Main Street in Las Cruces) connects and routes traffic from Arizona across the country to North Carolina. Locally, US 70 connects to major outbound roadways; Interstates 10 and 25, NM 185, NM 478, NM 28 all within close proximity to the subject section of roadway. Connectivity for the subject stretch of US 70 is especially vital connecting the east and west mesas bilaterally.

Source: https://en.wikipedia.org/wiki/U.S._Route_70

Figure 6: US 70 Route Map

D. Terrain & Drainage

The terrain along the subject section of US 70 is characterized by mild slopes within a densely developed area. The grade increases from the beginning of the project headed towards the I-25 interchange before leveling out at the end of the project.

Most of the drainage along US 70 sheet flows off the roadway into bar ditches and/or small ponding areas along either side of the roadway (within the ROW). There are a limited number of transverse culverts across US 70 and across abutting driveways. There are no longitudinal storm drains systems within the subject stretch of the corridor. The main feature is the aforementioned Las Cruces dam outfall channel crossing US 70. The outfall channel is rock plated along both its banks and bottom. Additional drainage information can be found in **Appendix C**.

E. School Access

There are no schools adjacent to the subject section of US 70; however, Jornada Elementary is served via Elks Drive within a short distance (approximately 2,000 feet) of the subject roadway. School buses and residents will be affected by any proposed improvements.

F. Emergency Response

An emergency response facility was recently built just east of the bridge; adjacent to Citizen's Bank. As one of the City's main thoroughfares every critical response entity utilizes the roadway to provide their respective services.

G. Safety on Existing Facility/Crash Data Analysis

The five-year crash study (2010-2014) yielded a total of 591 crashes. The crash rate for the study area is 5.83 crashes per million vehicle miles (provided in the equation below):

$$R = \frac{591 \text{ Crashes} * 1{,}000{,}000 \text{ Miles}}{34{,}267 \text{ Vehicles} * 365 \frac{\text{days}}{\text{year}} * 5 \text{ years} * 1.62 \text{ miles}} = 5.83 \text{ C/MVM}$$

Additional exploration into study area crash data can be found below:

Table 2: US 70 Summary Crash Statistics by Severity

Year	Property Damage Only	Injury/Non-Fatal	Fatality	Total
2010	50	51	--	**101**
2011	67	54	--	**121**
2012	94	34	1	**129**
2013	85	27	--	**112**
2014	91	37	--	**128**
Total	**387**	**203**	**1**	**591**

Source: NMDOT Planning and Traffic Safety Division

Table 3: US 70 Crash Types and Frequency

Type	2010	2011	2012	2013	2014	Total	Percent
Fixed Object	4	7	4	12	6	**33**	**5.6%**
Right Angle	1	--	--	--	2	**3**	**0.5%**
Rear End	48	63	38	44	51	**244**	**41.3%**
Backing	--	--	1	--	3	**4**	**0.7%**
Sideswipe: Same Direction	15	21	47	25	33	**141**	**23.9%**
Sideswipe: Opposite Direction	5	4	4	6	10	**29**	**4.9%**
Head On	2	--	--	--	--	**2**	**0.3%**
Left Turn	16	9	15	14	14	**68**	**11.5%**
Parked Vehicle/Parking Maneuver	--	1	2	1	1	**5**	**0.8%**
Overturn	1	2	1	--	1	**5**	**0.8%**
Driveway/Driveway Maneuver	8	12	2	1	1	**24**	**4.1%**
Pedestrian/Bicyclist	1	--	--	1	--	**2**	**0.3%**
Other	--	2	15	8	6	**31**	**5.2%**
Total	**101**	**121**	**129**	**112**	**128**	**591**	**100.0%**

Source: NMDOT Planning and Traffic Safety Division

The complete five-year crash data is analyzed in **Table 4** below:

Table 4: US 70 Crash Summary

ROUTE: US 70 (MAIN STREET)	YEAR 2010		YEAR 2011		YEAR 2012		YEAR 2013		YEAR 2014		TOTAL 2010 - 2014	
	# of Crashes	YR %	# of Crashes	YR %	# of Crashes	YR %	# of Crashes	YR %	# of Crashes	YR %	# of Crashes	% OF 5-yr
MP 149.23 TO MP 150.85	101	17%	121	20%	129	22%	112	19%	128	22%	591	100%
ACCIDENT TYPE												
Fixed Object	4	4%	7	6%	4	3%	12	11%	6	5%	33	6%
Right Angle	1	1%							2	2%	3	1%
Read End	48	48%	63	52%	38	29%	44	39%	51	40%	244	41%
Backing					1	1%			3	2%	4	1%
Sideswipe: Same Direction	15	15%	21	17%	47	36%	25	22%	33	26%	141	24%
Sideswipe: Opposite Direction	5	5%	4	3%	4	3%	6	5%	10	8%	29	5%
Head On	2	2%									2	0%
Left Turn	16	16%	9	7%	15	12%	14	13%	14	11%	68	12%
Parked Vehicle / Parking Maneuver			1	1%	2	2%	1	1%	1	1%	5	1%
Overturn	1	1%	2	2%	1	1%			1	1%	5	1%
Driveway / Driveway Maneuver	8	8%	12	10%	2	2%	1	1%	1	1%	24	4%
Pedestrian / Bicyclist	1	1%					1	1%			2	0%
Other			2	2%	15	12%	8	7%	6	5%	31	5%
ACCIDENT SEVERITY												
Property Damage Only (PDO)	50	50%	67	55%	94	73%	85	76%	91	71%	387	65%
Injury / Non-Fatal	51	50%	54	45%	34	26%	27	24%	37	29%	203	34%
Fatal					1	1%					1	0%
ROAD CONDITIONS												
Dry / Clear	95	94%	107	88%	120	93%	102	91%	115	90%	539	91%
Wet	3	3%	3	2%	5	4%	3	3%	10	8%	24	4%
Snowy / Icy			7	6%			1	1%			8	1%
Other	3	3%	4	3%	4	3%	6	5%	3	2%	20	3%
LIGHTING												
Daylight	82	81%	96	79%	112	87%	85	76%	101	79%	476	81%
Darkness	17	17%	18	15%	13	10%	21	19%	24	19%	93	16%
Dawn or Dusk	2	2%	7	6%	4	3%	6	5%	3	2%	22	4%
PROBABLE CAUSE												
Following Too Close	12	12%	18	15%	21	16%	10	9%	16	13%	77	13%
Driver Inattention	37	37%	36	30%	35	27%	29	26%	49	38%	186	31%
Excess Speed / Too Fast For Conditions	6	6%	9	7%	6	5%	5	4%	3	2%	29	5%
Avoid Other Vehicle	1	1%	1	1%	4	3%			2	2%	8	1%
Improper Driving	14	14%	21	17%	24	19%	19	17%	22	17%	100	17%
Failure to Use Turn Signal												
Failure to Yield R.O.W.	22	22%	18	15%	21	16%	13	12%	8	6%	82	14%
Disregard Traffic Control Device	3	3%	1	1%	1	1%	3	3%	9	7%	17	3%
Under Influence Alcohol/Drugs	2	2%	2	2%	2	2%	7	6%	4	3%	17	3%
Mechanical Defect			2	2%	2	2%	3	3%	1	1%	8	1%
Pedestrian Error									1	1%	1	0%
Road Defect / Construction Activity												
Other	4	4%	13	11%	13	10%	23	21%	13	10%	66	11%
ALCOHOL INVOLVEMENT												
Sobriety Unknown												
Had Been Drinking	2	2%	2	2%	2	2%	7	6%	2	2%	15	3%
Had Not Been Drinking	99	98%	119	98%	127	98%	105	94%	126	98%	576	97%

- The number of accidents annually remained fairly consistent; the five-year average is 118.2 crashes per year. Only calendar year 2010 varies more than 10% (positive-reduction) from the five-year average.

- Three (3) crash occurrences are more prevalent than the others:

    - Rear End (41%) – access management, evaluation of right turn lanes into adjacent businesses, and signalization timing improvements will likely reduce these types of crashes.

    - Side Swipe Same Direction (24%)

  - Left Turn (12%) – access management is anticipated to provide the most benefit to correcting left turn crashes. By limiting the number of access points onto US 70 these conflicts are anticipated to be reduced significantly.

- Approximately (34%) one-third of all crashes documented in the most recent period (2010 to 2014) resulted in sustained injuries (204) or fatality (1).

- The four highest identified probable causes are provided below:

  - Driver Inattention (31%) – motor vehicle operators are directly responsible for their safety on any given facility. Driver inattention most likely cannot be improved through geometric nor progression facilities.

  - Improper Driving (17%) – much like “Driver Inattention”, roadway improvements will most likely not prevent improper driving maneuvers.

  - Failure to Yield ROW (14%) – crossing movements ahead of oncoming traffic are completed based on driver selection and perceived gap intervals. Merging with the flow of traffic (from minor streets or driveways) also uses the same criteria and must yield to oncoming traffic. Access management and limiting the number of unconstrained driveways should improve this contributing factor.

  - Following Too Close (13%) – in order to reduce the number of rear-end crashes, signal intervals will be examined. Evaluation of left and right turn lanes should be considered to move cross-turning traffic out of the through travel lanes. As with the failure to yield ROW, access management will also aid with the reduction of these types of crashes.

Overall no discernible patterns were identified that could be improved through neither conventional engineering measures nor general geometric improvements.

- Other Considerations

  - Approximately 81-percent of the crashes occurred during the daylight hours. The remaining 19-percent occurred at night or dawn/dusk; the entire stretch of US 70 is within a lighted corridor. Traffic volumes during the daylight hours far exceed those of nighttime, and other accidents types are more likely the cause of most accidents rather than inconsistent/deficient roadway lighting.

  - Only three-percent (3%) of reported crashes involved alcohol or drugs.

- Pedestrian/Bicyclist crashes – only two (2) crashes occurred during the five-year analysis that involved pedestrians (2) or bicyclists (0). Each of these pedestrian involved crashes occurred near the US 70/Camino Del Rex intersections with a likely contributing cause of "failure to yield right-of-way". One event occurred during the daylight hours and the other occurred at dusk.

- Additional Identified Potential Safety Shortcomings

  - Substandard bridge approach/departure guardrail, end sections, and concrete bridge barrier railings occur at Alameda Arroyo and at I-25. An analysis of those guardrail length is shown in table 5. Figure 7 shows the location of the existing guardrail.

  - Steep slopes at back of sidewalk (in the vicinity of the existing bridge; particularly along the south side of US 70 between the existing Verizon Store and the Alameda Arroyo channel).

  - Lack of width on the existing bridge for lane expansion; as well as the lack of pedestrian and bicycle facilities.

  - Uncontrolled access within stretches of the existing corridor and excessively wide driveways.

  - Driveway/accesses too near existing intersecting incoming streets.

  - Posted speed limit reduction west of the US 70/Elks Drive/Triviz Drive intersection may also aid in reducing some of the area accidents. A speed reduction (concurrent with the 35 MPH speed limit posted west of the El Camino Real Drive intersection) should be considered due to the higher driveway density and the increased potential for pedestrian and bicycle traffic along the corridor even though the 85th Percentile speed of roadway users in this section (refer to **Table 6**) of the roadway reflect the current posted speed limit (45 MPH).


Narrow Bridge; without room for expansion


Excessive slopes at back of sidewalk

FIGURE 7 - GUARDRAIL LOCATION MAP

TABLE 5 - US 70 EXISTING GUARDRAIL LENGTH

GUARDRAIL DETAIL TABLE						
GUARDRAIL NO.	**GUARDRAIL TYPE**	**APPROACH TERMINAL**	**END TERMINAL**	**GUARDRAIL LENGHT (FT)**	**REQUIRED GUARDRAIL LENGHT (FT)**	**COMMENTS**
1	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	260	225	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
2a	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	**130**	137.5	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
2b	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	**120**	125	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
3a	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	TRANSITION-METAL BARRIER TO RIGID BARRIER	**85**	175	SLOPE
3b	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	TRANSITION-METAL BARRIER TO RIGID BARRIER	**120**	137.5	SLOPE
4	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	**70**	112.5	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
5	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	240	137.5	SLOPE
6	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	270	125	SLOPE
7	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	150	137.5	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
8	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	TRANSITION-METAL BARRIER TO RIGID BARRIER	**100**	162.5	SLOPE, TIED INTO CWB
9a	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	TRANSITION-METAL BARRIER TO RIGID BARRIER	**100**	212.5	SLOPE, TIED INTO CWB
9b	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	600	275	SLOPE
9c	W-BEAM	W-BEAM END SECTION	TURN DOWN END SECTION	140	125	SLOPE, LARGE OVERHEAD SIGN (NEED CWB??)
10a	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	BRIDGE METAL BARRIER TO RIGID BARRIER	340	250	LACK BRIDGE OUT END SECTION
10b	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	BRIDGE METAL BARRIER TO RIGID BARRIER	260	237.5	LACK BRIDGE OUT END SECTION
11a	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	BRIDGE METAL BARRIER TO RIGID BARRIER	340	262.5	LACK BRIDGE OUT END SECTION
11b	W-BEAM, WITH THRIE BEAM	THRIE BEAM END SECTION	BRIDGE METAL BARRIER TO RIGID BARRIER	260	137.5	LACK BRIDGE OUT END SECTION

NO.	DESCRIPTION	DATE	BY
4			
3			
2			
1			

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NEW MEXICO DEPARTMENT
OF TRANSPORTATION

US 70 (MAIN STREET)
FIGURE 7
US 70 GUARDRAIL LOCATION MAP

The clear zone for the subject corridor, per the American Association of State Highway and Transportation Officials (AASHTO) *Roadside Design Guide*, shall be as follows:

For design speeds of 35 and 45 MPH respectively and an average AADT in excess of 6000:

Design Speed	Slope	Clear Zone
35 MPH	3:1	16-18 feet
	5:1 to 4:1	16-18 feet
	6:1 or flatter	14-16 feet
45 MPH	3:1	20-22 feet
	5:1 to 4:1	24-28 feet
	6:1 or flatter	20-22 feet

There are a number of considerations for roadways with curb and gutter addressed within the *Roadside Design Guide*. Obstructions at intersections and driveways shall have a minimum lateral offset of three-feet (3'). Elsewhere a lateral offset of 1.5-feet minimum shall be utilized. As the curb does not provide "significant redirection capability" at the current design speed the clear zone requirements presented above should be considered. Should clear zone requirements be non-feasible, obstructions shall be placed as far from the roadway as possible, but no closer than the 1.5-feet minimum presented previously.

H. Access Management

The NMDOT has a *State Access Management Manual* (SAMM-NMAC 18.31.6) establishing governing standards on access points along their facilities. Within this manual (US 70-Urban Principal Arterial [UPA]) are criteria for an UPA as provided below:

- Performance of UPA facilities shall be a minimum Level of Service (LOS) of D.
- Signal spacing shall be 1/2 mile for posted speed limits of 55 MPH or less.
- Spacing of unsignalized access (full access) shall be ¼-mile minimum.
- Spacing of unsignalized access (partial access) where some turn movements may be restricted is 325-feet for 35 MPH to 40 MPH.
- Spacing of unsignalized access (partial access) where some turn movements may be restricted is 450-feet for 45 MPH to 50 MPH.

The majority of the existing accesses along US 70 were constructed prior to the latest standard, but shall be examined later within this study.

Multi-directional access into continuous left turn lane

Left turn movement out of Scanlon Drive; across four traffic lanes

Left turning maneuver out of Amigo Road; barrier island in place to restrict such movements. Left-In/Right-In/Right-Out only permitted

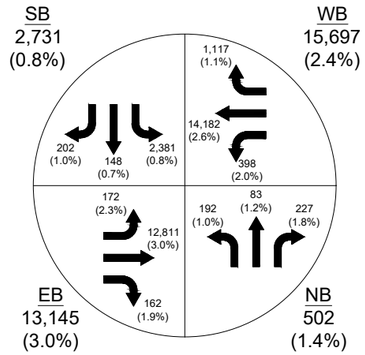
I. Existing Volume, Speed Study, & Operational Analysis

Traffic volumes were collected throughout the study area in early 2016, **Figure 8** on the next page details count locations. Pneumatic counters were placed to collect volume, classification, and speed data for the three (3) locations in the table below. Detailed traffic analysis, MVMPO analysis and schematic drawings are found in Appendix B.

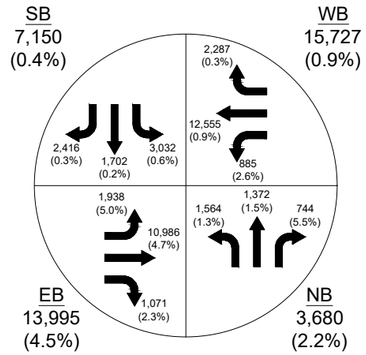
Table 6: US 70-2016 Volume & Speed Data

Data	Southwest Location (Bridge: MP 149.6)		Middle Location (Sonic: MP 149.9)		Northeast Location (Scanlon Dr: MP 150.2)	
	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound
Count Date	April 2016		April 2016		May 2016	
AADT Directional	18,599	17,755	17,957	16,831	15,200	16,329
AADT – Rounded	**36,400**		**34,800**		**31,600**	
% Heavy[1]	16.7%	11.5%	14.0%	17.7%	11.3%	10.6%
Posted Speed	45 MPH	45 MPH	45 MPH	45 MPH	45 MPH	45 MPH
85th Percentile Speed	47.1 MPH	45.9 MPH	44.7 MPH	45.5 MPH	44.0 MPH	45.7 MPH
Average Speed	41.2 MPH	40.4 MPH	39.3 MPH	38.6 MPH	36.1 MPH	40.1 MPH

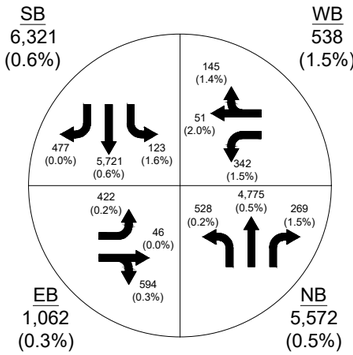
[1] FHWA Vehicle Classification Scheme F Report – Class 4 and higher



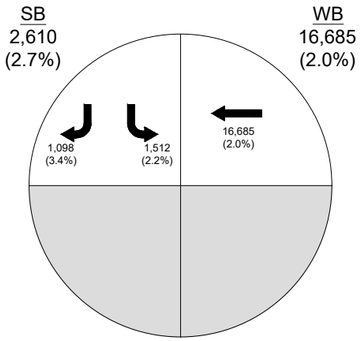
US 70 & EL CAMINO REAL/CAMINO DEL REX
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



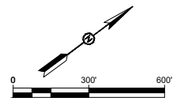
US 70 & ELKS/TRIVIZ DRIVE
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



US 70 & ELKS/LENOX AVE
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



US 70 & I-25 SOUTHBOUND OFF-RAMP
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



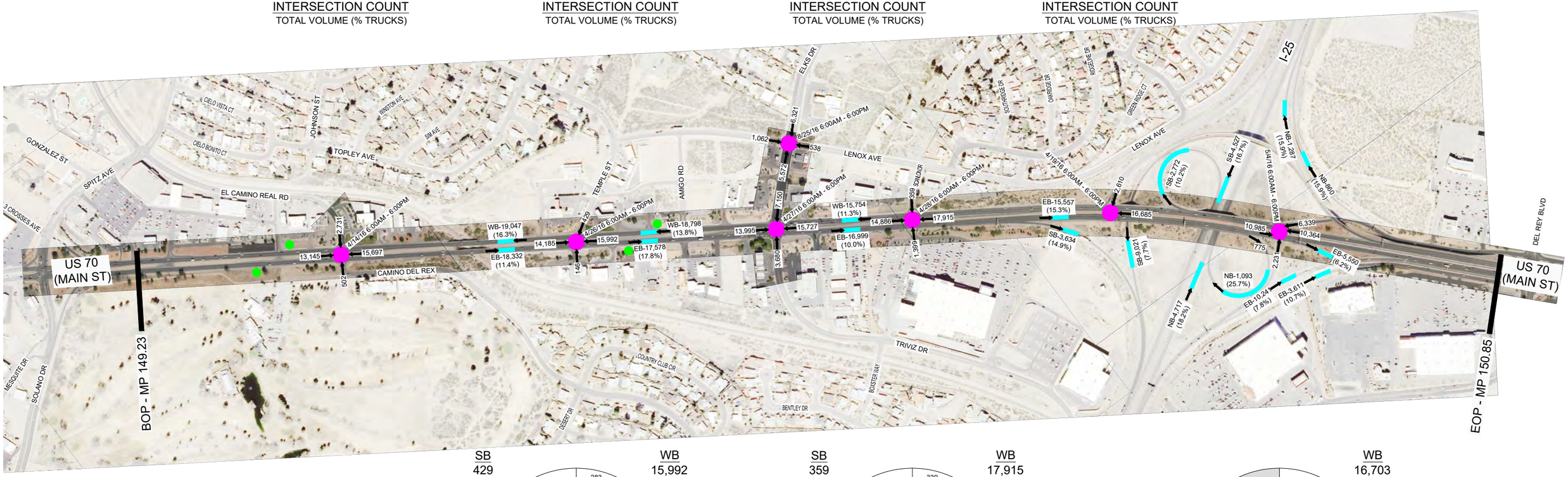
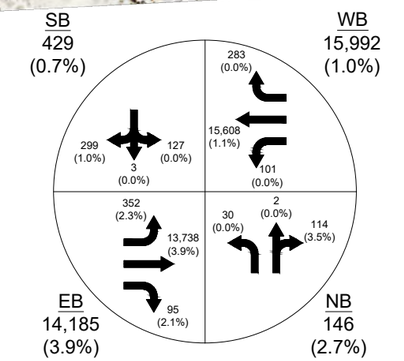


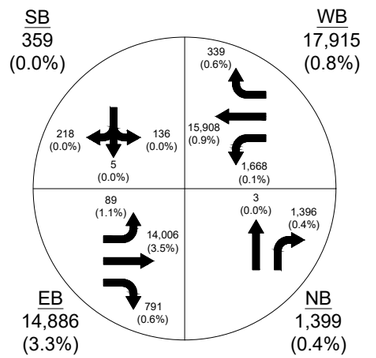
FIGURE 8 - COUNT LOCATION MAP

LEGEND

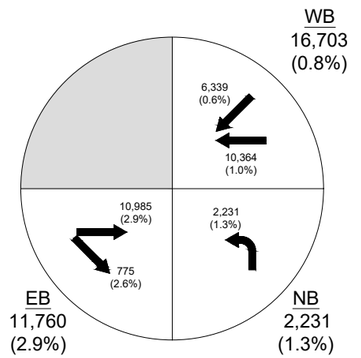
- 12-HOUR INTERSECTION COUNT w/ INCOMING VOLUMES
- 12 HR-PNEUMATIC TUBE COUNT
- EB-#### (#.#%) EASTBOUND 24 HR VOLUME % TRUCKS (≥ FHWA CLASS 4)
- WB-#### (#.#%) WESTBOUND 24 HR VOLUME % TRUCKS (≥ FHWA CLASS 4)
- BUS STOP LOCATION



US 70 & TEMPLE STREET/VERIZON ENTRY
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



US 70 & SCANLON DRIVE/LOWES ENTRY
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)



US 70 & I-25 NB RAMP/BATAAN ACCESS
INTERSECTION COUNT
TOTAL VOLUME (% TRUCKS)

FIGURE 8
COUNT LOCATION MAP
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270

The study area contains two posted speed limits: from the BOP (MP 149.23) to the intersection of Camino Real/Camino Del Rex and US 70 the posted speed limit is 35 MPH and from that intersection to the EOP (MP 150.85) the posted speed limit is 45 MPH. As shown in **Table 6**, average vehicle speeds are below the posted speed limits within each of the respective segments of US 70.

The existing roadway capacity was analyzed using the methodology of the 2010 *Highway Capacity Manual (*HCM). Level of Service is defined within the HCM as "A qualitative measure describing operational conditions within a traffic system, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience." The Level of Service (LOS) for intersections was determined by the computed delays for each minor movement at both signalized and unsignalized intersections.

The 2010 *HCM* presents the LOS criteria for signalized and unsignalized (two-way stop controlled [TWSC]) intersections as reproduced in **Tables 7** and **8** below:

Table 7: LOS Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Table 8: LOS Criteria for TWSC Intersections

Level of Service	Average Control Delay (s/veh)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

The capacity analyses for the current year (2016) intersections studied are presented below:

Table 9: US 70-2016 Peak Hour Movement Volumes

Intersection	Eastbound			Westbound			Northbound			Southbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
*** AM Peak ***												
US 70/Camino Del Rex & Camino Real[1]	14	973	8	27	1,708	95	23	7	39	233	8	12
US 70/Temple Street[2]	18	1,154	--	4	1,915	10	--	--	1	13	--	53
US 70/Elks Drive & Triviz Drive[1]	136	840	90	83	1,483	232	90	101	95	334	289	378
US 70/Scanlon Drive[2]	3	1,246	31	213	1,794	30	--	--	78	10	--	20
US 70/West Side of I-25[1]	--	--	--	--	1,998	--	--	--	--	234	--	135
US 70/East Side of I-25[1]	--	1,015	71	--	2,070	--	148	--	2	--	--	--
*** PM Peak ***												
US 70/Camino Del Rex & Camino Real[1]	5	1,830	28	69	1,226	159	14	5	26	232	15	20
US 70/Temple Street[2]	45	1,816	17	12	1,405	31	2	--	20	6	--	25
US 70/Elks Drive & Triviz Drive[1]	249	1,404	113	141	1,310	350	135	226	61	292	180	229
US 70/Scanlon Drive[2]	7	1,646	64	157	1,813	47	--	1	171	3	--	24
US 70/West Side of I-25[1]	--	--	--	--	1,945	--	--	--	--	159	--	122
US 70/East Side of I-25[1]	--	1,367	86	--	1,780	--	413	--	--	--	--	--

[1] Signalized intersections
[2] Minor Street stop controlled intersection

Table 10: US 70-2016 Intersection LOS Summary

Intersection	Control Type	AM Peak			PM Peak		
		V/C	Avg Delay	Avg LOS	V/C	Avg Delay	Avg LOS
US 70/Camino Del Rex & Camino Real	Signalized	1.05	31.9	C[1]	1.12	29.7	C[2]
US 70/Temple Street	OWSC	0.33	7.7	A[3]	0.40	5.7	A[4]
US 70/Elks Drive & Triviz Drive	Signalized	1.23	102.7	F	1.15	105.1	F
US 70/Scanlon Drive	OWSC	0.29	9.3	A[5]	0.37	21.1	C[6]
US 70/West Side of I-25	Signalized	0.71	15.9	B	0.75	10.3	B
US 70/East Side of I-25	Signalized	0.60	10.3	B	0.57	9.8	A

[1] - WB US 70, SB El Camino Real, LOS F

[2] - EB US 70 through, SB El Camino Real Left LOS F
[3] - SB Temple Approach LOS F
[4] - NB & SB Approach LOS F
[5] - SB Scanlon Approach LOS F, EB US 70 Left LOS E
[6] - SB Scanlon Approach LOS F, Lowe's NB Right, EB US 70 Left, LOS

Table 11: US 70-2016 Segment LOS Summary

US 70 Roadway Segment	LOS AM	LOS PM
Between BOP and Camino Real/Camino Del Rex – East Bound	D	F
Between BOP and Camino Real/Camino Del Rex – West Bound	F	C
Between Camino Real/Camino Del Rex & the US 70 Bridge – East Bound	B	E
Between Camino Real/Camino Del Rex & the US 70 Bridge – West Bound	B	B
Between the US 70 Bridge & Elks Drive/Triviz Drive – East Bound	B	F
Between the US 70 Bridge & Elks Drive/Triviz Drive – West Bound	F	F
Between Elks Drive/Triviz Drive & I-25 Interchange – East Bound	A	B
Between Elks Drive/Triviz Drive & I-25 Interchange – West Bound	C	C
Between the I-25 Interchange and the EOP – East Bound	C	C
Between the I-25 Interchange and the EOP – West Bound	D	E

J. Right-Of-Way

The Right-of-Way (ROW) from the beginning of the project (MP 149.23) to approximately Amigo Road is 200-feet. To the east the ROW increases to 245-feet (at approximately MP 149.86) through the Elks Drive/Triviz Drive intersection then transitions back down to 200-feet at the Lowe's Home Center western property line (~MP 150.07). Right-of-way in the vicinity of the I-25 interchange, also 200-feet, can be found on the Preliminary ROW Verification Map included with this report. The ROW along Triviz Drive as it adjoins US 70 (Main Street) is 60-feet and the Elks Drive ROW adjoining Main Street is approximately 73-feet. The Temple Street ROW adjoining US 70 is 50-feet, but widens to 75-feet to the north beyond the Citizens Bank Property. Both the El Camino Real Road and Camino Del Rex ROW are just over 50-feet at their intersection with Main Street.

K. Preliminary Property Ownership

The majority of the properties adjoining the Main Street ROW are commercial/retail type developments; ranging from small family owned retail shops to big box developments, gas stations, banks, etc. At the southwest end of the subject corridor lies the old Las Cruces Country Club (now known as Park Ridge Development) being rezoned and rebuilt as medical offices and eventually planned to house a new hospital. There are approximately 18 private residences along Camino Del Rex which parallel US 70 but are separated by a natural landscape buffer within the US 70 ROW.

L. Environmental Existing Conditions

1. Project Setting

Las Cruces is an urban community located in south central Doña Ana County, in south central New Mexico. Las Cruces has a history as an agricultural and border trade community, in close proximity to Interstates 10 and 25, El Paso, Texas (TX), and Mexico. The study area elevation is approximately 4,045 feet on average. The landscape at the study area is urban and has been modified by roadway and property development. Some natural vegetation and xeriscaping is present along the roadway.

2. Natural Resources

Geology

The North Main study area is located in far southern New Mexico in the Mexico Highland Section of the Basin and Range Physiographic Province (Williams, 1986). This part of New Mexico is influenced by the Rio Grande Rift, which consists of two parallel faults that extend in a north-south direction across New Mexico. For the last 30 million years, geologic movement has occurred along the faults. Dormant volcanoes and basalt formations are found in areas bordering the rift (Chronic, 1987). Elevation ranges from approximately 3,944 feet above mean sea level (amsl) at the beginning of project (BOP) to approximately 4,111 feet amsl at the end of project (EOP). Geologic formations include sedimentary Piedmont alluvial deposits (Holocene to lower Pleistocene) and the Upper Santa Fe Group (middle Pleistocene to uppermost Miocene), and includes deposits of higher gradient tributaries bordering major stream valleys, alluvial veneers of the piedmont slope, and alluvial fans. Alluvial deposits may locally include uppermost Pliocene deposits (New Mexico Bureau of Geology and Mineral Resources, 2003).

Soils

Four soil mapping units occur in the study area (see **Table 12**). The 2 major soils map units are Bluepoint loamy sand (0 to 5 percent slopes) and Pajarito fine sandy loam. Soil erosion risks are shown in **Table 12**. A slight risk indicates that little or no erosion is likely. Moderate risk indicates that some erosion is likely. Occasional maintenance may be required, and simple erosion-control measures would be needed. Pajarito fine sandy loam has a moderate erosion risk, and occurs in 37 percent of the study area. Riverwash-Arizo complex is found in the Outfall Channel that runs underneath US 70 in the study area and has a multi-use trail; the soil has a moderate-high erosion risk, and occurs in 15 percent of the study area. The other soils in the study area have only slight erosion risk.

Table 12: Soils Mapping Units

Soil Mapping Unit	Percent of Project Study Area	Erosion (k) Factor[1]	Wind Erodibility Group[2]	Surface Runoff
Bluepoint loamy sand, 0 to 5 percent slopes MLRA 42	42%	0.15	2	Slight
Bluepoint-Caliza-Yturbide complex	6.4%	0.15	2	Slight
Pajarito fine sandy loam	36.9%	0.24	3	Moderate
Riverwash-Arizo Complex	14.7%	0.49	6	Moderate-high

[1] K values range from 0.02 to 0.69—the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

[2] Wind erodibility group values range from 1-8—the higher the value, the less susceptible the soil is to wind erosion. *Source: USDA-NRCS (2016)*

Vegetation and Noxious Weeds

The study area is in an urban section of highway and local roadway rights-of-way and within a commercial area and residential neighborhood. It occurs in the Chihuahuan Basins and Playas Ecoregion and supports a disturbed Chihuahuan Desert Scrub vegetation community. Most areas have been cleared of native vegetation. Most disturbed areas have built environments, asphalt, gravel, or bare soil cover. State of New Mexico classes A, B, or C noxious weed species may be present within disturbed rights-of-way.

Wetlands and Waterways

The study area is in the Lower Rio Grande watershed, part of the Rio Grande basin. There is an ephemeral waterway crossing underneath a bridge on US 70/Main Street within the study area, known as the Alameda Arroyo and/or the Outfall Channel. The waterway discharges to the Rio Grande approximately 3.5 miles from the study area, and appears to be under federal jurisdiction. The ordinary high-water mark will be documented. Dredge or fill within regulated waters of the United States would require Clean Water Act (CWA) Section 404 permit coverage. If work within the waterway is necessary, a preconstruction notification (PCN) for the use of US Army Corps of Engineers (USACE) nationwide permit may be required. Work within the waterway is anticipated for this project to address either bridge rehabilitation or reconstruction. Depth to ground water varies from 2 feet to 412 feet (New Mexico Office of the State Engineer [NMOSE], 2016a). Floodplains within the study area are isolated to the Outfall Channel (Federal Emergency Management Agency, 2010). The Outfall Channel is a 100-year floodplain with small fragmented sections of 500-year floodplains within the channel. No wetlands occur in the study area.

Both surface and ground water supplies are used in Las Cruces for municipal, industrial and agricultural purposes. Water conservation programs for all water users are encouraged in the southwest to help meet the demands of a growing population. To address local water

demands during drought conditions, the Lower Rio Grande Regional Water Plan [NMOSE, 2016b]) recommends: "*the development of water conservation plans within the communities and the use of reclaimed water on areas such as parks, golf courses and other green spaces would also help with conservation goals and lower the use of potable water for these green areas*".

Wildlife
The study area is urban with limited trees and landscape vegetation. Nest sites for migratory birds may be present within landscape vegetation or in existing structures.

Threatened and Endangered Species
A pedestrian biological survey of the preferred alternative project area will be conducted to include identification of protected species and habitats. Recommendations for avoiding or mitigating impacts will be included in a biological resources report for the preferred alternative.

Five federal and many State of New Mexico listed species occur within Doña Ana County. Since this is an urban area, little habitat for protected species is likely to be present within or immediately adjacent to project construction areas. No aquatic, wetland, limestone cliff, riparian woodland, shoreline, or grassland habitat occurs within the study area. Thus, no suitable habitat for the following federal listed species is expected to be present:

- Least tern – Endangered
- Northern Aplomado Falcon – Experimental non-essential
- Southwestern willow flycatcher – Endangered
- Yellow-billed cuckoo – Threatened
- Sneed pincushion cactus – Endangered

3. Cultural Resources

Cultural Resources
A records search was completed for the proposed project. To conduct the file search, cultural resource data were downloaded from the New Mexico Cultural Resources Information System (NMCRIS) managed by the Archaeological Resource Management Section (ARMS) of the New Mexico Historic Preservation Division (HPD). As required, a 0.5-kilometer (km) (0.3 mile [mi]) radius of the study area was searched.

Two previously recorded sites are within a 0.5 km (0.3 mi) radius of the study area. Of the 2 previously recorded sites, 1 is within the study area, based on the ARMs information. The listings of the National Register of Historic Places (NRHP) and the State Register of Cultural Properties (SRCP) were reviewed and no listed property is located within a 0.5 km (0.3 mi) radius of the study area. In addition, 20 cultural resource surveys have been previously conducted within 0.5 km (0.3 mi) radius. The surveys were conducted from 1979 to 2014.

Section 4(f) Properties

As part of the Section 4(f) requirements, the Federal Highway Administration (FHWA) evaluates projects for impacts on public parks, recreation areas, wildlife and waterfowl refuges, and historic sites. FHWA projects are required to avoid such properties unless there is no prudent and feasible alternative to using that property. If a 4(f) property is used, the project must take steps to minimize harm to that property. The public multi-use trail that crosses underneath US 70/North Main and travels along the Alameda Arroyo/Outfall Channel would qualify as a Section 4(f) property. It is part of a large urban trail network in Las Cruces. Connectivity and access improvements may be made to the multi-use trail with the implementation of this project.

4. Social Resources

Communities and Land Use

The study area is urban in character and mostly developed by commercial business. There is a small segment of residential properties near the intersection of US 70 and Camino del Rex. A large vacant lot exists that was formerly the Las Cruces County Club. Residential neighborhoods exist north of the study area just beyond commercial developments on US 70. Two city parks, Apodaca Park and Jason Jiron Park, are near the intersections of US 70 and Madrid Avenue and El Camino Real, respectively.

Land use along the corridor is primarily commercial; a few residential homes exists near the intersection of Camino del Rex which are offset from the roadway, and separated by a strip of undeveloped land approximately 60 feet wide and a local street (Camino del Rex). Residential neighborhoods exist close to the study area, but US 70 is primarily a commercial roadway. The 110-acre property that was formerly the Las Cruces Country Club has been partially rezoned for high intensity commercial with at least 30 of the 110 acres rezoned for new development.

The community's regional plan, *One Valley One Vision 2040*, provides regional goals relating to both incorporated and unincorporated areas of Doña Ana County. Some regional goals related to land use include (One Valley One Vision Steering Committee, 2012) the following:

- Land use should serve as the element of the regional plan upon which all other elements of One Valley, One Vision 2040 are based.
- Provide a general form or pattern for the location, distribution, and characteristics of future land use within Doña Ana County to the year 2040.
- Create and integrate Smart Growth principles in planning.
- Encourage the development of communities with a mixture of land uses.
- Promote the region's status as one of New Mexico's most productive and economically important agricultural areas.

Socioeconomics and Environmental Justice

Las Cruces is an urban community in south central Doña Ana County, New Mexico. El Paso, TX lies approximately 40 miles south. The communities of Deming, Truth of Consequences, and Alamogordo are all accessible from Las Cruces within an approximately one-hour drive. Mexico is directly south of El Paso, TX. At the time of the decennial census in 2010, the City of Las Cruces had a population of 97,618 people, and New Mexico had a population of 2,059,179 with 209,233 people residing in Doña Ana County (see **Table 13**). Doña Ana County's population growth is projected at 1.39 percent for 2015 to 2020, compared to 1.26 for New Mexico. Las Cruces and Doña Ana County's population is younger than the state average (36.7 years) with a median age of 32.4 years for both regions. Homeowner occupancy rates vary around the state average of 68.2 percent. Rates in and near the study area range from 79.4 percent in Tract 1.04 to 59.7 percent in Tract 3.

Three Census Tracts provide local socioeconomic data for areas near the study area. Census Tract 1.02 includes the area south of North Main, and the former country club property that will be developed in the future. Tract 1.02 has a population with a median age of 38.2 years and a sizeable Hispanic/Latino population (62.2 percent). Census Tract 1.03 includes the area northwest of the study area. Tract 1.03 has a population with a median age of 30.6 years and a predominantly Hispanic/Latino population (71.4 percent). Census Tract 1.04 includes a large portion of the area that lies north of the roadway. Tract 1.04 has a population with a median age of 40.3 years and a sizeable Hispanic/Latino population (52.6 percent). Census Tract 3 includes the area south of the North Main roadway. Tract 3 has a population with a median age of 37.6 years and a sizeable Hispanic/Latino population (56.8 percent).

Table 13: Demographic Profile

Characteristic	New Mexico	Doña Ana County	Census Tract 1.02	Census Tract 1.03	Census Tract 1.04	Census Tract 3	Las Cruces
2010 Population							
- Total Population	2,059,179	209,233	3,969	4,863	4,826	3,685	97,618
- Median Age	36.7 years	32.4 years	38.2 years	30.6 years	40.3 years	37.6 years	32.4 years
- Percent under 18 years	25.2%	26.7%	25.3%	31.7%	23.9%	24.7%	24.3%
- Percent over 64 years	13.2%	6.6%	17.2%	11.1%	15.5%	15.0%	13.6%
Annual Population Growth Rate – 2015-2020	1.26%	1.39%	--	--	--	--	--
Race / Minority							
- White	68.4%	74.1%	75.1%	70.3%	79.0%	73.5%	75.3%
- Black/African American	2.1%	1.7%	2.4%	1.8%	1.8%	1.7%	2.4%
- Native American	9.4%	1.5%	2.5%	2.7%	1.2%	2.6%	1.7%
- Asian	1.4%	1.1%	0.5%	0.5%	1.1%	0.4%	1.6%
- Hawaiian/Pacific Islander	0.1%	0.1%	0.1%	0.0%	0.1%	0.3%	0.1%
- Some Other Race	15.0%	18.5%	15.8%	20.8%	13.2%	17.7%	15.3%
- Two or More Races	3.7%	3.0%	3.6%	4.0%	3.7%	3.8%	3.5%
- Percent Hispanic/Latino Any Race	46.3%	65.7%	62.2%	71.4%	52.6%	55.0%	56.8%
Housing							
- Owner-occupied	68.2%	64.7%	69.8%	69.9%	79.4%	59.7%	56.0%
- Renter-occupied	31.8%	35.3%	30.2%	30.1%	20.6%	40.3%	44.0%
2010-2014 Income and Poverty							
- Median Family Income	$54,801	$44,815	$49,464	$27,766	$84,107	$54,537	$50,327
- Family Poverty Rate	16.1%	21.8%	12.3%	38.1%	9.7%	18.3%	17.1%
- Per Capita Income	$23,948	$20,058	$19,364	$14,080	$29,729	$21,915	$21,782
- Per Capita Poverty Rate	20.9%	27.8%	20.7%	39.8%	15.8%	24.3%	23.9%

Source: Bureau of Business and Economic Research (2012); US Census Bureau (2016)

Las Cruces has an established urban economy built around a mixture of tourism, agriculture, education, and services for the traveling public and commercial freight. Las Cruces Metropolitan Statistical Area's (MSA) unemployment rate was higher (7.1 percent) than the New Mexico state unemployment rate (6.3 percent) as of February 2016 (New Mexico Department of Workforce Solutions, 2016).

Doña Ana County has a strong agricultural sector dominated by livestock, dairy products, pecans, and forage land. Ranching and dairy production is an important traditional part of the

region's economy. Pecan orchards dominate the Mesilla Valley along the Rio Grande. Forage production supports the dairies. The 2012 Census of Agriculture shows 2,184 farms with an average size of 302 acres. Of New Mexico's 33 counties, Doña Ana County is ranked first in pecan production and overall crop values, as well as first in the U.S. for pecans (National Agricultural Statistics Service, 2016).

Census Tracts near the study area have variable incomes. Median family incomes vary greatly, ranging from $84,107 in Tract 1.04 to $27,766 in Tract 1.03. The state median family income is $54,801, but family poverty rates vary significantly among the Census Tracts (see Table 2), ranging from 9.7 percent in Tract 1.04 to 38.1 percent in Tract 1.03. Based on these demographic statistics, the tracts may contain communities of concern for environmental justice.

Farmlands

The Farmland Protection Policy Act was passed to prevent the unnecessary and irreversible conversion of farmland to nonagricultural uses by federal programs. USDA-NRCS also rates soils based on suitability for food, feed, fiber, forage, and oilseed crops and provides farmland classifications that merits protection from conversion as Prime Farmland or Farmland of Statewide Importance. No soils in the study area are classified as Prime Farmland (**Table 14**). However, 78.9 percent of soils found in the study area are classified as Farmland of Statewide Importance. There is no irrigated agriculture or cultivated land in proximity to the study area; it is an urban area. The Rio Grande is approximately three miles from the study area.

Table 14: Farmland Classification

Soil Mapping Unit	Percent of Project Study Area	Farmland Classification
Bluepoint loamy sand, 0 to 5 percent slopes MLRA 42	42%	Farmland of statewide importance
Bluepoint-Caliza-Yturbide complex	6.4%	Not prime farmland
Pajarito fine sandy loam	36.9%	Farmland of statewide importance
Riverwash-Arizo Complex	14.7%	Not prime farmland

Source: USDA-NRCS (2016)

Multi-Modal Resources

Pedestrians and bicyclists use the US 70-North Main roadway for local access. A multi-use trail system crosses underneath a bridge at US 70-North Main roadway, parallel to the Alameda Arroyo/Outfall Channel. The roadway over the bridge is narrow and lacks shoulders, providing unsafe on-street conditions for bicycles. There are pedestrian crosswalks and sidewalk sections at the intersections of US 70 and Camino del Rex and Elks/Triviz Drives. Pedestrian facilities are not consistent along the roadway and do not meet American's with Disabilities (ADA) standards. Defined multimodal spaces and signage are lacking along the

roadway. Regarding transit, there are four bus stops along US 70-North Main within the study area. The roadway does not provide consistent multi-modal connectivity.

The Mesilla Valley Metropolitan Planning Organization's (MVMPO) Transport 2040 Plan includes a Trail System Priorities List (MVMPO, 2010). It characterizes the Alameda Arroyo/Outfall Channel as a Tier 1 trail, which is defined as a trail arterial network that connects major destinations and provides continuous routes across the region. Maintenance of the multi-use trail will be important to multi-modal users.

Visual Resources

The visual landscape of the US 70-North Main roadway, shown in Figures 3 through 5, consists of a small, urban, commercial business corridor, and the vacant lot of the former Las Cruces Country Club. The Organ Mountains to the east provide a scenic background. The terrain has a typical Chihuahuan desert scrub. The natural landscape is typical of southern New Mexico. Landscaping is present along the roadway, with grass, trees, and xeriscaping in some areas. Most people traveling through the corridor are likely to pay attention to the visual appearance of the roadway. It is an important commercial business corridor.

Figure 9. View looking north at the North Main and Elks Drive/Triviz Drive intersection.

Figure 10. View looking west on North Main.

Figure 11. View looking east on North Main.

Overall, the roadway corridor has an urban character with scenic mountain views to the east. It has been modified by development and transportation infrastructure. There are opportunities for visual improvements, including landscaping, sidewalks, and wayfinding signs to improve the character of the community. It is anticipated that aesthetic improvements will be desired by Stakeholders in the study area. Input from stakeholders and the project team will guide the development of alternatives in terms of visual resources.

Air Quality and Climate

Air quality is good in Las Cruces. Emission sources are limited and dispersed. The Mesilla Valley area is subject to occasional windstorms, which can affect visibility and health. Las Cruces is in attainment for all criteria pollutants (US Environmental Protection Agency, 2016; New Mexico Environment Department, 2016). A Natural Events Action Plan was developed for Doña Ana County to address localized and regional dust storm events that often exceed standards. Potential dust impacts and greenhouse gas emissions will be evaluated.

Las Cruces experiences hot summers, short cold winters, and an otherwise mild climate. It has a typical southwestern arid climate with limited and sporadic rainfall. Based on 1943 to 2012 climate data, the area receives an average of 8.68 inches of precipitation. More than 1.6 inches of monthly precipitation was received during both July and August. Maximum temperatures range from 96.5 degrees Fahrenheit (°F) in June to 58.4°F in January. Minimum temperatures range from 68.9°F in July to 29.3°F in January (Western Regional Climate Center, 2016).

Noise

Traffic noise is present along North Main. Traffic volumes are the main noise source within the study area. Highest volumes occur during the daytime hours. There is a high percentage of commercial trucks using North Main (US 70) as a cargo route. Residential properties and one (1) church on US 70 are noise sensitive receptors in the study area. Eighteen (18) residences are located on Camino del Rex, which runs parallel to North Main, and are set back approximately 90 feet from the North Main roadway. There is one church located near the Elks/Triviz intersection. Noise impacts would be addressed in Phase C.

Hazardous Materials

Land use along North Main is primarily commercial development. The highest potential for sites will be near the eastern end of the study area, where two gas stations currently exist near the Interstate 25/US 70 interchange. During Phase C, the NMDOT Environmental Geology Section would investigate hazardous materials sites in the study area.

M. Traffic Projections

1. Development of Horizon Year (2040) Traffic Projections

As part of the data acquisition, the project team requested 2040 traffic forecasts from the Mesilla Valley Metropolitan Planning Organization (MVMPO). The 2040 travel demand model uses estimates of future socioeconomic data (dwelling units and jobs) to forecast traffic volumes in the future.

Two travel demand models were provided by the MVMPO, a “no-action” model, which uses the 2040 socioeconomic forecast on the existing road network, and a “build” model, that includes improvements to the regional roadway network consistent the fiscally constrained Metropolitan Transportation Plan, Transport 2040.

A review of the two travel demand forecasts found they project modest increases in traffic volumes along US 70 in the study area. The increases along US 70 ranged from 3% to 10%; therefore, the existing traffic volumes were increased by 10% to project 2040 traffic volumes.

SECTION IV: AGENCY COORDINATION AND PUBLIC INVOLVEMENT

Agency coordination and public involvement are important processes for gathering feedback and input during the study process. Community representatives, members of the public, agency representatives, affected stakeholders, and study team members all play an important role in communicating information and issues about the study. The goal of this process is to produce transportation projects that fit within the context of a community and respond to the needs of the community and traveling public.

A. Agency Coordination

Agency coordination during the alignment study process is an instrumental part of the procedures outlined by the NMDOT. Each of the Federal, State, and local governments/agencies will provide diverse input and perspectives regarding the subject corridor. Through this comprehensive and ongoing collaboration, we expect most of the prominent upgrades and needs will surface and can be addressed.

B. Public Involvement & Context Sensitive Solutions Plan

A Public Involvement/Context Sensitive Solutions (PI/CSS) Plan was prepared and will be followed over the course of the study. The PI/CSS Plan establishes the project context, identifies major issues and affected project stakeholders, and develops a decision-making process sensitive to project context and is inclusive of stakeholders. Activities conducted will include the following: (1) making the public and stakeholders aware of the project; (2) providing meaningful information; and (3) involving stakeholders in the evaluation and decision process. This process helps lead to the development of preferred alternative options consistent with transportation, environmental, cultural, community, land use, and economic contexts in the study area. Specific methods, such as open house events, public meetings, and individual stakeholder meetings, will be used to inform and involve stakeholders, gather input, and to identify and resolve any issues or concerns that may arise during the study process. The PI/CSS Plan is an approach for implementing the public involvement requirement mandated by the National Environmental Policy Act (NEPA). This is a dynamic process that evolves as information is gathered, concerns are raised, and discussions occur with stakeholders and agencies.

Initially, public involvement will be solicited from property owners, local officials, neighborhoods, businesses, and interest groups that make up the primary user base or those that may be affected by the proposed alternative. The public's input will be considered during the evaluation and decision-making processes.

Stakeholders for this study include but are not limited to major landowners; the City of Las Cruces; Doña Ana County; emergency services; the Mesilla Valley Metropolitan Planning Organization, congressional representatives; US Army Corps of Engineers; US Customs and Border Protection; Doña Ana Community College – East Mesa campus; bicycle and pedestrian groups; utility representatives; business owners; public schools; business associations; citizen groups; and neighborhood associations.

C. Public Involvement Meetings

1. Summary of Public Involvement Meetings

Public Meeting #1

The first Public Information Meeting during the Phase 1 A/B portion of this study was held June 14, 2016 at Jornada Elementary School (due north of the project area along Elks Drive). Public notice was published in the Las Cruces Sun News, broadcasted on area public radio stations, and additional notices were emailed and/or distributed to stakeholders, businesses, and area residents. The meeting was conducted with the following objectives:

- Introduce the project and the project team
- Review the existing conditions and challenges within and along the facility
- Invite and solicit input from the public and stakeholders on their needs, thoughts, and desires for consideration during the development of proposed alternatives

Thirty-three community members, local government officials, and area service providers attended the meeting in addition to the project team. The meeting included a 30-minute open house period for discussions of the project, a brief presentation, and a short duration of question and answers.

Another public meeting during Phase I A/B will be held, and individual stakeholder interviews and meetings will be conducted with property and business owners, municipalities, utility and service providers, and others as needed. At the public meetings, the following information is proposed for the presentation:

- Project alternatives and assessment
- Recommended alternative and decision matrix
- Improvements to intersections, the bridge and outfall channel, ADA facilities, and utilities
- Potential environmental and socioeconomic impacts
- Project schedule

Property Owner Interviews for Businesses at the Elks/Triviz Intersection

A number of property owners adjacent to the Main Street intersection with Elks Drive/Triviz Drive were interviewed in late August 2016 to ascertain their observations on the traffic flow and operations at the subject intersection. These interviews included Walgreens Pharmacy, Valero Gas Station, Pic Quik Gas Station, CVS Pharmacy, Chevron Gas Station, and Baird's Automotive. Below is a summation of the questions posed during each interview:

- What traffic issues at the intersection have you observed?
- What traffic issues have you observed at your property and driveway(s)?
- Open request to determine if subject property owner has any requests.
- Open request to provide additional comments.

Main Street First Responder Interviews

Personnel from the City's Fire Department and Police Department were interviewed in the Fall of 2016 to garner input from first responders for consideration within respective alternatives. Below is a summation of the questions posed during each interview:

- What issues do you see with full concrete medians?
- What conditions should be considered for the Emergency Response Vehicles?
- What traffic issues have you observed at the Elks/Triviz Intersection?
- Is the speed limit adequate?
- Open request to determine if respective first responder has any requests.
- Open request to provide additional comments.

City of Las Cruces/NMDOT/Mesilla Valley MPO Stakeholder Meeting #1

This Stakeholder Meeting was held November 16, 2016 at the NMDOT South Region Design (SRD) Conference Room. The meeting request included City personnel from the Public Works, Planning, and Community Development Departments; as well as MPO Transportation Planners and NMDOT District 1. The meeting was conducted with the following objectives:

- Introduce the project and the project team
- Summarize the existing conditions
- Introduce some of the alternatives being considered for the corridor
- Gain input from City/MPO staff on upcoming adjacent improvements and provide input on proposed alternatives as daily users and administrators of the facilities.

Design alternatives presented to project stakeholder are summarized below:

- Alternate #1 – 6 Lane Main Street configuration with access management per SAMM.
- Alternate #2 – 6 Lane Main Street configuration with access management variances from SAMM.
- Sub-Alternate #1 – At-Grade Main Street/El Camino Real/Camino Del Rex intersection with the lane configuration offering the best LOS and resulting queue lengths.
- Sub-Alternate #2 – At-Grade Main Street/Elks Drive/Triviz Drive intersection with the lane configuration offering the best LOS and resulting queue lengths.

The meeting included a presentation, question/answer session, as well as a collaborative development of additional plausible alternatives which may be considered.

Shopping Center Stakeholder Meeting #1

A Shopping Center Stakeholder Meeting was held February 16, 2017 at the Elks Lodge (due north of the project area along Elks Drive). Public notices were hand delivered to shopping

center businesses along with emailed notices to businesses holders of record. The meeting was conducted with the following objectives:

- Introduce the project and the project team
- Summarize the existing conditions
- Introduce some of the alternatives being considered for the corridor
- Request input on respective alternatives from business owners/representatives

Design alternatives presented are summarized below:

- Alternate #1 – 6 Lane Main Street configuration with access management per SAMM.
- Alternate #2 – 6 Lane Main Street configuration with access management variances from SAMM.
- Alternate #3 – 6 Lane Main Street configuration with Grade Separation at the intersection of Main Street/Elks Drive/Triviz Drive.
- Sub-Alternate #1 – At-Grade Main Street/El Camino Real/Camino Del Rex intersection with the lane configuration offering the best LOS and resulting queue lengths.
- Sub-Alternate #2 – At-Grade Main Street/Elks Drive/Triviz Drive intersection with the lane configuration offering the best LOS and resulting queue lengths.

The meeting included a presentation and a brief question and answer session.

City of Las Cruces/NMDOT/Mesilla Valley MPO Stakeholder Meeting #2

This Stakeholder Meeting was held February 17, 2017 at the NMDOT South Region Design (SRD) Conference Room. The meeting request included City personnel from the Public Works, Planning, and Community Development Departments; as well as MPO Transportation Planners and NMDOT District 1. The meeting was conducted with the following objectives:

- Cursory review of discussions from Stakeholder Meeting #1 for additional CLC personnel at this meeting.
- Present alternatives from Stakeholder Meeting #1
- Present the Grade Separation Alternative resulting from Stakeholder Meeting #1
- Gauge CLC/MVMPO adjacent city improvements to their transportation facilities
- Request input on alternatives presented

This meeting included a presentation and question/answer/suggestion session.

City of Las Cruces/Mesilla Valley MPO/NMDOT Stakeholder Meeting

This meeting was held on March 8, 2017 to discuss plans for the City or MVMPO which may directly affect this project.

City of Las Cruces/ Mesilla Valley MPO/ NMDOT Stakeholder Meeting

This meeting was held on June 17, 2017 to discuss the impact future transportation projects planned by the City or MVMPO on this project.

2. Participant Comments and Responses

Public Meeting #1

A number of verbal questions and comments were received following the presentation and are summarized below:

- **Question/Comment #1** – How long is construction going to take?
  - **Response:** The construction duration is unknown until the type of project is designed and approved.

- **Question/Comment #2** – Is this a part of the intersection project?
  - **Response:** No, the meeting for the intersection is tomorrow night.

- **Question/Comment #3** – What are you going to do about traffic?
  - **Response:** It will likely switch from side to side and have lane restrictions similar to the traffic control that was done on I-25 and Missouri.

- **Question/Comment #4** – What about access during construction?
  - **Response**: It can be difficult, but we will work with the businesses on what they need for customer access. Different businesses have different clientele, either relying on foot traffic or not.

- **Question/Comment #5** – Is the drainage system involved?
  - **Response:** Yes, there doesn't seem to be too many drainage issues, but the arroyo will be addressed.

- **Question/Comment #6** – Will utilities be cut off?
  - **Response:** We will maintain utilities and work with the City to eliminate/reduce cut offs.

- **Question/Comment #7** – Will there be six lanes?
  - **Response:** Perhaps three in each direction but that will be determined.

- **Question/Comment #8** – Will you share volume figures?
  - **Response:** We have taken traffic counts and they are being processed. This will help determine what the roadway will need.

- **Question/Comment #9** – In the future, roadway alternatives will be presented at another public meeting.

- **Question/Comment #10** – What is wrong with the roadway?
  - **Response:** Access to CVS and Diamond Shamrock is poor. There needs to be a dedicated lane for entering I-25 north.

- **Question/Comment #11** – Can we restrict truck traffic?
  - **Response:** US 70 is a state route, so we cannot restrict truck traffic. There aren't any hazardous cargo restrictions.

- **Question/Comment #12** – Can the project be phased?
  - **Response:** Construction phasing will be considered and will also depend on funding. Further, this study can assist in pursuing additional funding. For instance, could widen the bridge. The congestion on Elks could be a priority. Cost can drive the decisions on phasing.

- **Question/Comment #13** – Will you be able to widen the bridge to allow for bicycles and pedestrians?
  - **Response:** We will evaluate drainage at the bridge, south of the dam, and widening of sidewalks. The trail could connect to North Main.

- **Question/Comment #14** – There could be improvements at Del Rey approaching US 70 west, by removing stop sign and installing yellow flashing lights instead.
  - **Response:** That interchange will be investigated to see how it's impacted by traffic.

Property Owner Interviews for Businesses at the Elks/Triviz Intersection

A summary of each property owner interview is shown below:

WALGREENS PHARMACY

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Traffic backs up on Triviz Drive in the afternoon (4:00 – 5:30 PM) and can sometimes block the driveway access. Otherwise, no major issues to report.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: No issues observed

- **Property Owner Requests**
  - **Response**: None

- **Additional Comments**
  - **Response**: None

VALERO GAS STATION

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Traffic backs up badly early morning, noon, and 4:00 – 5:00 PM. This blocks business entrance and hurts business. Some motorists assume the right lane into Elks Drive continues past the intersection.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: Customer's have issues exiting business from both driveways. Almost impossible for vehicles with trailers to exit driveways without blocking traffic or turning into oncoming lanes along Elks Drives. Many vehicles cut through property to avoid intersection.

- **Property Owner Requests**
  - **Response**: Can a driveway be constructed in the back of the property? This would make it easier for larger vehicles and general traffic flow.

- **Additional Comments**
  - **Response**: Business site was constructed in early 1990s and traffic issues progressively became worse early 2000s.

PIC QUIK GAS STATION

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Traffic backs up from Jornada Elementary School to Elks Drive from 7:00 – 8:00 AM on weekdays. Many vehicles attempt to cross over Lenox Drive to gain access to neighboring CVS Pharmacy and cause accidents. An accident occurs weekly with many being minor and going unreported. Drivers ignore the newly striped double yellow in from of CVS Pharmacy and still cross over.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: No issues at property.

- **Property Owner Requests**
  - **Response**: I-25 access off of Engler Road would greatly help traffic congestion as most vehicles queuing on Elks Drive are turning left on US 70 to access the interstate.

- **Additional Comments**
  - **Response**: To the manager's knowledge, no site improvements or development of the Pic Quik Store is planned for the coming years.

CVS PHARMACY

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Traffic backs up, blocks business entrances, hurts business.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: The City's recent slurry seal and restriping has made it illegal to turn left into business from Elks Drive. From the new striping, traffic now backs up in the left turn (to US 70) and completely blocks business entrance. US 70 driveway is mostly used as an exit as many motorists are not aware of it westbound.

- **Property Owner Requests**
  - **Response:** Can a left turn lane from Elks Drive be constructed solely for CVS Pharmacy with perhaps flexible traffic separators?

- **Additional Comments**
  - **Response:** Several "close-call" accidents observed from traffic turning left from Elks Drive to US 70.

CHEVRON GAS STATION

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Only issue is sometimes customers from Walgreens Pharmacy exiting onto Triviz Drive can interfere with Chevron customers doing the same.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: No issues observed.

- **Property Owner Requests**
  - **Response**: None at this time.

- **Additional Comments**
  - **Response**: None at this time.

BAIRD'S AUTOMOTIVE

- **Question #1** – What traffic issues at the intersection have you observed?
  - **Response**: Only issue is traffic light does not give green arrow for left turn (from US 70) in early morning hours (4:00 – 5:00 AM). Sometimes have to make illegal turn or find an alternate route.

- **Question #2** – What traffic issues have you observed at your property or driveway(s)?
  - **Response**: No issues observed.

- **Property Owner Requests**
  - **Response**: None at this time.

- **Additional Comments**
  - **Response**: None at this time.

Main Street First Responder Interviews

A summary of each first responder interview is shown on the following page:

LAS CRUCES FIRE DEPARTMENT (LCFD)

- **Question #1** – What issues do you see with full concrete medians?
  - **Response**: Medians will be okay. Mountable medians might be preferable, however this will be discussed with the drivers/first responders and a preference will be decided. Smith will be notified.

- **Question #2** – What conditions should be considered for the Emergency Response Vehicles?
  - **Response**: Turning radius for the largest of the trucks is 54 – 57 feet. The inner radius is 16-feet. Trucks turning on double-lefts are generally fine, however right turns can sometimes have issues. Larger radius might be required.

- **First Responder Requests**
  - **Response**: Stay in contact for any issues that may arise. In the design phase requested that review be conducted.

- **Additional Comments**
  - **Response**: There will be a Mountain View ER Facility developed at the property west of Citizens Bank. This building will share the driveway with Citizens Bank. A future access off of Solano Drive to Park Ridge Development might eventually be built.

LAS CRUCES POLICE DEPARTMENT (LCPD)

- **Question #1** – What issues do you see with full concrete medians?
  - **Response**: Medians will be okay but mountable medians for public safety to access or cross during emergencies. These can be between landscaping. Provide openings at Temple Street and Amigo Road. Opening at Scanlon Drive can be configured to have left turn from Main Street, but no crossover from Scanlon Drive to Lowe's.

- **Question #2** – What traffic issues have you observed at the Elks/Triviz Intersection?

  - **Response**: Mostly rear enders and sideswipes. Right turn lanes from Main Street to Elks Drive and Main Street to Triviz Drives would work. No right turn to businesses – use third lane for through traffic and turn into businesses. Keep the lanes alignment and intersection configurations simple.

- **Question #3** – Is the speed limit adequate?
  - **Response**: From Elks Drive west it should be 35 mph due to the businesses, traffic volumes, and turning traffic.

- **First Responder Requests**
  - **Response**: Stay in contact for any issues that may arise.

- **Additional Comments**
  - **Response**: None

<u>City of Las Cruces/NMDOT/Mesilla Valley MPO Stakeholder Meeting #1</u>
A number of verbal questions and comments were received following the presentation and are summarized below:

- **Comment/Question #1** – The Chevron driveway is too close to the intersection. What about frontage roads to combine the first three (3) driveways?
  - **Response**: Would need to analyze ROW needs and coordinate with property owners. This would improve business access for these properties as they don't currently have a left-in.

- **Comment/Question #2** – If there are frontage roads, would you still need three (3) driving lanes?
  - **Response**: Yes, due to queuing issues.

- **Comment/Question #3** – The At-Grade improvements at the Main Street/Elks Drive/Triviz Drive intersection require a good deal of additional ROW. Have other plausible improvements been considered? Roundabouts, grade separation, etc?
  - **Response**: A signal at the Elks Club would require Las Cruces Public Schools (LCPS) ROW to line up.
    - Grade separation could be analyzed. US 70 would go over the top. This would impact 1200 ft of driveways and take most of ROW. A roundabout would take more ROW than grade separation. Access along US 70 would be the issue. Alternatively, could look at US 70 going under Elks/Triviz. No frontage roads would be needed. Business access would be below. Would not need 6 lanes.

  - What about a roundabout at Lenox? Roundabout is preferable to the City vs. a signal but the queues and weaving conflicts would need to be addressed. If the intersection could be moved north, then would avoid Pic Quik.

  - Flyovers were discussed. Signal timing needs would be reduced. 2 lefts, 2 through lanes, and 2 rights on Elks would eliminate the queue, without a flyover. This would require portions of the CVS parking lot. A free right turn from Elks to North Main wouldn't work due to lack of gaps.

- **Comment/Question #4** – The MVMPO looks at this project from a different perspective, in terms of maintenance and not expansion of this roadway. The plans would need amending by the MVMPO. Reduced traffic is the desired end-point by way of mixed-use development, and multimodal facilities. Look at other alternatives without adding driving lanes. Multimodal transportation must be considered; transit, bicycle lanes, pedestrian amenities. Buffered bike lanes are preferable; green bike lanes are an option. Drainage control could be gained with landscaping design.

- **Comment/Question #5** – Can a low LOS be accepted when avoiding an increase in capacity?
  - **Response**: A temporary LOS would probably be fine due to short traffic peak periods.
    - **CLC Traffic**: only LOS D or better is acceptable.
    - **This is the conflict**. Must have exceptions here.

- **Comment/Question #6** – Urbanization and multimodal designs need different accommodations within standards for LOS, access, and parking. Bicycle lanes means no driveways, etc.

- **Comment/Question #7** – MVMPO: Consensus should be gained for an acceptable LOS. Would frontage roads reduce the need for a third driving lane?
  - **Response**: No but would accommodate a buffered bicycle lane. The current four lanes are already failing. This is a national highway.

- **Comment/Question #8** – Traffic numbers fluctuate greatly from 25K to 38K, moving up and down over time. People are driving less and populations are aging. Fluctuations could be attributed to construction of Spruce and Engler.

- **Comment/Question #9** – Have we seen an increase in transit use?
  - **Response**: We are seeing an increase but down right now because of low gas prices. New routes were added this year. Demographics, poverty rates, and the university/community college populations affect transit demand.

- **Comment/Question #9** – Grade separations at access points at I-25 and Engler were discussed. It would assist in overall traffic flows, but wouldn't affect Lenox Drive because the traffic is going west. The Lenox area could be modeled to analyze destinations. Ultimately, extending Engler to the west and tying into Valley Drive would be the solution for connectivity, but would take longer ramps than at Engler. That is in the Long-Range Plan. However, interstate solutions are not supposed to be used to solve local traffic problems, must look at surface streets first.

Shopping Center Stakeholder Meeting #1

A number of verbal questions and comments were received following the presentation and are summarized below:

- **Question #1** – Right turn lanes into shopping center driveways are desired. Is this cost prohibitive?
  - **Response**: Right turn lanes were not identified as the existing configuration doesn't currently contain these facilities, and with the additional through lane should provide adequate right turn maneuvers from the outside lane. The implementation of right turn lanes at each driveway also creates undesirable conflicts with bicyclists using the bike lanes.

- **Question #2** – Is landscaping being considered along shopping center?
  - **Response**: Landscaping was not considered along the shopping center frontage; should existing landscaping be damaged it would be replaced in kind as much as possible.

- **Question #3** – Why are medians proposed instead of a continuous left turn lane?
  - **Response**: A continuous left turn lane was not considered at it would not meet the access management outlined within the State Access Management Manual.

- **Question #4** – How do we get updates on project status?
  - **Response**: There are at least two (2) additional Public Meetings in the future to further discuss project alternatives and request feedback in the decision making progress. Additionally, we will work with the NMDOT to list this projects status on the Departments website

- **Question #5** – When do we anticipate construction would begin?
  - **Response**: To date the project is not on the NMDOT's project list for at least the next five (5) years, but that could change based on the findings of this study.

- **Question #6** – Continuous construction not only affects our bottom line, but it also negatively affects our customers and employees.
    - **Response**: Construction of the alternatives presented within this study will not occur during the upcoming reconstruction of the Solano Drive/Spitz intersection. We will further coordinate with businesses to accommodate as much as possible during both the design and eventual construction of an alternative.

- **Question #7** – Can you provide additional notices to encourage additional shopping center business to attend these meetings?
    - **Response**: Notices were hand delivered to the majority of businesses within the shopping center. As we now have your contact information you will receive meeting correspondence two weeks ahead of anticipated meetings. Your own personal communication with adjacent businesses will help to encourage participation at future meetings.

<u>City of Las Cruces/NMDOT/Mesilla Valley MPO Stakeholder Meeting #2</u>
A number of verbal questions and comments were received following the presentation and are summarized below:

- **Comment/Question #1** – Recommended making the bike lanes five-feet (5') wide with a three-foot (3') buffer along Main Street instead of four-feet (4') plus two-foot (2') presented, particularly in the 45 MPH zone from El Camino Real east. The speed is 35 MPH from Solano Drive to El Camino Real. MVMPO concurred.

- **Comment/Question #2** – Show the proposed cul-de-sac on Camino Del Rex with the proposed Park Ridge Development.

- **Comment/Question #3** – The proposed right turn from Main Street onto El Camino Real can't be reached because of the queue lengths on the thru lanes.

- **Comment/Question #4** – May as well provide dual westbound lefts to Park Ridge Boulevard since we have the room.

- **Comment/Question #5** – Verify the queue length on the southbound right turn lane on Elks Drive.

- **Comment/Question #6** – The grade separation and eliminating the medians may make it possible to narrow the Elks Drive/Triviz Drive roadway to fit within the existing ROW.

- **Comment/Question #7** – Assume protective/permissive turning movements (dual lefts only on protected and reevaluate if not how it was modeled).

- **Comment/Question #8** – The City wants adaptive signalization on the Elks Drive/Triviz Drive intersection. It may be necessary to have adaptive at the upstream and downstream signals for the system to work optimally at Elks/Triviz.

- **Comment/Question #9** – That are no CLC plans to widen El Camino Real at this time.

- **Comment/Question #10** – End the sidewalks at Scanlon Drive and at Lowe's

- **Comment/Question #11** – The City has seen ROW costs of $20 per square foot and $30,000 per parking space on previous projects.

- **Comment/Question #12** – The queues on Elks Drive, traffic should probably come out at Scanlon Drive instead of Lenox. Should think about traffic patterns that avoid the Lenox intersection. The big queue problem is a right turn onto US 70 westbound. Residential complaints are being received on the traffic into the neighborhood. What about a grade/bridge crossing underneath US 70?
    - **Response**: Cost issues for such a small neighborhood. The grade separation will help alleviate the traffic problem here.

- **Comment/Question #13** – Objects to the 10% growth over the next 20 years that is proposed in the study. They encourage no growth in vehicular traffic. MVMPO doesn't have three lanes projected for this section of roadway. MVMPO wants to see justification for the three lanes and additional turn lanes.
    - **Response**: The current LOS of the roadway varies between segments, AM and PM and direction. Generally, from Solano Drive to El Camino Real is LOS F, from the bridge to Elks Drive is LOS F, from Elks Drive to the east is LOS C. The westbound PM peak from I-25 to the EOP is LOS E. The intersection at El Camino Real is LOS C except for the westbound AM US 70 through, the eastbound PM US 70 through is LOS F. Elks Drive intersection is LOS F during the AM and PM Peaks. The LOS will be shown in the Phase 1 A/B Report.

- **Comment/Question #14** – MVMPO would like to see the LOS with a 10% decrease in traffic along Main Street.

- **Comment/Question #15** – Allow for transit stops. Pullouts are difficult due to the long acceleration lanes required to get back into traffic.

- **Comment/Question #16** – When will this be presented to the MVMPO?

- **Response**: The Study will need to undergo NMDOT internal review prior to presenting the findings.

- **Comment/Question #17** – Is it possible to run Main Street under Elks Drive through a tunnel?
  - **Response**: It appears the connection to I-25 would be difficult.

- **Comment/Question #18** – Is the City considering a signal at Ellendale?
  - **Response**: it may help platoon the traffic along Elks Drive. The City currently has no plans in the immediate future to install a signal here. There was a Traffic Impact Analysis (TIA) for a connection through the Jornada Elementary School/Elks Lodge properties. This could help at Lenox

- **Comment/Question #19** – The time line depends on costs. Cost Benefit Ratio (CBR) and life cycle analysis is needed. Phasing might be an option. Isn't cost efficient to spend 15-20 million dollars plus ROW costs and get LOS D and E.

3. Written Comments

Public Meeting #1

A handful of written comments were received following Public Information Meeting #1. These are summarized below:

- **Gill Sorg (Councilor): City of Las** Cruces – "Make all median and parkways with completed landscaping – this is an entrance into the heart of the City, put extra funding into a WOW landscape – make it beautiful, fitting to the southwest. With stormwater harvest and capture everywhere. Discourage truck traffic from Main Street-Picacho Avenue. Encourage use of I-10 and I 25. Access to CVS from Main/70 both east bound and west bound. All bus stops must have turn outs. Bridge must have bike and sidewalks."

- **Chris Thomas (Business Owner)** – "As a business owner in this area I am worried that access to my location will be limited compared to the current level. What impact will construction have on my business? Will flag men be present to allow access to my location? Can alternate routes be developed to access business? Specifically, Triviz and the Alameda Arroyo. Thanks for your time."

- **Mike Bartholomew: CLC Transit** – "The City of Las Cruces Transit Section requests that project design around our bus stops in this area be coordinated with the Transit Section. If bus pull outs are considered, they need to be designed so buses can effectively exit and re-enter traffic. Also when the design of Main with Elks/Triviz is done, we would like to see the right turn from eastbound Main to southbound Triviz to be addressed. It is too tight for buses and large trucks to safely turn. I feel this construction will impact traffic flow at other I-25 crossings. Perhaps a wayfinding app

for helping drivers cross I-25 more effectively will help. Study might assess impacts of this project on other I-25 crossings during the construction phase."

- **George Pearson (BPAC Chair):** CLC Mesilla Valley MPO – "Alternative selection criteria slide. Should be multi-modal, not just pedestrian/ADA. Bridge needs more shoulder room, very dangerous to ride a bicycle. Consider possibility of access from Main near bridge to outfall channel trail. Design for bicycles at Main and Camino Del Rex. Expect bicycle traffic from old Country Club and to access Albertsons and outfall channel trail."

D. Ongoing Public Involvement

Public involvement during the US 70 Roadway Improvements is both vital and ongoing. The Public Involvement Plan (PIP) identifies a number of opportunities to engage input from various agencies and the general public.

The following meetings have been held on:

- Phase 1 A/B Public Information Meeting #1 – conducted June 14, 2016
- Elks Drive/Triviz Drive Adjacent Business Interviews – conducted August 2016
- US Army Corps of Engineers (COE) Alameda Arroyo Bridge Meeting – conducted August 23, 2016
- First Responder Interviews – conducted Fall 2016
- CLC/MVMPO/NMDOT Stakeholder Meeting #1 – conducted November 16, 2016
- Shopping Center Business Stakeholder Meeting #1 – conducted February 16, 2017
- CLC/MVMPO/NMDOT Stakeholder Meeting #2 – conducted February 17, 2017
- CLC/MVMPO/NMDOT Stakeholder Meeting #3 – conducted March 8, 2017
- CLC/MVMPO/NMDOT Stakeholder Meeting #4 – conducted June 13, 2017
- CLC/MVMPO/NMDOT Stakeholder Meeting #5 – conducted August 31, 2017
- Phase 1 A/B Public Information Meeting #2 – pending NMDOT review of Phase 1A/B Report
- Phase 1 C Public Meeting #1

SECTION V: PROJECT PURPOSE AND NEED

Federal regulations state that this study shall establish the purpose and need of the project. The *purpose* portion of the statement is a broad overview of the objective trying to be attained during the proposed improvements. The *need* portion is an in-depth elaboration of both existing and expected future deficiencies and transportation problems.

A. Project Purpose and Need Statement

In general, roadway and intersection improvements, along with other physical, operational and safety improvements are needed on US 70 (Main Street) to help ensure that travel on these segments is safe and efficient and meets current and future needs. Based on input received from the Study Team and the Stakeholders, a Purpose and Need Statement was developed for the project as follows:

"The purpose of the proposed improvements is to correct existing physical deficiencies, facilitate traffic flow and operations, improve traffic safety conditions, manage access to adjoining properties, and develop appropriate facilities for bicyclists and pedestrians."

There are seven factors listed in the NMDOT *Location Study Procedures* guidebook for establishing the purpose and need for a transportation improvement. The applicability of these factors to the US 70 (Main Street) project is summarized as follows:

1. Physical Deficiencies

There are a number of physical deficiencies along Main Street including: minor deteriorated pavement conditions; deficient intersection geometries and turning lanes; inadequate number of driving lanes; narrow bridge with no shoulders or sidewalks; and lack of continuous facilities to accommodate pedestrians and bicyclists.

2. Safety

Safety improvements are needed to address intersection alignments, rear end and side swipe accidents, access to adjacent properties and intersecting streets, as well as the lack of adequate pedestrian and bicycle facilities.

3. Travel Demand and Congestion

Las Cruces is a growing city, particularly the East Mesa area. US 70 serves as a commuter route from the residential east Mesa to the business center in Las Cruces as well as the US 70 route through town. Currently, there are no alternate routes into the City's business center from the East Mesa through the City has plans for future transportation corridors at Engler and Madrid. Traffic volumes for Main Street indicate that there is a need for intersection improvements, particularly at Elk Drive/Triviz intersection, including auxiliary turning lanes to address the current and projected increases in traffic volumes and to maintain a satisfactory level of traffic operations. In addition, traffic operational improvements will provide for improved response times for emergency vehicles. The MVMPO traffic count data and

projections suggest no anticipated future traffic growth along Main Street. NMDOT and MVMPO agreed to a 20 year projection of 5% growth.

4. Access

Enhanced access and mobility is needed on Main Street in order to provide for more orderly traffic operations along these roadways. Access management is required to better define ingress and egress at business locations. Pedestrian and bicycle facilities need to be improved and implemented. All build alternates should provide for bus transportation.

5. System Connectivity

U.S. 70 provides connectivity not only to the East Mesa residential area but is also a major east – west roadway across southern New Mexico. Roadway connectivity is needed to maintain links to Arizona and Texas destinations. The project includes an interchange with I-25, the major north south roadway in New Mexico. Connectivity is also needed to provide for more timely emergency response services for police and fire.

6. Economic Development

Improvements to Main Street are needed to maintain an environment conducive to economic growth and development in Las Cruces. The project area has commercial development along its entire length. Las Cruces planning reports project increased economic activity (the new Park Ridge medical center) for Main Street and recommend it for use by vehicles, bicycles and pedestrians.

7. Legislative Mandate

At this time, there are no Legislative Mandates for this project.

SECTION VI: IDENTIFIED ALTERNATIVES

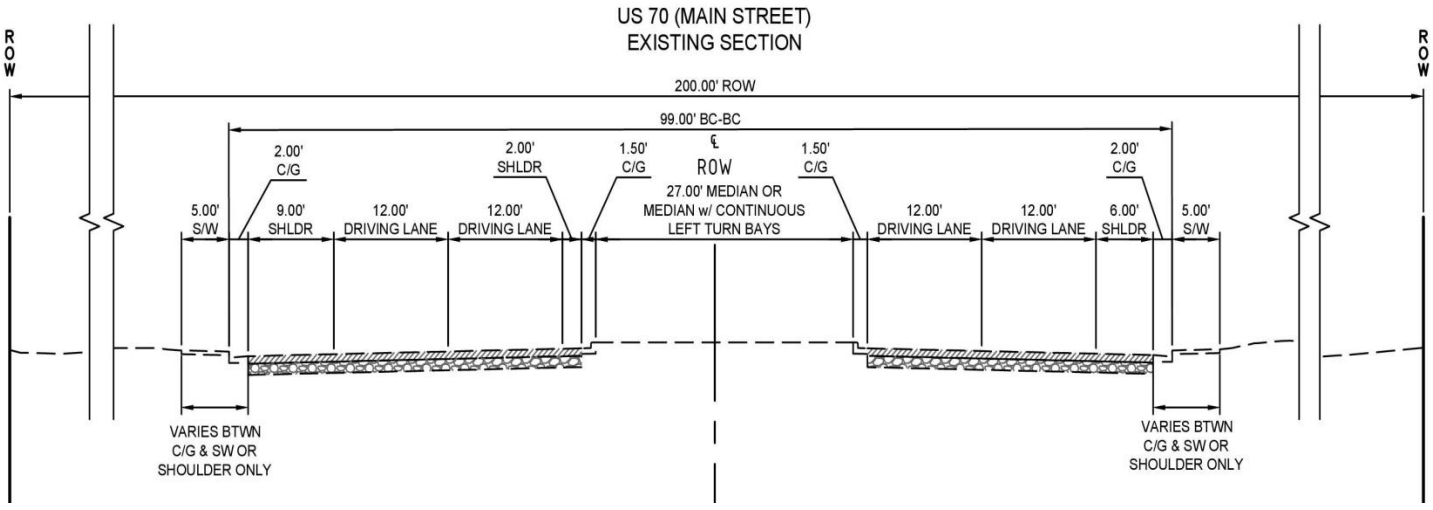
The following deficiencies were identified as requiring examination as a part of the US 70 (Main Street) Alignment Study:

- Need to improve safety along the subject corridor
- Need to improve traffic operations along US 70
- Need to improve intersection geometric deficiencies
- Need to improve multimodal facilities
- Need to limit the acquisition of ROW
- Need to address pavement deficiencies
- Need to involve the public and major stakeholders along the corridor

Based on the *Purpose and Need Statement* and evaluation criteria established herein; evaluation of the presented alternatives can be prioritized, ranked, and presented for consideration by NMDOT, the facility manager.

A. No-Build Alternative

The No-Build Alternative establishes a baseline alternate under which US 70 (Main Street) would remain in its current condition except for routine maintenance of the facility. Traffic patterns and operations will remain under existing conditions. Drainage, pavement, and multimodal patterns would also remain undisturbed. The existing Main Street typical section is presented below; as noted there are a number of variations throughout the corridor varying from curb and gutter with sidewalk and paved shoulders:

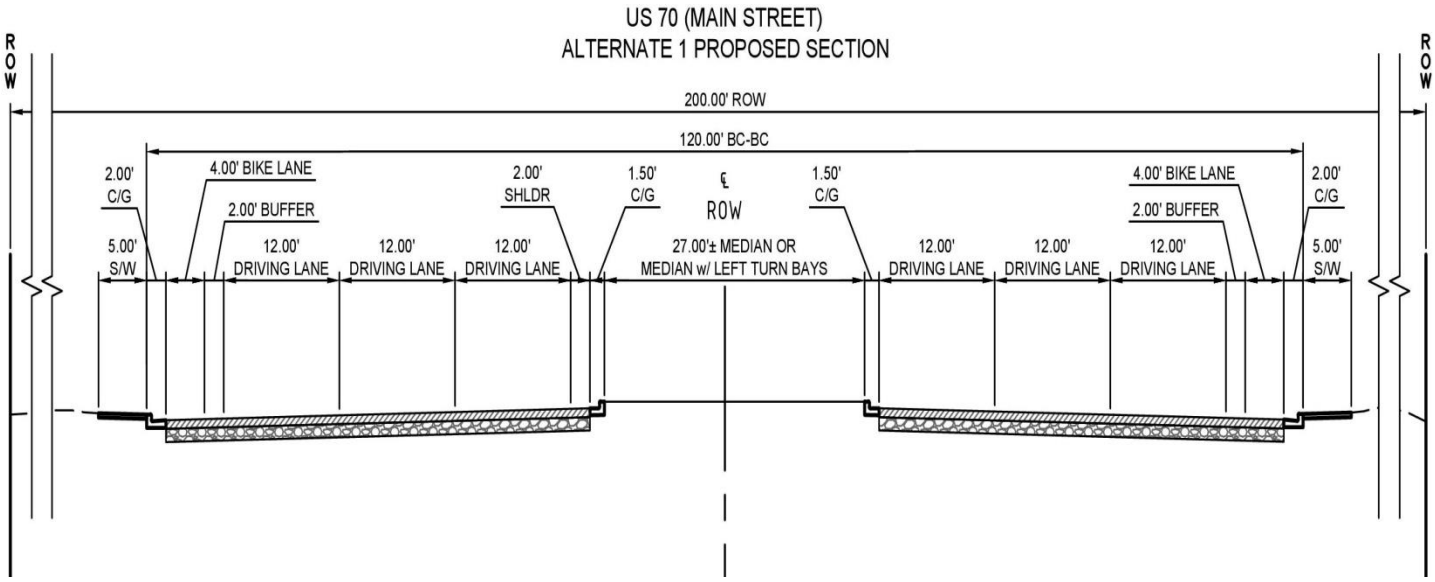


B. Alternate 1 – Six Lane Access Managed per SAMM Requirements

The Six-Lane Access Managed alternative proposes three (3) lanes in each direction from the free-right at Solano Drive accessing US 70 (Main Street) east through the US 70/Elks Drive intersection. This would match the incoming/outgoing street cross section existing east of the

aforementioned intersection. Within this alternate, full and partial accesses along the subject section are restricted to the spacing provided with the State Access Management Manual (SAMM). In conjunction with the additional through lane in each direction bicycle lanes would be added to the same section, but these bike lanes would not continue east of said intersection as facilities are not present at the I-25 interchange. Raised medians would be incorporated, except at street intersections, to limit uncontrolled access and improve the safety along the corridor. Additional lanes (right/left turn) will also be incorporated at the signalized intersections to improve queue lengths and adequately move the traffic through the intersections.

Alternate 1 would include an at-grade reconstruction of both the Main Street/El Camino Real/Camino Del Rex and the Main Street/Elks Drive/Triviz Drive intersections to improve the level of service for respective movements. A number of lane configurations were evaluated and are discussed further in a later section. The best lane configurations operationally considered are presented on the following page (Figure 12) for each respective intersection. Both intersections would be concrete pavement.



The section shown above depicts the primary Main Street section within Alternate 1. There are slight variations to include right turn lanes, left turn lanes, and dual left turn lanes as described later within this report. It should be noted that the additional driving lane and buffered bicycle lane in each direction are extended outward about the existing street section centerline.

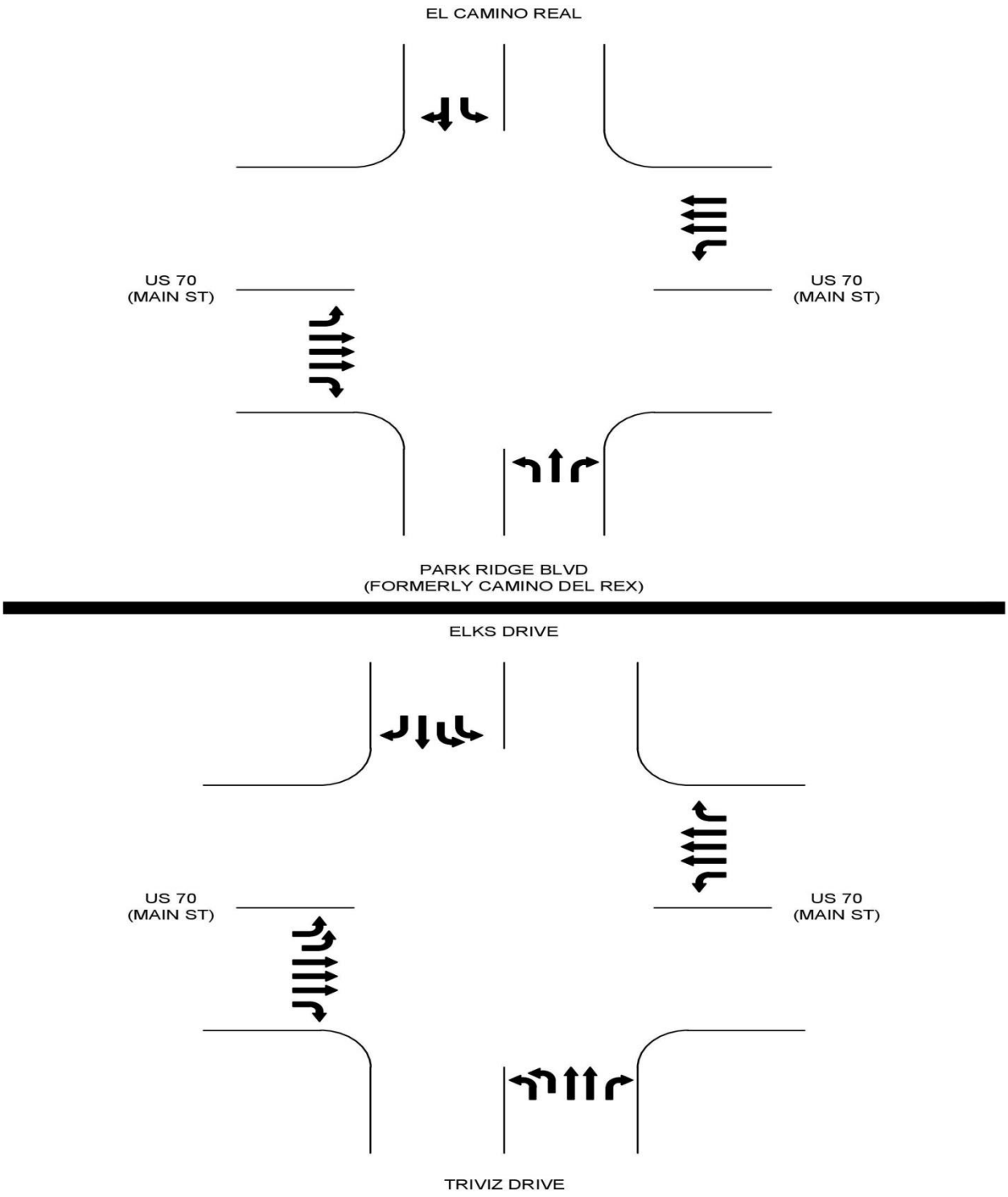


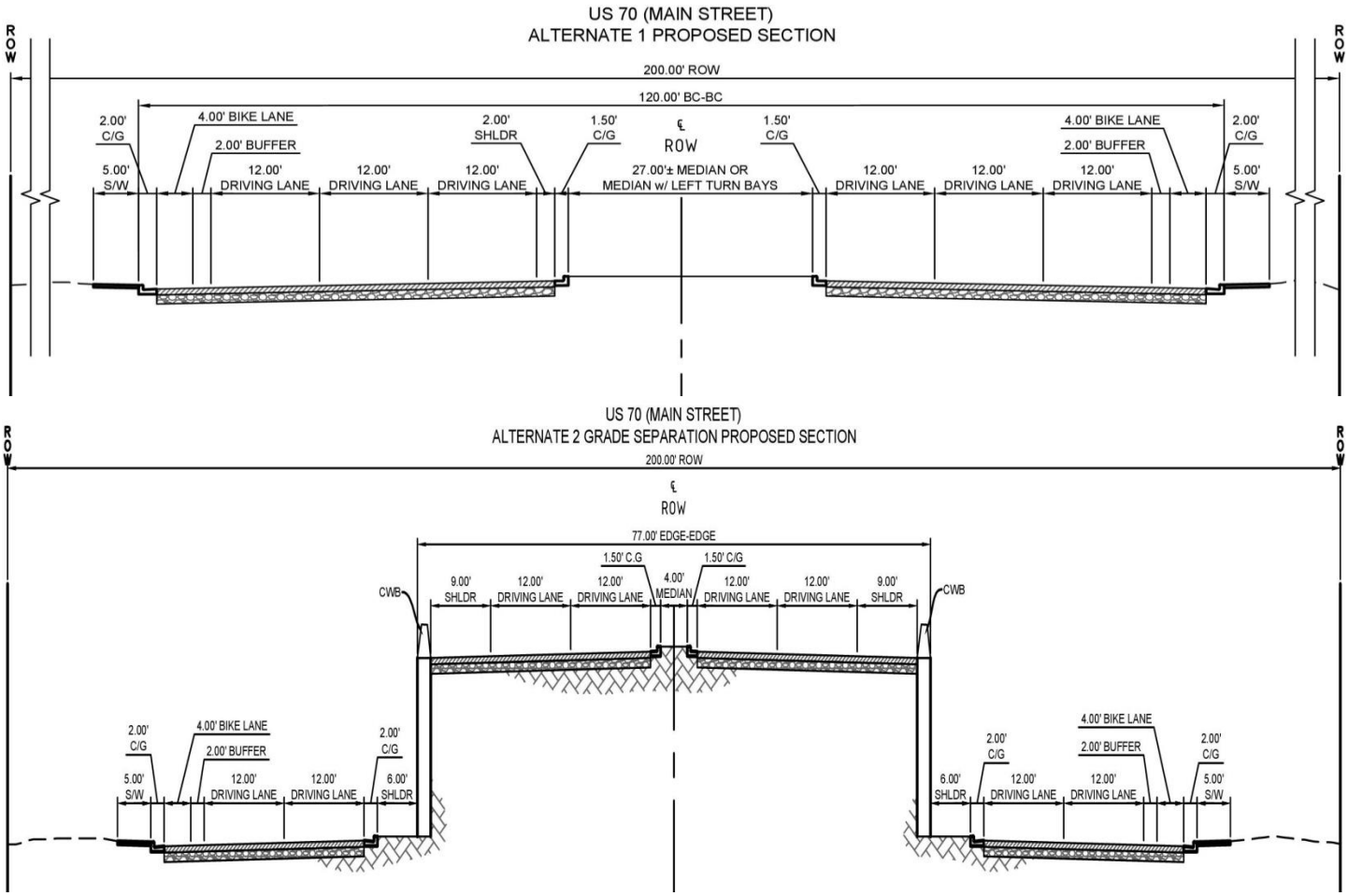
Figure 12: Alternate 1 - At-Grade Intersection Lane Configuration

Note: Dual left turns were modeled as a protected operation only due to safety concerns / Single left turns were modeled as protected-permissive / Any single left turn opposed by a dual left (i.e. Main Street at Elks Drive) was also modeled as a protected operation

C. Alternate 2 – Grade Separation at US 70/Elks Drive/Triviz Drive

Alternate 2 continues with the improvements presented within Alternate 1 from the BOP up to the east side of the Alameda Arroyo crossing structure. Continuing east the ramp and frontage road system begins to create the grade separation at the US 70/Elks Drive/Triviz Drive intersection. US 70 crosses over the top of Elks Drive/Triviz Drive. By removing the through traffic along Main Street, from the signalized intersection, the lanes can be reduced to two (2) lanes for east and westbound traffic respectively. Business access east from the arroyo crossing up to I-25 is provided via one-way two-lane frontage roads. Elks Drive and Triviz Drive access US 70 via on-ramps on either side of the grade separation. Dedicated u-turn ("Texas Turnarounds") lanes are also provided beneath the grade separation to accommodate these movements for both east and westbound traffic.

The best level of service lane configurations for the signalized intersections (Main Street/El Camino Real and Main Street/Elks Drive) are presented on the following page for Alternate 2 (Figure 13).



The first section shown on the previous page is the same section used in Alternate 1; however, for Alternate 2 this section would be implemented from the BOP to the Alameda Arroyo crossing structure. East from there the grade separation and frontage road system will be implemented. The grade separation would require a complete reconstruction of Main Street. As the grade separation and associated connections (ramps, flyovers, etc) are connected to the west side of I-25; the remaining eastbound section of Main Street would remain unaltered.

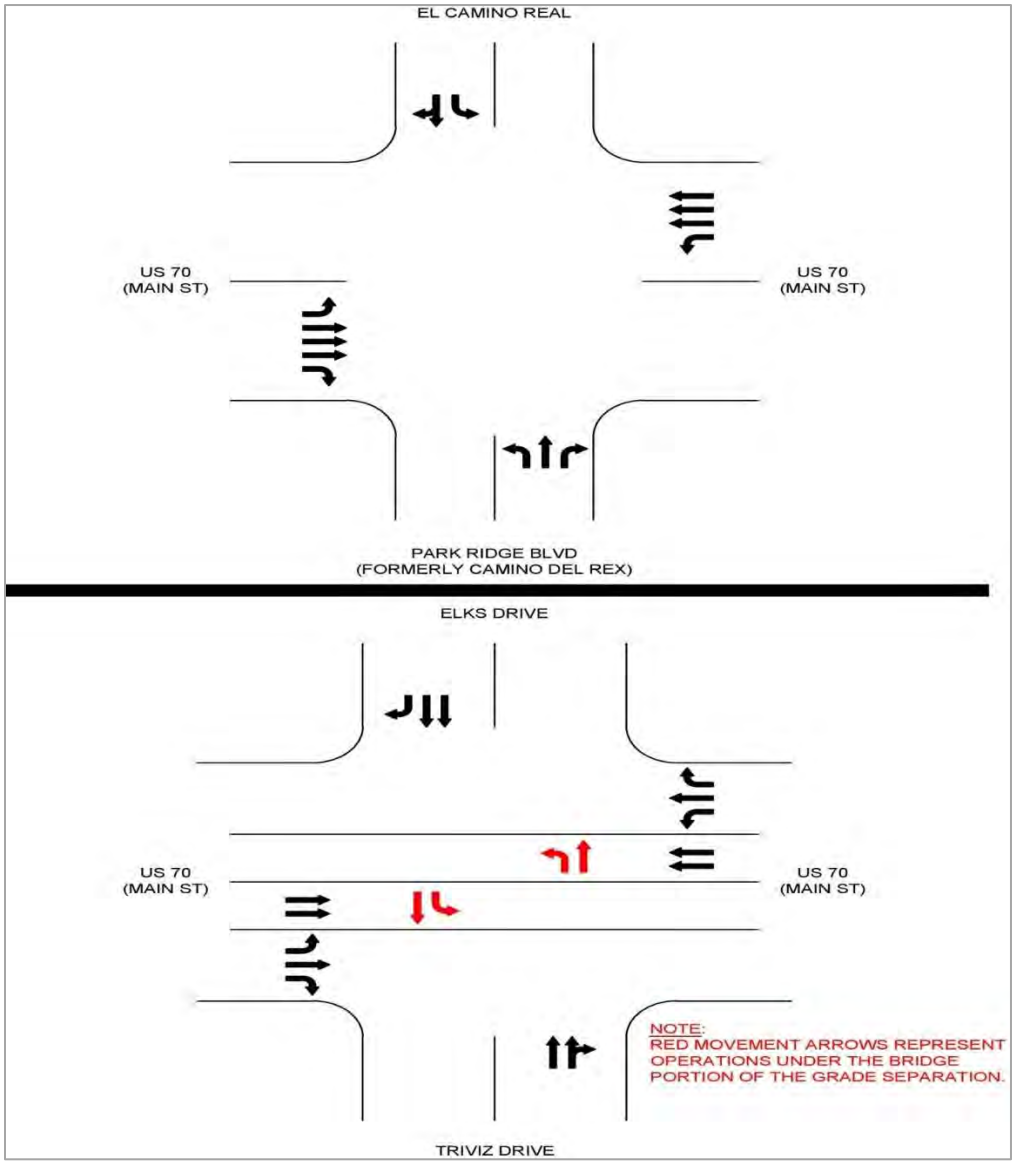


Figure 13: Alternate 2 - Grade Separation Lane Configuration

Both alternates 1 and 2 would be built in two phases due to high costs. Phase 1 would be from the BOP to Temple and phase 2 from Temple to I-25. The existing street from Temple to Elks/Triviz would include a mill and inlay of the existing pavement to match NMDOT's proposed mill and inlay from Elks/Triviz east on US 70.

SECTION VII: EVALUATION OF ALTERNATIVES

A. Evaluation Criteria

In order to determine the best alternative for improvements to Main Street (US 70) an evaluation matrix was created using several factors determined by the design team. The point value is assigned based on relative importance of the factor as determined by public and design team input. There are some important factors such as environmental, pedestrian and bicycle facilities, landscaping, and lighting not included as there are no real differences between alternates. The alternative with the highest point value will be the recommended alternative. The matrix is broken into four (4) major criteria with a number of contributing sub-factors influencing recommendations and findings from the evaluation criteria.

Each design alternative will be measured against the factors assumed for the No Build scenario to complete a comparative evaluation. These categories include:

1. Meets Purpose and Need

This first criterion is a measurement of how a particular alternative satisfies this project's purpose and need statement indicated in **Section V**. It also includes the ability of the alternative to encourage economic development.

2. Engineering Factors

A number of sub-factors will be examined in the "Engineering Factors" evaluation of each respective alternate as presented below:

Traffic Operations

- *Business Access* – this will evaluate how well each alternative either maintains existing access to business or improves said access.
- *Multimoda*l – used to evaluate each alternate's ability to provide secondary travel methods (aside from vehicular; such as sidewalks, bicycle lanes, and transit accessibility) along and throughout the amenities located along the subject corridor.
- *Level of Service (LOS) Improvements* – This criterion is a measure of how effectively a proposed design alternative will accommodate existing and projected 2040 traffic demands throughout the study corridor including connectivity within and outside the community; intersection improvements and level of service to move traffic and pedestrians within and through the corridor.

Safety

Main Street's existing safety evaluations presented previously in **Section III.G** offered reoccurring accidents types experienced under current conditions. This evaluation will look at how each relevant alternative improves these conflicts.

Constructability

The feasibility of the construction of each alternate should be evaluated closely to mitigate anticipated impacts to adjacent businesses/residents, impacts to traffic flow, and potential burdens to surrounding facilities as traffic is detoured around said construction. While each of these impacts are significant, construction costs and physical constraints also play into constructability of alternates.

Utility Impacts

As the study area lies within a heavily developed area of the City, a number of utility services are present along and transecting the corridor. It's reasonable to assume that any construction activity within study limits will impact utilities in some shape or form. Based upon that reasoning, each alternate's improvements shall assess how utilities are likely to be affected.

Right-of-Way (ROW) Requirements

The acquisition of ROW can be a lengthy and potentially costly endeavor. Each alternatives ROW requirements shall be outlined and weighed in concurrence with all other criteria.

Stakeholder Support

Stakeholder support typically plays hand-in-hand with business access; as support is likely garnered through maintaining or potentially improving a property's ingress/egress for their patrons. This particular measure may be a subjective evaluation as not all property owners along the subject corridor have offered their input.

3. Estimated Costs

This measure will be a quantitative estimate of the costs of each respective design alternative utilizing unit bid pricing from the most recent phase of the Main Street Reconstruction (LC00120 Letting Date November 18, 2016), Valley Drive Reconstruction (LC00160R Letting Date December 15, 2017), and NM 273 (McNutt) area (E100160 Letting Date May 9, 2018). Each of the conceptual level design alternatives provides sufficient detail to compare the alternates. However, due to a number of uncertainties unknown until the design process an eight-percent (8%) contingency will be incorporated into each Engineer's Opinion of Probable Construction Cost (EOPC).

4. Environmental Factors

Refer to **Section VII.E** for detailed evaluation of environmental impacts for each respective alternative. The primary environmental impact may be noise.

B. No-Build Alternative Evaluation

1. Meets Purpose and Need

The No-Build Alternative is not aligned with the principles established within the Purpose and Need Statement.

2. Engineering Factors

Traffic Operations

Business Access

Business Access within the No-Build Alternative will remain unaltered. Each business's driveway access will maintain current day entry/exit movements, but will be hampered by the projected traffic increase along Main Street.

Multimodal

Again, alternate transportation methods (multimodal) will not be improved under the No-Build Condition. Transit services will still provide service throughout the corridor, but bicyclists and pedestrians will be under serviced by a lack of facilities and/or intermittent amenities.

Level of Service (LOS) Improvements

The horizon year (2040) No-Build traffic analysis evaluated the 2040 traffic projection on the existing traffic lanes and assumes no construction of improvements. The results from the analysis are shown in **Table 15** for the signalized intersections, and **Table 16** for the unsignalized intersections. The analysis assumed optimized signal timing from Synchro, and included coordination between all the traffic signals from I-25 to Solano/Spitz. The Solano/Spitz intersection is not a part of this project, and is currently under construction; however, it was included in order to more accurately represent signal timing coordination that will be present in the field.

The analysis indicates that the signalized intersections at I-25 and Solano/Spitz will operate at an overall acceptable level of service with existing geometry (the analysis assumes the improvements under construction at Solano/Spitz are completed). There are some movements at the Solano/Spitz intersection that operate at LOS E or F, however overall the intersection operates at an acceptable level of service.

Table 15: 2040 No-Build Signalized Intersection Capacity Analysis Results

Signalized Intersections	2040 No-Build AM Peak			2040 No-Build PM Peak		
	Delay (sec.)	Max V/C	LOS	Delay (sec.)	Max V/C	LOS
US 70 & NB I-25 to WB US 70 Off-Ramp	10.7	0.83	B	8.8	0.72	A
US 70 & SB I-25 Off-Ramp	17.3	0.84	B	15.4	0.84	B
US 70 & Elks/Triviz	135.8	1.51	F[1]	151.1	1.41	F
US 70 & El Camino Real/Camino Del Rex	65.0	1.67	E[3]	80.1	1.48	F[2]
US 70 & Spitz/Solano	37.0	1.10	C[3]	32.2	0.86	C[4]

[1] – WB US 70 Through, SB Elks Left LOS F
[2] – EB US 70 Through, WB US 70 Left, SB El Camino Real Left LOS F
[3] – WB US 70 Through LOS F
[4] – EB US 70 Left, NB Solano Left and Through LOS E

The analysis does find the signalized intersections at Elks/Triviz and El Camino Real/Camino Del Rex operate at LOS E and LOS F in the no build condition. The improvements required to improve the level of service will be discussed in the next section.

Table 16: 2040 No-Build Unsignalized Intersection Results

Intersection/Movement	2040 No-Build AM Peak				2040 No-Build PM Peak			
	Delay	v/c	Queue (ft)*	LOS	Delay	v/c	Queue (ft)*	LOS
US 70 and Scanlon/Lowe's	**9.7**			**A**	**6.5**			**C**
NB Right	21.6	0.32	50	C	89.5	0.93	200	F
EB Left	51.0	0.05	25	F	45.2	0.09	25	E
WB Left	31.4	0.67	125	D	45.3	0.70	125	E
SB Approach	>300	1.8	150	F	93.3	0.51	75	F
US 70 and Temple	**16.1**			**C**	**1.2**			**A**
NB Left	**	**	**	F	149.5	0.11	25	F
NB Through/Right	15.1	0.01	0	B	24.7	0.15	25	C
EB Left	27.9	0.12	25	C	17.7	0.15	25	C
WB Left	13.0	0.01	0	B	20.5	0.06	25	C
SB Approach	>300	1.82	300	F	46.9	0.37	100	E
Elks and Lennox	**9.7**			**A**	**24.7**			**C**
NB Left	13.8	0.22	25	A	9.8	0.10	25	A
EB Left	229	0.60	50	F	352	1.38	200	F
EB Through/Right	20.5	0.31	50	C	21.9	0.31	50	C
WB Left	206	0.92	125	F	303	1.14	150	F
WB Through/Right	32.8	0.34	50	C	29.4	0.23	25	D
SB Left	8.5	0.02	25	A	10.5	0.06	25	B

** - HCM 95th Percentile queue rounded to next 25-foot increment*
*** - Volume exceeds capacity and the values cannot be calculated*

The unsignalized results show that the minor street left turns operate at poor levels of service. This is not surprising, given the volume on US 70. The alternatives analysis will evaluate these intersections with restricted access (i.e., no minor street left turns onto US 70), which will improve the LOS, but eliminate the left turns. Final determination of whether minor street left turns will be allowed will be evaluated by the study team as the project moves forward.

The intersection of Elk's Drive and Lenox Avenue operates at an overall acceptable level of service; however, the minor street left turns from Lenox onto Elk's operate with high delay and LOS F. If drivers perform a two-stage gap left turn maneuver, the delay reduces and the LOS improves to LOS E.

Figure 14 (at the end of this subsection) depicts the Level of Service at each intersection and various segments along US 70 (Main Street) for the current year and the 2040 Horizon Year.

Safety
Safety along the subject corridor will remain virtually the same; during peak day periods the safety may be lessened due to the projected increase of traffic.

Constructability
This criterion is not applicable to the No-Build Alternative.

Utility Impacts
The No-Build Alternative does not have associated construction activities and therefore no foreseeable utility impacts are expected.

Right-of-Way (ROW) Requirements
As facilities within study area would not be improved under the No-Build Alternate; there are no ROW requirements.

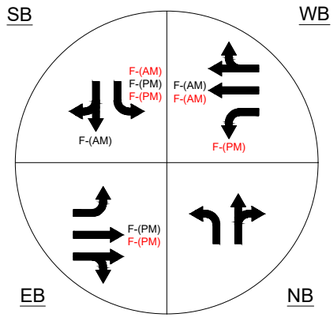
Stakeholder Support
Initially project stakeholders may support the No-Build conditions as their businesses will not be temporarily impacted by construction activities. However, as traffic volumes increase congestion increases, accident prevalence may increase, and ingress/egress becomes increasingly more difficult. These drawbacks are likely to encourage stakeholders to tolerate the temporary inconveniences to their businesses associated with construction and ultimately they will likely support the improvements presented in the presented alternatives.

3. Estimated Costs

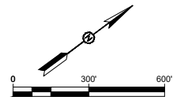
There are no anticipated construction costs, outside of general maintenance, associated with the No-Build Alternative.

4. Environmental Factors

Refer to **Section VII.E** for environmental impacts.



US 70 & EL CAMINO REAL/CAMINO DEL REX
EXISTING (2016) CONDITIONS LOS DETERMINATION
HORIZON YEAR (2040) NO-BUILD LOS DETERMINATION



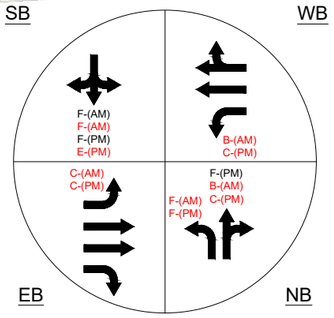
LEGEND

EXISTING (2016) CONDITIONS
SEGMENT LEVEL OF SERVICE
WB - LOS (AM) : LOS (PM)
EB - LOS (AM) : LOS (PM)

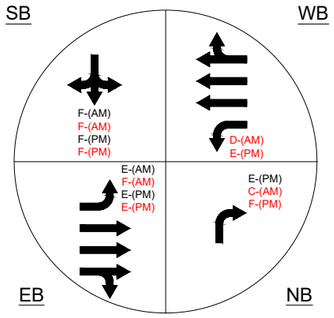
EXISTING (2016) CONDITIONS
INTERSECTION LEVEL OF SERVICE
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

HORIZON YEAR (2040) NO-BUILD
INTERSECTION LEVEL OF SERVICE
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

BUS STOP LOCATION



US 70 & TEMPLE STREET/VERIZON ENTRY
EXISTING (2016) CONDITIONS LOS DETERMINATION
HORIZON YEAR (2040) NO-BUILD LOS DETERMINATION



US 70 & SCANLON DRIVE/LOWES ENTRY
EXISTING (2016) CONDITIONS LOS DETERMINATION
HORIZON YEAR (2040) NO-BUILD LOS DETERMINATION

FIGURE 14
EXISTING LEVEL OF SERVICE MAP
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270

FIGURE 14 - EXISTING LEVEL OF SERVICE MAP

C. Alternate 1 – Six Lane Access Managed Per SAMM Requirements

1. Meets Purpose and Need

Alternate 1 partially meets the requirements provided in the Purpose and Need Statement. Multimodal (pedestrian, bicycle, transit) movement along Main Street will be vastly improved and vehicular access will be limited to appropriate spacing's outlined in the SAMM. The proposed access management will aide in safety improvements along the corridor by preventing a number of conflicting movements and it will prevent most (Temple Street will remain a full access) of the unrestricted left turn movements (potentially crossing up to 6 lanes of traffic) outside of signalized intersection.

While each of the signalized intersections function with an overall LOS of D or better during the peak movements; there are a number individual movements which operate deficiently (less than LOS D). Nearly the same situations occur for the unsignalized intersections within the study limits. These stop controlled access ways are hampered by the high through traffic volumes along Main Street preventing minor movements from occurring within a reasonable timeframe especially at full access points. As shown in **Tables 19** and **20** these accesses function much better in the left-in/right-in/right-out (LIRIRO) configurations.

Additionally, improvements to the minor streets (signalized intersections) require additional lanes and realignment to function accordingly. The aforementioned geometric improvements would require substantial ROW acquisition for ultimate build out.

2. Engineering Factor Assessment

Traffic Operations

Business Access

Alternate 1 maintains access to each property along the Main Street Corridor. Some of the access points will be modified from their current conditions (typically restricting cross traffic turning maneuvers at driveways which previously functioned as uncontrolled accesses). While property owners want their patrons to have unrestricted access throughout; safety and spacing issues arise which are discussed in additional detail below.

Multimodal

Alternate #1 addresses multimodal transportation in a number of beneficial ways. Transit services are continued along the corridor. Transit (bus) pullouts were considered but ultimately abandoned due to lengthy accel/merge lanes and heavy traffic conflicts preventing bus merging movements. The additional lane on each side will provide a place for the bus stop and still allow two lanes of traffic when a bus is stopped. Pedestrian access is improved by way of continuous sidewalks along both sides of the roadway from the beginning of the project (BOP) to the last business access along the corridor. Bicycle facilities are proposed along each side of the roadway from the BOP to the intersection with Elks Drive/Triviz Drive where they will be connected to existing outgoing facilities.

Level of Service (LOS) Improvements

As discussed above in **Section VII.B.2**, Horizon Year (2040) No-Build Traffic Analysis; the US 70 and Elks/Triviz intersection is anticipated to operate at LOS F in the 2040 AM and PM peak hours. To identify potential alternatives that would alleviate this forecast congestion, a series of improvements to the intersection were evaluated to determine if their implementation would reduce delay.

The improvements considered were:

- Adding a lane in each direction on US 70, resulting in a 6-lane US 70.
- In addition to the 6-lane US 70, adding a second left turn on Elks and Triviz.
- In addition to the improvements in number 2, add a dedicated northbound right turn lane on Triviz.
- In addition to the improvements in number 3, change the southbound right turn lane on Elk's to a shared through/right turn lane.
- In addition to the improvement in number 3, add a second southbound through lane on Elk's.
- In addition to the improvements in number 5, add a second westbound left turn lane

The results from the above improvements are summarized in **Table 17**.

Table 17: 2040 Elks/Triviz Improvement Alternatives Capacity Analysis

Signalized Intersections	2040 Build AM Peak			2040 Build PM Peak		
	Delay (sec.)	Max V/C	LOS	Delay (sec.)	Max V/C	LOS
6-Lanes US 70	42.8	1.05	D[1]	48.4	1.05	D[2]
6-Lanes US 70, plus Dual NB & SB Lefts	42.8	1.09	D[3]	36.7	0.87	D[4]
6-Lanes US 70, plus Dual NB & SB Lefts, plus NB Right	40.8	1.08	D[5]	35.5	0.86	D[6]
6-Lanes US 70, plus Dual NB & SB Lefts, NB Right, shared SB Thru/Right	56.6	1.39	E[7]	52.8	1.00	D[8]
6-Lanes US 70, plus Dual NB & SB Lefts, plus NB Right, 2 SB Through	48.1	1.30	D[9]	45.0	1.00	D[10]
6-Lanes US 70, plus Dual WB, NB, & SB Lefts, plus NB Right, 2 SB Through	48.1	1.30	D[9]	42.4	0.93	D[11]

[1] – SB Elk's Left and Right LOS F, NB Triviz Left and Thru, US 70 EB Left and SB Elk's Thru LOS E
[2] – WB US 70 Left and SB Elk's Left LOS F
[3] – SB Elk's Through and Right LOS F, US 70 EB Left and SB Elk's Left LOS E
[4] – EB US 70, NB Triviz Thru and Right, SB Elk's Left and Thru LOS E
[5] – SB Elk's Thru and Right LOS F, EB US 70 Left LOS E
[6] – EB US 70 Left, NB Triviz Left, SB Elk's Left and Thru LOS E
[7] – EB US 70 Left, SB Elk's Right LOS F, Elk's SB Thru and Right LOS E
[8] – EB US 70 Left, WB US 70 Left and SB Elk's Right LOS F, SB Elk's Left LOS E

[9] – SB Elk's Left and Right, LOS F, EB US 70 Left LOS E
[10] – WB US 70 Left LOS F, SB Elk's Left LOS E
[11] – US 70 WB Left, Elk's SB Left LOS E

It can be seen from **Table 17,** that at a minimum US 70 needs to be widened to 3 through lanes, with existing turn lanes, to achieve an overall intersection level of service of D, and that improvement will still result in multiple movements operating at LOS E and F in the peak hours.

The alternatives considered above in options 1 – 6 are considered the maximum that could be feasibly implemented at the intersection. The best overall intersection operations results from Option 3, adding the additional through lane on US 70 along with dual northbound and southbound lefts on Triviz and Elks and adding a dedicated northbound right turn lane on Triviz results in the overall lowest delay in the peak hours. Two movements result in a LOS F in the AM peak hour, and no movements LOS F in the PM peak hour. However, all the alternatives result in significant queue back-up for the southbound approach, with all alternatives having queues extending past Lenox Avenue. The intersection layouts for options 3 and 6 are shown in Appendix B. Traffic queues.are also shown on plans in appendix B for the two options.

At the MVMPO's request an analysis of various alternatives was performed using existing traffic (2016) volumes. Even assuming no growth, the various improvements resulted in overall level of services of D with some movements experiencing LOS of E or F. See Table 18 below.

Table 18: 2040 No Growth Scenario Evaluation – Triviz/Elks

Improvements Only on US 70	AM Peak Hour				PM Peak Hour			
	Overall LOS	Overall Delay	# Mvmts LOS E	# Mvmts LOS F	Overall LOS	Overall Delay	# Mvmts LOS E	# Mvmts LOS F
3 EB at Triviz (Convert EB Right to Thru/Right)	E	57.7	5	3	D	53.2	2	2
3 EB/WB at Triviz (Convert EB/WB Rights Thru/Rights)	D	45.2	3	3	E	58.8	1	2
3 EB/WB at Triviz, Dedicated EB/WB Rights at Triviz	E	55.4	3	1	D	41.9	2	0
4 EB/WB at Triviz , One Which is Thru/Right	C	34.9	2	1	D	47.0	2	0
4 EB/WB at Triviz, Dedicated EB/WB Rights at Triviz	C	27.4	0	0	D	38.4	1	0

(Continued on the following page)

Table 18 (Continued)								
Improvements on Both US 70 and Triviz/Elks	**AM Peak Hour**				**PM Peak Hour**			
	Overall LOS	**Overall Delay**	**# Mvmts LOS E**	**# Mvmts LOS F**	**Overall LOS**	**Overall Delay**	**# Mvmts LOS E**	**# Mvmts LOS F**
Dual NB/SB Lefts	D	51.6	4	3	D	43.3	4	2
Dual NM/SB Lefts, Dedicated NM Rights	D	49.8	5	1	D	38.7	5	1
Convert EB/WB Rights to Thru/Rights	D	42.7	4	2	E	58.2	1	3
Convert EB/WB Rights to Thru/Rights, Dedicated NB Right	D	41	4	1	E	57.9	1	3
Convert 3 EB/WB Thru, Dedicated EB/WB Rights, Dedicated NB Right	D	43.5	5	1	D	40.7	2	0

Signals optimized for each scenario
Impacts at other intersections not evaluated
Signals optimized for each scenario.2
Impacts at other intersections not evaluated

As discussed previously in **Section VII.B.2**, Horizon Year (2040) No-Build Traffic Analysis; the US 70 and El Camino Real intersection is anticipated to operate at LOS E and F in the 2040 AM and PM peak hours. Similar to the analysis of the intersection of US 70 and Elk's/Triviz, a series of alternative improvements were added to the existing geometry to evaluate intersection performance.

The improvements to the intersection that were considered are:

- Adding a lane in each direction on US 70, resulting in a 6-lane US 70.
- In addition to the 6-lane US 70, adding an eastbound right to serve the future Park Ridge development.
- In addition to all the improvements in number 2, adding a northbound right turn lane, to serve the future Park Ridge development.
- In addition to all the improvements in number 3, adding a second southbound left turn lane.
- In addition to all the improvements in number 4, adding a westbound right turn lane.

The results are shown in **Table 19**.

Table 19: 2040 El Camino Real Intersection Capacity Analyses

Signalized Intersections	2040 Build AM Peak			2040 Build PM Peak		
	Delay (sec.)	Max V/C	LOS	Delay (sec.)	Max V/C	LOS
6-Lanes US 70	23.3	0.89	C[1]	40.8	1.07	D[2]
6-Lanes US 70 plus EB Right	26.5	1.26	C[3]	42.1	1.24	D[4]
6-Lanes US 70, plus EB and NB Right	18.5	0.82	B[5]	32.3	0.96	C[6]
6-Lanes US 70, plus EB and NB Rights, and Dual SB Lefts	25.0	0.83	C[7]	28.3	0.91	C[8]
6-Lanes US 70, plus WB, EB, and NB Rights, and Dual SB Lefts	20.2	0.83	C[9]	27.7	0.91	C[10]

[1] – SB El Camino Real Left LOS E
[2] – SB El Camino Real Left LOS F, EB US 70 Right, WB US 70 Left LOS E
[3] – NB Park Ridge Right LOS F
[4] – NB Park Ridge LOS F, WB US 70, SB El Camino Real LOS E
[5] – No LOS E or F
[6] – WB US 70 LOS E
[7] – NB Park Ridge Left LOS E
[8] – WB US 70 Left, SB El Camino Real Left LOS E
[9] – NB Park Ridge Left, SB El Camino Real Left LOS E
[10] – WB US 70 Left, NB Park Ridge Left, SB El Camino Real Left LOS E

As with the Elk's/Triviz intersection, a 6-lane US 70 is required to achieve overall normally accepted levels of service at the El Camino Real intersection, however, as with Elk's/Triviz, there are movements LOS E or F. Option 3, the 6-lane US 70 with an eastbound and northbound right turn lane, results in the best overall performance. Adding a second southbound left turn lane increases overall delay and has poorer performance due to the protected left turn operation resulting in left turns having to wait longer with dual lefts than they have to with protected/permitted operation with a single left turn lane. Traffic queues are also shown on plans in appendix B for options 3 and 5.

Traffic Operations Temple Street

The intersection of Temple and US 70 was evaluated for two (2) scenarios. 1) full access with the 6-lane US 70, and 2) left-in/right-in/right-out (LIRIRO) restricted access, where there were no left turns allowed from Temple onto US 70. Left turns from US 70 onto Temple were still allowed in this analysis.

The results are shown in **Table 20**.

Table 20: 2040 Temple Street Improvements Unsignalized Intersection Results

Intersection/Movement	2040 Build AM Peak				2040 Build PM Peak			
	Delay	V/C	Queue* (ft)	LOS	Delay	V/C	Queue* (ft)	LOS
US 70 & Temple – Full Access	**38.5**			**E**	**2.0**			**A**
NB Left	**	**	**	F	326	0.23	25	F
NB Through/Right	16.8	0.01	0	C	29.1	0.18	25	D
EB Left	79.6	0.31	50	F	39.4	0.33	50	E
WB Left	21.1	0.02	25	C	46	0.14	25	E
SB Approach	>300	3.3	375	F	74.8	0.50	75	F
US 70 and Temple – LIRIRO	**4.0**			**A**	**1.2**			**A**
NB Right	16.8	0.01	0	C	29.6	0.19	25	D
EB Left	79.6	0.31	50	F	39.4	0.33	25	E
WB Left	21.1	0.02	25	C	46.0	0.14	25	E
SB Right	115.0	0.91	175	F	23.9	0.20	100	C

** - HCM 95th percentile queue rounded to the next 25-foot increment*
*** - Volume exceeds capacity and value cannot be calculated*

The results continue to show that the minor street left turns, if permitted, will operate at LOS F when US 70 is widened to 6 lanes. With restricted access and 6-lanes, the minor street traffic entering onto US 70 will operate with high delay during the peak hours. The left turns from US 70 onto the minor street will have poor performance in the peak hours, but are not expected to have significant queues.

The intersection of Scanlon/Lowe's Entrance and US 70 already has a 6-lane US 70 at the intersection. Therefore, the intersections were only evaluated for restricted access, where there were no left turns allowed from Scanlon or Lowe's onto US 70. Left turns from US 70 onto Scanlon and into Lowe's were still allowed in this analysis.

The results are shown in **Table 21**.

With restricted access and 6-lanes, the minor street traffic entering onto US 70 will operate with high delay during the peak hours. As with the Temple Street results, the left turns from US 70 onto the minor street will have poor performance in the peak hours, but are not expected to have significant queues.

Table 21: 2040 Scanlon Drive Improvements Unsignalized Intersection Results

Intersection/Movement	2040 Build AM Peak				2040 Build PM Peak			
	Delay	V/C	Queue* (ft)	LOS	Delay	V/C	Queue* (ft)	LOS
US 70 & Scanlon/Lowe's (LIRIRO)	**2.8**			**A**	**6.0**			**A**
NB Right	21.6	0.32	50	C	89.5	0.32	200	F
EB Left	51.0	0.05	25	F	45.2	0.05	25	E
WB Left	31.4	0.67	125	D	45.3	0.67	125	E
SB Right	36.6	0.28	50	E	31.1	1.8	25	D

** - HCM 95th percentile queue rounded to the next 25-foot increment*

Figures 15, 16, and 17 graphically present each intersection (with various lane configurations studied) and their respective LOS. Following the aforementioned figures, the Alternate 1 conceptual drawings are provided.

Safety

As mentioned earlier, Alternate 1 limits the number of unrestricted accesses along the corridor improving the overall safety along Main Street. Preventing turning movements from crossing a minimum of three (3) oncoming lanes while merging with traffic greatly reduces the likelihood of left-turn and side swipe accidents. Additionally, the introduction of the 3rd through lane in each direction should help to alleviate a number of the rear-end accidents experienced by placing some of the traffic anticipating turns into paralleling businesses into the outermost lane while leaving two (2) through lanes to carry most through traffic in each respective direction.

Constructability

Businesses along Main Street will be impacted by the construction activities associated with Alternate 1. Potentially, traffic control could limit the number of lanes conveying traffic, temporary restrict or close driveways, and lengthen travel times to area businesses. Potential detours could route prospective customers to alternate retail/business centers, but we anticipate once area residents and patrons acclimate to the construction activities they'll continue their accustomed practices within the study area accounting for travel inconveniences and delays.

Right-of-way (discussed further below) limitations also impacts Alternate 1 substantially. Elks Drive and Triviz Drive, minor City Arterials, carry a great deal of traffic to/from and across Main Street. These areas will be severely impacted by reconstruction activities at this at-grade intersection improvement.

Utility Impacts

Some utility impacts are anticipated with Alternate 1. The City of Las Cruces, as well as other providers, may choose to upgrade and/or replace their existing facilities within the corridor while construction is underway to prevent future service interruptions to complete such activities. Municipal separate storm sewer system (MS4) requirements will require capture and likely conveyance facilities to retain a 90th percentile storm event. The respective storm events vary between re-construction and new construction activities and additional information can be found in **Appendix C**. Widening of the existing roadway section proposed in Alternate 1 may also require localized grading and culvert improvements to maintain stormwater conveyance within the existing bar ditch system along Main Street.

Lighting, signalization, intelligent transportation systems (ITS), and signal interconnect are also proposed within Alternate 1 and will require installation of these facilities along the corridor.

ROW Requirements

Option 6A in **Appendix B** shows the proposed widening at the Main Street/Elks Drive/Triviz Drive intersection as well as widening along each of the side streets to accommodate the proposed improvements. Substantial ROW acquisition would be required from the following properties:

- Walgreens Pharmacy
- Valero Gas Station (slight ROW impact)
- Chacon Construction
- Grace Covenant Church
- Pic Quik Gas Station
- CVS Pharmacy
- Chevron Gas Station
- Baird's Automotive (slight ROW impact)

The most substantial impacts fall upon the Pic Quik Station (likely enough property acquisition to require complete removal of fueling facilities), CVS Pharmacy (likely requiring enough property acquisition requiring removal of a complete row of parking stalls as well as a drive aisle), and the Walgreens Pharmacy (also requiring removal of a number of parking stalls and potentially a drive aisle).

Stakeholder Support

Stakeholder support is expected to be an equal mixture of positive and negative for Alternate 1. Area businesses in the direct vicinity of the Main Street/Elks Drive/Triviz Drive will be greatly impacted via ROW takes and reconstruction activities. There is a real potential for strong and unrelenting opposition from these businesses as they'll be reluctant to relocate or adversely impacted by lost parking facilities.

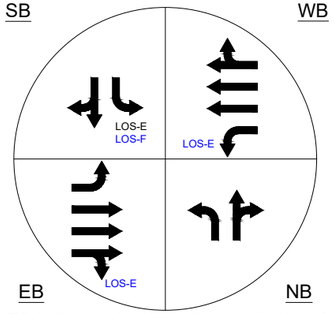
Area residents, businesses, and patrons beyond the Elks Drive intersection are likely to resist construction activities delaying daily activities, but are projected to support the improvements based on safety improvements, alternate transportation facilities, and ultimately lessened traffic congestion/improved cycle delays at intersections.

3. Estimated Costs

The total estimated construction cost for this alternate is **$30 million** (See appendix E)
Phase 1 (BOP to Temple) of this alternate is estimated at **$22 million**.
Right of way costs for Alternate 1 is estimated at **$2 million**.

4. Environmental Factors

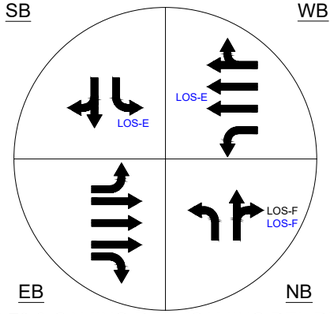
Refer to **Section VII.E** for environmental impacts.



US 70 & CAMINO REAL/CAMINO DEL REX

ALTERNATE 1 - 2040 LOS SUMMARY

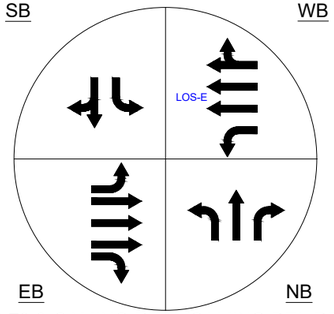
DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
23.3	0.89	C
INTERSECTION 2040 - PM		
40.8	1.07	D



US 70 & CAMINO REAL/CAMINO DEL REX

ALTERNATE 2 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
26.5	1.26	C
INTERSECTION 2040 - PM		
42.1	1.24	D



US 70 & CAMINO REAL/CAMINO DEL REX

ALTERNATE 3 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
18.5	0.82	B
INTERSECTION 2040 - PM		
32.3	0.96	C

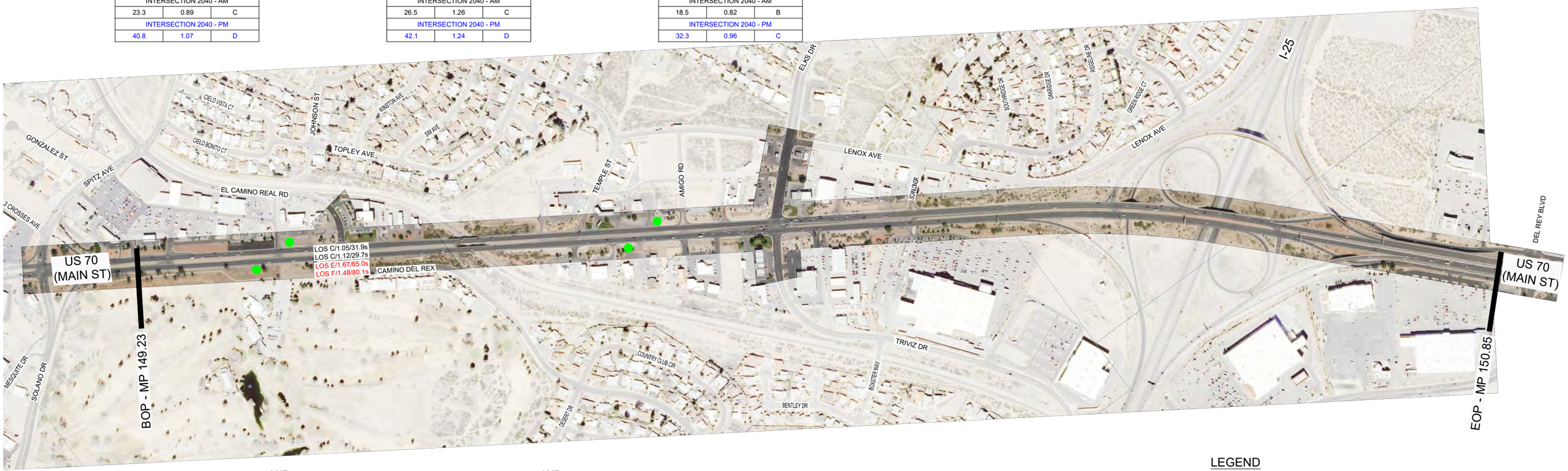
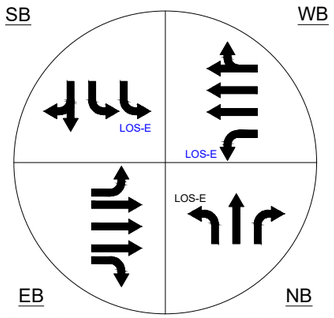


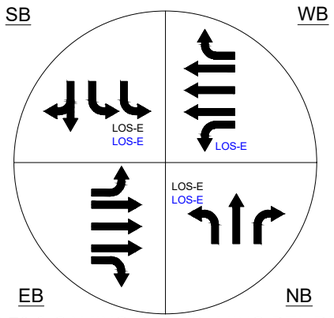
FIGURE 15 - US 70 & CAMINO REAL-CAMINO DEL REX LOS MAP



US 70 & CAMINO REAL/CAMINO DEL REX

ALTERNATE 4 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
25.0	0.83	C
INTERSECTION 2040 - PM		
28.3	0.91	C



US 70 & CAMINO REAL/CAMINO DEL REX

ALTERNATE 5 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
20.2	0.83	C
INTERSECTION 2040 - PM		
27.7	0.91	C

LEGEND

EXISTING (2016) CONDITIONS
INTERSECTION LEVEL OF SERVICE

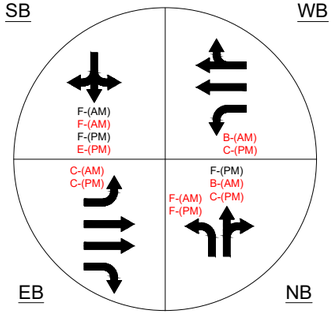
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

HORIZON YEAR (2040) NO-BUILD
INTERSECTION LEVEL OF SERVICE

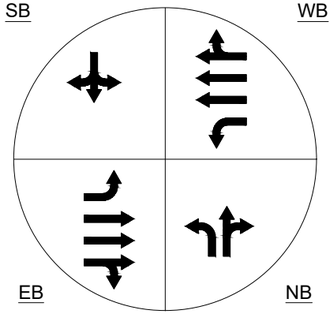
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

BUS STOP LOCATION

FIGURE 15
US 70 & CAMINO REAL-CAMINO DEL REX LOS MAP
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270



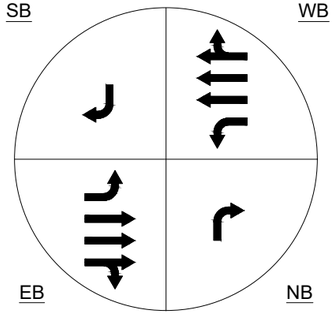
US 70 & TEMPLE STREET/VERIZON ENTRY
EXISTING (2016) CONDITIONS LOS DETERMINATION
HORIZON YEAR (2040) NO-BUILD LOS DETERMINATION



US 70 & TEMPLE STREET/VERIZON ENTRY
ALTERNATE #1 - FULL ACCESS
HORIZON YEAR (2040) LOS DETERMINATION - AM
HORIZON YEAR (2040) LOS DETERMINATION - PM

MOVEMENT	DELAY (sec.)	V/C	QUEUE* (FT)	LOS
INTERSECTION 2040 - AM				
US 70 & TEMPLE - FULL ACCESS	38.5			E
NB LEFT	**	**	**	F
NB THROUGH/RIGHT	16.8	0.01	0	C
EB LEFT	79.6	0.31	50	C
WB LEFT	21.1	0.02	25	C
SB APPROACH	>300	3.3	375	F
INTERSECTION 2040 - PM				
US 70 & TEMPLE - FULL ACCESS	2.0			A
NB LEFT	326	0.23	25	F
NB THROUGH/RIGHT	29.1	0.18	25	D
EB LEFT	39.4	0.33	50	E
WB LEFT	46	0.14	25	E
SB APPROACH	74.8	0.50	75	F

* - HCM 95TH PERCENTILE QUEUE ROUNDED TO NEXT 25-FOOT INCREMENT
**- VOLUME EXCEEDS CAPACITY AND VALUE CANNON BE CALCULATED



US 70 & TEMPLE STREET/VERIZON ENTRY
ALTERNATE #2 - LEFT-IN/RIGHT-IN/RIGHT-OUT (LIRIRO)
HORIZON YEAR (2040) LOS DETERMINATION - AM
HORIZON YEAR (2040) LOS DETERMINATION - PM

MOVEMENT	DELAY (sec.)	V/C	QUEUE* (FT)	LOS
INTERSECTION 2040 - AM				
US 70 & TEMPLE - LIRIRO	4.0			A
NB RIGHT	16.8	0.01	0	C
EB LEFT	79.6	0.31	50	F
WB LEFT	21.1	0.02	25	C
SB RIGHT	115.0	3.3	375	F
INTERSECTION 2040 - PM				
US 70 & TEMPLE - LIRIRO	1.2			A
NB RIGHT	29.6	0.19	25	D
EB LEFT	39.4	0.33	25	E
WB LEFT	46	0.14	25	E
SB RIGHT	23.9	0.20	100	C

* - HCM 95TH PERCENTILE QUEUE ROUNDED TO NEXT 25-FOOT INCREMENT

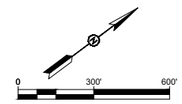


FIGURE 16 - US 70 & TEMPLE ST-SCANLON DR LOS MAP

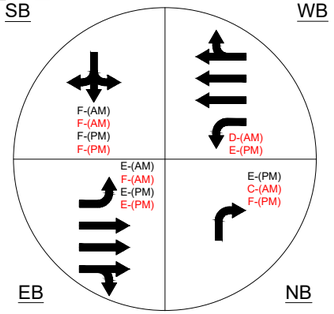
LEGEND

EXISTING (2016) CONDITIONS
SEGMENT LEVEL OF SERVICE
WB - LOS (AM) : LOS (PM)
EB - LOS (AM) : LOS (PM)

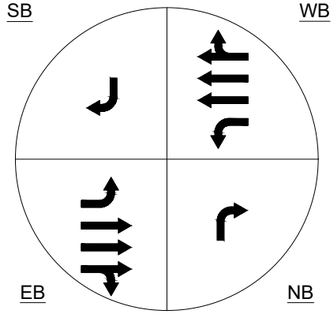
EXISTING (2016) CONDITIONS
INTERSECTION LEVEL OF SERVICE
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

HORIZON YEAR (2040) NO-BUILD
INTERSECTION LEVEL OF SERVICE
LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

BUS STOP LOCATION



US 70 & SCANLON DRIVE/LOWES ENTRY
EXISTING (2016) CONDITIONS LOS DETERMINATION
HORIZON YEAR (2040) NO-BUILD LOS DETERMINATION

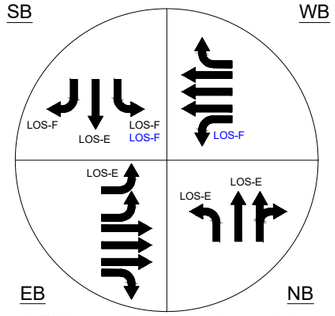


US 70 & SCANLON DRIVE/LOWES ENTRY
ALTERNATE #1 - LEFT-IN/RIGHT-IN/RIGHT-OUT (LIRIRO)
HORIZON YEAR (2040) LOS DETERMINATION - AM
HORIZON YEAR (2040) LOS DETERMINATION - PM

MOVEMENT	DELAY (sec.)	V/C	QUEUE* (FT)	LOS
INTERSECTION 2040 - AM				
US 70 & SCANLON/LOWE'S - LIRIRO	6.0			A
NB RIGHT	89.5	0.32	200	F
EB LEFT	45.2	0.05	25	E
WB LEFT	45.3	0.67	125	E
SB RIGHT	31.1	1.8	25	D
INTERSECTION 2040 - PM				
US 70 & SCANLON/LOWE'S - LIRIRO	2.8			A
NB RIGHT	21.6	0.32	50	C
EB LEFT	51.0	0.05	25	F
WB LEFT	31.4	0.67	125	D
SB RIGHT	36.6	0.28	50	E

* - HCM 95TH PERCENTILE QUEUE ROUNDED TO NEXT 25-FOOT INCREMENT

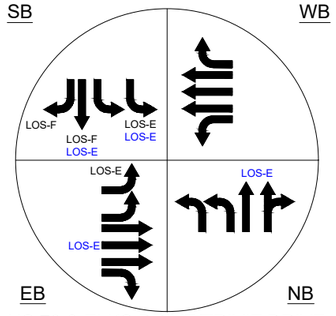
FIGURE 16
US 70 & TEMPLE ST-SCANLON DR LOS MAP
TEMPLE STREET & SCANLON DRIVE
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270



US 70 & ELKS DRIVE/TRIVIZ DRIVE

ALTERNATE 1 - 2040 LOS SUMMARY

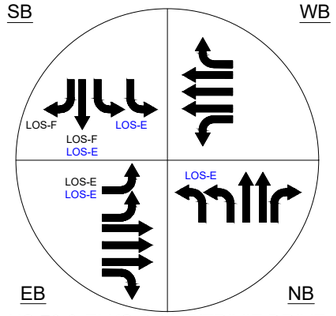
DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
42.8	1.05	D
INTERSECTION 2040 - PM		
48.4	1.05	D



US 70 & ELKS DRIVE/TRIVIZ DRIVE

ALTERNATE 2 - 2040 LOS SUMMARY

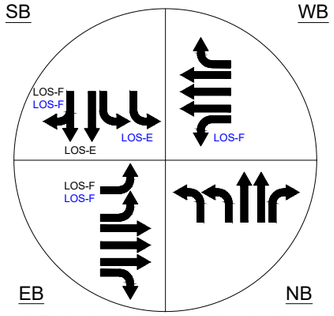
DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
42.8	1.09	D
INTERSECTION 2040 - PM		
36.7	0.87	D



US 70 & ELKS DRIVE/TRIVIZ DRIVE

ALTERNATE 3 - 2040 LOS SUMMARY

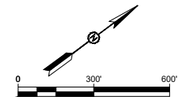
DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
40.8	1.08	D
INTERSECTION 2040 - PM		
35.5	0.86	D



US 70 & ELKS DRIVE/TRIVIZ DRIVE

ALTERNATE 4 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
56.6	1.39	E
INTERSECTION 2040 - PM		
52.8	1.00	D



LEGEND

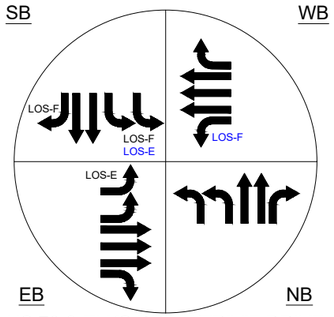
EXISTING (2016) CONDITIONS
INTERSECTION LEVEL OF SERVICE

LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

HORIZON YEAR (2040) NO-BUILD
INTERSECTION LEVEL OF SERVICE

LOS #/#.##/##.#s AM LOS # / V/C / AVG DELAY
LOS #/#.##/##.#s PM LOS # / V/C / AVG DELAY

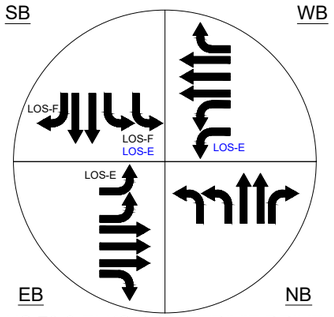
BUS STOP LOCATION



US 70 & ELKS DRIVE/TRIVIZ DRIVE

ALTERNATE 5 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
48.1	1.30	D
INTERSECTION 2040 - PM		
45.0	1.00	D



US 70 & ELKS DRIVE/TRIVIZ DRIVE

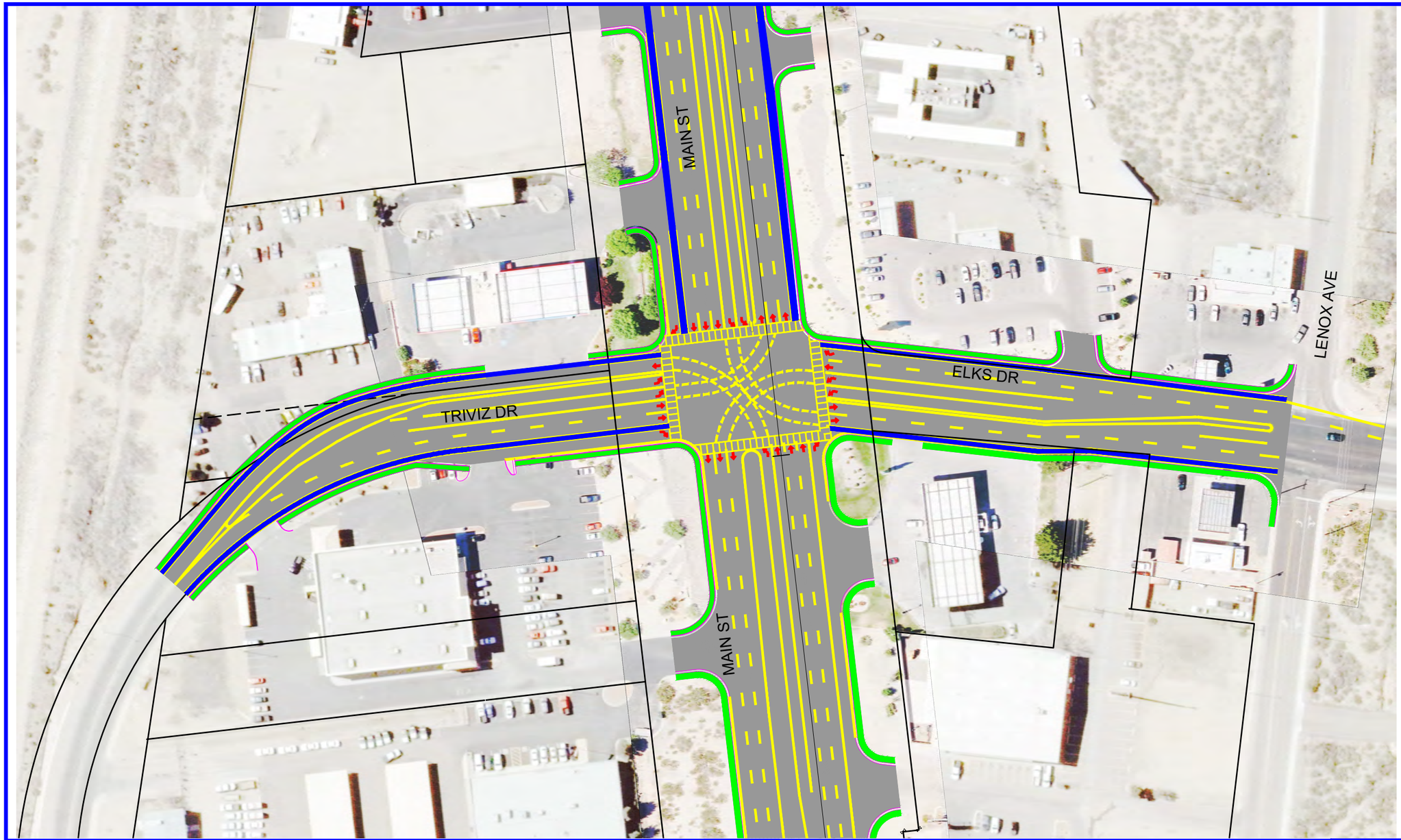
ALTERNATE 6 - 2040 LOS SUMMARY

DELAY (sec.)	MAX V/C	LOS
INTERSECTION 2040 - AM		
48.1	1.30	D
INTERSECTION 2040 - PM		
42.4	0.93	D

FIGURE 17
US 70 & ELKS DR-TRIVIZ DR LOS MAP
US 70 ROADWAY IMPROVEMENT SERVICES
(MP 149.23 TO MP 150.85)
CN LC00270

FIGURE 17 - US 70 & ELKS DR-TRIVIZ DR LOS MAP

PROJECT CONTROL NUMBER: CN LC00270

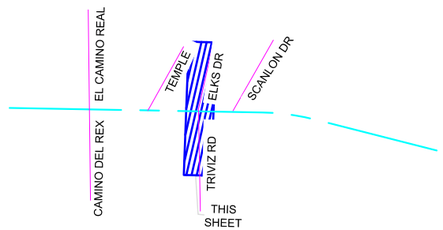


LEGEND

- PROPOSED CURB & GUTTER
- PROPOSED 5' SIDEWALK
- PROPOSED LANE
- SURVEY ℄
- CONSTRUCTION ℄
- ROW LINE
- BIKE LANE

0 100' 200'

KEY MAP



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NO.	DESCRIPTION	DATE	BY
4			
3			
2			
1			

REVISIONS (OR CHANGE NOTICES)

NEW MEXICO DEPARTMENT
OF TRANSPORTATION

US 70 (MAIN STREET)
ALTERNATE I
PLAN ELKS & TRIVIZ
AT GRADE

TONY AGUIRRE
12-Mar-18

Drawing File: L:\SEC---PROJECTS\816202 LC MAIN STREET\ENGINEERING\CADD\PLANSET\PLAN ELKS & TRIVIZ.DWG
2:54 PM

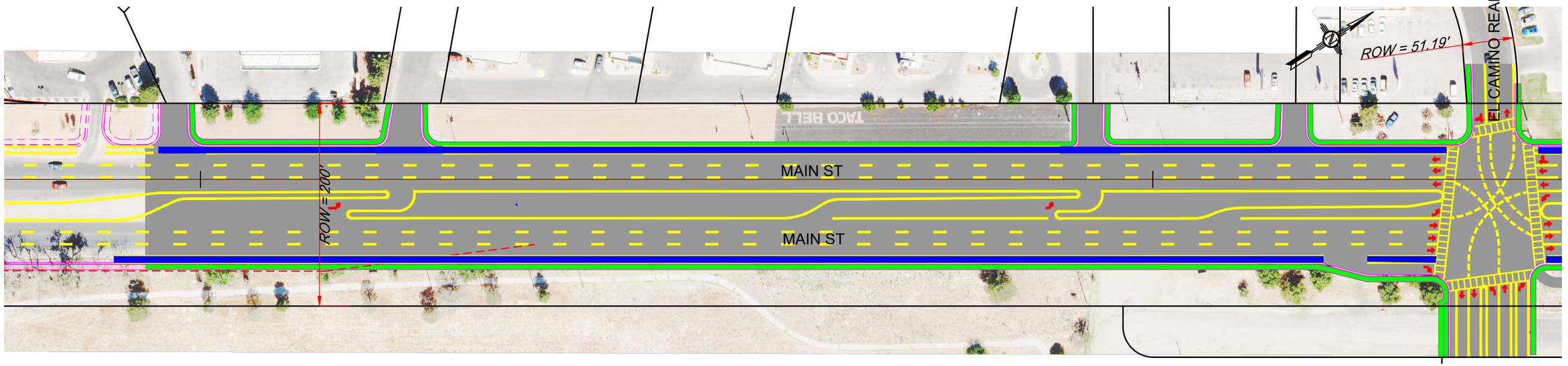
DESIGNED BY: PRJ DESIGNER

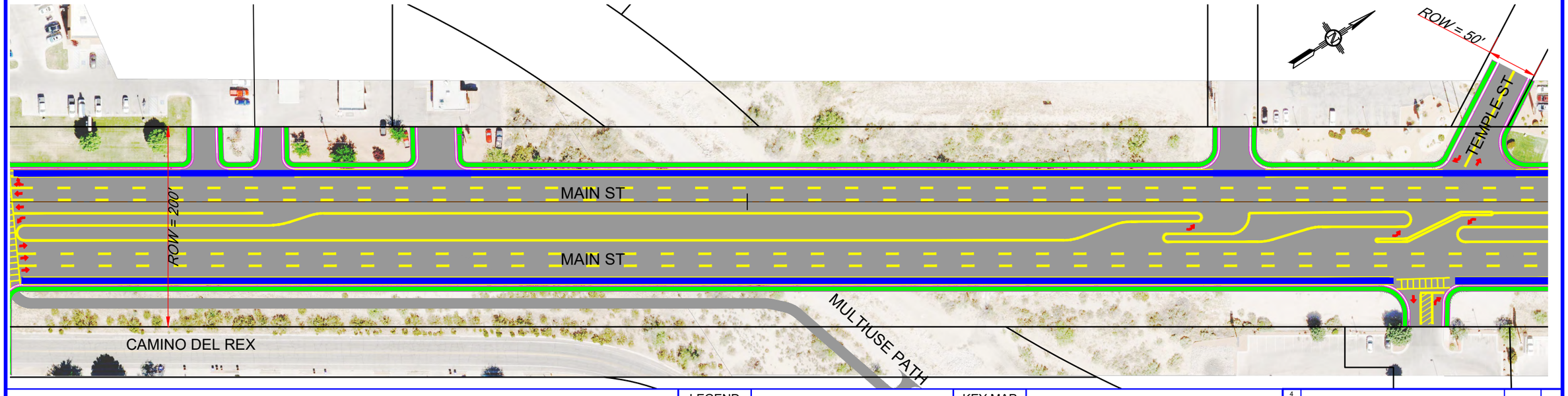
NEW MEXICO PROJECT NO. CN LC00270

DRAWING SCALE: 1"=100'

SHEET NO. ALTERNATE I

PROJECT CONTROL NUMBER: CN LC00270





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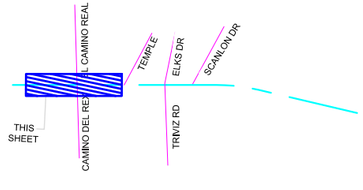
0 100' 200'

LEGEND

- PROPOSED CURB & GUTTER
- PROPOSED 5' SIDEWALK
- PROPOSED LANE
- SURVEY ℄
- CONSTRUCTION ℄
- ROW LINE
- BIKE LANE

KEY MAP



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REVISIONS (OR CHANGE NOTICES)

NEW MEXICO DEPARTMENT
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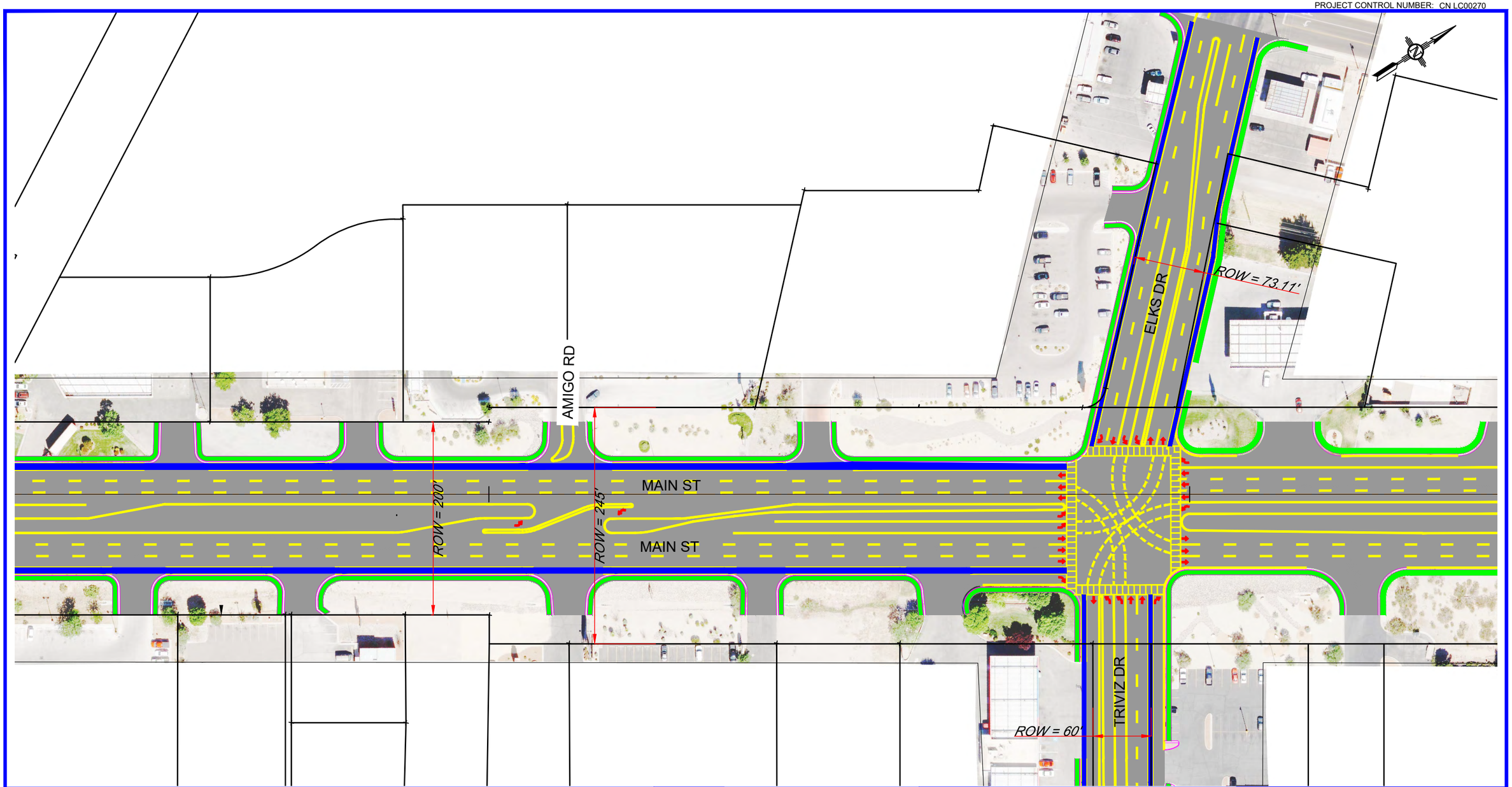
US 70 (MAIN STREET)
ALTERNATE I
PLAN STA 219+00 TO 248+00

PROJECT CONTROL NUMBER: CN LC00270



LEGEND

- PROPOSED CURB & GUTTER
- PROPOSED 5' SIDEWALK
- PROPOSED LANE
- SURVEY ℄
- CONSTRUCTION ℄
- ROW LINE
- BIKE LANE

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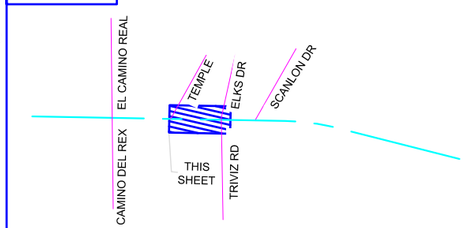
KEY MAP



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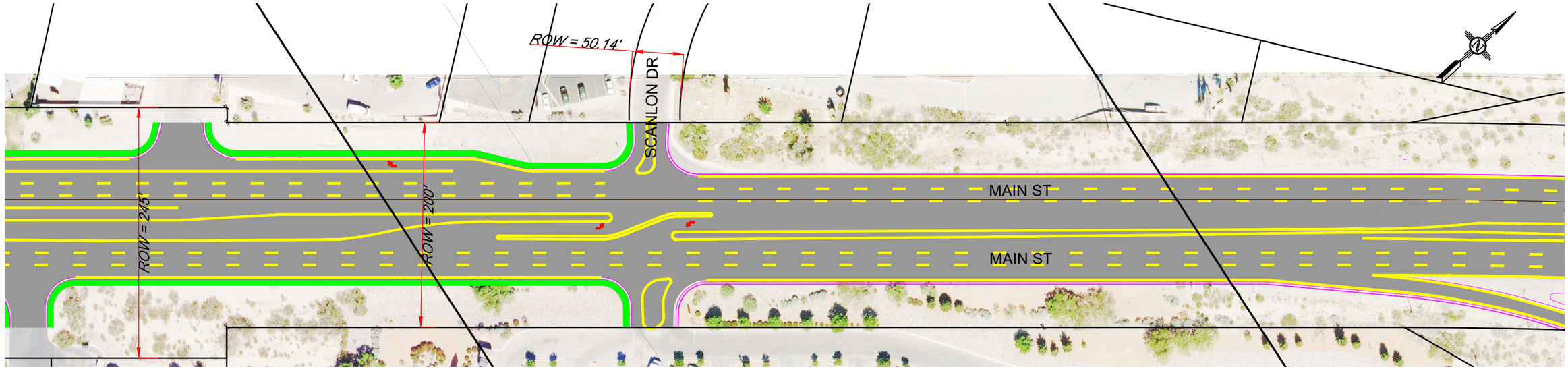
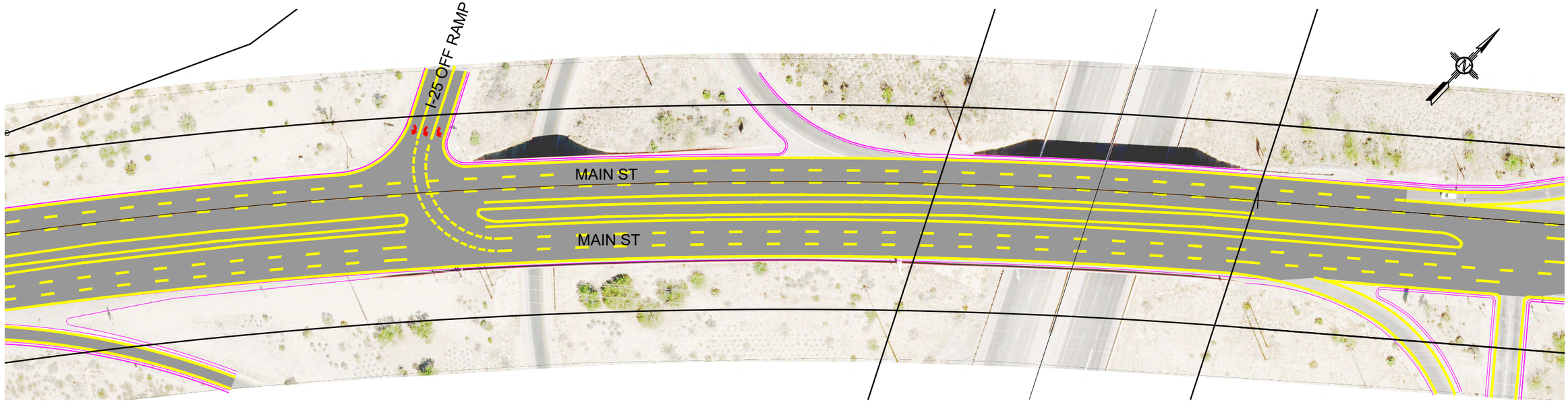
US 70 (MAIN STREET)
ALTERNATE I
PLAN STA 248+00 TO 263+00

PROJECT CONTROL NUMBER: CN LC00270

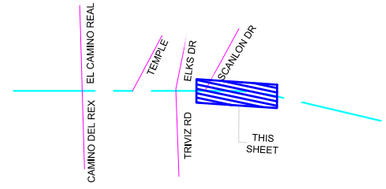




LEGEND

- PROPOSED CURB & GUTTER
- PROPOSED 5' SIDEWALK
- PROPOSED LANE
- SURVEY ℄
- CONSTRUCTION ℄
- ROW LINE
- BIKE LANE

KEY MAP



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SHEET NO. ALTERNATE I

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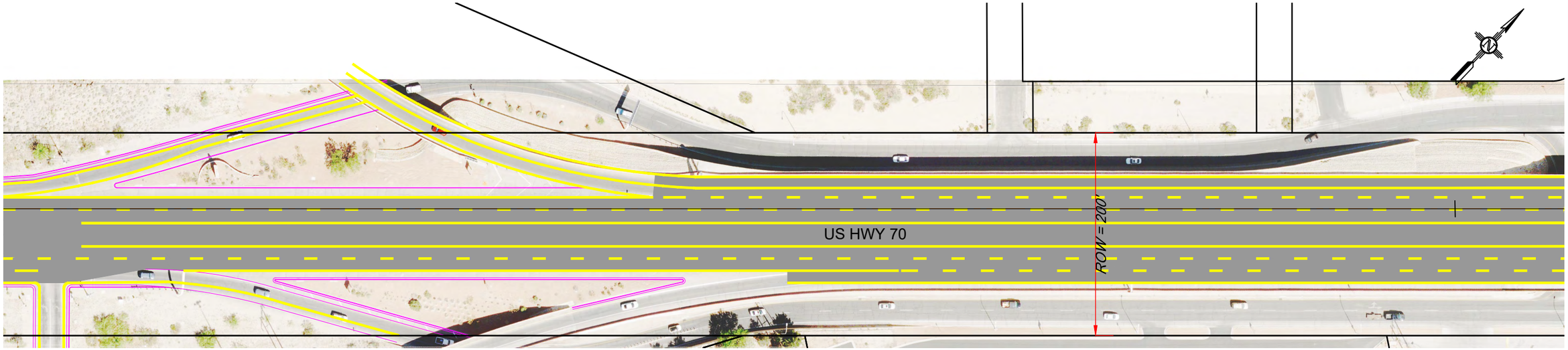

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LEGEND

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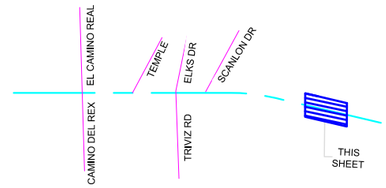
KEY MAP



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US 70 (MAIN STREET)
ALTERNATE I
PLAN STA 292+00 TO 307+00

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DRAWING SCALE: 1"=100'

SHEET NO. ALTERNATE I

D. Alternate 2 – Grade Separation at US 70/Elks Drive/Triviz Drive

1. Meets Purpose and Need

Alternate 2 most closely satisfies each aspect presented within the Purpose and Need Statement. Traffic flow is greatly improved via the grade separation at Elks on both Main Street and intersecting minor streets. Queuing durations and lengths along Elks Drive would be reduced immensely as a result of the grade separation as well. The proposed frontage road system, concurrent with the grade separation, would provide facilities for transit, bicyclists, and pedestrians away from higher speed outgoing/incoming traffic along the Main Street through lanes. As users become acclimated to the frontage road system and u-turn maneuvers business access should function seamlessly via right-in/right-out ingress/egress at their respective businesses.

2. Engineering Factor Assessment

Traffic Operations

Business Access

Like the previous alternate, Alternate 2 will restrict full access driveways from the BOP to Alameda Arroyo in accordance with the spacing requirements outlined in the SAMM. All the unsignalized accesses along Main Street will function as left-in/right-in/right-out (LIRIRO) except those along the new frontage road system from Temple to Scanlon which will be right-in/right-out only. Again, as users become acclimated to the frontage road system and u-turn maneuvers business access should function seamlessly via right-in/right-out ingress/egress at their respective businesses.

Multimodal

Similar to Alternate 1, the improvements suggested in Alternate 2 greatly increase opportunities for multimodal transportation throughout the corridor. Alternate 2 mimics Alternate 1 improvements from the beginning of the project (BOP) to the Alameda Arroyo crossing structure with improvements including continuous sidewalks and bicycle lanes on each side of the proposed roadway.

From the Arroyo structure east, the grade separation and frontage road system are employed. The sidewalks and bicycle lanes will converge/diverge from the section proposed in Alternate 1 onto the Alternate 2 frontage road system. Again, the bicycle lanes will connect to existing facilities along Elks Drive and Triviz Drive. The sidewalks will serve all businesses along the corridor (terminating at Scanlon Drive and the Lowe's driveway). Transit facilities will also be routed onto the frontage roads to serve area businesses and then can merge back onto eastbound US 70 on the west side of the I-25 interchange. The bicycle lanes and bus stops should function safer since they will be on the frontage roads where speeds will be lower and the traffic volume lower.

Level of Service (LOS) Improvement

Due to the poor performance of the Elks/Triviz intersection in its current at-grade configuration, an analysis was performed to evaluate a grade-separated interchange at the intersection. A tight-diamond interchange was selected due to right-of-way constraints. Also, due to existing grade, US 70/Main Street goes over the intersection and lands, west of the Temple intersection. This configuration results in frontage roads serving the business between Scanlon and Lowe's on the east, to Temple on the west.

The 2040 forecast traffic volumes at the intersection were modified to be consistent with the turning movements at a diamond interchange. To account for traffic to the businesses along the new frontage roads, a volume of 350 vehicles in the peak hour was added to the intersection. This is considered a conservative estimate. Additional analysis would be required to evaluate actual driveway counts or trip generation estimates for these businesses.

The forecast level of service for the interchange alternative is shown below.

Table 22: 2040 Elks/Triviz Diamond Interchange Alternative Capacity Analysis

Signalized Intersections	2040 Build AM Peak			2040 Build PM Peak		
	Delay (sec.)	Max V/C	LOS	Delay (sec.)	Max V/C	LOS
Westbound Ramp	13.4	0.68	B	18.1	0.68	B
Eastbound Ramp	12.3	0.75	B	24.3	0.76	C

It can be seen the level of service is much better than the at-grade intersection. In addition, the southbound queue does not back up past Lenox Avenue, although it will on occasion back-up past the entrance to the CVS Pharmacy.

The lanes at each intersection required to achieve this level of service is shown below.

Table 23: Elks/Triviz Diamond Interchange Lane Configuration

Location	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Westbound Ramp	-	-	-	1	1	1	1	2	-	-	2	1
Eastbound Ramp	1	1	1	1	1	1	1	2	<	1	1	-

The number of lanes required on US 70 was also evaluated. The maximum volume anticipated for either direction in the peak hour is approximately 1,700 vph. HCM multilane highway analysis indicates that 2-lanes in each direction can accommodate the forecast traffic at acceptable levels of service (LOS B).

The conceptual layout for Alternate 2 can be seen in **Figure 19** at the end of this sub-section.

Safety

Alternate 2 continues the safety improvements measures suggested with Alternate 1. Alternate 2 also benefits from the grade separation which removes US 70 through traffic from the turning vehicle conflicts; thereby further reducing the opportunities for right-angle and rear-end crashes.

Constructability

Businesses along Main Street will be impacted by the construction activities associated with Alternate 2. Potentially construction traffic control could limit the number of lanes conveying traffic, temporary restrict or close driveways, and lengthen travel times to area businesses. Potential detours could route prospective customers to alternate retail/business centers, but we anticipate once area residents and patrons acclimate to the construction activities they'll continue their accustomed practices within the study area accounting for travel inconveniences and delays.

Substantial costs and construction activity is expected with the grade separation. A variety of construction phasing and intricate traffic control is expected for this construction.

Utility Impacts

Utility impacts are anticipated with Alternate 2. The City of Las Cruces, as well as other providers, may choose to upgrade and/or replace their existing facilities within the corridor while construction is underway to prevent future service interruptions to complete such activities. Municipal separate storm sewer system (MS4) requirements will require capture and likely conveyance facilities to retain a percentile storm event. The respective storm events vary between re-construction and new construction activities and additional information can be found in **Appendix C**. Adding the frontage roads and grade separation to the existing roadway section proposed in Alternate 2 may also require localized grading and culvert improvements to maintain stormwater conveyance within the existing bar ditch system along Main Street.

Lighting, signalization, intelligent transportation systems (ITS), and signal interconnect are also proposed within Alternate 2 and will require installation of these facilities along the corridor.

Right-of-Way (ROW) Requirements

The ROW requirements associated with Alternate 2 are not as extensive as the previous alternate. However, as can be seen in **Figure 19** to align the on-grade portion (Elks Drive and Triviz Drive) of the grade separation, ROW acquisition will still be required but less than that required in Alternate 1. In addition to the Elks and Triviz areas, ROW acquisition will be required at the frontage road braided ramp accessing US 70 eastbound and the southbound connection to I-25 as well as the flyover from eastbound Main Street to southbound I-25.

It may be possible to utilize a significant portion of both Elks Drive and Triviz Drive on either side of the grade separation. This would be evaluated further during the design process, but could significantly reduce ROW acquisition in this area.

Stakeholder Support

Stakeholder support is expected to be higher than that associated with Alternate 1 as fewer businesses in the Main Street/Elks Drive/Triviz Drive intersection area are negatively impacted under Alternate 2. Initially business goers may oppose the frontage road business access due to perceived travel times to access businesses on the north and south sides of Main Street, but once familiarization is achieved; ingress/egress movements and safety improvements will likely be seen as a benefit thereby garnering further support.

3. Estimated Costs

The total estimated construction cost for this alternate is **$55 million** (See appendix E)
Phase 1 (BOP to Temple) of this alternate (the same as alternate 1) is estimated at **$22 million.**
Right of way costs for Alternate 2 are estimated at **$1 million.**

4. Environmental Factors

Refer to **Section VII.E** for environmental impacts.

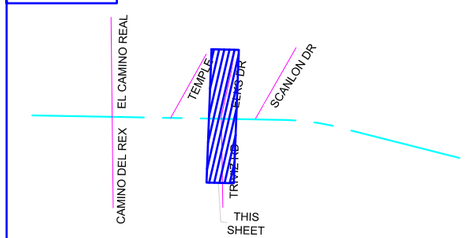
PROJECT CONTROL NUMBER: CN LC00270

LEGEND

- PROPOSED CURB & GUTTER
- PROPOSED 5' SIDEWALK
- PROPOSED LANE
- SURVEY ℄
- CONSTRUCTION ℄
- ROW LINE
- BIKE LANE

0 100' 200'

KEY MAP



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ALTERNATE II
PLAN ELKS & TRIVIZ
GRADE SEPARATION

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SHEET NO. ALTERNATE II

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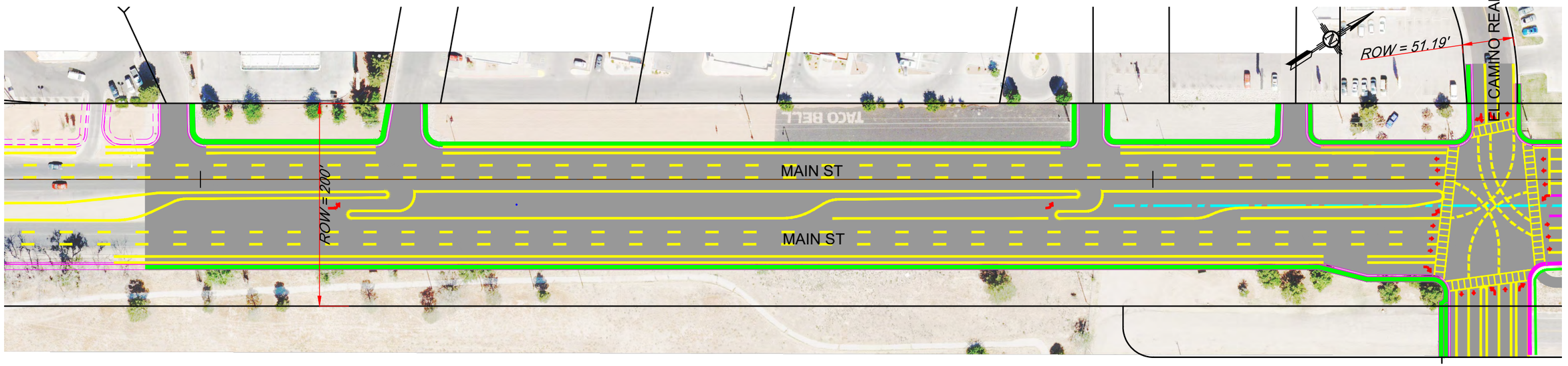

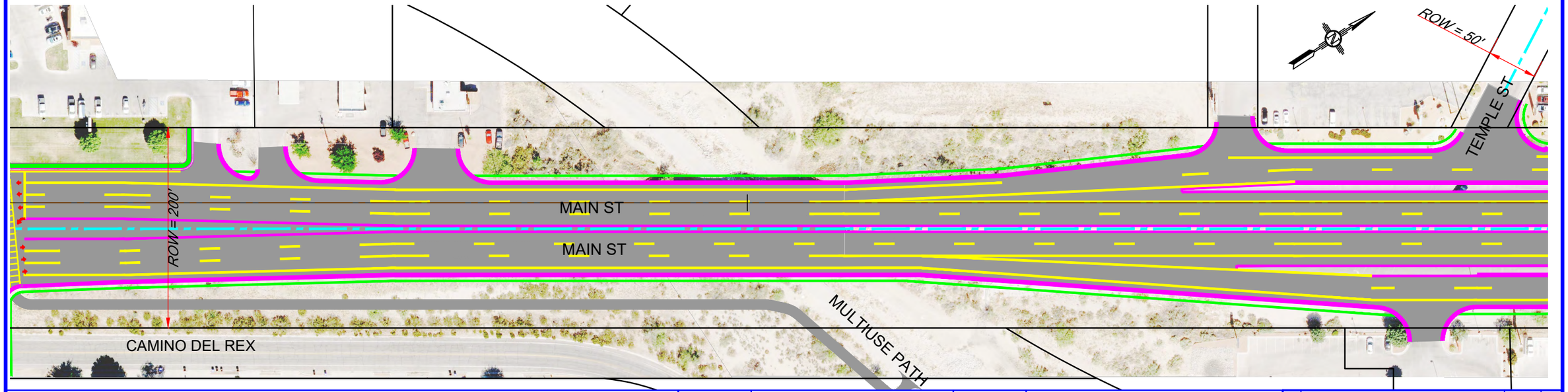

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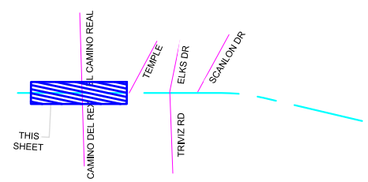

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PLAN STA 219+00 TO 248+00
GRADE SEPARATION

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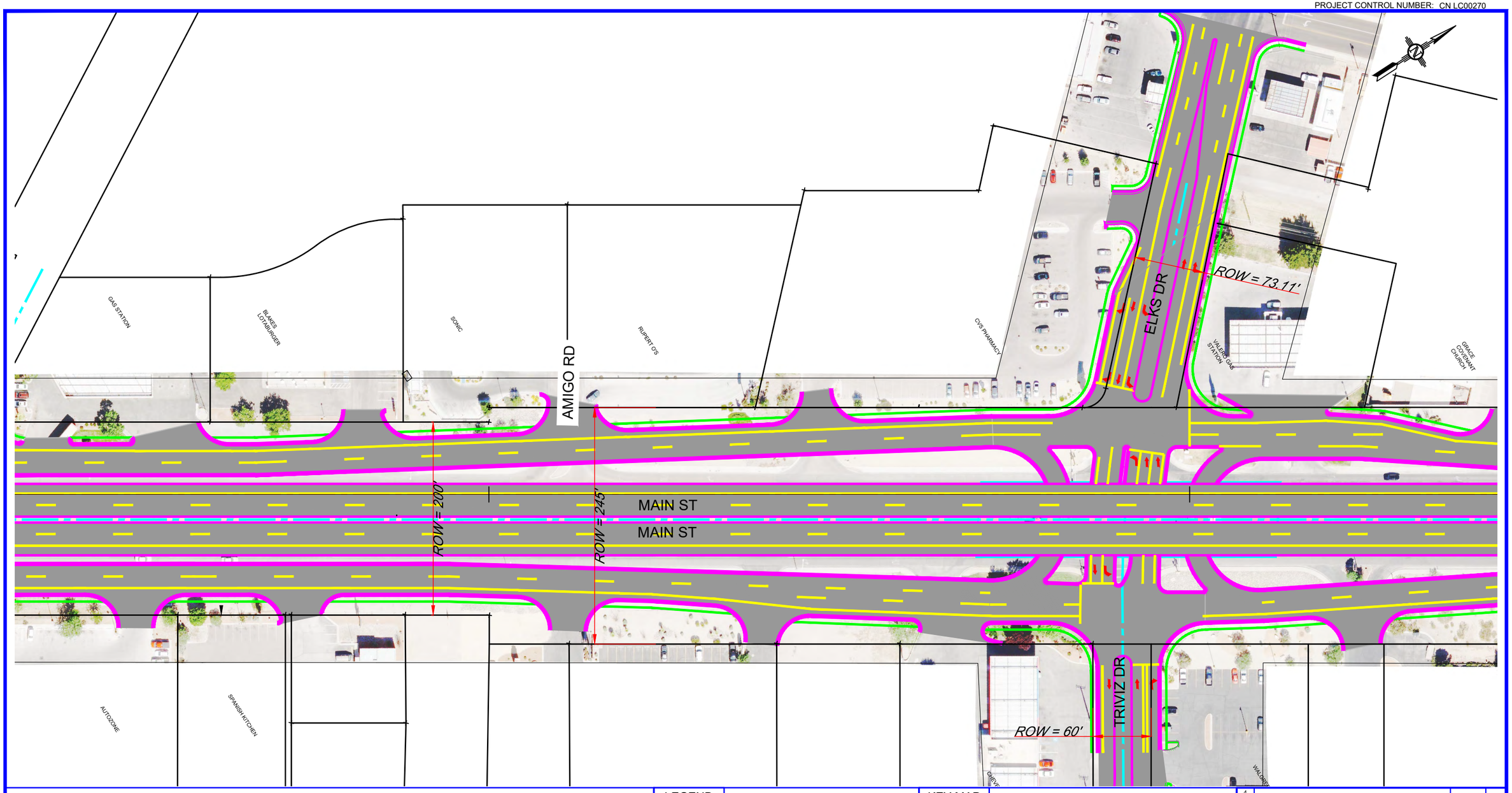

LEGEND

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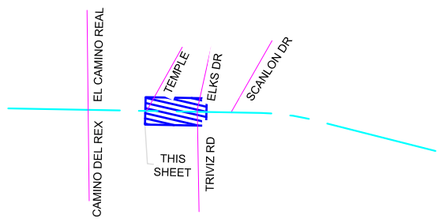
KEY MAP



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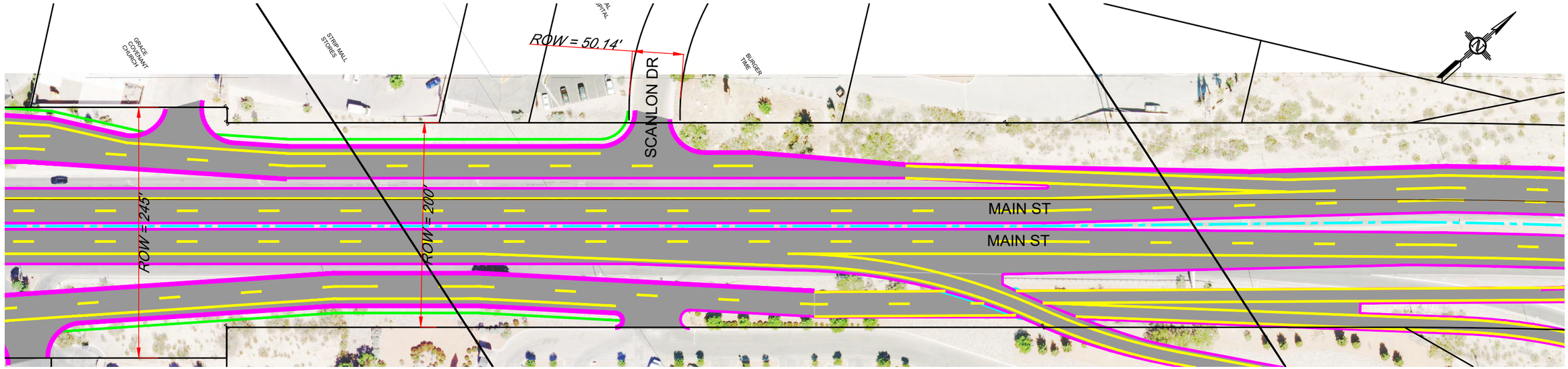

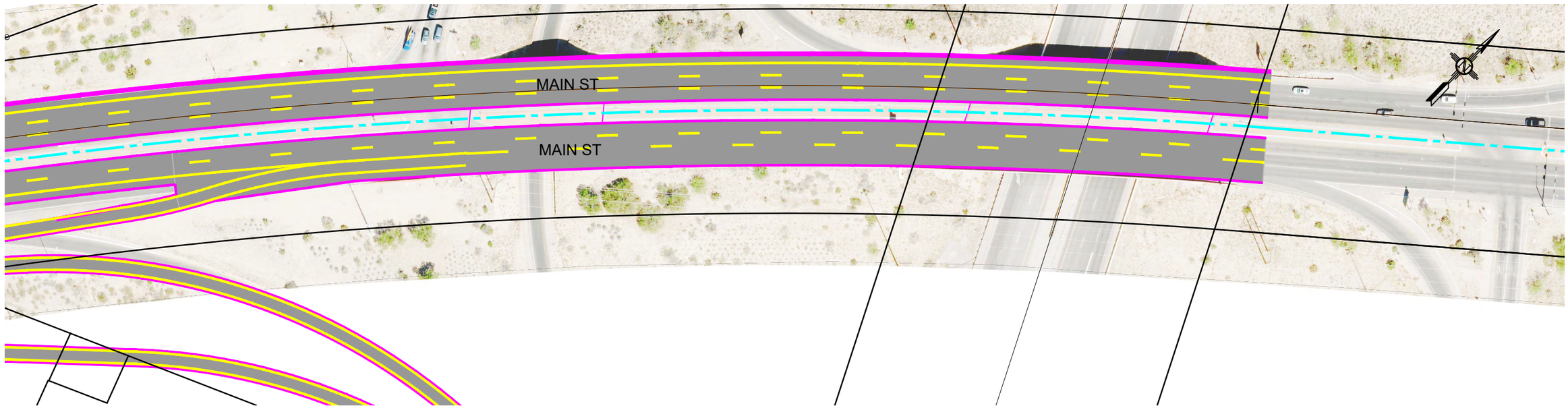

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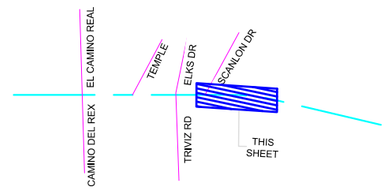

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GRADE SEPARATION

E. Environmental Factor Assessment – All Alternatives

1. Natural Resources Impacts

Geology Impacts

Geology impacts (**Table 24**) of the build alternatives would consist of excavation and ground recontouring for the roadway typical section, intersection improvements, bridge replacement options, and the potential grade separation in Alternative 2.

Table 24: Geology Impacts

Alternative	No Impact	Low Impact	Moderate Impact	Comments on Impact
No-Build	✓			No excavation and ground recontouring would be needed
Alternative 1		✓		Small areas of excavation and ground recontouring would be needed. Typical section would be 21-feet wider than existing
Alternative 2			✓	Moderate areas of excavation and ground recontouring would be needed. Typical section would be 58-feet wider than existing
Bridge (Dual)			✓	Areas of excavation would be needed to support bridge columns
Concrete Box Culverts		✓		Areas of excavation would be needed to support CBCs (at shallower depths than bridge columns)

Soil Impacts

Soils impacts (**Table 25**) would vary depending on the surface area disturbance, quantify of excavation, and erosion potential. A Storm Water Pollution Prevention Plan (SWPPP) would specify best management practices (BMPs) to minimize soil erosion and sediment transport during construction.

Table 25: Soil Impacts

Alternative	No Impact	Low Impact	Moderate Impact	Comments on Impact
No-Build	✓			No excavation or disturbance would occur
Alternative 1		✓		Small areas of soil excavation and disturbance would occur. Roadway typical section would be 21-feet wider than existing
Alternative 2			✓	Moderate areas of soil excavation and disturbance would occur. Roadway typical section would be 58-feet wider than existing
Bridge (Dual)			✓	Moderate areas of soil excavation and disturbance would occur with the bridge replacement options
Concrete Box Culverts			✓	

Vegetation and Noxious Weeds Impacts

Vegetation impacts (**Table 26**) would consist mainly of disturbance from clearing and grubbing prior to the start of construction. Alternative 2 has a wider typical section and would require a larger amount of vegetation disturbance. The build alternatives provide an opportunity to install landscaping along the urban corridor, which is a commercial area. Control measures would be needed for Class A and Class B noxious weeds.

Table 26: Vegetation and Noxious Weeds Impacts

Alternative	No Impact	Slight Impact	Low Impact	Comments on Impact
No-Build	✓			There would be no vegetation disturbance or potential spread of noxious weeds
Alternative 1		✓		There would be areas of vegetation disturbance
Alternative 2			✓	There would be areas of vegetation disturbance and a wider typical section
Bridge (Dual)		✓		Some vegetation disturbance could occur with the bridge replacement options
Concrete Box Culverts		✓		

Wetlands and Waterway Impacts

Wetlands are not expected to be present in the study area, and therefore impacts to wetlands are not anticipated. Moderate impacts to the Alameda Arroyo outfall channel would occur with the build alternatives and bridge replacement options. Clean Water Act Section 404 permitting is expected to be required for either of the build alternatives and whether the bridge is replaced in-kind or with concrete box culverts. There would be no impacts to the outfall channel with the no-build alternative.

Wildlife Impacts

Impacts to wildlife (**Table 27**) would vary depending on the amount of disturbed vegetation or structures. Alternative 2 would require a larger amount of vegetation disturbance, and the bridge replacement options would disturb the existing structures. Nest sites for migratory birds may be present within landscape vegetation or in existing structures.

Table 27: Wildlife Impacts

Alternative	No Impact	Slight Impact	Low Impact	Comments on Impact
No-Build	✓			There would be no impacts to wildlife
Alternative 1		✓		Areas of vegetation/habitat would be disturbed to expand the roadway
Alternative 2			✓	A larger amount of vegetation/habitat would be disturbed to expand the roadway
Bridge (Dual)		✓		Temporary impacts to wildlife during construction of bridge replacement option
Concrete Box Culverts		✓		

Threatened and Endangered Species Impacts

No threatened or endangered species are known to occur in the study area. Impacts to protected species and/or habitat are not expected with either of the build alternatives.

2. Cultural Resources Impacts

Cultural Resource Impacts

Archaeological sites, features, and historic properties would be identified during the field survey for the selected project area. The existing bridge structures over the Alameda Arroyo were built in the 1950's. Impacts to cultural resources would be evaluated in the survey report and recommended mitigation measures would be developed. There would be no impacts to cultural resources with the no-build alternative.

Section 4(f) Property Impacts

Impacts to Section 4(f) Properties are not expected with either of the build alternatives. There would be temporary impacts to the Alameda Arroyo multiuse path, but ultimately it would be maintained underneath the US 70 /North Main roadway. Access to the multiuse path from Triviz Drive would not be impacted by the build alternatives. There would be no temporary impacts to the multiuse path with the no-build alternative.

3. Social Resources Impacts

Communities and Land Use Impacts

Community and land use impacts (**Table 28**) would vary between the two build alternatives because ROW needs are different between the at-grade and grade separation at the Elks/Triviz intersection. The grade separation wouldn't impact driver behavior; the traveling public is familiar with grade separation infrastructure on the eastern portion of US 70 across the I-25 interchange. Other proposed roadway improvements would occur within the ROW.

Table 28: Communities and Land Use Impacts

Alternative	No Impact	Low Impact	Moderate Impact	Comments on Impact
No-Build	✓			No community or land use impacts
Alternative 1			✓	Highest ROW needs at Elks/Triviz intersection from approximately seven properties, including business parking spots and a gas station pump removal
Alternative 2		✓		Some ROW needed at Elks/Triviz intersection and for flyover onto I-25
Bridge (Dual)	✓			Bridge replacement options would not have community or land use impacts
Concrete Box Culverts	✓			

Socioeconomic and Environmental Justice Impacts

The build alternatives provide socioeconomic benefits (**Table 29**). The build alternatives would provide ADA-compliant facilities (sidewalks, ramps, crossings), improving access for all roadway users. Businesses along US 70 would have a safer roadway for customer access. Improvements to intersections would provide safer crossing conditions by adding medians for refuge. Traffic flow would be improved by adding capacity and turn lanes where needed. Construction jobs would provide short-term benefits. There would be temporary impacts during construction, but access to all businesses would be maintained. No environmental justice impacts are expected.

Table 29: Socioeconomic and Environmental Impacts

Alternative	No Impact	Slight Impact	Low Impact	Benefits	Comments on Impact
No-Build	✓				No socioeconomic or environmental justice impacts
Alternative 1		✓		✓	2-3 left turns onto US 70 would be prohibited to meet access standards and improve safety
Alternative 2		✓		✓	2-3 left turns onto US 70 would be prohibited to meet access standards and improve safety. Temporary/low impact to driver behavior for the grade separation
Bridge (Dual)	✓				Bridge replacement options would not have socioeconomic or environmental justice impacts
Concrete Box Culverts	✓				

Farmland Impacts

There are no farmlands in the study area. The build alternatives would not impact cultivated lands.

Multi-Modal Resource Impacts

Multi-modal resources would be improved with the build alternatives (**Table 30**). The build alternatives would provide for on-street bicycle lanes and continuous sidewalk along the roadway. American's with Disabilities Act compliant facilities would be implemented with the build alternatives. The Alameda Arroyo multiuse path would be maintained as existing. There would be temporary impacts to the path during construction of the bridge replacement or concrete box culverts.

Table 30: Multimodal Resource Impacts

Alternative	No Impact	Slight Impact	Benefit	Comments on Impact
No-Build	✓			There would be no improvements to multimodal resources in the study area. ADA improvements would not be made. Sidewalks would remain unconnected
Alternative 1			✓	The build alternatives would provide continuous sidewalk along the roadway and an on-street bicycle lane, including a 4-foot lane with a 2-foot buffer
Alternative 2			✓	
Bridge (Dual)			✓	Bridge replacement options would provide a wider facility than currently exists, and bicycle lanes
Concrete Box Culverts			✓	

Visual Resource Impacts

\Visual impacts (**Table 31**) would vary between the two build alternatives. The build alternatives would produce a wider roadway corridor, and would be visually different with the potential grade separation and additional travel lanes. A new bridge under US 70 would be a visual enhancement from existing, and concrete box culverts would be a visually different structure than the existing bridge.

Table 31: Visual Resource Impacts

Alternative	No Impact	Slight Impact	Moderate Impact	Comments on Impact
No-Build	✓			There would be no change to the visual appearance of the roadway corridor
Alternative 1		✓		Alternate 1's roadway would be 21-feet wider than existing, and add a travel lane in each direction
Alternative 2			✓	Alternate 2's roadway would be visually different with an overpass structure, on-off ramps, and frontage roads at the Elks/Triviz intersection
Bridge (Dual)	✓			No change
Concrete Box Culverts		✓		CBCs would be visually different from the multiuse path vantage point

Air Quality Impacts

Impacts to air quality (**Table 32**) would vary with the grade separation and changes in vehicle emissions rates between a 4-lane facility and a 6-lane roadway. An air quality study may be required to assess increased capacity on the roadway. Increased capacity could decrease congestion and improve air quality conditions. Dust impacts during construction would be monitored and mitigated with best management practices.

Table 32: Air Quality Impacts

Alternative	No Impact	Slight Impact	Low Impact	Comments on Impact
No-Build	✓			Capacity would not be added to the roadway, there would be no change in vehicle emission rates, and there would be no temporary dust impacts caused by construction
Alternative 1		✓		Two through lanes would be added to US 70, potentially improving congestion and vehicle emission rates
Alternative 2		✓		Two through lanes would be added to US 70 with a vertical shift in the roadway at the grade separation, potentially altering vehicle emission rates
Bridge (Dual)		✓		Temporary dust impacts caused by construction
Concrete Box Culverts		✓		

Noise Impacts

Noise impacts (**Table 33**) would vary with the grade separation and increased capacity on the roadway, and the types of noise receptors that would be impacted by the changes. A noise study may be required to assess increased capacity on the roadway and the grade separation. Vertical and horizontal changes of the preferred alternative roadway would be modeled and assessed for noise impacts, and mitigation recommendations would be developed as necessary.

Table 33: Noise Impacts

Alternative	No Impact	Low Impact	Moderate Impact	Comments on Impact
No-Build	✓			No change in noise levels
Alternative 1		✓		Two through lanes would be added to US 70
Alternative 2			✓	Two through lanes would be added to US 70 with a vertical shift in the roadway at the grade separation, potentially altering noise patterns
Bridge (Dual)	✓			Bridge replacement options would not affect roadway noise
Concrete Box Culverts	✓			

Hazardous Materials Impacts

The NMDOT Environmental Geology Section will investigate hazardous materials sites in and near the study area. Alternative 1 would have an impact to hazardous materials if the Pic Quik gas station pumps need to be relocated or removed.

SECTION VIII: ADDITIONAL DESIGN CONSIDERATIONS

A. Applicable Design Considerations

1. Bridge Crossing versus Culvert Crossing at Alameda Arroyo

Two (2) alternate crossing structures were examined for crossing the Alameda Arroyo; a pair of bridges or a set of concrete box culverts (CBC). As the Alameda Arroyo is a United States Army Corps of Engineers (USACE) administered controlled release channel stemming from the Las Cruces dam; both the Section 404 and 408 permit processes must be considered. The preliminary analysis of each alternative is presented below.

Concrete Box Culvert (CBC) Crossing Structure

Included with conveying the released flows in the Alameda Arroyo are requirements to maintain an existing maintenance road (and utility lines), a multimodal path, as well as a secondary channel (identified as “Channel E”). Each of these features is examined in greater detail in **Appendix C**.

The proposed crossing section identified in the Preliminary Drainage Report includes five (5) CBCs of various sizes (1-10’Sx8’R, 1-12’Sx12’R, 1-14’Sx8’R, and 2-14’Sx14’R). Each of the respective CBCs would be approximately 200-feet in length. The anticipated capacity of this bank of CBCs is approximately 9,650 cfs at the lowest soffit elevation. These CBCs are capable of conveying nearly the same capacity of the existing bridge structure (~10,000 cfs) in place today. At the level of detail provided in the Preliminary Drainage Report and the uncertainty with the USACE requirements the proposed estimate is evaluated for five 14’x14’ CBCs.

Once the design phase of this project is underway the Final Drainage Report, refinement to required sizing, and USACE permitting can be undertaken. Based on the findings of the Preliminary Drainage Report the CBC crossing structure has an anticipated cost of approximately **$6.7 million**. This cost is quite variable as the Final Drainage Report and design requirements from the USACE could greatly affect this figure.

Bridge Crossing Structure

The second alternative for crossing the Alameda Arroyo includes a pair of bridges (similar to configuration existing today). Preliminary bridge evaluations show the existing bridge provides approximately 1,600 square feet of opening. Various bridge spans have been studied (at the conceptual level) to determine if a larger span is plausible to minimize disturbances within the USACE administered channel areas. (See Appendix D) However, there is still a large amount of uncertainty with what construction activities would require the Section 408 Permit process.

Based on these preliminary investigations the bridges have an approximate conceptual level cost of about **$8.4 million**. As with the previous alternate the Final Drainage Report and extension bridge criteria selection and design will need to be completed in order to further refine the anticipated costs.

2. Rehabilitation of Existing Facilities East of I-25 Interchange

Each of the previously presented Alternatives produced improvements west of the I-25 Interchange. Based on our capacity and operational analysis of the existing corridor, the eastern segment of Main Street is functioning satisfactorily. When examining the 2040 horizon year, the main focus east of I-25 is pavement rehabilitation. NMDOT currently has a mill and inlay project under design for area east of I-25. NMDOT currently is designing a project to mill and inlay the existing roadway section east of the Elks/Triviz intersection.

3. Continuous Left Turn Lane with Alternate 1

This configuration was suggested by stakeholders to allow unrestricted access from the shopping center at the beginning of the project area. There are existing small sections along the subject corridor that have this configuration. These areas suffer from dangerous conflicting turn movements and staging of vehicles (within the dedicated left turn lane) entering oncoming traffic movements. These conflicts will become further compounded with the additional through traffic lane in each direction. As a result of the heightened safety concerns this option was abandoned, but is mentioned for thoroughness of the evaluation.

4. Frontage Road Systems with Alternate 1

Shopping Center Frontage Road

This frontage road was preliminarily evaluated for the shopping center. It would ease ingress/egress for shopping patrons and there are available ROW widths to accommodate this amenity. This frontage road system would require access agreements between individual properties within the shopping center as it would utilize a single entry/exit into the shopping center along Main Street. While a single access point would more closely meet the SAMM spacing requirements and limit the number of accesses onto Main Street; the turning movements leaving the shopping center onto eastbound US 70 would suffer severely as the through traffic on Main Street free flows without predictable gaps in traffic to complete the aforementioned movements. The shortcomings outweighed the potential benefits of this system so it was not studied in additional detail.

Frontage Roads at the Elks Drive/Triviz Drive Intersection

Frontage roads were also considered in the vicinity of this intersection to prevent direct access to US 70 at the intersection (basically would facilitate moving the driveway access away from the signalized intersection insomuch as possible). While this improvement was considered beneficial it's limited in the number of businesses that the system could serve, also connecting of the frontage roads to the minor streets (Elks Drive and Triviz Drive) would create a new access close to the intersection which is not desired, and if the

frontage roads were to serve bi-directional two-way traffic they would need to be terminated in a cul-de-sac or similar configuration and would likely require additional ROW on each side of Main Street to allow for perpendicular connections to the main thoroughfare and adequate storage of queued vehicles. The existing storm drainage structures and bar ditch conveyances would be disrupted by this frontage road system; likely requiring the installation of a storm drain system. These limitations are present on each of the four (4) legs of the intersections in some form or another. The shortcomings outweighed the potential benefits of this system so this system was not studied in additional detail.

5. Partial Access Managed per SAMM Requirements with Alternate 1

This particular scenario left the non-conforming driveways at the shopping center in their existing full access configuration. One of these existing full access driveways is approximately 400-feet from the signalized intersection at El Camino Real Road. Due to the horizon year queue lengths experienced on the eastbound through movements (~650-feet) along US 70 this driveway is rendered useless most of the time. As such, this scenario was abandoned in favor of Alternate 1 which allows adequate access to the shopping center and maintains the spacing requirements of the SAMM.

6. Additional Traffic Signal at US 70/Temple Street with Alternate 1

This option was studied in conjunction with the improvements presented in Alternate 1. The intent of the alternative was to evaluate the improvement to the US 70/Elks Drive/Triviz Drive intersection and subsequent delays experienced along the southbound (left and right turns) movements from Elks Drive on US 70. It is anticipated that a signalized access point at Temple Street would influence users from the neighborhoods, due north of US 70, to access US 70 at a location other than Elks Drive or Solano Drive.

7. Other transportation Corridors

The Mesilla Valley Metropolitan Planning Organization (MVMPO) in conjunction with the City of Las Cruces (CLC) analyzed (modeled) and provided rough construction estimates for several corridors whose installation might alleviate some of the traffic congestion on US 70, particularly at the Elks/Triviz intersection. The corridors were modeled to see how the construction of those corridor(s) could divert drivers from U.S.70. The other corridors were:

- extending Engler from Elks to El Camino Real;
- Extending Madrid under I-25 to Telshor;
- Widening Telshor;
- extending Engler from Del Rey to Sonoma Ranch and adding I-25 ramps at Engler.

These alternates are shown in Figure 20. The modeling for the other corridors is cumulative, i.e. they are built beginning with the first project (Engler extension to Camino Real and adding a project until they are all built. The resulting decrease or increase in traffic and project costs are shown in Table 34. It should be noted that these alternates

do not include any improvement to North Main Street (U.S.70). These are all new corridors except for Telshor which is a widening of the existing street. The impacts to the US 70 corridor are shown for each alternate in Appendix B.

B. Design Considerations Outside the Scope of this Report

There have been a number of studies, outside the scope of this report, that have looked at ways of improving traffic flow conditions adjacent to Main Street. Some of these studies are summarized below as they could help to improve these conditions on US 70 (Main Street), but have not been further analyzed herein.

Traffic Signal at Ellendale Drive

The studied traffic signal is located approximately 0.37 miles north of the US 70/Elks Drive Intersection (due south of the Jornada Elementary School main parking lot). The studied improvements also included a secondary connection to the subdivision served by Lenox Avenue and Scanlon Drive. The secondary connection provides residents within the subdivision an entry/exit besides Lenox Avenue. This would help to alleviate the congestion along Lenox Avenue as left (southbound) turning movements are greatly hampered by queue lengths during the peak hours. It's likely that the proposed signal at Elks Drive/Ellendale Drive would also help with these queuing lengths as southbound traffic would platoon more evenly providing additional breaks in traffic flow for the movements occurring at Elks Drive/Lenox Avenue. There are a number of factors which need to be further evaluated prior to bringing the improvements to fruition; acquisition of ROW from the Elks Lodge and/or Las Cruces Public Schools, a cost benefit analysis of whether the secondary connection is feasible for the amount of subdivision residents served, amongst other criteria.

Engler Road/Interstate 25 Connection

In 2012 the Engler Road/Interstate 25 overpass was constructed connecting Elks Drive to Del Rey Boulevard via Engler Road. Construction of a complete interchange (access/exit ramps) accessing I-25 would assist in overall traffic flows and dispersion of area residents to primary travel corridors exiting the City. However, under the scope of this project interstate solutions (connections) shall not be utilized to solve local traffic problems and therefore was not studied. The City should continue its long range planning to develop additional connections to major surface streets to facilitate connectivity. This was one of the corridors analyzed by MVMPO in section A.7 above. Add description of each MVMPO corridor.

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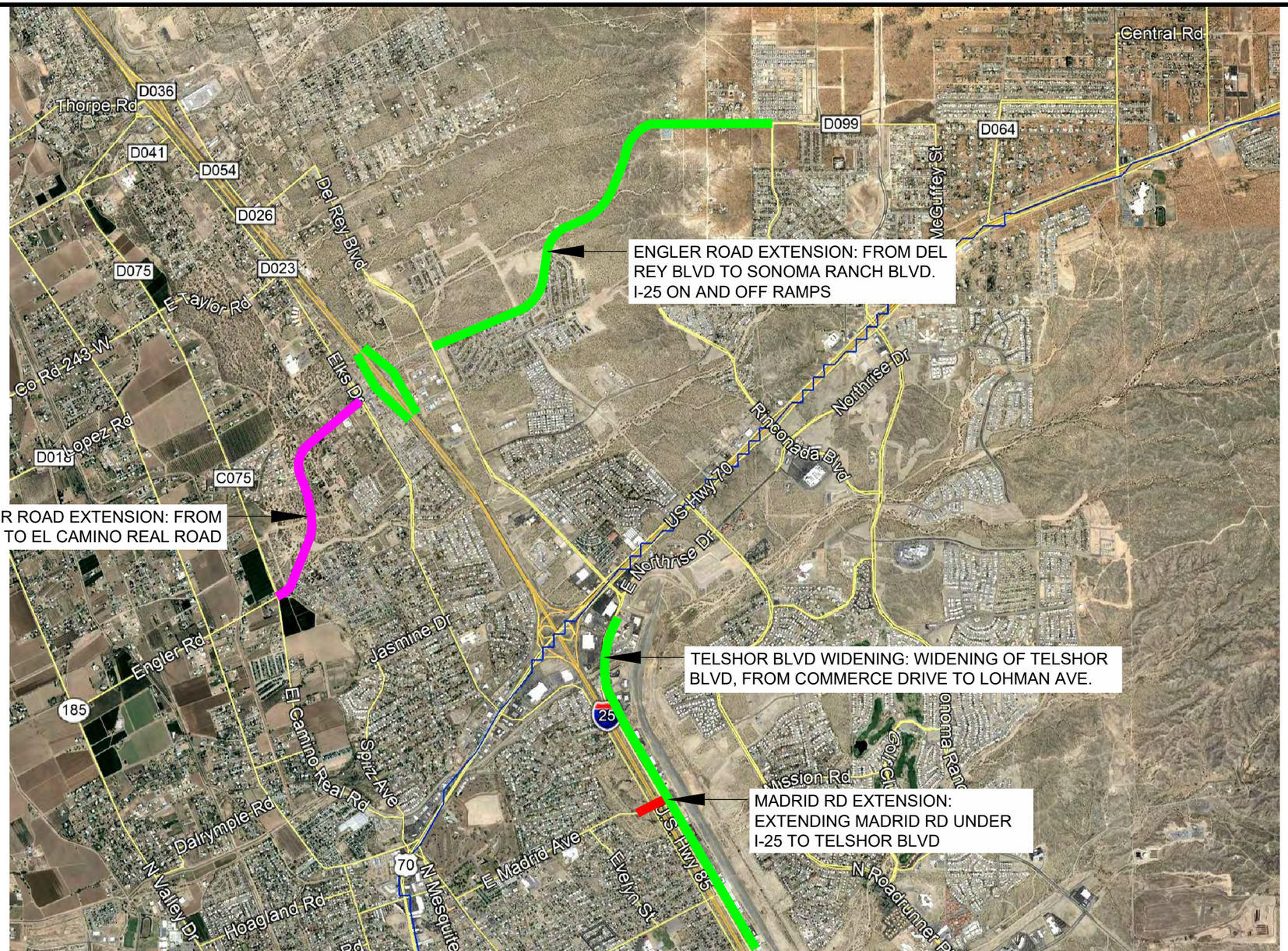

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US 70 (MAIN STREET)
FIGURE 20
MPO CORRIDOR LOCATION MAP

ROADWAY	2015 AADT	2040 AADT No Build	% Change
Elks	14830	13928	-6.1%
Triviz	8169	11077	35.6%
U.S 70	28310	30486	7.7%
North Main	28332	32451	14.5%

ROADWAY	2040 AAADT No Build	2040_AADT With Engler $9.9 Million	% Change	2040 AADT Madrid Ext. Only $16 Million	% Change	2040 AADT Telshor Widening Only $3.5 Million	% Change	2040 AADT Madrid and Telshor $19.5 Million	% Change	2040 AADT Engler Ext, Madrid Ext. , Telshor Widening $29.4 Milion	% Change
Elks	13928	13082	-6.1%	13959	0.2%	14370	-1.2%	14538	4.4%	13700	-1.6%
Triviz	11077	9784	-11.7%	9735	-12.1%	9780	3.8%	9420	-15.0%	9113	-17.7%
U.S 70	30486	31059	1.9%	30919	1.4%	30800	4.5%	29462	-3.4%	29054	-4.7%
North Main	32451	29007	-10.6%	30081	-7.3%	29770	0.3%	29689	-8.5%	28954	-10.8%

Table 34

SECTION IX: SELECTION OF ALTERNATE

The selection matrix presented below was implemented to assist the study team in determining the most efficient and effective alternative to continue with in the Phase C process. The No-Build Alternate received the least satisfactory results and Alternate 2 received the highest score. Therefore, the No-Build and Alternate 2 shall advance to the Phase C Study.

Table 35: Selection Criteria Matrix

Evaluation Factor	Point Value	No-Build	Alternate 1 Six-Lane per SAMM w/ At-Grade Intersections	Alternate 2 Six-Lane per SAMM w/ Grade Separation at Elks Drive/Triviz Drive
Meets Purpose & Need	10	0	10	10
Engineering Factors				
Business Access	10	5	7	9
Multimodal	10	3	7	9
Level of Service (LOS) Improvements	20	5	15	19
Safety	20	6	14	18
Constructability	15	15	10	8
Utility Impacts	10	10	7	7
Right-of-Way (ROW) Requirements	10	10	5	7
Stakeholder Support	10	5	4	6
Estimated Costs	20	20	11	9
Environmental Factors	10	9	9	8
Total	**145**	**88**	**99**	**110**

Selection criteria is weighted most heavily on items (Level of Service (LOS) Improvements and Safety) related to the safety and welfare of facility users. The other highly weighted variable is the Estimated Cost.

SECTION X: RECOMMENDATIONS

Based on the evaluations of reach respective alternate and its functionality presented in **Section VII**, the best solution to accommodate the multitude of movement types and improvements is Alternate 2. Alternate 2 (Six-Lanes with Grade Separation adhering to the spacing requirements in the State Access Management Manual) best adheres to all suggested selection criteria, but also likely involves the greatest cost burdens. The roadway would be built symmetrically about the existing roadway utilizing the existing roadway and medians. No additional right of way is expected for the first phase of construction for this alternate (Solano to Temple). There would be geometric improvements at the existing intersections – El Camino Real/Camino Del Rex, Temple, Amigo and Scanlon. A grade separation would be built at the Elks/Triviz intersection. Frontage roads would be added to accommodate the grade separation from Temple to Scanlon .Other improvements would be two additional lanes, bicycle lanes, sidewalk improvements, lighting, and upgrading traffic signals. The Alameda Arroyo bridge section would be widened to accommodate bicycle lanes and sidewalks on each side as well as the additional two lanes.

The grade separation at Elks/Triviz is the only alternate that will provide an improvement to the intersection due to the high volumes and their turning movements from the side street of Elks and Triviz. The at grade alternate at this intersection provides no benefit returning only a level of service (LOS) of D or E for the intersection with turning movements being LOS E or F. The east-west (U.S. 70) movements are impeded by the north-south movements of Elks and Triviz. The turning movements from Elks and Triviz are LOS F. The grade separation allows for U.S. 70 to remain at two lanes in each direction at this intersection and provide a LOS of B. Because the grade separation will provide the greatest benefit to the LOS on Elks and Triviz, and because the north/south traffic volume is primarily generated from local City streets, the City's participation in funding is imperative for the successful implementation of the preferred alternative of the project.

The recommended alternate with these suggested improvements offers users both an efficient and pleasant driving experience. The level of service, functional capacity and safety of the roadway are improved by these recommendations. The residents of Las Cruces will benefit from on-street bicycle facilities and accessible sidewalks and these facilities will be separated from the through traffic for much of the corridor. Access to businesses will be improved by the frontage roads, though motorists and businesses will have learn to use the grade separation to get from one side of the roadway to the other.

The estimated cost of the total project from the BOP at Solano Drive to the signal at the south bound off ramp on the west side of I-25 is **$56 million** including right of way acquisition. Due to the high cost of the single project, it is recommended the project be built in two phases. The first phase would be a six-lane section from the BOP to Temple Avenue including concrete box culverts to replace the Alameda bridge. The second phase would be from Temple to the SB off ramp from I-25 and include the grade separation at Elks/Triviz and frontage roads from Temple to Scanlon. Phase 1 has an estimated cost of **$22 million** and phase 2 is estimated at **$32 million**.

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APPENDICES

APPENDIX A DOCUMENTATION – PUBLIC MEETING

APPENDIX B TRAFFIC CAPACITY ANALYSIS SUMMARIES

APPENDIX C PRELIMINARY DRAINAGE REPORT

APPENDIX D BRIDGE REPORT

APPENDIX E GEOTECHNICAL REPORT

APPENDIX F COST ESTIMATES

APPENDIX F INTERSTATE ACCESS CHANGE REQUEST (IACR)

***** Note – after preliminary investigations within this study, the Interstate Access Change Request (IACR) was not required**