

TABLE OF CONTENTS

EXECUTIVE SUMMARYi

1. INTRODUCTION.....1-1

1.1. Phase A Overview1-3

1.2. Phase B Overview1-3

2. PURPOSE AND NEED2-1

2.1. Safety2-1

2.2. Physical Deficiencies2-2

2.3. Travel Demand & Congestion2-3

2.4. System Connectivity2-3

2.5. Access2-3

2.6. Economic Development.....2-4

2.7. Legislative Mandate.....2-4

2.8. Purpose and Need Statement2-4

3. PUBLIC INVOLVEMENT AND AGENCY COORDINATION.....3-1

4. TRAFFIC FORECASTS.....4-1

4.1. Link Level of Service (LOS) Comparison4-2

4.2. Intersection Level of Service (LOS) Comparison4-2

4.3. Vehicle Miles Traveled (VMT) & Vehicle Hours Traveled (VHT) Comparison.....4-2

5. DETAILED EVALUATION OF ALTERNATIVES.....5-1

5.1. No Build Alternative5-1

5.2. Allison Alignment5-1

5.3. I-40 Crossing5-1

5.4. Allison Alignment Alternatives5-2

5.5. Drainage5-2

5.6. Environmental General Evaluation5-3

5.7. Utilities5-5

5.8. Geotechnical Assessment5-5

5.9. West Alignment5-5

5.10. West-Center Alignment.....5-8

5.11. Center Alignment5-12

5.12. East – Center Alignment.....5-16

5.13. East Alignment.....5-20

5.14. Preferred Corridor Alternative5-23

5.15. Interstate 40 Frontage Road Alternatives5-25

5.16. Allison Corridor Interchange Alternatives.....5-25

6. ALIGNMENT PHASING AND PRIORITY PLAN6-1

6.1. Central Alignment Phasing6-1

6.2. Central Alignment Priority Plan.....6-1

7. CONCLUSIONS AND RECOMMENDATIONS.....7-1

LIST OF TABLES

Table 2-1: Comparison to State & County Crash and Fatality Rates.....2-1

Table 3-1: Phase B Public Involvement.....3-1

Table 4-1: Allison Road Corridor Traffic Analysis Protocol.....4-1

Table 4-2: Allison Road Corridor VMT, VHT and the Ratio for the Study Area4-3

Table 5-1: Allison Road Alignment Summary5-2

Table 5-2: 100-Year Flow vs. I-40 Elevation5-2

Table 5-3: West Central Alignment Structural Alternatives.....5-9

Table 5-3: Center Alignment Structural Alternatives.....5-13

Table 5-4: East Center Alignment Structural Alternatives5-17

Table 5-2 : Alternative Development Methodology Matrix5-24

LIST OF FIGURES

Figure 1-1: Location Map1-1

Figure 1-2: Phase A Corridor Alternatives1-1

Figure 1-3: Project Vicinity Map.....1-2

Figure 1-3: Project Limits Map.....1-4

Figure 5-1: Allison Corridor Alternatives.....5-1

Figure 5-2: West Alignment and Summary.....5-7

Figure 5-6: West - Center Alignment and Summary5-11

Figure 5-3: Center Alignment and Summary5-15

Figure 5-5: East - Center Alignment and Summary.....5-19

Figure 5-4: East Alignment and Summary.....5-22

Figure 5-7: Center Alignment with Rural Diamond and Two-Way Frontage Road5-27

Figure 5-8: Center Alignment with Tight Diamond and One-Way Frontage Road.....5-28

Figure 5-9: Center Alignment with Single Point Urban Interchange and Two-Way Frontage Road.....5-29

Figure 5-10: Center Alignment with Partial Clover Leaf Interchange and Two-Way Frontage Road.....5-30

Figure 6-1: Center Alignment Phasing6-3

Figure 6-2: Priority Project 1.....6-4

APPENDICES

- Appendix A – Proposed Corridor Alternative Plan and Profile Sheets
- Appendix B – Traffic Operations Analysis
- Appendix C – Right of Way Maps
- Appendix D – Utility Maps
- Appendix E – Public Involvement Meeting Minutes

EXECUTIVE SUMMARY

PROJECT BACKGROUND & OVERVIEW

This project is located in the City of Gallup, McKinley County, New Mexico, as shown in Figure 1-2, page 1-1. More specifically the project limits are east and west along Interstate 40, from the West Gallup Interchange, approximately mile post 14, to existing Allison Road underpass with the interstate. The Northern limit of the study area is approximately West Maloney Avenue and the bluffs located to the north of I-40 and the project is bounded on the south by NM 118, formerly US 66 refer to page 1-2, Figure 1-1.

This report builds on the "Initial Evaluation of Alternatives Allison Road Corridor and Interstate 40 Interchange Study" (aka Phase A Report). The Phase A Report evaluated the existing Allison Road and considered three potential corridors as alternates to existing Allison Road corridor. The Phase A Report recommended that the "East Corridor" be carried forward for further evaluation and that alternatives be developed for Allison Road within this corridor.

The New Mexico Department of Transportation (NMDOT) is planning this project, which is designated as NMDOT project numbers SP-GA-5459(201) AND SP-GA-5459(202), CN C7G801/C7G802. In addition to the New Mexico Department of Transportation, the Federal Highway Administration (FHWA) and Northwest New Mexico Council of Governments (NWNMCOG) have oversight and review roles in this project. The study area also includes connectivity to existing NM 118 south of the interstate and West Maloney Avenue north of the interstate.

This study has been developed according to NMDOT Location Studies Procedures: A Guidebook for Alignment and Corridor Studies. As set forth in the aforementioned guide, the objectives of this study is to further develop and evaluate the alternatives advanced from the Initial Evaluation of Alternatives Study; determine which alternatives will be carried forward for Environmental Documentation and Processing (Phase C). The scope of this report was to develop alternative alignments within the East Corridor that addressed existing issues, needs, and that fit within the context of the City of Gallup's long range planning initiatives. Alignment alternatives developed within this corridor provide the opportunity for good regional connectivity north and south of the interstate. As well the potential for an interchange connection to the interstate was evaluated; although, an interchange cannot be justified unless it fits in with the regional transportation system and complies with the 8 requirements in the Federal Highway's Interstate Access Policy. More specifically this study encompasses the development and evaluation of the following:

- Location of Allison Road Intersection with NM 118 to allow City streets connection to the Allison Rd to be extended to the south to Mendoza Road in the future.
- Location of Allison Road to allow extension to the north toward Coal Basin Road
- One-way or two-way or no frontage roads at Interstate 40
- To assess the viability of an underpass or overpass with Interstate 40.
- I-40 Interchange alternatives that can be constructed given the type of frontage road chosen.
- Development of a phase and priority plan for the corridor construction to address funding limitations.

As part of this study the existing conditions of the transportation network and facilities were further evaluated and documented. This evaluation included: development and analysis of five alternatives within the east corridor; assessment of proposed horizontal and vertical roadway geometry; bridge and drainage structure analysis; Current and future land use, as well as, current and design year traffic link volumes were evaluated based on traffic count data obtained in December of 2009. The Phase B development was systematic in nature. This study evaluated not only corridor alignments but evaluated the type of grade separation required with I-40, frontage road configurations, possible interchange types that fit within the context of the corridor, and finally developed a priority and phasing plan for the corridor that would enable the corridor to be constructed in segments as funding becomes available.

PUBLIC INVOLVEMENT AND AGENCY COORDINATION

A Public Involvement Plan (PIP) was prepared by Parametrix and Bohannon Huston, Inc. (BHI) and was approved by the New Mexico Department of Transportation (NMDOT) for Allison Road (Rd) Corridor and Interstate 40 (I-40) Interchange Study in December 2009. The process outlined in the PIP is a formal approach to implementing the public involvement requirements mandated by the Council on Environmental Quality's (CEQ's) National Environmental Policy Act (NEPA) guidelines, the NMDOT's Location Study Procedures, and the Federal Highway Administration (FHWA) and NMDOT Context Sensitive Design (CSD)/Context-Sensitive Solutions (CSS) process.

A Study Team was formed by NMDOT consultants and by Steve Lopez, NMDOT Central Regional Bureau Project Development Engineer (PDE). A Project Management Team (PMT) was formed by representatives from FHWA, NMDOT Central Region Design and NMDOT District 6, the City of Gallup Public Works Department (City), NMDOT Environmental Design Division, and other consultants including BHI, Wilson & Company, Inc., TBE Group, Parametrix, AMEC Earth and Environmental, Inc., and

DePauli Engineering and Surveying, LLC. As the study progressed, other interested stakeholders were incorporated into the PMT including the Northwest Regional Planning Organization (NWRPO), McKinley County (County), Burlington Northern Santa Fe (BNSF) Railroad, and Gallup Joint Utilities.

Stakeholders are people who could potentially be positively or negatively affected by a project or who have a “stake” in the success or failure of a project. Examples of stakeholders include individuals, public and private groups, elected officials, non-governmental organizations, government agencies, and the owning agency. Every effort was made to reach traditionally underserved populations, including low income and minority households and persons with disabilities. As public meetings were held further stakeholders identified were added to the list of stakeholders.

PURPOSE AND NEED

The purpose of proposed Allison Road Corridor improvements identified through coordination with stakeholders is to mitigate existing geometric, physical, and operational deficiencies, improve safety, and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range local and regional planning goals to facilitate economic growth.

There are seven factors that may be used to establish the need for transportation improvements. These factors are:

- Safety;
- Physical deficiencies;
- Travel demand & congestion;
- System connectivity;
- Access;
- Economic development;
- Legislative mandate.

Using these seven factors as a basis, the Allison Road corridor was reviewed with stakeholders, as set forth in the Public Involvement Plan (PIP) prepared for this study. During meetings with the stakeholders many issues and concerns, with both the existing and future state of this corridor, were identified. These concerns were documented and investigated to confirm that they represented a factor that should be included in the determination of the project need.

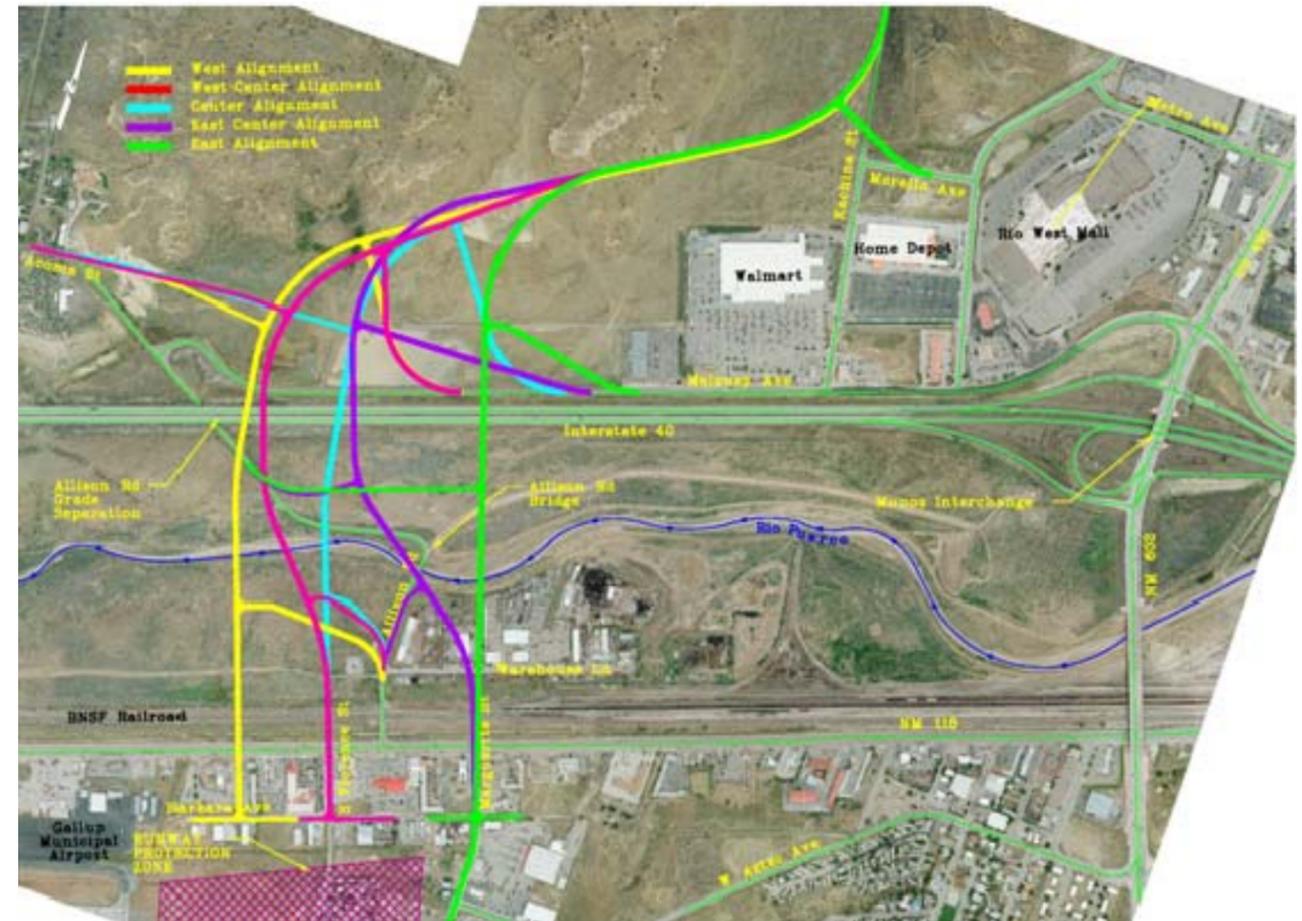
DESCRIPTION OF ALIGNMENT ALTERNATIVES

As shown the graphic to the right, different roadway alignment alternatives were developed within the East Corridor selected at the conclusion of the initial evaluation of alternatives. In total, five different alignment alternatives were developed and evaluated. The “No Build” alternative was also considered

and evaluate. In order to qualitatively assess these alignment alternatives within the selected corridor, various transportation elements that have the potential to be developed within the corridor were evaluated. The transportation elements considered in addition to the alignment alternatives were:

1. Allison Road Corridor vertical alignment as a underpass with I-40
2. Allison Road Corridor vertical alignment as a overpass with I-40
3. A one way frontage road pair between the Allison Corridor and the Munoz Interchange
4. A two way frontage road pair between the Allison Corridor and the Munoz Interchange
5. A service interchange at Allison Rd. and I-40

This approach led to the systematic approach in the development and elimination of alternatives and other potential transportation elements.



With respect to the five alternatives considered, there were three locations along NM118 that were alignment crossings facilitated connections to the local street network that provided the potential to extent the alignment south toward Mendoza Road.

ALIGNMENT	NM118 CROSSING LOCATION	OVERVIEW
West	850-Feet west of Florence Road	This alignment provides the maximum spacing to the Munoz Interchange; however, the Airport runway protection zone precluded extension of this alternative to the south. This alignment is a hybrid between the West & Center alignments. The rationale behind the development of this alignment was to maximize the distance to the Munoz Interchange while providing a connection to the existing street network.
West Center	Florence Road	This alternative provides adequate spacing to the Munoz Interchange while connecting to the existing local street network.
Center	Florence Road	This alignment is a hybrid between the East & Center alignments. The rationale behind the development of this alignment was to maximize the distance to the Munoz Interchange while providing a connection to the existing street network.
East Center	Marguerite Road	This alignment was developed as it represents that most linear crossing of NM118 and I-40 that aligns with the existing local street network.
East	Marguerite Road	

All of the alignments would have an overpass at NM 118, the BNSF Railroad, and Interstate 40. All five of the alignments cross NM 118 and the BNSF Railroad at approximately 90 degrees in order to minimize the length of the overpass structures and additionally would accommodate a future interchange at Interstate 40. A new bridge would be constructed over the Rio Puerco for each alignment. A grade separation between I-40 will be required for all of the alignment options considered. As part of the initial alignment development an evaluation was performed to determine the most appropriate type of grade separation, either an underpass or an overpass. The finding of these evaluations recommends that an overpass with I-40 be constructed. This is due to the fact that an underpass would require significant reconstruction of the interstate in order to place the underpass at an elevation above the 100-year flood elevation of the Rio Puerco.

The No Build Alternative would mean not making any physical changes to Allison Road. No right-of-way would be required and no costs would be associated with this alternative. However, the No-Build Alternative does not meet the project purpose and need of mitigating the geometric, physical and operational deficiencies, improving safety or providing connectivity to facilitate economic growth. Therefore, the No Build Alternative is eliminated from further consideration.

PREFERRED CORRIDOR ALTERNATIVE

The Center Alignment (see page iii) was selected as the preferred alternative. Qualitative measurements were used to rank alternatives rather than numeric values. In the reference matrix, a red square denotes a fatal flaw, a yellow square is a serious concern, and a green square represents an acceptable impact in regard to that specific evaluation parameter. The results of the evaluation process are shown on page v. The evaluations were performed in collaboration with the project team during review meetings.

CENTRAL ALIGNMENT PRIORITY PLAN

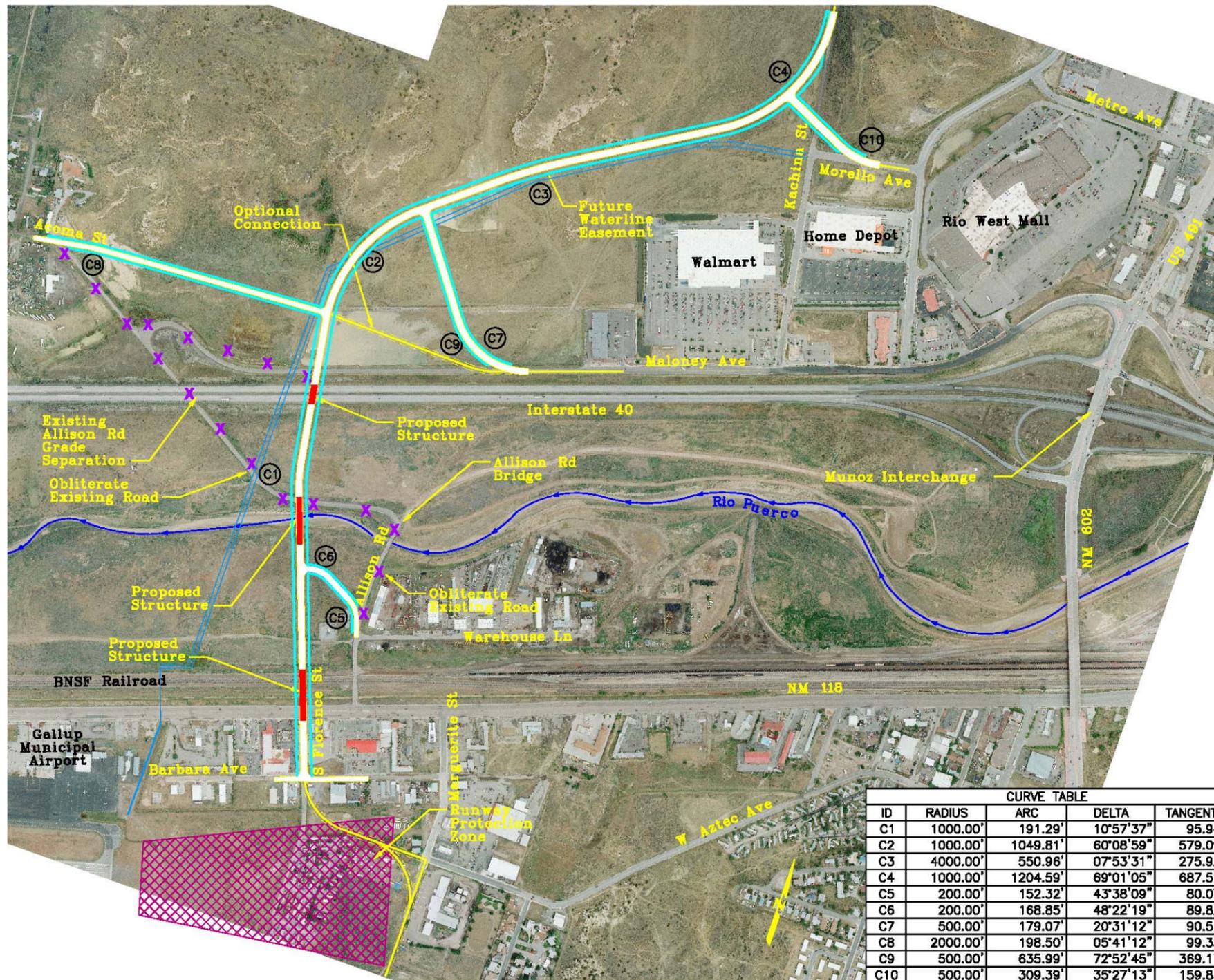
Funding limitation preclude construction of the entire central alignment as one project. To address this a phased construction plan was developed for the central alignment. The Central Alignment lends itself to being constructed in several phases rather than requiring development of the entire corridor as one project. The six phase limits were established to satisfy both constructability and funding. Generally speaking, the estimated construction cost for each of the proposed phases is very similar. The grade separation of the central alignment over the BNSF tracks will be the most expensive phase of this corridor development. This is attributed to the length of the span required to transverse the BNSF track/NM118 and the acquisition and impacts to properties to the south of NM 118.

The six phases listed below in order of priority:

- Replacement of the Existing Rio Puerco Bridge
- Construction of an overpass with Interstate 40
- Construction of the connection to W. Maloney Ave. and Aztec Dr.
- Construction of the connection to Kachina St.
- Grade Separation of Central Alignment over BNSF tracks and NM118
- Construction of an Interchange with Central Corridor and Interstate 40

RECOMMENDATIONS

It is recommended that the Central Alignment continue to be developed and that this project proceed into Phase C. Further biological and cultural resource investigations will also be required as the project moves into preliminary design and Phase ID. The Center Alignment has the potential to impact Route 66 and historic segments of the BNSF railway. A more detailed investigation, including field surveys and further coordination with the NMDOT Environmental Geology Bureau (EGB) will be required to determine the potential for hazardous materials within the project corridor. After discussions with the NMDOT EGB it is recommended that the entire proposed Center Alignment be evaluated during Phase C. Then only first priority project be taken to preliminary and final design



Center Alignment Summary

Advantages:

- A reasonable connection can be made to Warehouse Lane.
- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- Most of the alignment is constructed off of the existing alignment. The Allison Road underpass can be utilized while the I-40 overpass is constructed.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- Avoids impacting the mesas north of I-40.

Disadvantages:

- Impacts the mobile home park on Florence Street.
- There will be one business relocated on Marguerite Street to extend W. Aztec Avenue.
- There will be one business relocated on the southwest corner of Florence St. and Barbara Ave. because access cannot be provided.
- Access impacts to the America's Best Value Inn Restaurant and Blake's Restaurant at NM 118. The alignment is shorter than the West Alignment but longer than the East Alignment so it will have a medium construction cost and amount of right-of-way takes.

1. INTRODUCTION

The NMDOT has designated this as NMDOT Project SP-GA-5459(201)/SP-GA-5459(202) and has assigned control numbers C7G801/C7G802. The Phase B Study Limits are from approximately the East end of the Gallup Municipal Airport on the west, to the Munoz Interchange on the east, and from West Maloney Avenue on the north end to NM 118 or Old Route 66 on the south end. However, transportation planning efforts extend beyond these limits and look at how this new corridor will fit within the regional transportation system, as well as the City of Gallup Long Range Transportation Growth Plan, connecting north towards Gamerco and south towards Mendoza Rd. This study is located in the City of Gallup, McKinley County, New Mexico, as shown in Figure 1-1. The current alignment of Allison Road is located at approximately I-40 milepost 18. Allison Road crosses Interstate 40 at a concrete box culvert underpass. See Figure 1-4: on page 1-4.

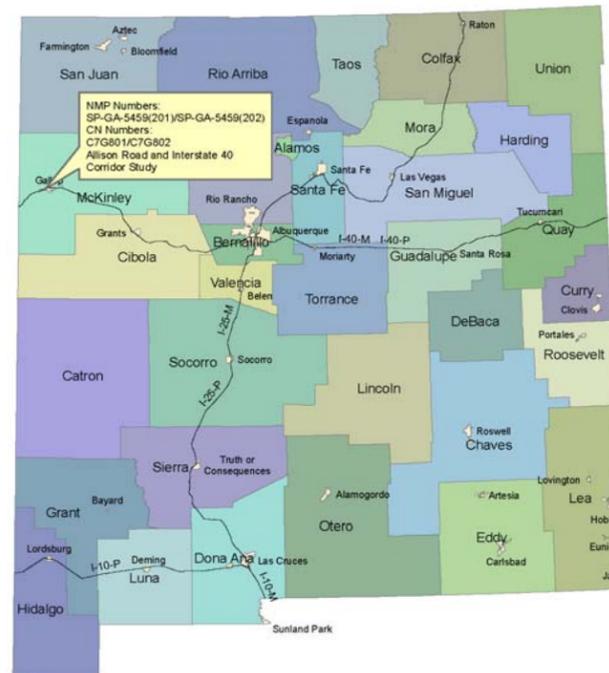


Figure 1-1: Location Map

A Study Team was formed by NMDOT consultants and by Steve Lopez, NMDOT Central Regional Bureau Project Development Engineer (PDE). A Project Management Team (PMT) was formed by representatives from FHWA, NMDOT Central Region Design and NMDOT District 6, the City of Gallup Public Works Department (City), NMDOT Environmental Design Division, and other consultants including Bohannon Huston, Inc., Wilson & Company, Inc., TBE Group, Parametrix, AMEC Earth and Environmental, Inc. As the study progressed, other interested stakeholders were incorporated into the PMT including the Northwest Regional Planning Organization (NWRPO), McKinley County (County), Burlington Northern Santa Fe (BNSF) Railroad, and Gallup Joint Utilities.

This report builds upon the decisions and conclusions determined from the Initial Evaluations of Alternatives (Phase A Report) prepared under NMDOT Project Numbers SP-GA-5459(201)/SP-GA-5459(202), CN C7G801/C7G802. The Phase A report explored three potential corridors in western Gallup within which the Allison Road Corridor could be relocated. Phase A concluded that the East Corridor, labeled “3” in Figure 1-2 was the most viable corridor for Allison Road Improvements.

The scope of this report was to develop alternative alignments within the eastern corridor (see figure 1-1, #3 below) that addressed existing issues, needs, and that fit within the context of the City of Gallup’s long range planning initiatives. Alignment alternatives developed within this corridor provide the opportunity for good regional connectivity north and south of the interstate. The potential for an interchange connection to the interstate was also evaluated; although, an interchange cannot be justified unless it fits in with the regional transportation system and complies with the 8 requirements in the Federal Highway’s Interstate Access Policy. More specifically this study encompasses the development and evaluation of the following:

- Location of Allison Road Intersection with NM 118 to allow Allison Rd. to be extended to the south to Mendoza Road in the future.
- Location of Allison Road to allow its extension to the north toward Coal Basin Road
- One-way or two-way or no frontage roads at Interstate 40
- To assess the viability of an underpass or overpass with Interstate 40.
- I-40 Interchange alternatives that can be constructed given the type of frontage road chosen.
- Development of phase and priority plan for the corridor construction to address funding limitations.

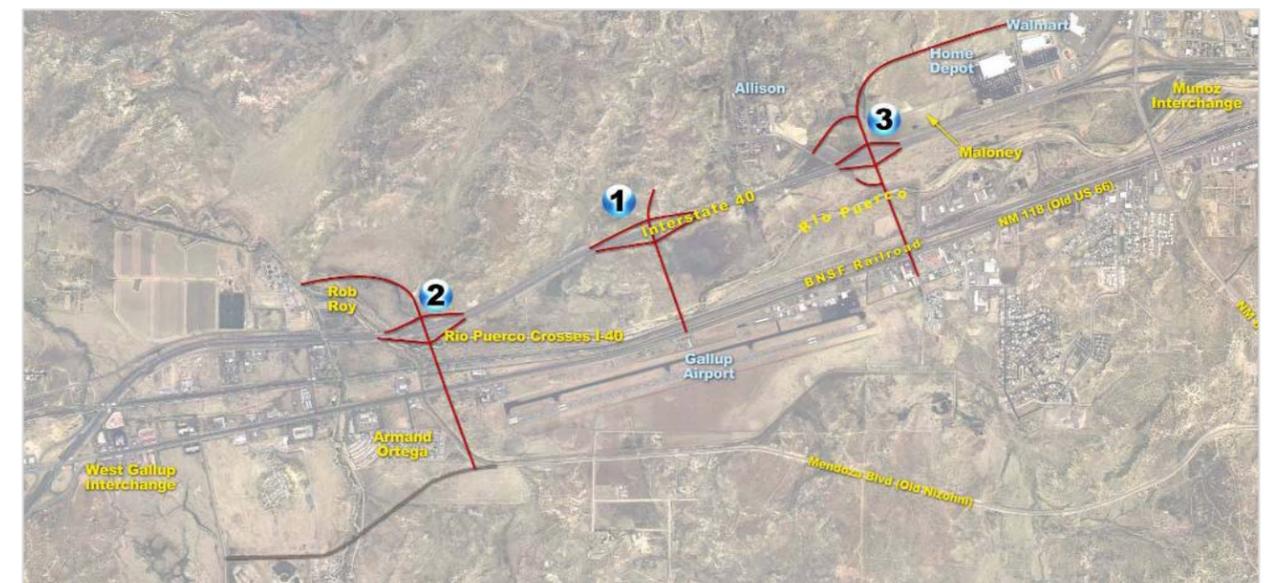


Figure 1-2: Phase A Corridor Alternatives



Figure 1-3: Project Vicinity Map

1.1. PHASE A OVERVIEW

The Phase A Corridor Study (Study) was completed in August 2010. The Study evaluated the existing conditions of Allison Road and determined if there were other potential corridors in western Gallup to relocate the existing Allison Road between the West Gallup Interchange, mile post 14, and the Munoz Interchange at milepost 20.

Evaluation of the existing condition along Allison Road concluded that there are many physical deficiencies within this corridor that should be mitigated including roadway geometrics, structural, pavement condition and drainage facilities. Additionally, the system connectivity provided by the existing corridor could be improved. There were three alternative corridors that were evaluated as part of the Phase A Study. The first alternative was located at the midpoint of the project limits between the West Gallup Interchange and the Munoz Interchange. The second alternative was located approximately 1-mile east of the West Gallup Interchange and the final alternatives was located within the existing Allison Road Corridor.

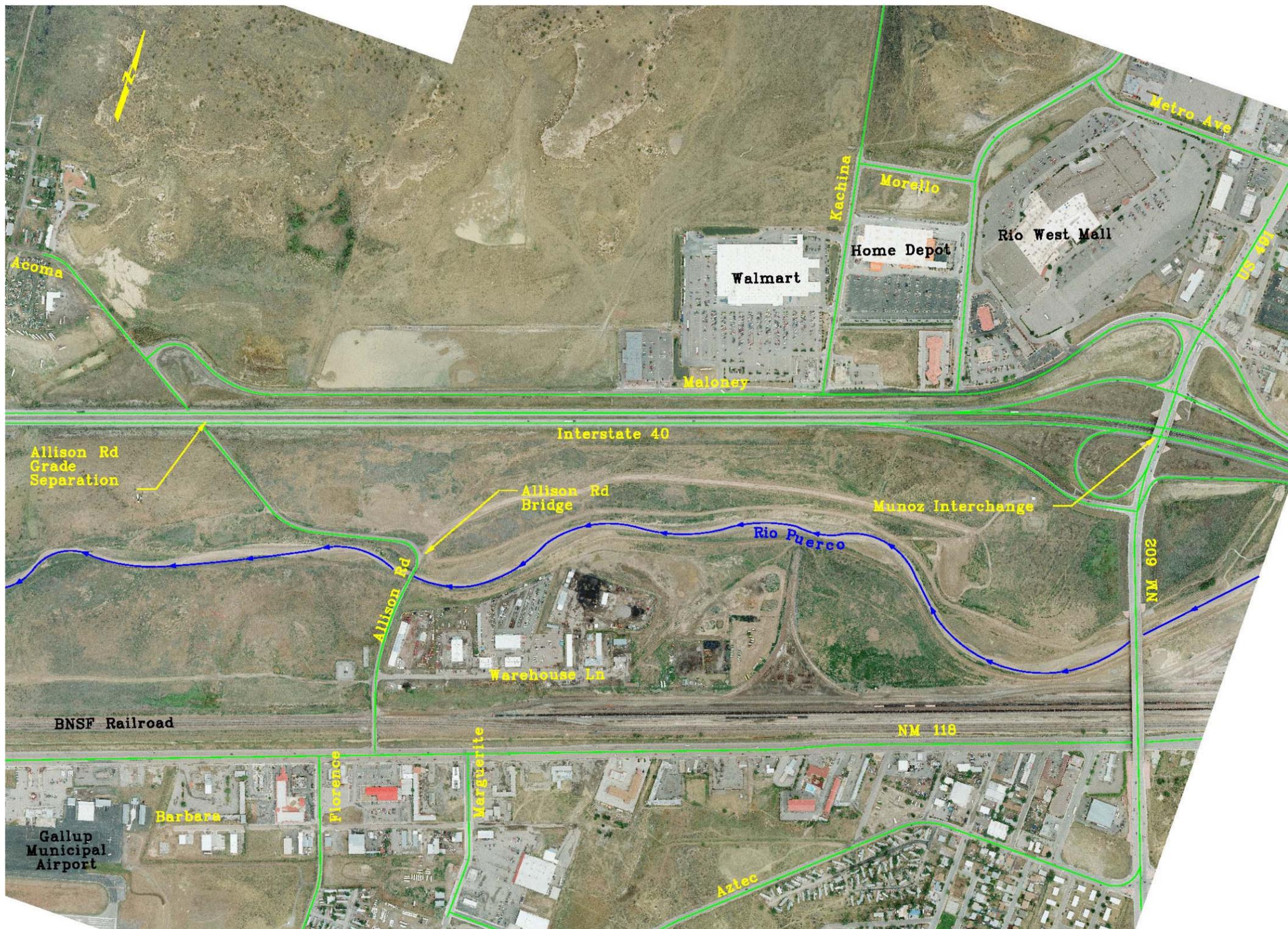
All alternatives were developed in close coordination with the PMT and with the public in accordance with the Public Involvement Plan (PIP) developed for this project. The evaluation of alternatives for Phase A was extensive. Four distinct alternative evaluation matrices were developed to ensure that all points of view were adequately represented. The matrices developed focused on Purpose & Need, Stakeholder Issues, Public Issues and Environmental Issues. The existing Allison Road corridor was unanimously selected by the Project Management Team and Stakeholders as the preferred alternative for the following reasons:

- This alternative is located approximately at the same location as existing Allison Road Corridor and therefore will reconstruct and replace existing Allison Road and the deficient Allison Road Bridge;
- There is adequate spacing between this location and the Munoz Interchange for a new future interchange;
- This corridor alignment can easily be extended to the north to tie into existing transportation facilities such as Coal Basin Road, Gamerco and others. Equally important to the regional transportation system this corridor can be extended south beyond NM118 to tie to Mendoza Road;

- This alternative location will provide good access and improve mobility to existing businesses in the area and lands north and south of I-40 that have potential for development. Congestion relief to US491/NM602 could be provided if the regional transportation connections are made to the north and south; and
- Input from public meetings substantiates support of this alternative.

1.2. PHASE B OVERVIEW

Building on the Phase A Study, the Phase B Report provides a Detailed Evaluation of Alternatives and sets forth a preferred alternative to be carried forward to environmental clearance and design. The development of the Phase B study was systematic in nature. This Study evaluated not only corridor alignments but evaluated the type of grade separation required with I-40, frontage road configurations, possible interchange types that fit within the context of the corridor, and finally developed a priority and phasing plan for the corridor that would enable the corridor to be constructed in segments as funding becomes available.



Key Issues within Project Limits:

- Congestion within the Munoz Interchange LOS F.
- Allison Road/I-40 Underpass Functionally Obsolete
- Allison Road/Rio Puerco Bridge Structurally Deficient
- Operational Deficiencies caused by At-Grade crossing of Allison Road and BNSF railroad tracks.
- Poor horizontal geometry and sight distance at north end of Rio Puerco Bridge.
- Higher than state average crash rate within corridor.

Figure 1-4: Project Limits Map

2. PURPOSE AND NEED

There are seven factors that may establish the need for transportation improvements. These factors are:

- Safety;
- Physical deficiencies;
- Travel demand & congestion;
- System connectivity;
- Access;
- Economic development and;
- Legislative mandate.

The purpose of proposed Allison Road Corridor improvements is to mitigate existing geometric, physical, and operational deficiencies, improve safety, and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range local and regional planning goals to facilitate economic growth.

Using these seven factors as a basis, the Allison Road corridor was reviewed with stakeholders, as set forth in the Public Involvement Plan (PIP) prepared for this study. During meetings with the stakeholders many issues and concerns, with both the existing and future state of this corridor were identified. These were documented and investigated to confirm that they represented a factor that should be included in the determination of the project need. Framed by the seven purpose and need factors, the existing conditions within the Allison Corridor are summarized in the following sections.

2.1. SAFETY

Safety can be defined in three ways: normative, substantive, and perceived. Normative safety is the measure to which designs meet applicable design standards (geometric compliance). Substantive safety is the measure to which the historical safety record is favorable, irrespective of whether the design standards are met or not. Perceived safety is the subjective measure of the level of comfort experienced by users of a facility. Consideration of these three safety measures individually and in aggregate is important when assessing existing conditions and potential improvements.

2.1.1. NORMATIVE SAFETY ASSESSMENT

The standards applicable to the Allison Road corridor are the 2004 AASHTO Geometric Design of Highways and Streets “Green Book” and the AASHTO Roadside Design Guide. The existing roadway was compared to these standards for geometric compliance. The following is a summary of deficiencies on existing Allison Road that do not meet current AASHTO geometric design standards:

- The existing roadway typical section is 24-feet wide which is standard for a two-lane roadway, however, the typical section is lacking a shoulder, which for a bridge on a collector roadway should be a minimum of 5-feet wide;
- Existing Allison Road Bridge crossing the Rio Puerco is only 23-feet wide. The recommended minimum standard bridge width is 36’ feet wide – 2 – 12’ lanes with 6’ shoulders;
- The horizontal curvature north of the bridge has inadequate stopping sight distance (i.e. blind curve) due to the temporary concrete wall barrier lining the roadway and no curve widening provided to accommodate off-tracking of large vehicles;
- The roadside barrier along Allison Road, that shields the Rio Puerco, is comprised of dilapidated temporary concrete wall barrier.
- The metal bridge barrier rail is listed as substandard in the bridge inspection report due to broken, dry and checked wooden posts with traffic damage;
- The existing concrete box culvert (CBC) crossing that carries I-40 over Allison Road is 25-feet wide; the recommended width is 30-feet. Additionally, this structure only has 14-feet of vertical clearance and is classified as functionally obsolete in the NMDOT bridge inspection reports.

2.1.2. SUBSTANTIVE SAFETY ASSESSMENT

The substantive safety of the transportation facilities within the study corridor was quantified by reviewing crash data obtained from City and State law enforcement as well as by contacting BNSF rail operations. Allison Road has a significantly higher crash rate than the other facilities within the study limits.

Over the 5-year analysis period there were 4 crashes at the Allison Road/NM 118 Intersection. In 2005 one pedestrian was killed when struck by a train. The crash data provided by the City of Gallup for Allison Road only specified the probable cause of the crash and the sobriety of the driver. The following table shows the number of crashes and the corresponding crash rate per million vehicle miles (MVM).

CRASH RATES	2004	2005	2006	2007	2008
Total Crashes	5	3	8	5	2
Crash Rate per MVM	10.34	6.20	16.54	10.34	4.14
State Ave	2.11	2.23	2.05	1.90	n/a
McKinley	1.43	1.14	1.03	.86	n/a

The crash rate for this 7-tenth of a mile road is significantly higher than both the statewide and county average crash rates. The average crash rate over the 5-year analysis period is 9.51. The average statewide crash rate for 2004 through 2008 is 2.07. The McKinley County average crash rate is 1.11. Of the 22 crashes reported 3 (14%) involved drivers that had been drinking. The primary probable cause of crashes is attributed to; following too close 32%, driver inattention 23% and excess speed/too fast for conditions 23%.

By comparison the average crash rate over the five year analysis period for West Maloney Avenue was 0.71 per MVM although the average daily traffic, ADT, is nearly double that of Allison Road. The average crash rate on NM 118 was reported to be 2.9 per MVM over the analysis period and that of US 491 was 6.10.

2.1.3. PERCEIVED SAFETY ASSESSMENT

Perceived Safety is based solely on the perspective of the users of the facility and as such is anecdotal in nature. While there may not be either a normative or substantive safety concern, perceived safety issues may preclude some users from using a facility, because to them their perception is a reality. Discussions with stakeholders and public input during the initial public meeting revealed the following perceived safety issues:

- In general it was expressed that pedestrians and bicyclists avoid using Allison Road because there are no sidewalks or shoulders.
- Pedestrian and bicyclists do not like crossing the railroad tracks.
- During BNSF rail operations the intersection of NM 118/Allison becomes very congested. People become frustrated with the congestion. This frustration often leads to drivers making erratic traffic maneuvers that create an unsafe environment.
- Incident management on Allison Road can be impeded due to rail operations due to a lack of redundant routes;
- Allison Road is perceived unsafe by users because the existing bridge over the Rio Puerco is viewed as “ready to fall down.”

2.2. PHYSICAL DEFICIENCIES

Within the study limits physical deficiencies are manifested in several ways, including roadway geometrics, structural, pavement condition and drainage facilities. Considered individually, each of these

deficient conditions could justify improvements: collectively, they warrant improvement actions within the Allison Road Corridor.

2.2.1. ROADWAY GEOMETRICS

Deficient roadway geometrics are a contributing factor to the normative safety issues discussed previously. The following are the geometric deficiencies noted during the evaluation of the Allison Road Corridor.

- No existing roadway shoulders on Allison Road;
- Insufficient roadway widening on curves north of bridge crossing Rio Puerco;
- Curve length on curve immediately north of bridge is too short resulting in a blind curve;
- Existing roadway curvature limits the operating speed of the facility to a design speed of 25 mph (assuming 6% super elevation) and precludes upgrading the functional classification of the facility in accordance with the City of Gallup Growth Management Plan.

2.2.2. STRUCTURAL

There are two structural elements on Allison Road, a timber bridge over the Rio Puerco and a box culvert that passes Allison Road under Interstate 40. Both structures are structurally and/or functionally deficient.

The existing timber bridge was constructed in 1940 and has a structural rating of 43.8. Many of the girders on this bridge are warped, cracked or loose. This structure is also functionally obsolete because it has substandard width.

The existing concrete box culvert is structurally sound but is functionally obsolete because it has only 14-feet of vertical clearance.

2.2.3. PAVEMENT CONDITION

A cursory pavement assessment was performed as part of this study. In general, Allison Road pavement has excessive alligator cracking and is in need of maintenance or improvement.

2.2.4. DRAINAGE FACILITIES

An existing structures evaluation was performed as part of this study. Most of the drainage facilities within the study limits perform adequately. It was noted that the existing culverts near West

Maloney and Allison are partially filled with sediment deposits. This has reduced the functional/design capacity, causing water to backup and impound along the north side of West Maloney Ave. A field investigation revealed that the flows from these culverts are being impeded from out falling to the Rio Puerco due to manmade detention facilities on private property between I-40 & NM 118.

During meetings with the City of Gallup, it was identified that water overtops the banks of the Rio Puerco at the Allison Road Bridge crossing during major storm events. The 100-year event water surface elevation was computed as 6491.10 at Allison Road. The top of roadway elevation is 6489.81, which is over a foot lower.

2.3. TRAVEL DEMAND & CONGESTION

Travel demand and associated congestion for the roadway within the study limits were estimated using a Travel Demand Model (TDM). For analytical purposes, the Base Year Analysis was established as 2010 and the 20-year forecast horizon year 2030. Existing traffic counts were performed at the onset of this study, December 2009, and were used to calibrate the TDM. The 2030 TDM roadway network was established based on the City of Gallup Long Range Growth Management Plan.

Current traffic volumes on Allison Road are very low. It is a local road that is used by local traffic to access properties in the area and provides access from NM 118 that allows some traffic to bypass congestion that occurs at the Munoz Interchange (US 491/NM 602). Based on traffic counts the Peak Hour Volume on Allison Rd. is 289 vehicles. This equates to an average daily traffic volume of nearly 2,000 vehicles per day. The current Level Of Service (LOS) based on capacity analysis for the roadway link is Level Of Service B. The expected 2030 peak hour volume is 463 and the estimated LOS is A for a two lane typical section. This increase in 2030 demand is attributed to the TDM model showing Allison Road connecting to West Maloney Avenue on the north and to Mendoza Boulevard on the South. The lack of capacity of Allison Road does not justify the need for a project; however, the operations of the intersection of Allison Road with NM 118 do, as further discussed below.

The Allison Road/NM 118 intersection is currently unsignalized. Located approximately 200-feet north of the Allison Road/NM 118 intersection is a signalized railroad crossing with BNSF facilities. The 2009 average daily train traffic at Gallup was 60 trains every 24 hours. This includes both eastbound and westbound freight trains through Gallup and two Amtrak Passenger trains. In 2006 through 2008, there were 88, 83 and 76 trains respectively. BNSF anticipates that daily train numbers will return to the higher volumes again as the economy recovers¹. There are additional conflicts at the intersection caused by rail

yard switching operations that activate the railroad crossing. There is inadequate storage on Allison Road between NM 118 and the BNSF tracks for northbound traffic when the railroad crossing is activated. Because of this traffic, turning off of NM 118 onto northbound Allison Road routinely backs up on to NM 118.

2.4. SYSTEM CONNECTIVITY

The Rio Puerco, Interstate 40, and the BNSF railroad tracks run east to west and are continuous throughout the City of Gallup and in effect divide Gallup into north and south halves. Within the study limits, NM 602, Allison Road and Sanostee Drive are currently the only facilities that provide access across the railroad tracks and I-40. As such, improvements to Allison Road Corridor will directly impact the effectiveness of this facility to convey traffic between NM 118 and West Maloney Avenue across Interstate 40 and BNSF rail facilities which in turn will improve the overall system connectivity between the north and south side of Gallup.

2.5. ACCESS

Within the study limits there are three modes of access that need to be assessed: community, local, and regional. Community access refers to access on either side of I-40 within either the north or south side of Gallup exclusively. Local access describes the access the facility provides across the interstate and between north and south Gallup. Regional access speaks to how well a facility provides access to other facilities that provide transportation to areas outside of the Gallup City Limits.

Existing Allison Road currently provides local access between NM 118 and West Maloney Blvd and to City maintenance and BNSF yards located between the interstate and NM 118. Some local traffic uses Allison Road to access the commercial developments along West Maloney Ave and US 491 to avoid congestion on NM 602/US 491 through the Munoz Interchange. Allison Road is currently only a local roadway and thus provides no community or regional access. By rectifying the geometric deficiencies that limit the design speed and thus the functional classification of Allison Road, local access could be improved.

The Allison Road Corridor has the potential to provide significant improvements to community and regional access. The long range growth plan for the City of Gallup shows Allison Road connecting to Mendoza Boulevard to the south of NM 118. This would provide access to planned housing developments in this area. Ultimately, regional access could be provided, if the Allison Road corridor was located such that proper interchange spacing was obtained and a future interchange with I-40 could be constructed.

¹ Train volume information provided by BNSF.

2.6. ECONOMIC DEVELOPMENT

The City of Gallup Growth Management Plan identifies a significant amount of developable land between I-40 and NM 118. The close proximity to the BNSF rail facilities makes these lands attractive locations for trucking, storage, and manufacturing facilities. These industries could provide much needed jobs within the City. However, the desire for businesses to locate in the area between I-40 and NM 118 is diminished due to the fact that Allison Road does not provide adequate community, local and/or regional access to facilitate economic development opportunities.

2.7. LEGISLATIVE MANDATE

In 2009 the State Legislature appropriated the funding to conduct this study. No specific mandate has been made to construct improvements on Allison Rd Corridor. However, keen interest in the Allison Road Corridor has been expressed by the City of Gallup, McKinley County and State Officials.

2.8. PURPOSE AND NEED STATEMENT

The purpose of proposed Allison Road Corridor improvements is to mitigate existing geometric, physical, and operational deficiencies, improve safety, and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range local and regional planning goals to facilitate economic growth. In particular, primary consideration should be given to the following needs in this corridor:

- Improve traffic operations in the intersection of NM 118 and Allison Road by reducing the impacts associated with rail operations and;
- Correct geometric, physical, and safety deficiencies within the Allison Road Corridor that limit the operational speed of the roadway and limit the potential to increase the functional classification of the facility.

3. PUBLIC INVOLVEMENT AND AGENCY COORDINATION

A Public Involvement Plan (PIP) was prepared by Parametrix and Bohannon Huston, Inc. (BHI) and was approved by the New Mexico Department of Transportation (NMDOT) for Allison Road (Rd) Corridor and Interstate 40 (I-40) Interchange Study in December 2009. The PIP purpose is to ensure that information about the study was made available to the concerned public and that the public has an opportunity to participate in the decision-making process. The process outlined in the PIP is a formal approach to implementing the public involvement requirements mandated by the Council on Environmental Quality's (CEQ's) National Environmental Policy Act (NEPA) guidelines, the NMDOT's Location Study Procedures, and the Federal Highway Administration (FHWA) and NMDOT Context Sensitive Design (CSD)/Context-Sensitive Solutions (CSS) process.

The NMDOT is committed to the CSD/CSS process, which considers aesthetic, cultural, environmental, and community values in balance with more traditional design criteria in transportation infrastructure development such as safety, mobility, and protection of tort liability. A Study Team has been formed by NMDOT consultants and by Steve Lopez, NMDOT Central Regional Bureau Project Development Engineer (PDE). A Project Management Team (PMT) was formed by representatives from FHWA, NMDOT Central Region Design and NMDOT District 6, the City of Gallup Public Works Department (City), NMDOT Environmental Design Division, and other consultants including BHI, Wilson & Company, Inc., TBE Group, Parametrix, AMEC Earth and Environmental, Inc., and DePauli Engineering and Surveying, LLC, the Northwest Regional Planning Organization (NWRPO), McKinley County (County), Burlington Northern Santa Fe (BNSF) Railroad, and Gallup Joint Utilities.

Stakeholders are people who could potentially be positively or negatively affected by a project or who have a "stake" in the success or failure of a project. Examples of stakeholders include individuals, public and private groups, elected officials, non-governmental organizations, government agencies, and the owning agency. The stakeholders identified in Exhibit A of the PIP include also individuals or groups who have shown an interest or have participated in the public involvement activities of other transportation issues in the Gallup region. Every effort was made to reach traditionally underserved populations, including low income and minority households and persons with disabilities. As public meetings were held further stakeholders identified were added to the list of stakeholders.

In addition to the Study Team and the PMT, there was an opportunity for key stakeholders to participate in a Stakeholder Advisory Group (SAG). The public involvement process provided information to stakeholders and invited input during all phases of the study, including definition of purpose and need, identification of community impacts, and selection of feasible alternatives. Public involvement for this

project has also been designed to provide project information to the public through local media advertisements, public involvement meetings, small group workshops, individual interviews, and written correspondence. A public meeting was held at the City of Gallup City Hall Council Chambers July 22, 2010 at the conclusion of Phase A and the start of Phase B. This second public meeting focused on presenting the full range of alternatives developed by the Study Team and consultants during Phase A. Alternatives were graphically presented, and summaries of the major components of each were available for review. At the conclusion of Phase B a Public Meeting was again conducted at the City of Gallup City Hall Council Chambers June 21, 2011. At this meeting the project development process was reviewed, the development of alternatives summarized, and the next steps in project development were presented. Meeting minutes for this meeting and all subsequent meetings can be found in Appendix E of this report, see Table 3-1 for a listing of date and purpose of each meeting.

Date	Meeting Purpose
Thursday, July 22, 2010	Public Information Meeting
Thursday, October 14, 2010	PMT Meeting
Monday, November 22, 2010	PMT Meeting
Thursday, December 9, 2010	PMT Meeting
Wednesday, January 26, 2011	PMT Meeting
Tuesday, June 21, 2011	Public Information Meeting

4. TRAFFIC FORECASTS

As stated earlier, the purpose of the proposed Allison Road improvements is to mitigate existing geometric, physical and operational deficiencies, improve safety and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range and regional planning goals to facilitate economic growth. In order to fully understand how well the corridor improvements meet the purpose and needs of this project, it is imperative that, from an operational perspective, both regional and local traffic operations be considered. Additionally, there are many different transportation elements and configurations for how the Allison Road Corridor improvements may be developed within the context of the existing transportation network. For instance, this corridor could be configured as a local arterial route or alternatively as a regional arterial with a frontage road system and a service interchange.

In order to quantitatively assess the various configuration scenarios a traffic operational analysis protocol was developed. Under this protocol, the applicable transportation components suitable for this corridor were considered. The components considered are:

1. Allison Road Corridor with Local Links
2. Allison Road Corridor with Regional Links
3. Regional Links just to South of I-40
4. Regional Links just to North of I-40
5. A one way frontage road pair between the Allison Corridor and the I-40/Munoz Interchange
6. A two way frontage road pair between the Allison Corridor and the I-40/Munoz Interchange
7. A service interchange at Allison Rd. and I-40

For the purpose of this analysis local links were considered to be connection of Allison Road north of the Interstate 40 to Morello Avenue and to West Aztec Avenue on the south of the interstate. Regional connections were defined by making connection of Allison Road to Coal Basin Road north of the interstate and to Mendoza Parkway south of the interstate.

The next step in developing the traffic operation analysis protocol was to specify different combinations of the aforementioned transportation components. Table 4-1 shows the twelve configurations derived from the transportation components that were analyzed. The purpose of the Allison Road modeling is to understand the effects of the different configurations in the context of Gallup,

NM transportation network. The PM roadway conditions were run in VISUM 11.02 PTV. Four different evaluation criteria were produced from the model and were used to put forth recommendations for the ultimate configuration of the Allison Road Corridor.

The evaluation criteria considered are:

- 1) Link level of service (LOS)
- 2) Intersection LOS
- 3) Vehicle miles traveled (VMT)
- 4) Vehicle hours traveled (VHT).

In addition to the configurations listed, operational analysis was performed on the existing transportation network for existing traffic volumes as also for the projected traffic volumes expected in the design year 2030.

Table 4-1: Allison Road Corridor Traffic Analysis Protocol							
	Allison with local links	Allison w/regional links	Allison regional south	Allison regional north	1-way Frontage Pair	2-way Frontage Pair	Interchange
Configuration 1	✓						
Configuration 2		✓					
Configuration 3			✓				
Configuration 4				✓			
Configuration 5	✓						✓
Configuration 6		✓					✓
Configuration 7	✓				✓		
Configuration 8		✓			✓		
Configuration 9	✓					✓	
Configuration 10		✓				✓	
Configuration 11	✓				✓		✓
Configuration 12	✓					✓	✓

4.1. LINK LEVEL OF SERVICE (LOS) COMPARISON

The model provided LOS for some of the roadways in 2030 within the study area. Projected improvements in comparison with all the other configurations were:

- The configurations with the interchange at Allison Road were projected to have a better LOS along NM 118 and around the interchange at Hwy 491.
- The configurations with the regional links were projected to have a better LOS along Hwy 491.
- The configurations with the one way frontage road were projected to have a better LOS along I-40 between Hwy 491 and Allison Road. The two way frontage road did not show any positive changes compared to the rest of configurations.

Conclusions from the analysis can be drawn:

- The configurations with the Interchange 40 at Allison Road will draw traffic away from the interchange at I-40/US 491 and draw some of the traffic off of NM 118.
- The configurations with the regional link will draw traffic away from US 491.
- That the configurations with the frontage road in both one-way and two-way cases will likely draw traffic away from I-40 between US 491 and Allison Road.

4.2. INTERSECTION LEVEL OF SERVICE (LOS) COMPARISON

The model provided LOS for some of the possible signalized intersections in 2030 within the study area. Projected improvements in comparison with all the other configurations:

- In configurations that the interchange at Allison Road is present, the LOS for one or more signalized intersections along NM 118 improves in LOS. The intersection at West Maloney Ave/US 491 also improves in some configurations with the interchange present compared to the other configurations.
- In configurations that the regional links are existing and proposed northern regional links were present, the LOS for the intersection at Coal Basin Rd/US 491 is projected to improve compared to other configurations. The southern link did not show any improvement in LOS.
- In configurations that the frontage roads are present, the LOS for all intersections did not show any improvement compared to other configurations.

Conclusions from the analysis can be drawn:

- The addition of the interchange is projected to relieve some of the delay along NM 118 and US 491 just north of I-40.
- The construction of the regional links or northern regional links is projected to relieve some of the delay along US 491 north of I-40.
- The construction of the frontage road is not projected to change the LOS.

4.3. VEHICLE MILES TRAVELED (VMT) & VEHICLE HOURS TRAVELED (VHT) COMPARISON

VMT is how many miles were traveled by each vehicle during the peak hour in the study area. The lower the VMT, the shorter the distance traffic in the study area had to take to get to and from the modeled destinations, if vehicles volumes stayed the same. This does not necessarily correlate to a faster travel time. Example: If modeled traffic travels half the distance but it takes twice as long, then there is no time savings.

VHT is how much travel time by each vehicle during the peak hour in the study area. The lower the time, the quicker the modeled traffic went to and from the destinations, if vehicle volumes stayed the same. This does not take into account the amount of miles traveled to get to the destinations. Example: If modeled traffic travels four times the distance but it takes half as long.

The ratio between VMT and VHT gives an average traffic flow in the study area. The higher the ratio, the faster the modeled trips are getting to and from the destination. The ratio of miles and time together is an indication of the efficiency of the system.

Some improvements were projected to be more beneficial to the traffic flow within the study area than others. Table 4-2 provides the projected VMT, VHT, and the ratio between the different configurations. Configurations 6, 7, 11, and 12 have the highest regional and total ratios. The roadway improvement that is similar between these different configurations is the addition of an interchange at Allison Road in the model. The interchange will improve the network operations within the study area the most.

Configurations that were evaluated with the regional links showed the second most projected improvement to the study area. Comparing configuration 3 and 4 it is noticed that the northern regional links are projected to provide a slightly better traffic flow than the southern regional links.

Comparing the configurations with the frontage road to ones without a frontage road, the improvements were very slight. The two way frontage pair was projected to be higher than the one way pair but overall both had very slight impact on the network. The projected improvements are estimates from a model and should not be used as a definite number. They are used as a comparison between the different configurations. All configurations show improvement over the No Build option.

Table 4-2: Allison Road Corridor VMT, VHT and the Ratio for the Study Area									
	VMT*			VHT*			Ratio		
	MILES			HOURS			VMT/VHT		
	Regional	Local	Total	Regional	Local	Total	Regional	Local	Total
No Build	15155	596	15750	331	20	351	45.78	29.80	44.87
Configuration 1	13825	534	14359	299	17	316	46.31	31.19	45.49
Configuration 2	13518	521	14039	291	17	309	46.42	31.35	45.61
Configuration 3	13793	535	14329	298	17	315	46.29	31.24	45.47
Configuration 4	13609	537	14147	293	17	310	46.44	31.30	45.60
Configuration 5	13831	557	14387	297	18	315	46.61	30.95	45.72
Configuration 6	13505	544	14049	289	18	306	46.78	31.01	45.88
Configuration 7	13898	535	14433	301	17	318	46.16	31.30	45.37
Configuration 8	13438	517	13955	290	16	306	46.40	31.43	45.59
Configuration 9	13743	523	14265	297	17	314	46.29	31.41	45.50
Configuration 10	13481	514	13995	290	16	307	46.43	31.48	45.63
Configuration 11	13879	557	14436	298	18	316	46.54	30.98	45.66
Configuration 12	13828	545	14373	297	18	314	46.59	31.09	45.72

**rounded*
 Source: Wilson & Company, 2010

5. DETAILED EVALUATION OF ALTERNATIVES

In order to meet the purpose and need of this study, the proposed alignment of Allison Road should mitigate existing geometric, physical, and operational deficiencies, improve safety, and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range local and regional planning goals to facilitate economic growth.

The City of Gallup Growth Management Master Plan shows Allison Road as a minor arterial roadway. The minimum right-of-way width for an arterial roadway is 100 feet per City of Gallup Land Development Standards. A 40 mph design speed was used.

5.1. NO BUILD ALTERNATIVE

The No Build Alternative would mean not making any physical changes to Allison Road. No right-of-way would be required and no costs would be associated with this alternative. However, the No-Build Alternative does not meet the project need of mitigating the geometric, physical and operational deficiencies, improving safety or providing connectivity to facilitate economic growth. Therefore, the No Build Alternative is eliminated from further consideration.

5.2. ALLISON ALIGNMENT

A grade separation is needed at the BNSF railroad tracks and NM 118 in order to eliminate the traffic congestion issues in the NM 118 / Allison Road intersection due to rail operations. Ideally, the Allison alignment should be perpendicular at its intersection with Interstate 40, the Rio Puerco and the railroad tracks in order to minimize construction costs.

Five alignments were developed and evaluated within the Allison Corridor. Three locations for the alignments to cross NM 118 were considered. These locations were selected as crossing locations because of the potential to extend the alignment south to Mendoza Road. The West Alignment crosses NM 118 approximately 850-feet west of Florence Street and crosses I-40 near the location of the existing underpass. The Center Alignment crosses NM 118 at Florence Street and crosses I-40 about 870 feet east of the existing underpass. The East Alignment crosses NM 118 at Marguerite Street and crosses I-40 one mile from the Munoz Interchange. The West-Center Alignment is a combination of the West Alignment and the Center Alignment that crosses NM 118 at Florence Street and then curves to the west. The East-Center Alignment is a combination of the East Alignment and the Center Alignment that crosses NM 118 at Marguerite Street and then curves to the west. Table 5-1 provides a synopsis of the alternatives while Figure 5-1 provides a graphical representation of the alternatives.

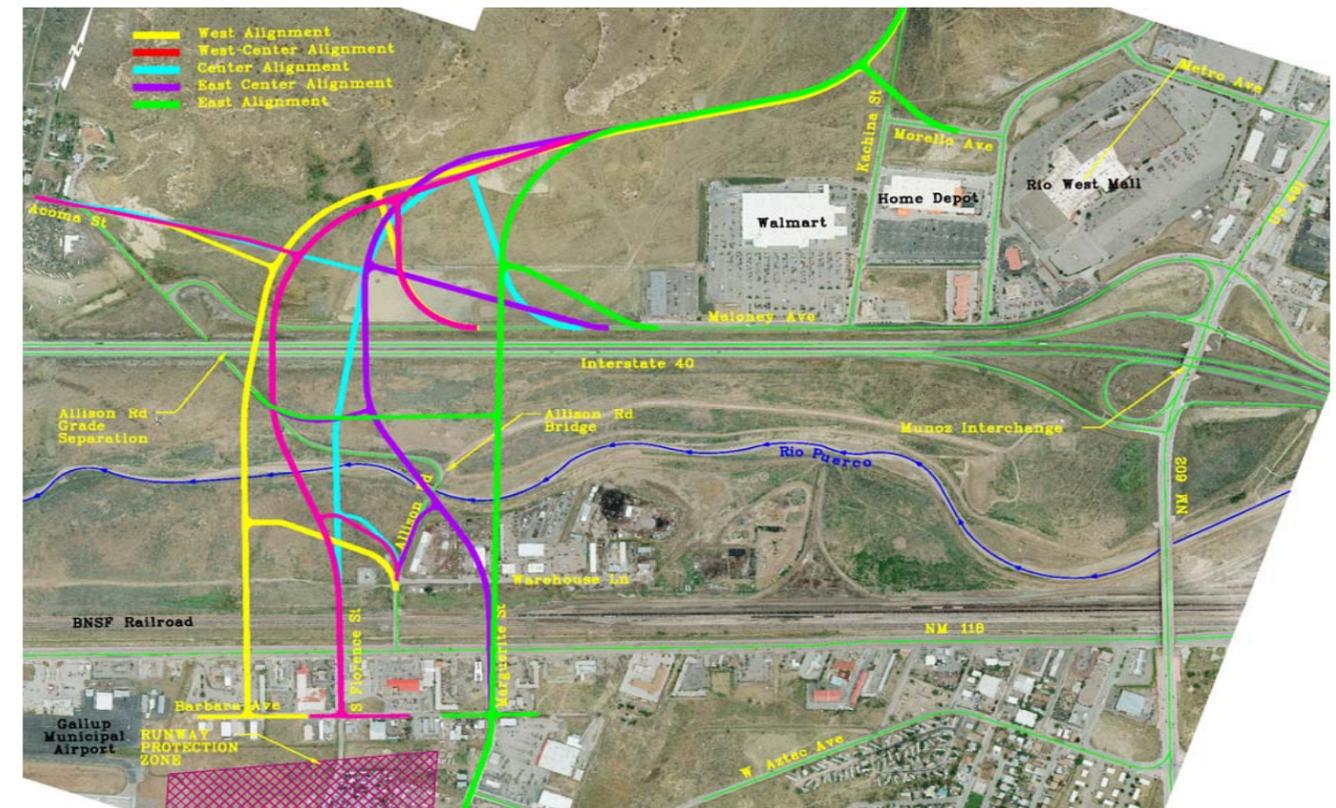


Figure 5-1: Allison Corridor Alternatives

5.3. I-40 CROSSING

A grade separation between the Allison Corridor and I-40 will be required for all of the alignment options considered. As part of the initial alignment development an evaluation was performed to determine the most appropriate type of grade separation, either an underpass or an overpass. The findings of these evaluations are detailed in the following sections.

5.3.1. OPTION 1 - UNDERPASS OF I-40

An underpass of I-40 was investigated to determine the impacts to I-40 and to the Allison Road Corridor. The underpass would need to provide the ability to construct an interchange in the future so the vertical profiles assume that the ramps intersect the alignment 200 feet left and right of I-40. The slope at the ramps would need to be approximately +/- 2%. It was assumed for alignment alternatives that the vertical profile of Interstate 40 remains unchanged.

ALIGNMENT	NM118 CROSSING LOCATION	OVERVIEW
West	850-Feet west of Florence Road	This alignment provides the maximum spacing to the Munoz Interchange; however, the Airport runway protection zone precluded extension of this alternative to the south.
West Center	Florence Road	This alignment is a hybrid between the West & Center alignments. The rationale behind the development of this alignment was to maximize the distance to the Munoz Interchange while providing a connection to the existing street network.
Center	Florence Road	This alternative provides adequate spacing to the Munoz Interchange while connecting to the existing local street network.
East Center	Marguerite Road	This alignment is a hybrid between the East & Center alignments. The rationale behind the development of this alignment was to maximize the distance to the Munoz Interchange while providing a connection to the existing street network.
East	Marguerite Road	This alignment was developed as it represents that most linear crossing of NM118 and I-40 that aligns with the existing local street network.

The underpass alignments are shown in Appendix A. The West Alignment is approximately 6.4 feet above the low flow elevation of the Rio Puerco. The West-Center Alignment is approximately 5 feet above the low flow elevation. Both the center alignment and the east alignment are below the low flow elevation so the underpass would flood whenever the Rio Puerco overtops its banks. In all four alignments the underpass would be flooded during the 100-year storm event.

The following table compares the 100-year flow elevation to the elevation of I-40. In all cases I-40 would need to be raised or the proposed underpass would flood during a 100-year storm event. Raising Interstate 40 by any of these amounts would cost more than reconstructing Allison Road. For this reason the underpass option is eliminated.

Alignment	Approximate 100-year flow elevation	Exist I-40 Elevation	Amount I-40 would need to be raised (ft)
West	6482	6493	11
West-Center	6482	6491.5	12.5
Center	6484	6484	22
East	6484	6483	23

5.3.2. OPTION 2 - OVERPASS OF I-40

An overpass of I-40 for a future interchange was investigated. It was assumed that the ramps intersect the proposed alignment 200 feet right and left of the I-40 alignment. The overpass alignments are shown in Appendix A on the plan and profile sheets for each alignment.

An Allison Road overpass would be above the 100 year storm event so there would be no flooding issues. All four alignments have acceptable vertical grades for constructing intersections with the frontage roads and future ramps. The overpass option is the preferred option for the Allison alignment.

5.4. ALLISON ALIGNMENT ALTERNATIVES

The alignment of Allison Rd. should be able to be extended south to Mendoza Blvd in the future to meet the goals of the City of Gallup Long Range Street Plan. All of the alignments would have an overpass of NM 118, the BNSF Railroad, and Interstate 40. All alignments cross NM 118 and the BNSF Railroad tracks at approximately 90 degrees in order to minimize the length of the overpass structure. All four potential Allison Road alignments allow for a future interchange at Interstate 40. A new bridge would be constructed over the Rio Puerco for each alignment.

With respect to each of the Allison Road Alternatives evaluated, safety would be improved because the existing adverse geometric features are mitigated. The drainage concept and the environmental aspects are the same for each Alternative. A preliminary drainage study was prepared as part of this study. The following section provides an overview of the findings of that report. Section 5.6 provides an overview of the potential environmental impacts of improvements within this corridor. A Geotechnical Engineering Evaluation was prepared in conjunction with this report. As summarized in section 5.8 sets forth recommendations and considerations with respect to existing geologic formations and soils within the project limits.

5.5. DRAINAGE

Drainage in the study area generally flows from east to west and from north to south. The Rio Puerco is located between NM 118 and Interstate 40. Bohannon Huston analyzed the Rio Puerco and was responsible for sizing the Allison Road Bridge over the Rio Puerco, which is proposed to pass the 100-year peak discharge of 20,000 cubic feet per second (cfs).

A drainage study for the remainder of the corridor was prepared by Wilson & Company in February, 2011. All four alternatives have similar drainage patterns and issues; therefore, analysis under the drainage report was only given for the Center Alignment and was applied to the other alternatives.

The Coal Basin is a watershed which impacts the proposed corridors. It is approximately 4.3 square miles with its geometry extending 3.1 miles north of I-40 and encompassing a 1.5 mile strip beginning at US 491 and extending east. Several past drainage studies analyzed Coal Basin particularly for finding drainage solutions for the prominent flooding areas along W. Maloney Avenue. The lower reach of Coal Basin is flat, causing runoff to stagnate and pond on the undeveloped land abutting W. Maloney Avenue. These lands are prime commercial locations; however, developers have been hesitant to build since expensive drainage improvements would be required to mitigate potential flooding. The solutions developed by previous studies of Coal Basin included the following: regional attenuations, upsizing culverts, channelizing, creating an additional outlet, and restricting the discharge rate for future development. Wilson & Company used the drainage analysis and solutions from these reports as a base for evaluating the hydrologic parameters and developing solutions.

The historic path of Coal Basin Wash entered the Puerco River just east of County Road 60. Residential, commercial land use and natural terrain are located in the watershed. The construction of I-40 obstructed the flow path and has caused drainage problems north of I-40. Currently the Allison Road box culvert under I-40 acts as an outlet for the basin. Stock ponds downstream of these outlets have aggregated the flow path, which has compounded inadequate drainage for areas in the lower reach.

Three drainage alternatives have been developed Alternative 3. Concepts include diverting runoff around the corridor, cross-draining under the corridor, attenuating, and creating an additional outlet. Cost estimates have been provided for each alternative. Alternative 2 costs came in the lowest at \$2.8 million. The alternative places box structures and pipes for full conveyance of the runoff in the watersheds existing drainage paths. The design team selected Wilson & Company Alternative 2 to be used in the design of future phases within the Corridor.

5.6. ENVIRONMENTAL GENERAL EVALUATION

A complete resource survey would be required during Phase C in order to fully assess any environmental impacts. The following is a summary of potential impacts within the proposed corridor. It is expected that there would be no impacts associated with the no build alternative. The following environmental analysis has been completed in accordance with the National Environmental Policy Act of 1969 (NEPA). The NEPA framework requires a systematic and interdisciplinary approach throughout the decision-making process including the analysis of potential environmental impacts, the development and consideration of alternatives, and the solicitation of public involvement. The NEPA process for the proposed project has also been conducted in accordance with the New Mexico Department of Transportation (NMDOT) Location Study Procedures (NMDOT, 2000), the Federal Highway

Administration (FHWA) Technical Advisory T 6640.8A, 23 Code of Federal Regulations (CFR) Parts 771 and 772, and other applicable guidelines and regulations.

5.6.1. BIOLOGICAL RESOURCES

Soils: Since the majority of the soils located within the project corridor are moderately well drained to well drained soils that exhibit negligible to low surface runoff and moderately slow permeability, there are negligible to minor impacts expected from the proposed improvements. However, the soils located within the Rio Puerco channel are subject to occasional, very brief periods of flooding between July and September. It is anticipated that the proposed improvements will disturb more than one acre of land; therefore a Storm Water Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NPDES) would be required to prevent erosion during construction. No impact to soils is expected from the proposed build alternative.

Vegetation: There are portions of the corridor that are developed and due to the disturbed nature of the vegetation located adjacent to the proposed build alternative, within these developed areas, negligible impacts to native vegetation are expected to result from the proposed project. However, there are portions of the corridor north of Interstate 40 that are not disturbed. It is expected that minor impact to these areas may occur, this will be confirmed during Phase C development.

Threatened and Endangered Species: A full biological survey of the proposed project area would need to be completed in Phase C to determine the presence or absence of listed species. No federally listed threatened or endangered species are expected to occur within the proposed build alternative.

Wildlife: Within this corridor there is mostly urban and commercial composition; however, there exist large areas north of Interstate 40 that are undisturbed. Negligible to minor impacts to wildlife or migratory birds are expected as a result of the proposed build alternative.

5.6.2. WATER RESOURCES

Section 404 of the Clean Water Act (CWA), (CWA; 33 U.S.C. 1251 et seq.) as amended, provides for the protection of Waters of the United States through regulation of the discharge of dredged or fill material. The United States Army Corps of Engineers (USACE) requires that a Section 404 evaluation be conducted for all proposed construction that will occur within their jurisdiction. The jurisdictional areas within the project corridor include the Rio Puerco and the jurisdictional wetland located adjacent to W. Maloney Ave. Under Section 404 of the CWA mitigation is required for any impacts to jurisdictional wetlands. A wetland mitigation plan will be necessary to meet the conditions of the Section 404 permit and the Section 401 water quality certification.

Section 401 of the CWA, (CEA; 33 U.S.C. 1251 et seq.) as amended, requires that a Water Quality Certification Permit be obtained for anticipated discharges associated with construction activities or other disturbance within waterways. The construction of sediment basins may be required to minimize the amount of sediment load into the Rio Puerco.

In regard to floodplains, the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 mandate the Federal Emergency Management Agency (FEMA) to evaluate flood hazards. Executive Order 11988 "Floodplain Management" requires that any potential impacts to floodplain areas be studied, assessed, and identified to reduce the risk of flood loss and to minimize the impacts to the beneficial values served by floodplains. The proposed alignment is located within an area classified by FEMA as a 1% annual chance floodplain and the Rio Puerco channel is classified as a high risk for flooding. Coordination with FEMA and the local floodplain manager will be necessary in Phase C in order to comply with Executive Order 11988 Floodplain Management.

5.6.3. HAZARDOUS MATERIALS

The potential for hazardous materials within the City of Gallup and McKinley County yards would have to be assessed further with an Initial Site Assessment (ISA). The need for an ISA would be determined by the NMDOT Environmental Geology Bureau (EGB) during Phase C. Currently there are no EPA designated sites or leaking underground storage tanks located within the City yards or the project corridor; therefore, impacts associated with contaminated properties are not expected as a result of the proposed build alternative.

If impacts are identified, appropriate clean up, avoidance, or mitigation measures for any potential hazardous materials will have to be in accordance with the NMDOT's Handbook of Hazardous Waste Management (August 1999).

5.6.4. AIR QUALITY

Since the City of Gallup is in attainment for the six criteria pollutants managed under the Clean Air Act (CAA), no significant impacts to air quality are expected as a result of the proposed build alternative. Construction-related air quality issues will be controlled as recommended by the New Mexico Environment Department.

5.6.5. NOISE

In general, ambient noise for the vast majority of the proposed corridor is currently related to traffic noise as the project area is located primarily along Interstate-40 (I-40) and other major roadways. Noise

levels in the immediate vicinity of the proposed alignment could increase as a result of construction, which would create temporary disturbances in adjacent areas.

During Phase C, a noise study will be completed to evaluate potential noise impacts directly associated with the proposed build alternative. Existing land use will be considered when the noise study is completed.

5.6.6. VISUAL

No significant visual impacts to the viewshed within the project corridor are expected as a result of the proposed build alternative.

5.6.7. COMMUNITY COHESION

There is potential for a positive impact on system connectivity, travel demand and congestion, access, and economic development from the proposed project. The proposed improvements would improve traffic operations at the intersection of NM 118 and Allison Road. These improvements would also correct geometric, physical, and safety deficiencies within the project corridor, and it would provide the opportunity for corridor preservation and future construction of an interchange with I-40. The proposed alignment's location would also maximize access to developable land and access between I-40 and NM 118.

5.6.8. LAND USE

The general land use within the proposed project area consists of primarily industrial, commercial, and transportation corridors. The extent of the project area north of I-40 consists of a commercial shopping center and the southern extent of the project area consists of the Burlington Northern Santa Fe Railway (BNSF) line and Old Route 66. There is limited residential use within the proposed project limits.

The proposed build alternative is compliant with the current land use within the project area. Future land use plans as outlined by the City of Gallup and McKinley County will need to be considered in the preliminary design as the proposed build alternative is carried forward into Phase C.

5.6.9. RIGHT-OF-WAY

Given the urban nature of the corridor, any need for property acquisition includes the possibility of displacement of businesses and/or residents. If right-of-way acquisition is required for the proposed build alternative, property owners will be compensated the appraised fair market value for property, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA) and other applicable federal and state regulations. Property value compensation will be

addressed individually with each property owner and property owners will be assured continued access, or relocation of access, if necessary.

5.6.10. CULTURAL RESOURCES

A review of historic aerial photos, as well as the records of the New Mexico Cultural Resource Information System of the Archaeological Records Management Section (ARMS), was performed to identify existing archeological, cultural, and historic resources within the general project vicinity. Results of the research, to date, indicate that there are no previously recorded sites located within the immediate vicinity. However, a historic segment of the Burlington Northern Santa Fe (BNSF) railroad is present within the project corridor. The alignment of Route 66 located within the project corridor has not been identified as a contributing element in the National Register of Historic Places (NRHP). The BNSF railway segment and the Route 66 segment will need to be further evaluated during Phase C for NRHP eligibility status.

A more detailed investigation, including field surveys, and further coordination with the State Historic Preservation Officer (SHPO) will be required in Phase C once the area of potential effect is more clearly defined for the proposed improvements. It is assumed that no more than 10 historic buildings and no more than two archaeological sites would be identified during the Phase C cultural resource investigation.

5.7. UTILITIES

All four alternative alignments have similar utility crossings. Existing utility maps are shown in Appendix D. There is an existing telephone line on Kachina St where the alignments tie in on the north end. There is a water line easement from Morello Ave west and then south to cross under I-40 east of the existing Allison underpass. All of the alignments were aligned to be outside of this water line easement except where the alignments cross the easement.

There are existing overhead electric lines between NM 118 and Interstate 40. These lines will affect the Center and East-Center alignments the most. Since the alignments will be raised to go over NM 118, the BNSF Railroad, the Rio Puerco, and Interstate 40, some of these lines will have to be raised or relocated.

There is an existing gas line between NM 118 and I-40 that is crossed by the East-Center and the East alignments.

There are existing sanitary, water, gas, telephone and electric lines in NM 118 and in the existing road right-of-way south of NM 118. All of these utilities will have to be adjusted to construct the preferred alignment.

5.8. GEOTECHNICAL ASSESSMENT

A site reconnaissance and literature review of the proposed transportation corridor did not reveal geological or geotechnical site conditions that would prevent the development of the proposed project. Presence of a shale-sandstone formation to the north and soft, wet alluvial soils along both sides of the Rio Puerco along the alignment represent features and conditions to be further studied during the geotechnical and foundation investigation phases of this project.

5.9. WEST ALIGNMENT

The West Alignment is shown in Figure 5-2. The alignment begins 354 feet south of Barbara Street, then curves to the west to go through the former Shalimar Inn property. The south end of the alignment can be extended to South Mendoza Road. An extension of W. Aztec Road west provides a connection to Florence Street that can be used to access NM 118. The West Alignment then goes north with a perpendicular crossing of NM 118, the BNSF Railroad tracks, and the Rio Puerco. The crossing of I-40 is at a ten degree skew about 250 feet east of the existing Allison Road Underpass. On the north side of Interstate 40, the alignment arcs to the east and skirts the foot of the mesa. The northeast end can connect with an extension of Kachina Street north in order to create a community connection. A local connection can also be made to Morello Avenue behind the Home Depot Store to provide circulation until that occurs.

An intersection can be provided at Barbara Avenue to provide local circulation. A connection can be made to Warehouse Lane to provide access to the local businesses. W. West Maloney Ave. (the I-40 north frontage road) and Acoma Street can be extended to meet the new alignment on the north side of I-40.

Preliminary plan and profile sheets of the West Alignment can be found in Appendix A.

5.9.1. CONSTRUCTABILITY

Most of the West Alignment can be constructed off line so existing traffic operations on Allison Road can be maintained. The existing I-40 underpass can be used while the I-40 overpass is constructed. The Acoma Street Neighborhood can be connected to the new alignment before the underpass is closed.

In order to construct the south end of the project, access will need to be maintained to the existing businesses on Barbara Avenue. There will be some disruption of traffic on NM 118 for the construction of the overpass. Coordination will be needed with the BNSF Railroad to construct an overpass of the tracks.

5.9.2. RIGHT-OF-WAY & ACCESS

The Allison Road right-of-way is assumed to be 100 feet wide. Approximately 20 acres of right-of-way would be required for the West Alignment. Warehouse Lane was assumed to be a local street with a 60 foot wide right-of-way. The extension of Warehouse Lane to meet the new alignment of Allison would require 1.4 acres of right-of-way.

An additional 2 acres of right-of-way would be needed if it is decided to extend W. Aztec Avenue west. W. Aztec Avenue was assumed to be a collector street with a right-of-way 64 feet wide. One business on the northwest corner of Marguerite St. and W. Aztec Ave. would have to be relocated.

The Allison West Alignment would require the relocation of one business on Barbara Street. Existing businesses on Barbara Street east and west of Allison Rd. can be served by a connection to Allison. The connection to the west would be designed as a driveway in order to tie before the first business access.

The West Alignment goes through the east side of the Shalimar Inn property. The building is derelict and would need to be torn down. The remainder of the right-of-way needed is empty.

Approximately 1.8 acres of right-of-way would be needed for the extension of Acoma Street. Acoma Street was assumed to be a local street with a 60' right-of-way width requirement.

The existing right-of-way width for West Maloney Street is 70 feet wide. Approximately 1.7 acres of right-of-way would be needed to extend West Maloney Street to the Center Alignment.

The existing right-of-way width for Morello Avenue is 80 feet wide. Approximately 1.1 acres of right-of-way would be needed for the tie from Morello Avenue to the Center Alignment.

5.9.3. BRIDGES

The West Alignment will require three bridges; an overpass of NM 118 and the BNSF Railroad tracks, a Rio Puerco river bridge and an overpass of Interstate 40. Structural consideration of this alternative was not developed further because it was eliminated from consideration due to airport right of way issues.

5.9.4. ADVANTAGES AND DISADVANTAGES

The advantages of the West Alignment are:

- It does not impact the mobile home park on Florence Street.
- The West Alignment goes through the former Shalimar Inn property as it crosses NM 118 so it does not impact an operating business.

- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- A reasonable connection can be made to Warehouse Lane.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- The alignment can avoid impacting the mesas north of I-40.

The disadvantages of the West Alignment are:

- There will be one business relocation on Barbara Avenue.
- There will be one business relocation on Marguerite Street to extend W. Aztec Avenue.
- It is the longest alignment so it will have the greatest construction cost and the greatest amount of right-of-way takes.
- The alignment cannot be extended to the south because of impacts to the airport property on the south end. Coordination with the airport indicates that the alignment is within the runway protection zone of the Gallup Airport. No new construction will be allowed within this area. For this reason, this alignment will be eliminated from further consideration.

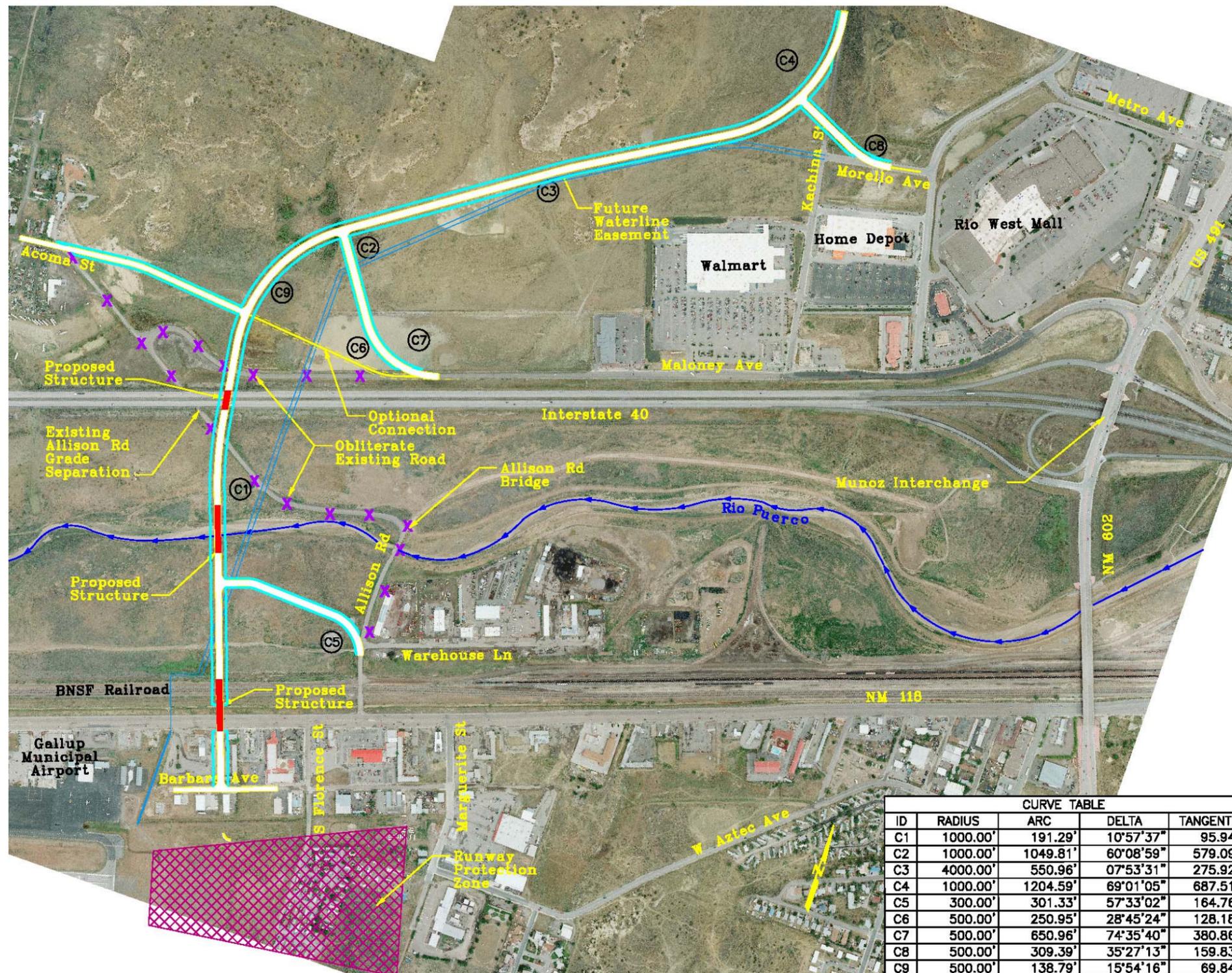


Figure 5-2: West Alignment and Summary

West Alignment Summary

Advantages:

- No impact to mobile home park on Florence Street.
- Goes through the former Shalimar Inn property as it crosses NM 118.
- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- A reasonable connection can be made to Warehouse Lane.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- Does not impact the mesas north of I-40.

Disadvantages:

- There will be one business relocation on Barbara Avenue.
- There will be one business relocation on Marguerite Street to extend W. Aztec Avenue.
- Longest alignment and will have the greatest construction cost and the greatest amount of right-of-way take.
- FATAL FLAW: Cannot be extended to South because of Gallup Airport.

5.10. WEST-CENTER ALIGNMENT

The West-Center Alignment is shown in Figure 5-3: West - Center Alignment and Summary. The alignment begins on Florence Street adjacent to the mobile home park. The south end of the alignment can be extended to Mendoza Road. An extension of W. Aztec Road west provides a connection to Marguerite St. that can be used to access NM 118. The Center Alignment then goes north with a perpendicular crossing of NM 118, and the BNSF Railroad tracks. The alignment then curves to the west and crosses the Rio Puerco at a 20 to 25 degree skew. The crossing of I-40 is in approximately the same location as the West Alignment. It is offset from the existing Allison Rd. Underpass for constructability. The I-40 overpass is at a ten degree skew to the west. On the north side of Interstate 40, the alignment arcs to the east and goes along the edge of the mesa. The northeast end can connect with an extension of Kachina Street in order to create a community connection. A local connection can also be made to Morello Avenue behind the Home Depot Store to provide circulation until that occurs.

Barbara Avenue can be connected to Allison Road to provide local circulation. Warehouse Lane can be extended to Allison Road to provide access to the existing businesses. West Maloney Ave. (the I-40 north frontage road) and Acoma Street can be extended to meet the new alignment.

A preliminary vertical profile for the West-Center Alignment can be found in Appendix A. The profile shows that on the north side of I-40 the alignment cuts into the mesa. Approximately 60 feet of rock and dirt would have to be removed in this area for the vertical profile.

5.10.1. CONSTRUCTABILITY

Most of the West-Center Alignment can be constructed off line so existing Allison Road can be maintained. The existing I-40 underpass can be used while the I-40 overpass is constructed.

In order to construct the south end of the project, access will need to be maintained to the existing businesses on Barbara Street. There will be some disruption of traffic on NM 118 for the construction of the overpass. Coordination will be needed with the BNSF Railroad to construct an overpass of the tracks.

5.10.2. RIGHT-OF-WAY

The Allison Rd. right-of-way is assumed to be 100-feet wide. 14.1 acres of right-of-way would be required for the West-Center Alignment. Warehouse Lane was assumed to be a local street with a 60-foot wide right-of-way. The extension of Warehouse Lane to meet the new alignment of Allison would require .83 acres of right-of-way.

An additional 1.2 acres of right-of-way would be needed if it is decided to extend W. Aztec Avenue. W. Aztec Avenue was assumed to be a collector street with a 64-foot wide right-of-way. One business on the northwest corner of Marguerite St. and W. Aztec Ave. would have to be relocated.

The Allison Rd. West-Center Alignment would require the relocation of one business on Barbara Street at the southwest corner of the intersection. Existing businesses on Barbara Street east and west of Allison Rd. can be served by a connection to Allison Rd.

The overpass of NM 118 would impact the access and parking of two businesses, the restaurant at America's Best Value Inn on the southwest corner and Thunderbird Wholesale Indian Jewelry on the southeast corner of Florence and NM 118. Allison Road could potentially be constructed without total takes of the two properties.

Approximately 1.4 acres of right-of-way would be needed for the extension of Acoma Street. Acoma Street was assumed to be a local street with a 60-foot right-of-way width requirement.

The existing right-of-way width for West Maloney Street is 70-feet wide. Approximately 2.3 acres of right-of-way would be needed to extend West Maloney Street to the West-Center Alignment.

The existing right-of-way width for Morello Avenue is 80-feet wide. Approximately 1 acre of right-of-way would be needed for the tie from Morello Avenue to the West-Center Alignment.

5.10.3. BRIDGES

The West-Center Alignment will require three bridges; an overpass of NM 118 and the BNSF Railroad tracks, a Rio Puerco river bridge and an overpass of Interstate 40. Table 5-3: West Central Alignment Structural Alternatives provides detailed information regarding each of these bridges.

The structure over NM 118 and the BNSF Railroad would be a three-span prestressed concrete girder bridge on deep drilled foundations. The bridge would be placed on MSE walls at each abutment. Locating all bridge piers and abutments outside of the BNSF right-of-way necessitates span lengths which would require a bridge type that would not be cost-effective in this situation, such as steel plate girder. Therefore, two bridge piers are located within BNSF right-of-way. The piers are located a minimum of 25 feet from the centerline of the existing railroad tracks.

The bridge over the Rio Puerco would be located near the location of the existing Allison Rd Bridge. The length of the bridge was determined by hydraulic needs as determined by the hydraulic analysis. The bridge would be a two-span prestressed concrete girder bridge on deep drilled foundations. One pier would be located in the Rio Puerco. The bridge would be placed on MSE walls at each abutment.

The overpass of Interstate 40 would be a two-span prestressed concrete girder bridge on deep drilled foundations. The bridge would be placed on MSE walls at each abutment. One pier would be

located between the east- and west-bound lanes of Interstate 40.

Table 5-3: West Central Alignment Structural Alternatives

Alternative	Feature Intersected	Structure Length [ft]	Approx. Skew [deg]	Span						Width Out to Out [ft]	Deck Type	Superstructure	Substructure	Approximate Cost \$			
				No. Spans	Span 1	Span 2	Span 3	Span 4	Span 5						Span 6	Structure Type	Girder Depth
West-central	NM 118 and BNSF Railroad	345'	0.00°	3	115.0'	115.0'	115.0'				40.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		2,070,000
West-central	Rio Puerco	350'	29.00°	3	125.0'	125.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		2,100,000
West-central	I-40	130'	0.00°	1	65.0'	65.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	54"	66"		780,000

5.10.4. ADVANTAGES AND DISADVANTAGES

The advantages of the West-Center Alignment are:

- A reasonable connection can be made to Warehouse Lane.
- The alignment is perpendicular to NM 118, and the BNSF Railroad tracks to minimize structure costs.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- The alignment can avoid impacting the mesas north of I-40.

The disadvantages of the West-Center Alignment are:

- The alignment is 20 – 25 degrees skewed to the Rio Puerco which will increase the length of the bridge over the river.
- It will impact the mobile home park on Florence Street. There are two mobile homes with access directly on Florence Street that would have to be relocated if the street is converted to a minor arterial.
- There will be one business relocated on Marguerite Street to extend W. Aztec Avenue.
- There will be one business relocated on the southwest corner of Florence and Barbara because access cannot be provided.
- Access impacts to the America's Best Value Inn Restaurant and Blake's Restaurant at NM 118.
- The alignment is almost the same length as the West Alignment so it has a similar amount of right-of-way take. The skewed bridge over the Rio Puerco will have a higher construction cost than a perpendicular bridge. The alignment cuts into the mesa will also increase the construction cost. This alignment is estimated to have the highest construction costs.

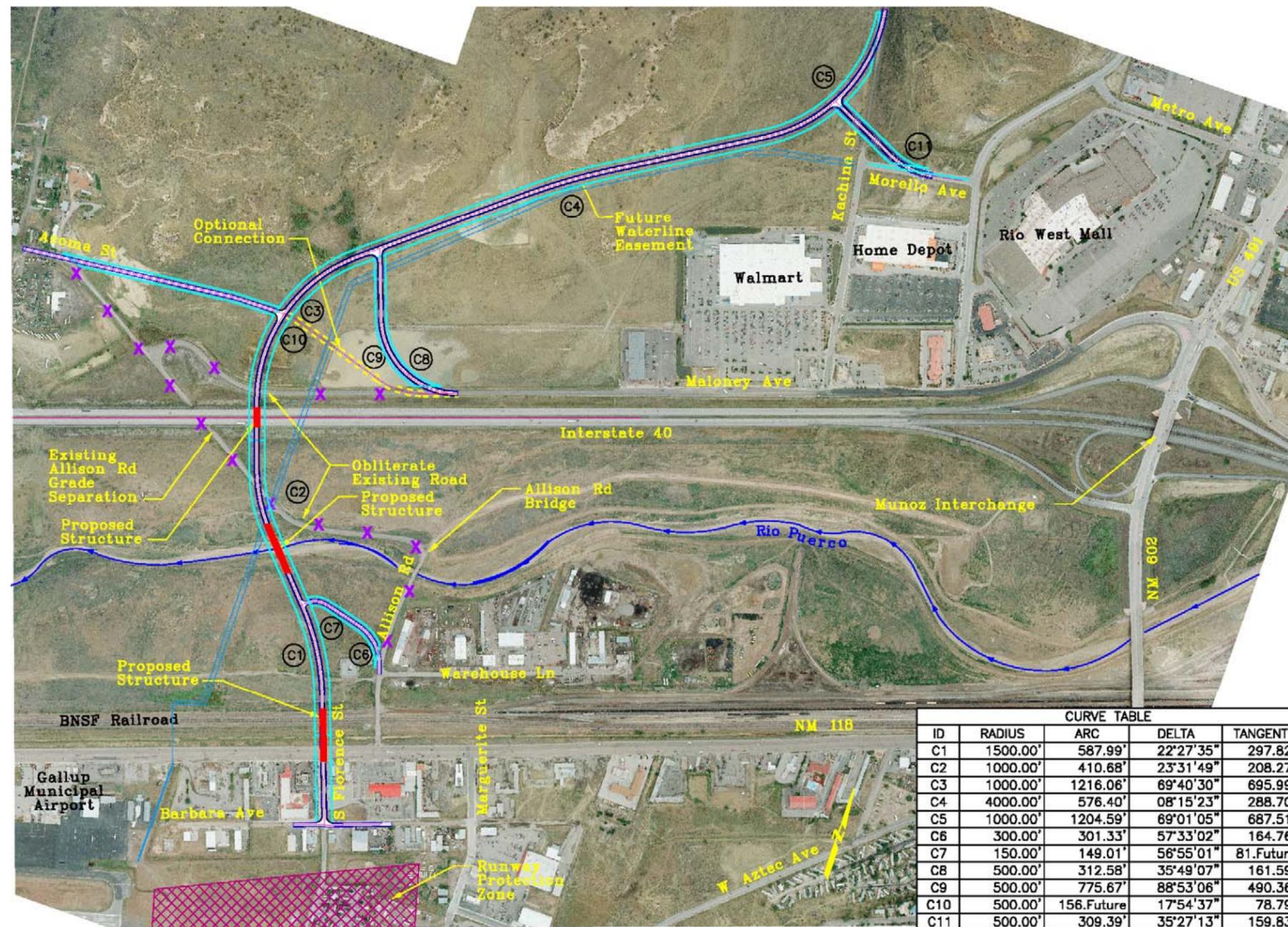


Figure 5-3: West - Center Alignment and Summary

West Center Alignment Summary

Advantages:

- A reasonable connection can be made to Warehouse Lane.
- The alignment is perpendicular to NM 118, and the BNSF Railroad tracks to minimize structure costs.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- The alignment can avoid impacting the mesas north of I-40.

Disadvantages:

- Skewed to the Rio Puerco which will increase the length of the bridge over the river.
- Impacts the mobile home park on Florence Street.
- There will be one business relocated on Marguerite Street to extend W. Aztec Avenue.
- There will be one business relocated on the southwest corner of Florence and Barbara because access cannot be provided.
- Access impacts to the America's Best Value Inn Restaurant and Blake's Restaurant at NM 118.
- The alignment cuts into the mesas on the north side of I-40. A significant amount of dirt and rock would have to be removed to construct the alignment.
- The alignment cuts into the mesa will also increase the construction cost. Highest construction costs of all Alternatives.

5.11. CENTER ALIGNMENT

The Center Alignment is shown in Figure 5-4. The alignment begins on Florence Street adjacent to the mobile home park. The south end of the alignment can be extended to south Mendoza Road. A westward extension of W. Aztec Road provides a connection to Marguerite that can be used to access NM 118. The Center Alignment then goes north with a perpendicular crossing of NM 118, the BNSF Railroad tracks and the Rio Puerco. The crossing of I-40 is at a ten degree skew in order to facilitate turning to the east north of I-40. On the north side of Interstate 40, the alignment arcs to the east and skirts the foot of the mesa. The northeast end can connect with a northward extension of Kachina Street in order to create a community connection. A local connection can also be made to Morello Avenue behind the Home Depot Store to provide circulation until that occurs.

Barbara Avenue can be connected to Allison Road to provide local circulation. Warehouse Lane can be extended to Allison Road to provide access to the existing businesses. West Maloney Ave. (the I-40 north frontage road) and Acoma Street can be extended to meet the new alignment. Acoma Street can be connected using the existing Allison Road underpass or it can be connected on the north side of I-40. West Maloney Ave. can align with Acoma Street or curve to the north so that it intersects a tangent section of Allison Road.

Preliminary plan and profile sheets of the Center Alignment can be found in Appendix A. On the south end the Center Alignment ties vertically at Aztec Road.

5.11.1. CONSTRUCTABILITY

Most of the Center Alignment can be constructed off line so existing Allison Road can be maintained. The existing I-40 underpass can be used while the I-40 overpass is constructed.

In order to construct the south end of the project, access will need to be maintained to the existing businesses on Barbara Street. There will be some disruption of traffic on NM 118 for the construction of the overpass. Coordination will be needed with the BNSF Railroad to construct an overpass of the tracks.

5.11.2. RIGHT-OF-WAY

The Allison Rd. right-of-way is assumed to be 100-feet wide. Approximately 14.5 acres of right-of-way would be required for the Center Alignment. Warehouse Lane was assumed to be a local street with a 60-foot wide right-of-way. The extension of Warehouse Lane to meet the new alignment of Allison Rd. would require 0.7 acres of right-of-way.

An additional 1.2 acres of right-of-way would be needed if it is decided to extend W. Aztec Avenue. W. Aztec Avenue was assumed to be a collector street with a right-of-way 64 feet wide. One business on the northwest corner of Marguerite St. and W. Aztec Ave. would have to be relocated.

The Allison Center Alignment would require the relocation of one business on Barbara Street at the southwest corner of the intersection. Existing businesses on Barbara Street east and west of Allison Rd. can be served by a connection to Allison Rd.

The overpass of NM 118 would impact the access and parking of two businesses; the restaurant at America's Best Value Inn on the southwest corner and Blake's Restaurant on the southeast corner of Florence St. and NM 118. Allison Road could potentially be constructed without total takes of the two properties but traffic circulation in this area would be affected.

Approximately 2.5 acres of right-of-way would be needed for the southward extension of Acoma Street south. Acoma Street was assumed to be a local street with a 60-foot right-of-way width requirement.

The existing right-of-way width for West Maloney Street is 70 feet wide. Approximately 1.9 acres of right-of-way would be needed to extend West Maloney Street to the Center Alignment.

The existing right-of-way width for Morello Avenue is 80 feet wide. Approximately 1 acre of right-of-way would be needed for the tie from Morello Avenue to the Center Alignment.

5.11.3. BRIDGES

The Center Alignment will require three bridges; an overpass of NM 118 and the BNSF Railroad tracks, a Rio Puerco river bridge and an overpass of Interstate 40. Table 5-4 provides detailed information regarding each of these bridges.

The structure over NM 118 and the BNSF Railroad would be a three-span prestressed concrete girder bridge on deep drilled foundations. The bridge would be placed on MSE walls at each abutment. Locating all bridge piers and abutments outside of the BNSF right-of-way necessitates span lengths which would require a bridge type that would not be cost-effective in this situation, such as steel plate girder. Therefore, two bridge piers are located within BNSF right-of-way. The piers are located a minimum of 25 feet from the centerline of the existing railroad tracks.

The bridge over the Rio Puerco would be located near the location of the existing Allison Rd Bridge. The length of the bridge was determined by hydraulic needs as determined by the hydraulic analysis. The bridge would be a two-span prestressed concrete girder bridge on deep drilled foundations. One pier would be located in the Rio Puerco. The bridge would be placed on MSE walls at each abutment.

The overpass of Interstate 40 would be a two-span prestressed concrete girder bridge on deep drilled foundations. The bridge would be placed on MSE walls at each abutment. One pier would be located between the east- and west-bound lanes of Interstate 40.

Table 5-4: Center Alignment Structural Alternatives																	
Alternative	Feature Intersected	Structure Length	Approximate Skew	Span							Width Out to Out	Deck	Superstructure			Substructure	Approximate Cost
				No. Spans	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6			[ft]	Deck Type	Structure Type		
Central	NM 118 and BNSF Railroad	345'	0.00°	3	115.0'	115.0'	115.0'				40.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		2,070,000
Central	Rio Puerco	350'	0.00°	1	125.0'	125.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		2,100,000
Central	I-40	130'	9.65°	2	65.0'	65.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	54"	66"		780,000

5.11.4. ADVANTAGES AND DISADVANTAGES

The advantages of the Center Alignment are:

- A reasonable connection can be made to Warehouse Lane.
- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- The alignment can avoid impacting the mesas north of I-40.

The disadvantages of the Center Alignment are:

- It will impact the mobile home park on Florence Street. There are two mobile homes with access directly on Florence Street that would have to be relocated if the street is converted to a minor arterial.
- There will be one business relocated on Marguerite Street to extend W. Aztec Avenue.
- There will be one business relocated on the southwest corner of Florence and Barbara because access cannot be provided.
- Access impacts to the America's Best Value Inn Restaurant and Blake's Restaurant at NM 118.
- The alignment is shorter than the West Alignment but longer than the East Alignment so it will have a medium construction cost and amount of right-of-way take.

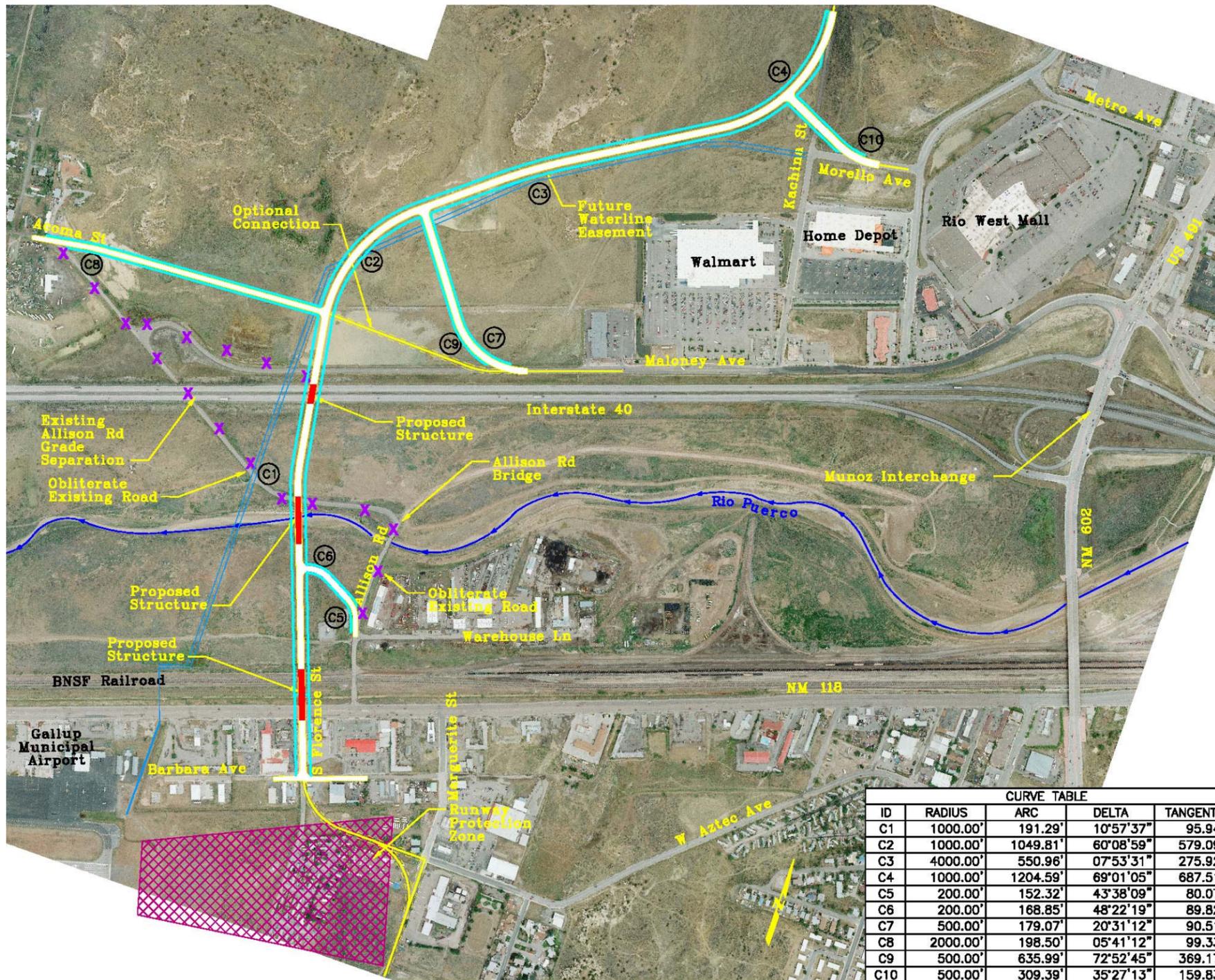


Figure 5-4: Center Alignment and Summary

Center Alignment Summary

Advantages:

- A reasonable connection can be made to Warehouse Lane.
- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- Most of the alignment is constructed off of existing. The Allison Road underpass can be utilized while the I-40 overpass is constructed.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- Avoids impacting the mesas north of I-40.

Disadvantages:

- Impacts the mobile home park on Florence Street.
- There will be one business relocated on Marguerite Street to extend W. Aztec Avenue.
- There will be one business relocated on the southwest corner of Florence and Barbara because access cannot be provided.
- Access impacts to the America's Best Value Inn Restaurant and Blake's Restaurant at NM 118. The alignment is shorter than the West Alignment but longer than the East Alignment so it will have a medium construction cost and amount of right-of-way take.

5.12. EAST – CENTER ALIGNMENT

The East – Center Alignment is shown in Figure 5-5: East - Center Alignment and Summary. This alignment was developed as an alternative to remove the fatal flaw of the East Alignment which was the spacing to the Munoz Interchange.

The alignment begins on Marguerite Street at West Aztec Ave. The south end of the alignment can be extended to Mendoza Road. Barbara Avenue can be upgraded to provide a connection to Florence Street to access NM 118. In order to increase the spacing to the adjacent interchange a horizontal curve was placed just north of the BNSF tracks. While this improves the interchange spacing it also necessitates placing a portion of the horizontal curve on the proposed bridge structure, which would increase construction costs. Additionally, this option requires a bridge structure to span Warehouse Lane in order to maintain access to the existing City maintenance yards located to the north of the BNSF tracks. On the north side of the Interstate 40 the alignment arcs to the east and skirts the foot of the mesa. The northeast end can connect with an extension of Kachina Street in order to create a community connection. A connection can also be made to Morello Avenue behind the Home Depot Store to provide circulation until that occurs.

West Maloney Ave. (the I-40 north frontage road) and Acoma Street can be extended to meet the new alignment. Acoma Street can be connected using the existing Allison Road underpass or it can be connected on the north side of I-40 to align with West Maloney Ave. A connection cannot be made at Warehouse Lane to provide access to the existing businesses. Vertically the connection cannot be made because Allison Road is approximately 30 feet above the existing grade crossing the BNSF Railroad Tracks. Allison Road would be about 24 feet above the existing grade of Warehouse Lane.

A preliminary vertical profile for the East Center Alignment can be found in Appendix A. On the south end the East Alignment ties vertically at W. Aztec Ave. At Warehouse Lane the profile is still 30 feet above existing ground because of the required clearance over the BNSF Railroad tracks. It is not possible to tie Warehouse Lane to the East Alignment in this location and provide access to the existing businesses.

5.12.1. SAFETY

Safety would be improved by this alternative.

5.12.2. CONSTRUCTABILITY

Most of the East Alignment is to be constructed off line so existing Allison Road access can be maintained. The I-40 underpass can be used while the I-40 overpass is constructed. In order to construct the south end of the project, access will need to be maintained to the existing businesses on Barbara Street. There will be some disruption of traffic on NM 118 for the construction of the overpass. Coordination will be needed with the BNSF Railroad to construct an overpass structure over the tracks.

To address construction budget limitations, the ability to construct alternatives in phases was considered. This alternative is constructible however; the first phase of construction would require the construction of the NM118 and BNSF grade separation concurrent with the construction of the Allison crossing of the Rio Puerco because of vertical grades.

5.12.3. RIGHT-OF-WAY

The Allison right-of-way is assumed to be 100-foot wide. Approximately 10.7 acres of right-of-way would be required for the East-Center Alignment.

The grade of Allison Road on the existing Marguerite Street alignment would have to be raised in order to build an overpass structure over the BNSF Railroad tracks. This would impact the access for the business on the northeast corner of Barbara Street. The drive into the business is immediately adjacent to the existing intersection; however, the business has multiple driveways so access could be maintained. A 100-ft wide right-of-way at NM 118 will impact the Sonic Drive-in on the southwest corner and Pow Wow Indian Jewelry on the southeast corner. The existing right-of-way is approximately 52-ft. Property would be needed from one or both businesses. Centering the take would result in both properties being a right-of-way take. In addition, the existing Sonic Drive-In access onto Marguerite would be eliminated.

The East-Center Alignment would result in one business take and one partial take along Warehouse Lane for the roadway.

Approximately 2.5 acres of right-of-way would be needed for the southward extension of Acoma Street. Acoma Street was assumed to be a local street with a 60-ft right-of-way width requirement.

The existing right-of-way width for West Maloney Street is 70-ft wide. Approximately 1.9 acres of right-of-way would be needed to extend West Maloney Street to the East-Center Alignment.

The existing right-of-way width for Morello Avenue is 80-ft wide. Approximately 1 acre of right-of-way would be needed for the tie from Morello Avenue to the East-Center Alignment.

5.12.4. BRIDGES

East-Center Alignment will require three bridges; an overpass of NM 118 and the BNSF Railroad tracks, a Rio Puerco river bridge and an overpass of Interstate 40. Table 5-5 provides detailed information regarding each of these bridges.

The structure over NM 118 and the BNSF Railroad would be a six-span prestressed concrete girder bridge on deep drilled foundations. The bridge also spans Warehouse Lane. The bridge will be placed on MSE walls at each abutment. Locating all bridge piers and abutments outside of the BNSF right-of-way necessitates span lengths which would require a bridge type that would not be cost-effective in this situation, such as steel plate girder. Therefore, two bridge piers are located within BNSF right-of-way. The piers are located a minimum of 25 feet from the centerline of the existing railroad tracks. Construction and design of this bridge would be complicated by several factors. The construction of the

bridge would necessitate the removal of at least one existing building. Additionally, the alignment at the location of the bridge is on a horizontal curve, which would result in either curved girders or a wider bridge to accommodate the curve. The length of the bridge would also result in higher costs for the project.

The bridge over the Rio Puerco would be located near the location of the existing Allison Rd Bridge. The length of the bridge was determined by hydraulic needs as determined by the hydraulic analysis. The bridge would be a two-span prestressed concrete girder bridge on deep drilled foundations with a 45° skew. One pier would be located in the Rio Puerco. The bridge would be placed on MSE walls at each abutment.

The overpass of Interstate 40 would be a two-span prestressed concrete girder bridge on deep drilled foundations. The bridge will be placed on MSE walls at each abutment. One pier will be located between the east- and west-bound lanes of Interstate 40.

Table 5-5: East Center Alignment Structural Alternatives

Alternative	Feature Intersected	Structure Length	Approximate Skew	Span						Width Out to Out	Deck	Superstructure			Substructure	Approximate Cost	
				No. Spans	Span 1	Span 2	Span 3	Span 4	Span 5			Span 6	Deck Type	Structure Type			Girder Depth
East-Center	NM 118 and BNSF Railroad	648'	0.00°	5	108.0'	108.0'	108.0'	108.0'	108.0'	108.0'	42.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		4,082,400
East-Center	Rio Puerco	350'	45.00°	1	125.0'	125.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	72"	84"		2,100,000
East-Center	I-40	130'	0.00°	1	65.0'	65.0'					40.0'	Reinforced Concrete	Prestressed Concrete Girder	54"	66"		780,000

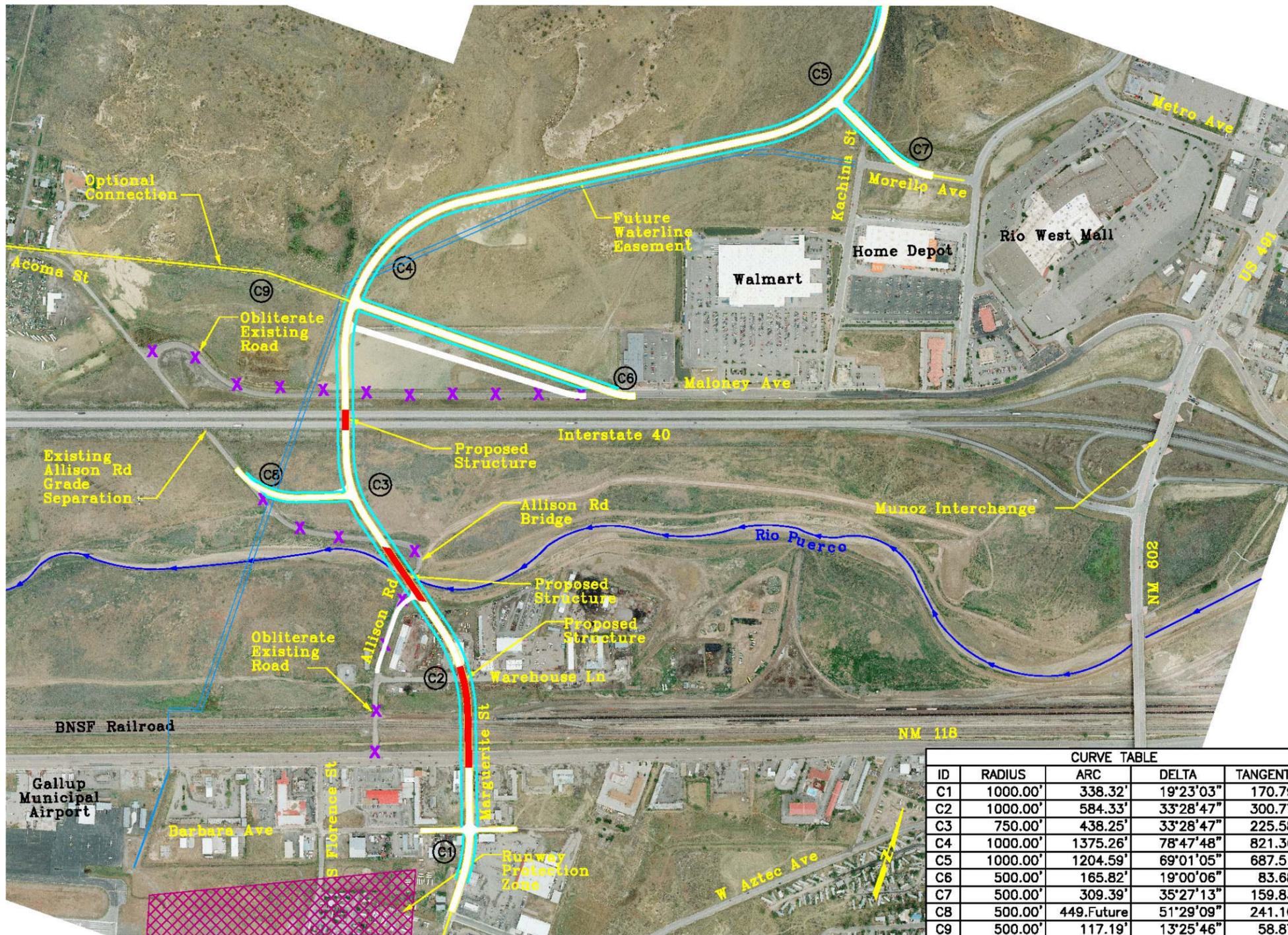
5.12.5. ADVANTAGES AND DISADVANTAGES

The advantages of the East-Center Alignment are:

- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic access can be maintained.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- The alignment can avoid impacting the mesas north of I-40.

The disadvantages of the East-Center Alignment are:

- The bridge structure over NM 118, the BNSF Railroad tracks and Warehouse Lane is the longest structure and therefore the most costly of all the structures alternatives.
- Impacts to the City of Gallup yards along Warehouse Lane.
- The business in the northeast corner of Marguerite and Barbara Streets would lose access off of Barbara Street.
- Access impacts to the Sonic Drive-in Restaurant and Pow Wow Indian Jewelry at NM 118. One business is potentially a right-of-way take.



East – Center Alignment Summary

Advantages:

- Meets minimum spacing distance to the Munoz Interchange thus allowing the potential for a future interchange.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- The alignment can avoid impacting the mesas north of I-40.

Disadvantages:

- Cannot connect to existing Warehouse Lane vertically. Structure length increased to span Warehouse Lane.
- The business in the northeast corner of Marguerite and Barbara would lose access off of Barbara Street. Access impacts to the Sonic Drive-in Restaurant and Pow Wow Indian Jewelry at NM 118. One business is potentially a right-of-way take.
- Significant impacts to County Yards and buildings, would require relocation.
- Horizontal Curvature on BNSF bridge would increase structure costs.

Figure 5-5: East - Center Alignment and Summary

5.13. EAST ALIGNMENT

The East Alignment is shown in Figure 5-6: East Alignment and Summary. The alignment begins on Marguerite Street at W. Aztec Ave. The south end of the alignment can be extended south to Mendoza Road. Barbara Avenue can be upgraded to provide a connection to Florence Street to access NM 118. The East Alignment then goes north with a perpendicular crossing of NM 118, the BNSF Railroad tracks, the Rio Puerco, and I-40. On the north side of the interstate, the alignment arcs to the east and skirts the foot of the mesa. The northeast end can connect with a northward extension of Kachina Street in order to create a community connection. A connection can also be made to Morello Avenue behind the Home Depot Store to provide circulation until that occurs.

West Maloney Avenue (the I-40 north frontage road) and Acoma Street can be extended to meet the new alignment. Acoma Street can be connected using the existing Allison Road underpass or it can be connected on the north side of I-40 to align with West Maloney Ave. A connection cannot be made at Warehouse Lane to provide access to the existing businesses. The connection cannot be made vertically because Allison Road is approximately 30 feet above the existing grade crossing the BNSF Railroad Tracks. The East Alignment would require a new access road to be constructed on the north side of the businesses along Warehouse Lane.

A preliminary vertical profile for the East Alignment can be found in Appendix A. On the south end the East Alignment ties vertically at W. Aztec Ave. At Warehouse Lane the profile is still 30 feet above existing ground because of the required clearance over the BNSF Railroad tracks. It is not possible to tie Warehouse Lane to the East Alignment in this location and provide access to the existing businesses.

5.13.1. CONSTRUCTABILITY

Most of the East Alignment is to be constructed off line so existing Allison Road can be maintained. The I-40 underpass can be used while the I-40 overpass is constructed.

In order to construct the south end of the project, access will need to be maintained to the existing businesses on Barbara Street. There will be some disruption of traffic on NM 118 for the construction of the overpass. Coordination will be needed with the BNSF Railroad to construct an overpass of the tracks.

5.13.2. RIGHT-OF-WAY

The Allison Rd. right-of-way is assumed to be 100-feet wide. Approximately 13 acres of right-of-way would be required for the East Alignment.

The grade of Allison Road on the existing Marguerite Street alignment would have to be raised in order to build an overpass over the BNSF Railroad tracks. This would impact the access to the business on the northeast corner of Barbara Street. The driveway into the business is immediately adjacent to the existing intersection; however, the business has multiple driveways so access could be maintained. A 100-ft wide right-of-way at NM 118 will impact the Sonic Drive-in on the southwest corner and Pow Wow Indian Jewelry on the southeast corner. The existing right-of-way is approximately 52 feet. Property would be needed from one or both businesses. Centering the take would result in both properties being a right-of-way take. In addition, the existing Sonic Drive-In access onto Marguerite would be eliminated.

The East Alignment would result in one business take along Warehouse Lane for the roadway. There would also be access issues for the other businesses along Warehouse Lane. The profile grade will be raised approximately 24 feet at Warehouse Lane in order to construct an overpass structure over the railroad tracks. Warehouse Lane profile grade would have to be extremely steep to provide access to any of the adjacent businesses. An alternative would be to construct an access roadway on the north side of the businesses. This alternative would require approximately 1.5 acres of right-of-way and would require property from 4 separate parcels.

The existing right-of-way on Morello Avenue is 80-feet wide. Approximately 0.9 acres of right-of-way would be required to extend Morello to the East Alignment.

The existing right-of-way on West Maloney Avenue is 70-feet wide. Approximately 1.5 acres of right-of-way would be required to realign West Maloney with the East Alignment.

1.8 acres of right-of-way would also be needed to extend Acoma Street south to the East Alignment using the existing Allison underpass. The right-of-way was assumed to be 60-feet wide.

No right-of-way was assumed for reconstructing Warehouse Lane adjacent to the Rio Puerco, on the back side of the existing businesses. For the purposes of this analysis, it was assumed that access could be provided at another location but that the businesses would be damaged.

A total of 14.6 acres of right-of-way would be required to construct the East Alignment. In addition, there would be one business relocated at the intersection of NM 118, access impacts to one business on the northeast corner of the alignment and Barbara Street, and one business relocated and 4 parcels with access impacts along Warehouse Lane.

5.13.3. BRIDGES

The East Alignment will require four bridges; an overpass structure over NM 118 and the BNSF Railroad tracks, a Rio Puerco river bridge and an overpass of Interstate 40.

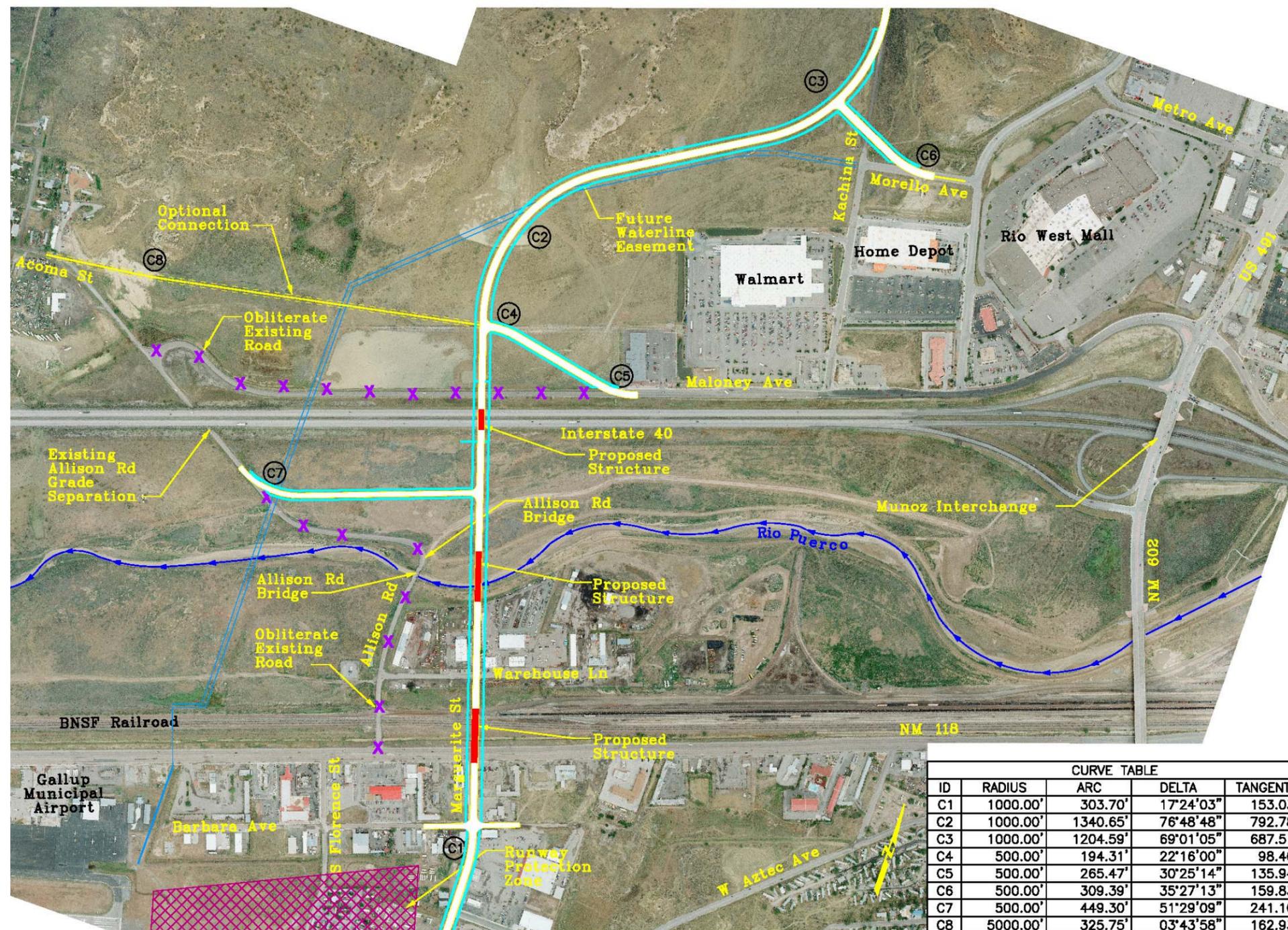
5.13.4. ADVANTAGES AND DISADVANTAGES

The advantages of the East Alignment are:

- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, the Rio Puerco and Interstate 40 to minimize structure costs.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than connecting a road on the north side of I-40.
- The alignment can avoid impacting the mesas north of I-40.

The disadvantages of the East Alignment are:

- Cannot connect to existing Warehouse Lane vertically. An alternate road could be constructed on the north side of the properties served by Warehouse Lane but it would require property from each parcel.
- The business in the northeast corner of Marguerite and Barbara Streets would lose access off of Barbara Street.
- Access impacts to the Sonic Drive-in Restaurant and Pow Wow Indian Jewelry at NM 118. One business is potentially a right-of-way take.
- The East Alignment is the shortest alignment so it will have the least construction cost and amount of right-of-way take.
- Less than 1 mile separation between the I-40/Exit 20 Interchange and the proposed I-40 overpass for future interchange.



East Alignment Summary

Advantages:

- The alignment is perpendicular to NM 118, the BNSF Railroad tracks, and the Rio Puerco to minimize structure costs.
- Most of the alignment is constructed off of existing roads so it can be easily constructed. The Allison Road underpass can be utilized while the I-40 overpass is constructed so traffic can be maintained.
- Acoma Drive can be connected to Allison Road using the existing I-40 underpass which would require less construction than a road on the north side of I-40.
- The alignment can avoid impacting the mesas north of I-40.

Disadvantages:

- Cannot connect to existing Warehouse Lane vertically. An alternate road could be constructed on the north side of the properties served by Warehouse Lane but it would require property from each parcel.
- The business in the northeast corner of Marguerite and Barbara would lose access off of Barbara Street.
- Access impacts to the Sonic Drive-in Restaurant and Pow Wow Indian Jewelry at NM 118. One business is potentially a right-of-way take.
- **FATAL FLAW** : Close spacing to existing Munoz Interchange

Figure 5-6: East Alignment and Summary

5.14. PREFERRED CORRIDOR ALTERNATIVE

The Center Alignment (see page 5-15) was selected as the preferred alternative. The purpose of the follow section is to establish the veracity of this alternative as the preferred alignment. Table 5-6 : Alternative Development Methodology Matrix shown on page 5-24, maps the selection process from Phase A through the Phase B. The evaluations were performed in collaboration with the project team during review meetings. Qualitative measurements were used to rank alternatives rather than numeric values. In the reference matrix, a red square denotes a fatal flaw, a yellow square is a serious concern, and a green square represents an acceptable impact in regard to that specific evaluation parameter.

As a means of review the Phase A focused on the review of alternative corridors. Several of the corridors are viable for future development within Gallup between Munoz Ave and the West Gallup Interchange. However, the East Corridor Alternative had the most potential for meeting the stated purpose and need. As a result of Phase A the East Corridor Alternative was carried through to the Phase B Detailed Evaluation of Alternatives.

As part of the Phase B Report development five distinct alternatives were developed and evaluated within this corridor. These five alternatives were screened against the purpose and need of this project. Of the alternatives developed and evaluated during the initial screening of Phase B alternatives, the Center Alignment and the East Center Alignment best meet the purpose and need of this project and were carried forward and evaluated against more detailed engineering criteria. During the detailed evaluation process the factors that were used to compare alternatives were right of way required, earthwork, bridge structures required, construction cost and ability to be constructed in phased construction to meet funding constraints. The priority and phasing of the Center Alignment is discussed in detail in Section 6 of this report beginning on page6-1.

Table 5-6 : Alternative Development Methodology Matrix

Phase A Criteria							Disposition
Corridor	Purpose and Need	Stakeholder Issues	Community Issues	Environmental Issues	Public Input		
No Build	Red	Red	Red	Green	Red		DROPPED
West Corridor	Red	Yellow	Yellow	Green	Red		DROPPED
Central Corridor	Red	Yellow	Yellow	Green	Red		DROPPED
East Corridor	Green	Green	Green	Green	Green		CARRIED FORWARD

Phase B: initial Screening												
East Corridor Alignment	Over I-40	Under I-40	Distance to Munoz Interchange	Regional Connectivity, North	Regional Connectivity, South	System Connectivity	Access	Stakeholder Input	Economic Development	Project Phasing	Disposition	
East Alignment	Green	Red	Red	Green	Green	Green	Green	Red	Green	Red	DROPPED	
West Central Alignment	Green	Red	Green	Green	Yellow	Green	Green	Red	Green	Red	DROPPED	
West Alignment	Green	Red	Green	Green	Red						DROPPED	
East Central Alignment	Green	Red	Green	Green	Green	Green	Green	Green	Green	Yellow	CARRIED FORWARD	
Central Alignment	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	CARRIED FORWARD	

Phase B: Detailed Evaluation										
Typical Section Alternative	ROW	Potential Relocations	Earthwork		Major Items and Cost					
	Easement Acquisition Required		Cut, CY	Fill, CY	Roadway Length, FT	MSE Wall, SF	Bridge Span Length, FT	Stakeholder Input	Initial Phase Cost	Total Cost
NMDOT Std Cut/Fill	26.3 Ac	2	9100	165100	8222	7500	1108	Red	Yellow	\$\$\$
MSE on 100' ROW	22.6 Ac	2	3350	148050	8222	98324	1108	Red	Yellow	\$\$\$\$
NMDOT Std Cut/Fill	25.3 Ac	0	2350	213050	7645	6000	805	Green	Green	\$
MSE on 100' ROW	21.0 Ac	0	1750	191450	7645	171998	805	Red	Green	\$\$

5.15. INTERSTATE 40 FRONTAGE ROAD ALTERNATIVES

Another aspect of the future development of the Allison Road Corridor was how and what type of frontage roads could be developed. Frontage Roads will be important to the future economic development within the study limits because they will provide the backbone for access and circulation. During incident management that shuts down the Interstate 40, the frontage roads will provide system redundancy. There is an existing I-40 Frontage Road, called Maloney Road, on the north side of I-40 between existing Allison Road and US 491 / NM 602. There is no existing road on the south side of I-40. None of the Allison alignment alternatives preclude the construction of future frontage roads; however, the interchange type selected may dictate the frontage road type. Three options are discussed in the following section, No Frontage Road, one way frontage road pair, and a two-way frontage road pair.

5.15.1. OPTION 1 – NO FRONTAGE ROAD

There is an existing I-40 Frontage Road, called Maloney Road, on the north side between existing Allison Road and US 491. If this frontage road is not connected to the new Allison Road alignment then there would be no system redundancy and poor circulation for new development in the area. For this reason, this is not a viable option.

There is no existing frontage road on the south side of I-40. The City of Gallup is interested in developing the property between I-40 and the Rio Puerco. An east-west route will be required for this development. Putting the east-west route adjacent to I-40 maximizes the amount of area available for development. Option 1 – No Frontage Road was eliminated for these reasons.

5.15.2. OPTION 2 – ONE WAY FRONTAGE ROADS

Option 2 –the One Way Frontage Roads is shown in Figure 5-8 along with Interchange Alternative 3, the tight diamond interchange. This is the only interchange alternative of those investigated that works with one way frontage roads. The frontage road on the south side of I-40 would be one way eastbound. The existing north frontage road, Maloney Road, is a two-way frontage road. Maloney Road would be converted to one way westbound.

West Maloney Road provides access to the Rio West Mall, Wal-Mart, Home Depot, and other retail stores and restaurants. The existing ingress access to the businesses along the frontage road from US 491/NM 602 would not change. The egress access would change. The Rio West Mall has one other exit onto US 491/NM 602. One disadvantage of this alternative is that in order to leave one of the other

businesses, traffic would have to either travel west to the new Allison Road alignment which could be out of direction for many road users or use the local roads Kachina St to Morello Ave to W. Jefferson, to Metro Ave to get back to US 491/NM 602. The capacity of these smaller streets would have to be increased to handle the additional traffic. Another effect of making the frontage road one way is to redistribute traffic from the major intersection at US 491/NM 602 to several smaller intersections. The capacity of the smaller intersections would have to be increased to handle the additional traffic.

The one way frontage road alternative was eliminated because it does not provide adequate traffic circulation in an area with high traffic demand and potential growth.

5.15.3. OPTION 3 – TWO-WAY FRONTAGE ROADS

Option 3 – Two-way frontage roads are shown with the interchange alternatives in Figure 5-7 through Figure 5-10. The existing two-way frontage road on the north side of I-40 would remain and be connected to the new Allison alignment. A two-way frontage road would also be constructed on the south side of I-40 to provide access to the land between the interstate and Rio Puerco. The frontage road on the south side may or may not be connected to US 491 / NM 602. Option 3 - the two-way frontage roads is the preferred alternative because it provides the best traffic circulation and it provides the best access to land designated for development.

5.16. ALLISON CORRIDOR INTERCHANGE ALTERNATIVES

Five interchange alternatives were evaluated for a future connection to Interstate 40 concurrent with the development of the various corridor alternatives. Interchange types evaluated included a rural diamond interchange, a tight diamond interchange with two way frontage roads, a tight diamond interchange with one way frontage roads, a single point urban interchange, and a partial clover leaf interchange. All of these interchange types will work with the Center Alignment. The tight diamond interchanges and the single point urban interchange will work with the East-Center Alignment. The rural diamond interchange and the partial clover leaf were eliminated for the East-Center Alignment because the ramp intersections would be located in the horizontal curvature which causes sight distance problems. This evaluation was used to narrow down the interchange options so that right-of-way can be preserved for a future interchange as the area develops.

Due to the long-range planning horizon of this study, construction costs for the various interchange types were not developed. Costs were compared on a basis of relative cost. The most inexpensive interchange types are the rural diamond and the partial clover leaf, interchange alternatives 1 and 5. The next expensive interchange type is the tight urban diamond, interchange alternative 2. The cost increase

is attributed to the fact that a retaining wall system is generally required to facilitate bringing the ramp terminals closer to the interstate. The most expensive interchange configuration considered is the single point urban interchange.

5.16.1. INTERCHANGE ALTERNATIVE 1 – RURAL DIAMOND INTERCHANGE

A rural diamond interchange is shown on the Center Alignment in Figure 5-7. The ramp intersections are shown 600 feet apart. No walls are required for the rural diamond interchange. This configuration requires approximately 10.8 acres of new right-of-way.

5.16.2. INTERCHANGE ALTERNATIVE 2 – TIGHT DIAMOND INTERCHANGE WITH TWO WAY FRONTAGE ROADS

A tight diamond interchange with two way frontage roads is shown in Figure 5-8. The ramp intersections in the figure are shown 400 feet apart. This type of interchange will require retaining walls between the interstate and the ramps. Approximately 4.4 acres would be required not including the right-of-way for the frontage road.

5.16.3. INTERCHANGE ALTERNATIVE 3 – TIGHT DIAMOND INTERCHANGE WITH ONE WAY FRONTAGE ROADS

A tight diamond interchange with one way frontage roads is shown in Figure 5-8. The frontage road intersections with Allison in the figure are shown 300 feet apart. This type of interchange will require retaining walls between the interstate and the frontage road. Approximately 3.1 acres would be required not including the right-of-way for the frontage road on the south side of the interstate.

5.16.4. INTERCHANGE ALTERNATIVE 4 – SINGLE POINT URBAN INTERCHANGE

A single point urban interchange (SPUI) is shown in Figure 5-9. One advantage of the SPUI interchange is that only 1.9 acres would be required for construction. Another advantage of a SPUI is that traffic is controlled by a single traffic signal so there is less delay than with a diamond interchange. The major disadvantage of a single point urban interchange is that the overpass bridge must be wider to accommodate the ramp intersection with Allison. This wider bridge makes the SPUI interchange more expensive than a diamond interchange. In addition, there is a large area of uncontrolled pavement in the middle of the intersection. This large area can make it difficult for bicycles to cross in the time allotted so SPUI's are not recommended where bicycle traffic is expected. Pedestrians may take up to 4 signal cycles to get through the length of the SPUI.

5.16.5. INTERCHANGE ALTERNATIVE 5 – PARTIAL CLOVER LEAF INTERCHANGE

A partial clover leaf interchange is shown in Figure 5-10. Approximately 15.5 acres would be required. This interchange type provides the advantage of increasing the acceleration distance for eastbound I-40 with respect to the Munoz Interchange, and also increases the west bound deceleration and weave distance from the Munoz Interchange.

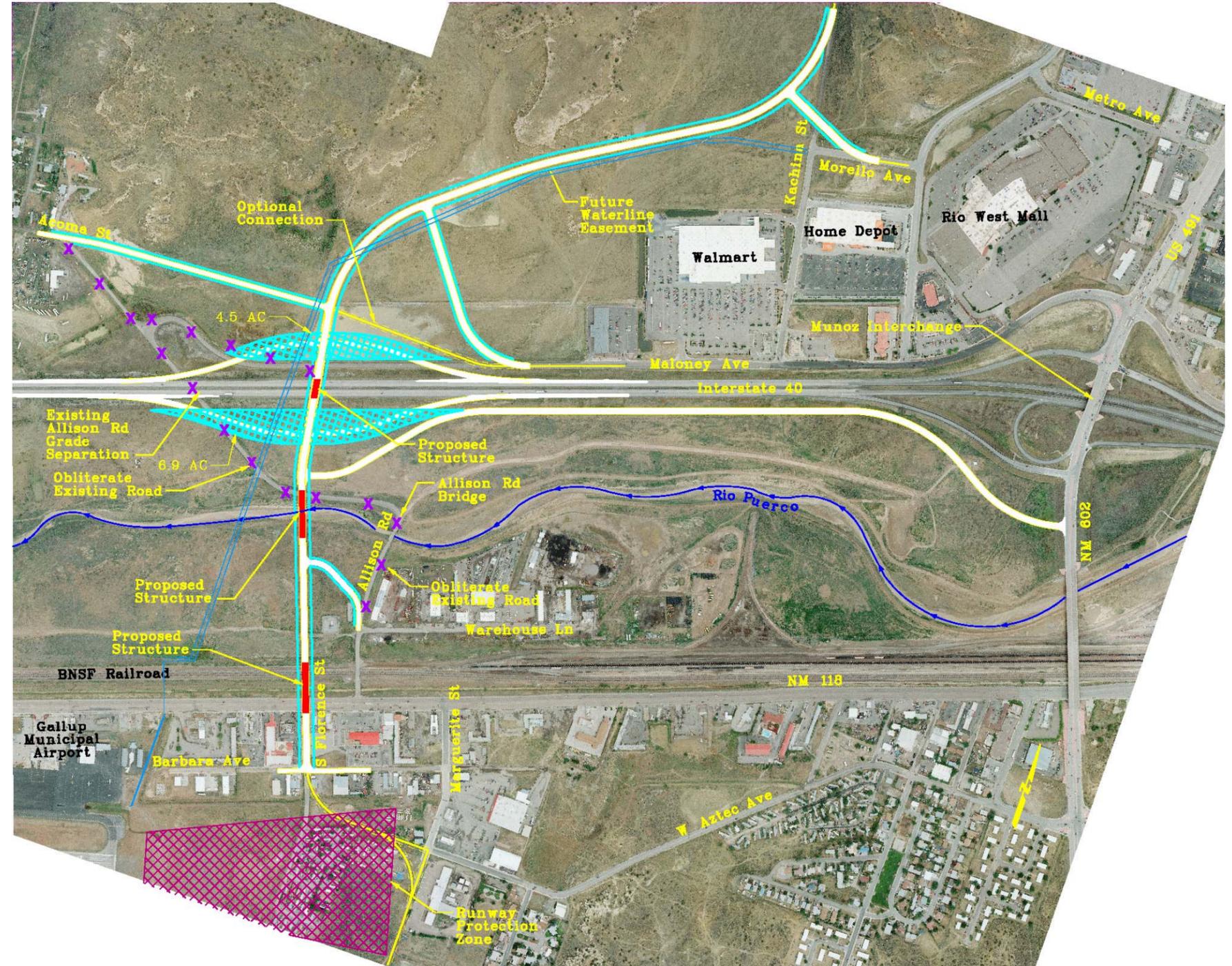


Figure 5-7: Center Alignment with Rural Diamond and Two-Way Frontage Road

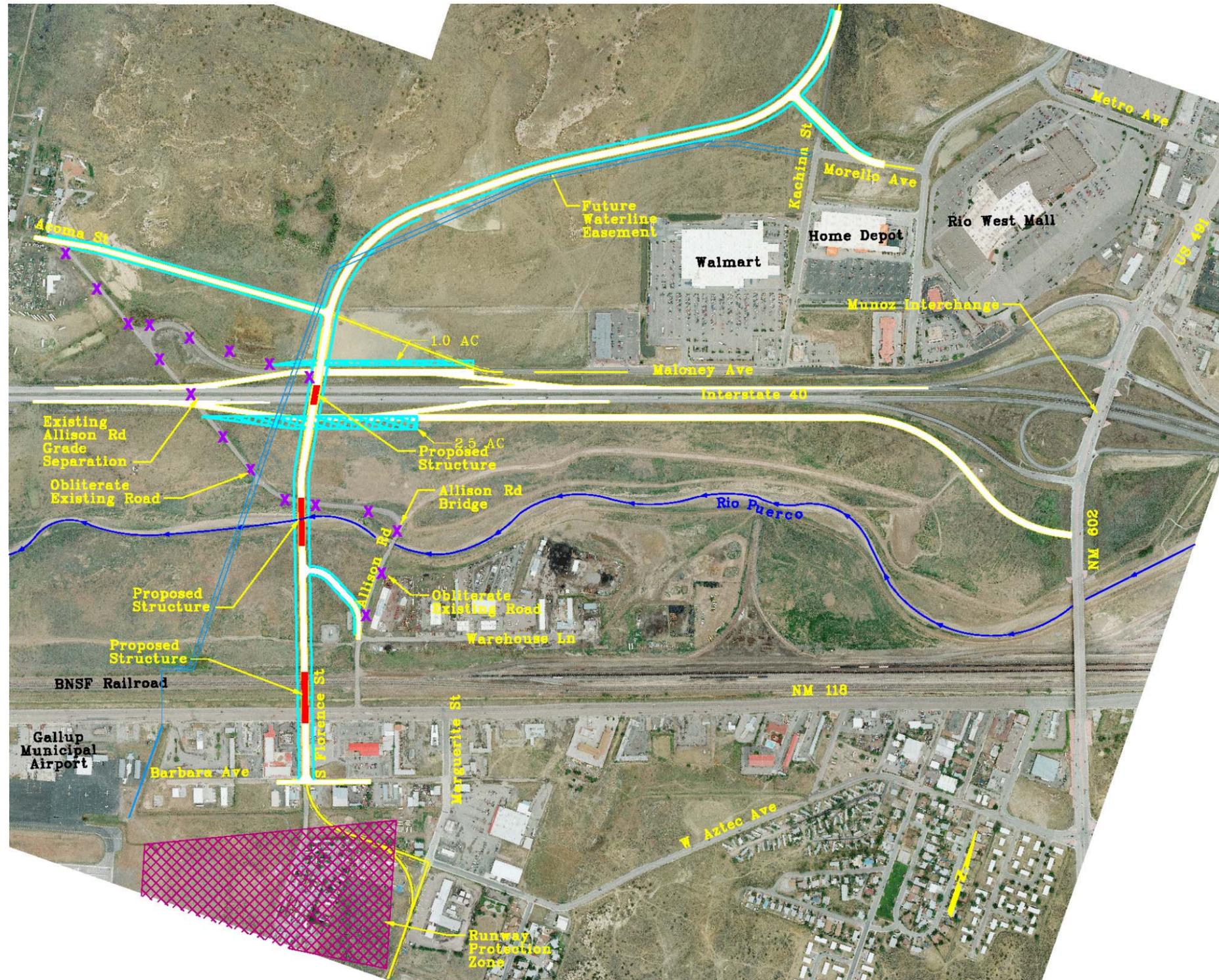


Figure 5-8: Center Alignment with Tight Diamond and One-Way Frontage Road

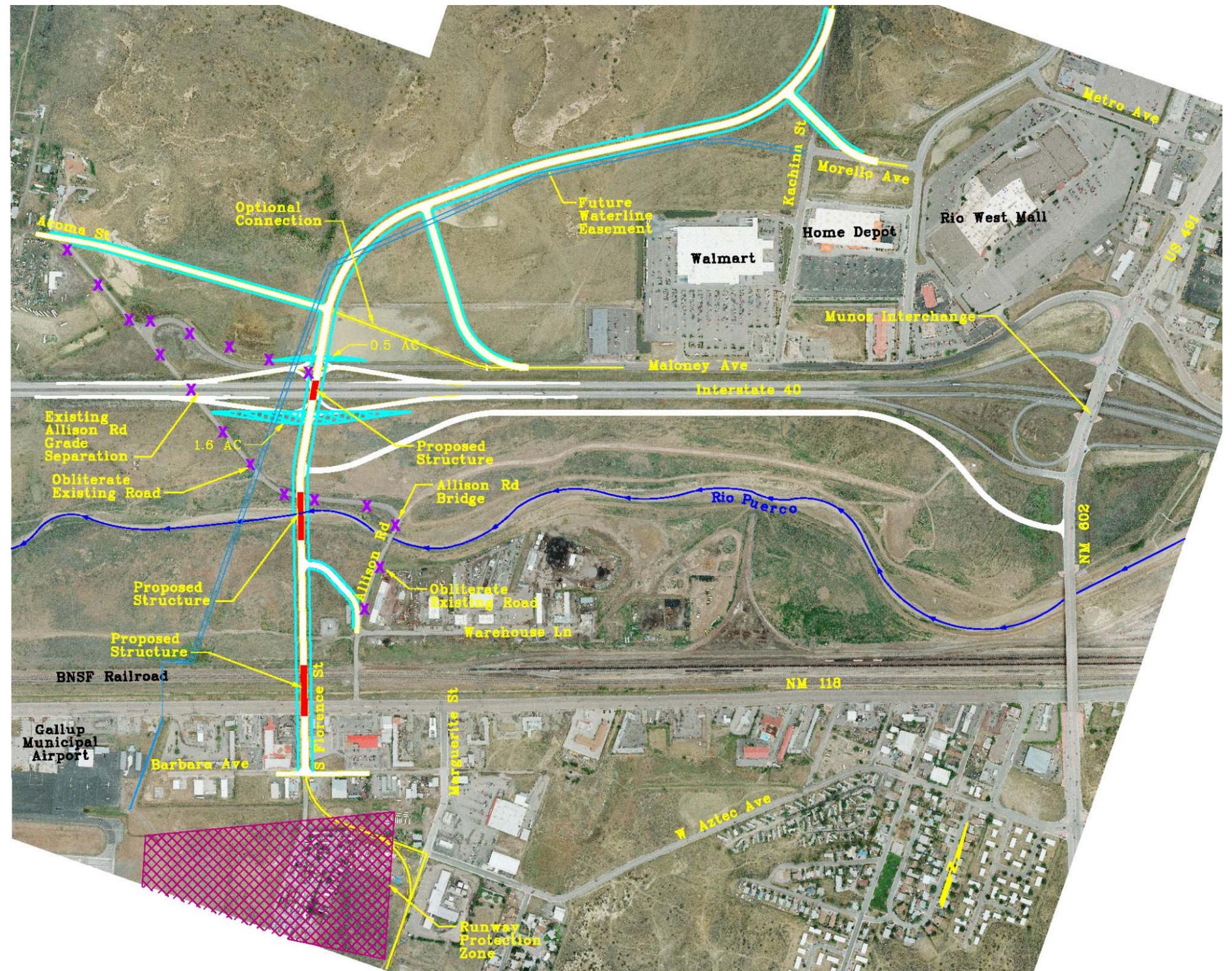


Figure 5-9: Center Alignment with Single Point Urban Interchange and Two-Way Frontage Road

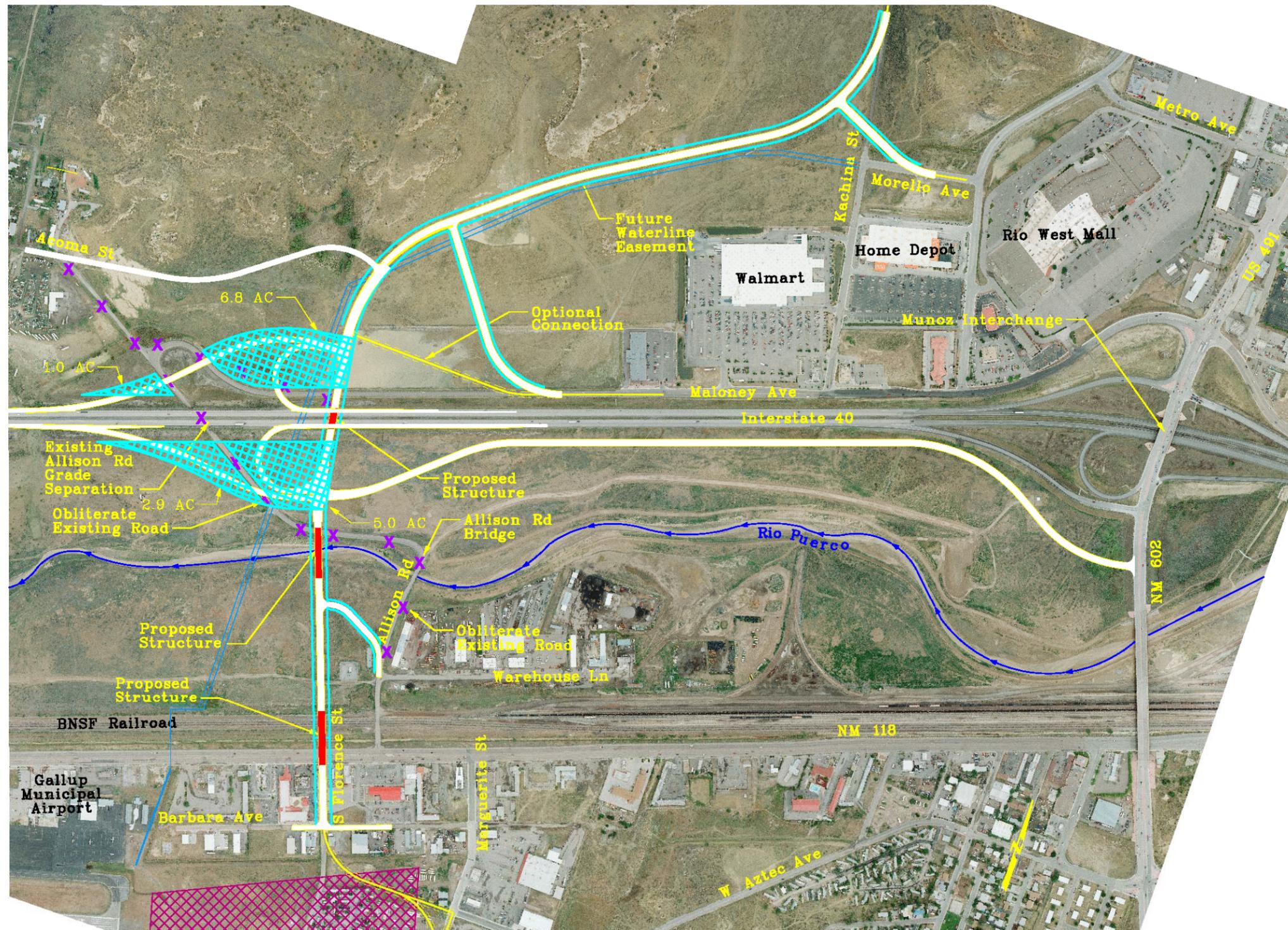


Figure 5-10: Center Alignment with Partial Clover Leaf Interchange and Two-Way Frontage Road

6. ALIGNMENT PHASING AND PRIORITY PLAN

The objective of this Detailed Evaluation of Alternatives for the Allison Corridor and I-40 Interchange Study was to develop alternatives that were in keeping with the intent of the purpose and need statement and to select a preferred alternative. As discussed in the previous section of this report, the Central Alignment was selected as the preferred alternative carried forward for preliminary design and environmental assessment.

6.1. CENTRAL ALIGNMENT PHASING

The Central Alignment lends itself to being constructed in several phases rather than requiring development of the entire corridor as one project. Figure 6-1: Center Alignment Phasing, shows a schematic diagram of the five individual projects that could comprise the total construction of the Central Corridor. The five phases listed below are listed south to north not necessarily by priority to construct:

- Grade Separation of Central Alignment over BNSF tracks and NM118
- Replacement of the Existing Rio Puerco Bridge
- Construction of an overpass with Interstate 40
- Construction of an Interchange with Central Corridor and the Interstate
- Construction of the connection to Maloney and Aztec
- Construction of the connection to Kachina.

The phase limits were established to satisfy both constructability and funding. Generally speaking, the estimated construction cost for each of these phases is very similar. The grade separation of the central alignment over the BNSF tracks will be the most expensive phase of this corridor development. This is attributed to the length of the span required to transverse the BNSF tracks and the acquisition and impacts to properties to the south of NM 118.

6.2. CENTRAL ALIGNMENT PRIORITY PLAN

The following discussion recommends the sequence of project development of the Center Alignment.

6.2.1. FIRST PRIORITY PROJECT – REPLACEMENT OF THE RIO PUERCO BRIDGE.

The most immediate need within the existing Allison Road Corridor is the replacement of the existing Rio Puerco Bridge. The replacement of this structure was chosen as the highest priority because as

discussed in section 2.2.2 on 2-2 this structure is functionally obsolete and structurally deficient. The deck elevation is also below the 100-year flood elevation. Furthermore, as discussed in section 2.2.1 Roadway Geometrics beginning on page 2-2, the existing horizontal geometrics on the north end of the structure do not meet current design standards.

The proposed limits and horizontal alignment for the first priority project are shown in Figure 6-2: Priority Project 1. This project would replace the existing structure and could, for the most part, be constructed off line of existing Allison Road. The point of beginning for this alignment is at the existing Allison Road/Warehouse Lane intersection. The end of this project would tie to the existing Allison Road alignment just to the south of the existing Allison Road Underpass with I-40. Shown in red on the figure is the entire developed corridor which could be constructed with minimal rework of this first project.

6.2.2. SECOND PRIORITY PROJECT – BNSF & NM118 OVERPASS.

As discussed in section 2.3 beginning on page 2-3, BNSF rail operations cause operation issues at the intersection of NM 118 and Allison Road. The volume of train traffic is projected to increase in the coming years. The construction of a grade separation of Allison Road over the BNSF tracks and NM118, will be the most costly of the priority projects, due to the length of the structure required and property acquisitions that could be required south of NM118. Similar in nature to the Kachina Road connection, this project would provide the opportunity to make a south regional connection to Mendoza Parkway. Both of these project facets would improve traffic operations and the safety of the traveling public. Another benefit of this connection would be that it further justifies the construction of an interchange with I-40 due to the regional connectivity of the Allison Corridor. There may be potential for BNSF to contribute funds toward this project as it would remove the existing at grade Railroad crossing.

6.2.3. THIRD PRIORITY PROJECT – I-40 OVERPASS

The second project that should be considered is the construction of an overpass of Allison Road and I-40. This project would mitigate the existing functionally obsolete Allison Road underpass of I-40. Additionally, this project continues to improve the horizontal geometrics of this corridor. A temporary connection and modifications to Maloney would be required in the interim until Priority project three is developed. Based on existing traffic analysis and projections, developed as part of this study, these improvements themselves would not generate sufficient traffic volumes to warrant an interchange at this time. Nonetheless, the proposed overpass would need to be constructed so that it would easily accommodate interchange ramps.

6.2.4. FOURTH PRIORITY PROJECT – MALONEY & ACOMA CONNECTION

This priority project would involve the construction of road improvements that make connections to Aztec Road, which provides access to a neighborhood and realignment of existing Maloney Avenue to connect to the Allison Road realignment. This project could be developer funded based on the business development opportunities that prevail at the time this project is being developed. This project will provide circulation and access to parcels identified in the City of Gallup's Long Range Growth Plan as available for commercial development.

6.2.5. FIFTH PRIORITY PROJECT – CONNECTION TO KACHINA ST.

Similar in nature to the third priority project, the fourth priority project is adjacent to existing and potential commercial developments and will improve access and circulation. This project could also be a public/private partnership or a developer funded project. The fourth priority project will connect Allison Road to Morello Avenue and Kachina Street. Developing Kachina Road further to the north toward Coal Basin Road was not part of the scope of this project; however, this connection is a vital step toward creation of a regional transportation network that is required to justify the construction of an interchange between Allison Road and I-40.

6.2.6. SIXTH PRIORITY PROJECT – I-40 INTERCHANGE AND FRONTAGE ROADS

The sixth and final priority project would be to construct a service interchange with I-40. As shown in Figure 6-1 and 6-2 the proposed Allison Road corridor lends itself to many interchange forms. The purpose of this study was to identify the interchange location and evaluate its potential impact to traffic operations. Prior to interchange development a detailed analysis of the different interchange forms should be conducted based on the prevailing projected developments and travel demands. Nonetheless, the interchange cannot be justified unless it fits in with the regional transportation system and complies with the 8 requirements in the Federal Highway's Interstate Access Policy.

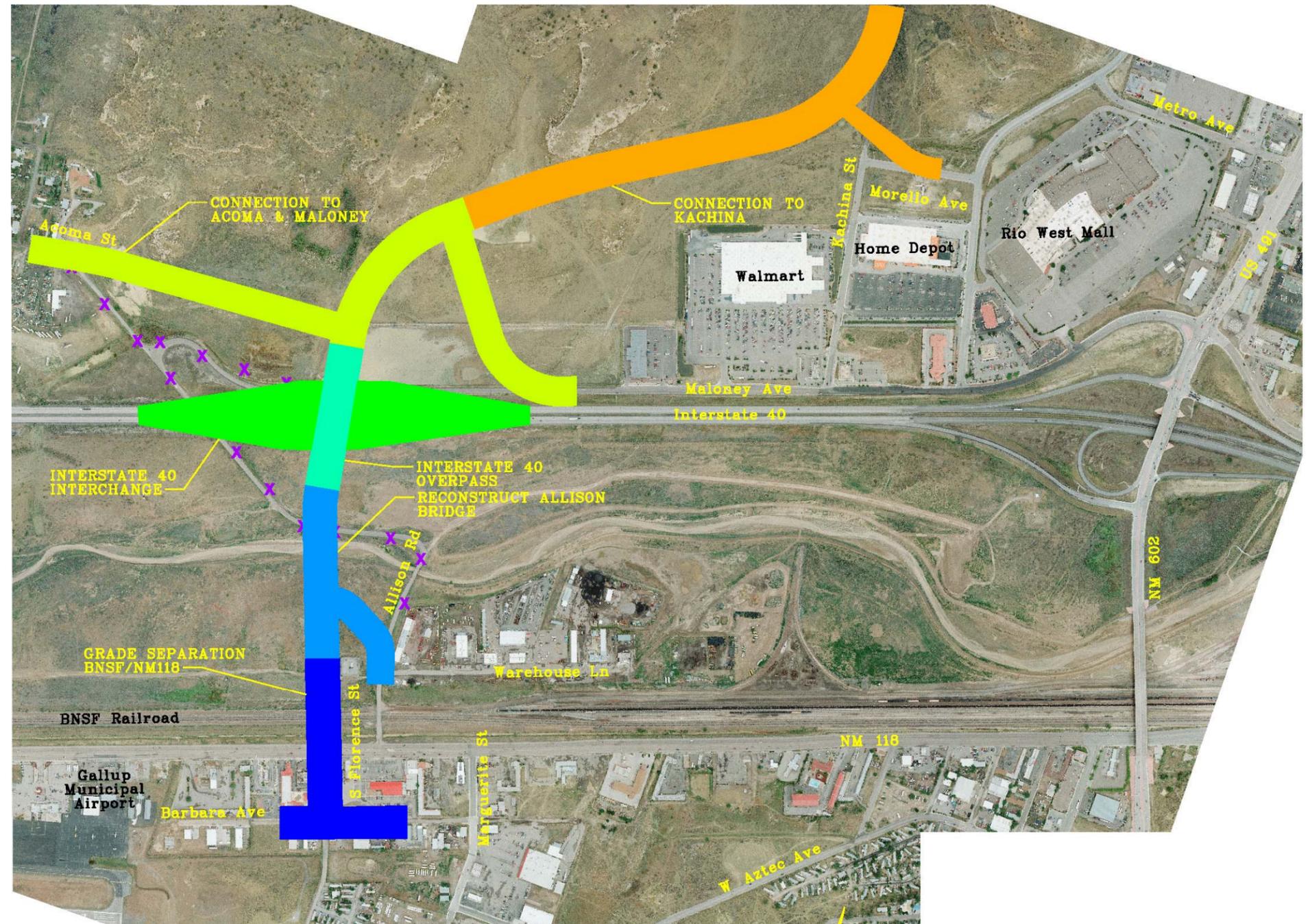


Figure 6-1: Center Alignment Phasing

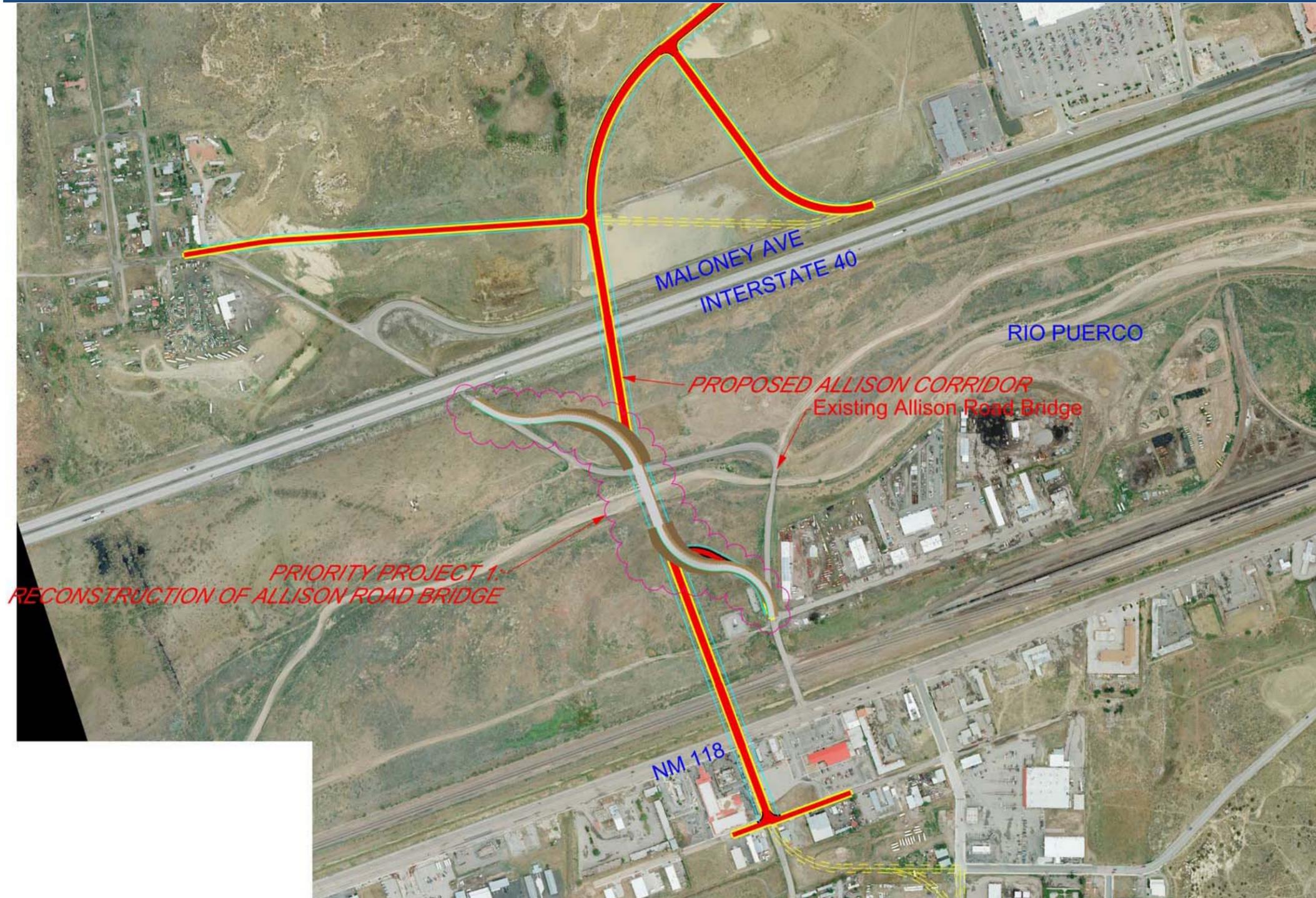


Figure 6-2: Priority Project 1

7. CONCLUSIONS AND RECOMMENDATIONS

The objective of the Detailed Evaluation of Alternatives for Allison Road Corridor and Interstate 40 Interchange Study was to 1) develop alignment alternatives within the preferred alignment corridor identified in Phase A; 2) evaluate alternatives based on the stated purpose and need; 3) develop a phasing and priority plan for corridor development; and 4) recommend alternatives to be carried forward to the Phase C Study. Evaluation of the existing condition along Allison Road concluded that many physical deficiencies exist within this corridor that should be mitigated including roadway geometrics, structural, pavement conditions and drainage facilities. Additionally, the system connectivity to roads outside the existing corridor could be improved. As stated in the purpose and need statement, the primary purpose for improving the existing Allison Corridor is to mitigate the existing geometric, physical, and operational deficiencies, improve safety, and provide system connectivity to the existing NMDOT and City of Gallup transportation network that are compatible with long range local and regional planning goals to facilitate economic growth.

Five corridor alternatives and the “No Build” alternative were developed and evaluated. Additionally, other transportation elements within the corridor were evaluated. These included a frontage road system, various interchange forms, and type of grade separation with the interstate. The project management team and stakeholders unanimously selected the Central Alignment as the preferred alternative with the grade separation of I-40 being configured as an overpass. It is the recommendation that the Center Alignment be carried forward to Phase C. Funding constraints will require a phased approach to full build out of this corridor. The first priority project considered is the replacement of the existing structure crossing the Rio Puerco.

It is recommended that the Central Alignment continue to be developed and that this project proceed into Phase C. Further biological and cultural resource investigations will also be required as the project moves into final design and Phase C. The Center Alignment has the potential to impact Route 66 and historic segments of the BNSF railway. A more detailed investigation, including field surveys and further coordination with the NMDOT Environmental Geology Bureau (EGB) will be required to determine the potential for hazardous materials within the project corridor. After discussions with the NMDOT EGB it is recommended that the entire proposed Center Alignment be evaluated during Phase C. Then only first priority project be taken to final design.

A noise study would be recommended for this alternative once a design is established in Phase C. As well, right-of-way needs and potential impacts will be determined in Phase C for this alternative.

The soil disturbance will exceed the threshold amount of 1 acre that triggers the need for National Pollutant Discharge Elimination System (NPDES) permit coverage. As required under the Clean Water Act, the construction contractor will prepare a Storm Water Prevention Plan (SWPPP) and obtain required NPDES permit coverage for construction activity. Best Management Practices (BMPs) such as the use of hay bales, silt fences, or other techniques will be used to prevent erosion and transport of sediment. According to the Federal Emergency Management Agency (FEMA), the area located to the south of the BNSF railway line is considered within the 1% annual chance floodplain. BMPs will be necessary, especially near where the proposed alignment crosses the Rio Puerco. As this project proceeds through the environmental and design process, further coordination with the United States Army Corps of Engineers (USACE) will be required due to the crossing of the Rio Puerco by the proposed alignments.