FINAL PROJECT PRIORITIZATION PLAN FOR THE NM 599 CORRIDOR

PROJECT NO. WIP-599-1(102)

CONTROL NO. D5SF2

APRIL 2010

Prepared for:

New Mexico Department of Transportation
Northern Design Bureau
P.O. Box 1149
Santa Fe, NM 87504-1149

Prepared by:

Parametrix

Bohannan ▲ Huston INC.

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

sites southwest

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PREPARED FOR:
NEW MEXICO DEPARTMENT OF TRANSPORTATION
NORTHERN DESIGN BUREAU
P.O. BOX 1149
SANTA FE, NM 87504-1149

PREPARED BY:

BOHANNAN HUSTON, INC.
7500 JEFFERSON ST. NE
COURTYARD ONE
ALBUQUERQUE, NM 87109

PARAMETRIX
8801 JEFFERSON ST.
BLDG B
ALBUQUERQUE, NM 87113

SITES SOUTHWEST
121 TIJERAS NE
SUITE 3100
ALBUQUERQUE, NM 87102

PREPARED BY:

Jeanette A. Walther April 1, 2010

JEANETTE WALTHER, P.E., P.T.O.E. DATE

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I. EXECUTIVE SUMMARY

NM 599 serves as a North/South by-pass for vehicles traveling through Santa Fe and a WIPP route for low level nuclear waste traveling to the Waste Isolation Pilot Project near Carlsbad. As a high-speed limited access bypass through Santa Fe NM 599 provides local Santa Fe traffic an additional North South travel corridor and alleviates traffic congestion along Cerrillos Road and St. Francis Drive.

NM 599 was designed as a controlled access facility with interchanges at all access points. Currently, it is a limited access facility with 12 allowable access points. There are five interim at-grade intersections along the corridor where right-of-way has been preserved for future interchanges. Two additional access points at Jaguar Road and Caja del Rio have not been constructed. Changes in regional traffic demand and issues related to the alignments of the intersections of other roads with NM 599 have necessitated the need for reanalysis of the corridor.

This study has been coordinated with two concurrent studies sponsored by the New Mexico Department of Transportation: the Interstate 25 Corridor Study (from NM 550 to Old Pecos Trail) and the St. Francis Drive Corridor Study (from I-25 to NM 599). Each of these facilities provides different levels of transportation service and addresses different needs, but the three corridors also accommodate similar and overlapping travel demands. St. Francis Drive and NM 599 both serve north-south through travel. St. Francis provides greater accessibility to property, while NM 599 provides higher mobility. The Interstate 25 corridor provides interstate access to NM 599 and St Francis Drive, but has the potential to interconnect with other major streets, which could influence the operation of both NM 599 and St. Francis Drive. The executive summaries of the I-25 Corridor Study and the St. Francis Drive Corridor Study can be found in Appendix A.

Purpose and Need

The crash rates on NM 599 for the period from 2003 through 2007 were below the statewide average; however, the crashes have a high severity at the unsignalized intersections with most of the crashes having injuries. Fatal crashes within the five year period were all single car crashes mostly occurring at horizontal curves. The fatality rate in 2006 was much higher than the statewide rate because there were four fatalities in one crash. The lack of gaps in NM 599 traffic during the peak hours causes drivers to take risks to cross or access NM 599 which leads to a public concern about safety at the existing intersections.

NM 599 is used for local circulation in the area; however, the unsignalized intersections have failing levels of service during the peak hours. The NM 599 frontage roads are discontinuous along the corridor causing traffic to back track in order to reach their destinations. In addition, the local area roadway network is lacking in links between NM 599 and central Santa Fe which is a problem that must be addressed by local government.

This area of Santa Fe has many approved and proposed plans for the development of both housing and business. This economic development is important to Santa Fe to provide the opportunity for Santa Fe's population to live and work in the community. Improved access to NM 599 would support this development by improving the flow of traffic onto and across NM599 from the local area.

Access at the unsignalized intersections, CR 62, CR 70 Connection (Via Veteranos) and Camino de los Montoyas, is very poor with the level of service on the cross streets failing during the peak hours. Improved access to or across NM 599 is needed for local multimodal transportation on the north side of Santa Fe including vehicles, future transit, pedestrians and bicycles.

NM 599 must continue to function as a relief route for the City of Santa Fe and as an alternative for hazardous waste transport from Los Alamos around the populated areas of Santa Fe. Improved access to or across NM 599 is needed for the all modes of travel as the area continues to develop. There is public perception that improvements are needed to address safety concerns, particularly at existing at-grade intersections.

The purpose of the study is to develop a prioritization plan for public funding that addresses the access issues and supports economic development, regional transportation and long range planning goals.

Detailed Evaluation of Alternatives

Viable alternatives for improvement were developed at all of the access points in between Interstate 25 and US 84/285. The Interstate 25 Interchange was analyzed as part of the I-25 Corridor Study. The US 84/285 Interchange was analyzed as part of the St. Francis Corridor Study.

1. **No Build –** The No Build Alternative would mean not making any physical changes to NM 599. No right-of-way would be required and no costs would be associated with this alternative. The No Build does not meet the project need of providing improved access to or across NM 599 for the all modes of travel as the area continues to develop. In addition, the No Build does not continue the development of an access controlled facility by removing at-grade intersections as was originally planned.
2. **Interstate 25 –** The I-25 Corridor Study recommends that the entrance and exit ramps be improved to improve the merge and diverge areas of the ramps and I-25 mainlines. Auxiliary lanes are recommended on I-25 between the interchanges. Acceleration and deceleration lanes are recommended on NM 599 for the southbound ramps.
3. **I-25 N. Frontage Road -** This alternative is shown in Figure 3, on page 23. Through traffic on the I-25 N. Frontage Road would use an overpass to cross NM 599. The existing intersection would be converted to a right-in, right-out so that frontage road traffic could access NM 599. The preferred alternative at the I-25 Frontage Road Intersection with NM 599 is to install an overpass. The overpass would improve the safety at the existing intersection and meet the purpose and need of eventually making NM 599 an access controlled facility. It is recommended that the I-25 Frontage Road Overpass be prioritized with the other alternatives.

4. **Jaguar Road –** The preferred alternative at the Jaguar location is to construct an interchange as shown in Figure 5 on page 29. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, it improves safety at the Airport Road Intersection, and it would provide improved access to Tierra Contenta, the Santa Fe Airport and undeveloped areas east and west of NM 599. It is recommended that the Jaguar Interchange be prioritized with the other alternatives.
5. **The W. Frontage Road from I-25 to Jaguar Road**, shown in Figures 7 and 8, on pages 35 and 40, would improve access to undeveloped lands west of NM 599. However, the owner of the land has plans to develop a north-south circulation road further away from NM 599 which would serve the same purpose. It is recommended that the alternative be eliminated.
6. **The E. Frontage Road from I-25 to Jaguar** shown in Figures 7 and 8, on pages 35 and 40, meets the purpose and need of improving circulation around NM 599. It would provide improved access to undeveloped areas east of NM 599. It is recommended that the frontage road be prioritized with the other alternatives.
7. **The W. Frontage Road from Jaguar Road to Airport** shown in Figure 9 on page 45 would improve access to undeveloped lands west of NM 599. However, the land is already master planned with an access road further to the west. This access road would provide better access given the grades of the proposed frontage road. It is recommended that the alternative be eliminated.
8. **The E. Frontage Road from Jaguar Road to Airport** shown in Figure 9 on page 45 would improve access to Tierra Contenta and undeveloped lands east of NM 599. Tierra Contenta is already master planned with an access road further to the west. The Tierra Contenta access road provides access to the remaining undeveloped land in the area. The Tierra Contenta Corporation has asked that the alternative be eliminated since it requires right-of-way from their property that is already platted for commercial and community development. It is recommended that the alternative be eliminated.
9. **Airport Road** - The preferred alternative at the Airport Intersection is to construct an interchange as shown in Figure 10 on page54. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, and it improves safety at the Airport Road Intersection. It is recommended that the Airport Interchange be prioritized with the other alternatives.
10. **Extension of Frontage Road across Santa Fe River** - The extension of the frontage road across the Santa Fe River as shown in Figure 12 on page 59 meets the purpose and need of improving circulation in the area of NM 599. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. It is recommended that the alternative be prioritized with the other alternatives.

11. **Caja del Rio** - The preferred alternative for the Caja del Rio Location is to construct an interchange as shown in Figure 13 on page 65. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. The estimated construction cost for the interchange is approximately the same as the cost for the south frontage road but it provides improved access both north and south. The frontage road only provides access to the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.
12. **County Road 62** - The preferred alternative for the CR 62 Intersection is to construct an interchange as shown in Figure 15 on page 74. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. It is recommended that the alternative be prioritized with the other alternatives. In the interim before funding is available for an interchange the NMDOT is considering other options such as a signal or flashers.
13. **County Road 70 Connection (Via Veteranos)** - The preferred alternative for the CR 70 Connection (Via Veteranos) Intersection is to construct an interchange as shown in Figure 16. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. It is recommended that the alternative be prioritized with the other alternatives. In the interim before funding is available for an interchange the NMDOT is considering other options such as a signal or flashers.
14. **Ephriam Road** - The preferred alternative for the Ephriam Intersection is to construct an interchange as shown in Figure 17 on page 83. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is the least expensive alternative; however, the interchange alternative provides access to the existing private land on the north side of NM 599 and to City of Santa Fe owned land on the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.
15. **Camino de los Montoyas** - The preferred alternative for the Camino de los Montoyas Intersection is to construct an interchange with a frontage road to provide access on the south side as shown in Figure 20 on page 96. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is less expensive than the overpass alternative. The interchange also provides better access to the area than the alternative to use the overpass with a frontage road back to the Ephriam Interchange. It is recommended that the alternative be prioritized with the other alternatives.

16. **The W. Frontage Road from Camino de los Montoyas to Ridgetop** shown in Figures 23 and 24 would meet the purpose and need of providing improved circulation in the NM 599 corridor. However, the undeveloped area is mainly City of Santa Fe open space. The city does not have a need for improved access. There is a private development parcel on the northwest corner of the Ridgetop Road Interchange. The developer of that parcel has plans to access Ridgetop Road. For these reasons it is recommended that the alternative be eliminated.
17. **The E. Frontage Road from Camino de los Montoyas to Ridgetop Road** shown in Figures 23 and 24 would provide improved circulation in the NM 599 corridor. However, the existing development plan for the Northwest Quadrant is approved without access at Camino de los Montoyas. There is no way to provide a frontage road in this area without providing a connection from Camino de los Montoyas to the Northwest Quadrant development which is currently not allowed by the approved development plan. In addition, the Northwest Quadrant Development has a circulation road in the plan further away from NM 599 that serves the same purpose. For these reasons, it is recommended that the frontage road alternative be eliminated.
18. **US 84/285 Interchange –** The St. Francis Corridor study recommends that an auxiliary lane be added between the eastbound NM 599 ramp and southbound US 84/285. The lanes would be restriped lanes so that the outside southbound lane drops at the Guadalupe interchange. This is to improve merge operations from NM 599 onto US 84/285.

Project Priority Plan

The NM 599 projects in order of priority for public funding are shown in Table 1. Projects were prioritized based on their ability to satisfy the purpose and need, public input, and cost. The total cost of all projects is $85,625,000.

Table 1 – NM 599 Priority for Public Funding		
Location	**Priority**	**Total Cost**
CR 62 Interchange	1	$6,500,000
CR 70 Connection Interchange	2	$8,000,000
Airport Road Interchange	3	$11,000,000
I-25 Frontage Road Overpass	4	$6,000,000
Extend NM 599 Frontage Road across SF River	5	$4,300,000
Caja del Rio Interchange	6	$12,650,000
Ephriam Rd Interchange	6	$8,000,000
Camino de los Montoyas Interchange w/ Frt Rd	8	$11,050,000
Jaguar Rd Interchange	8	$8,000,000
NM 599 E. Frt Rd to I-25	10	$10,125,000
Total Cost		$85,625,000

If private funding becomes available then any of these projects could be constructed. The projects with the least priority do not require an interchange or frontage road unless necessitated by development in which case they should be privately funded.

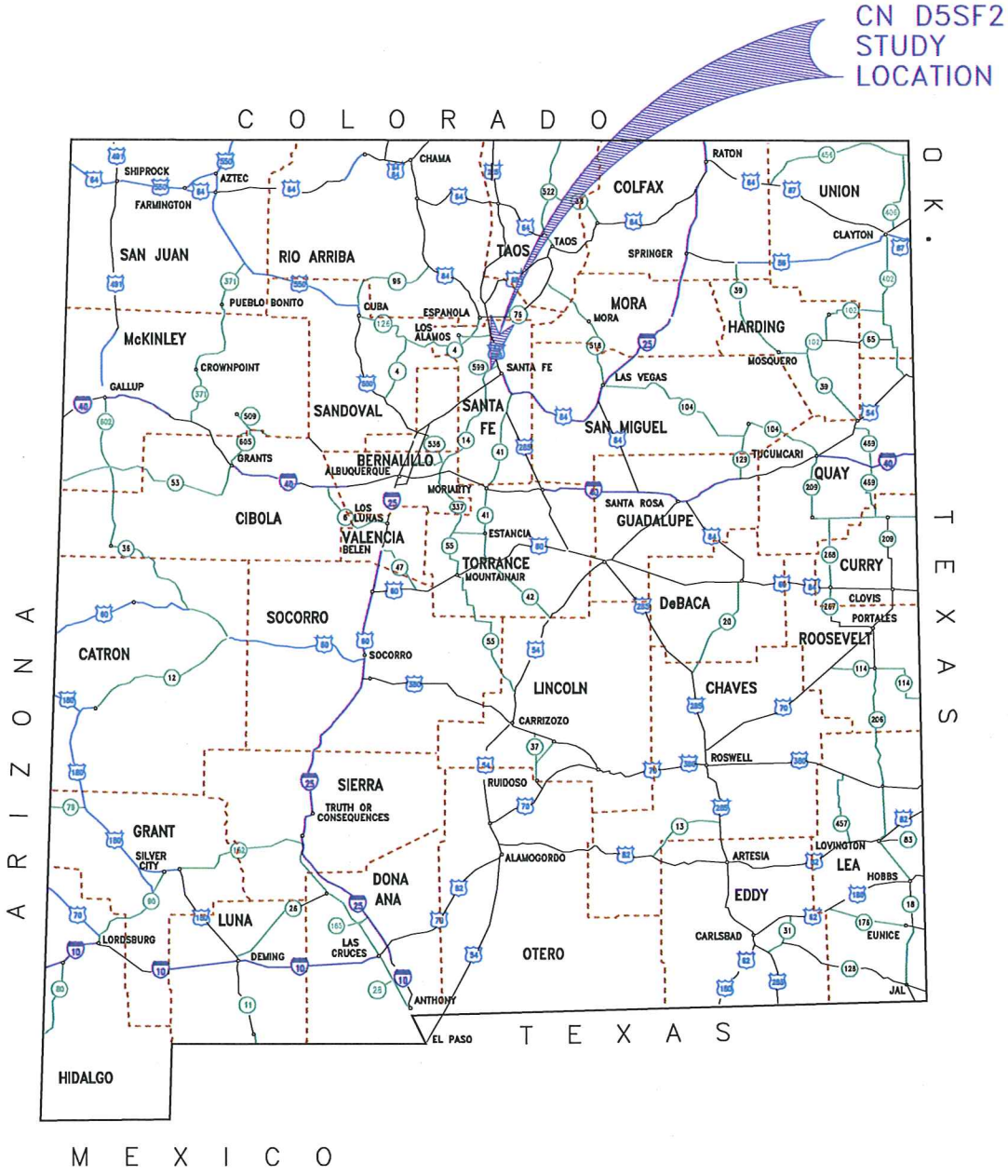
II. INTRODUCTION

The NM 599 Corridor also referred to as the Santa Fe Bypass and the Veterans Memorial Highway, is located on the west and north sides of the City of Santa Fe beginning at NM 14 east of Interstate 25. The location map is shown in Figure 1. The corridor connects I-25 southwest of Santa Fe to US 84/285 North of Santa Fe as shown in Figure 2. The roadway facility serves as a North/South by-pass for vehicles traveling through Santa Fe and a WIPP route for low level nuclear waste traveling to the Waste Isolation Pilot Project near Carlsbad. As a high-speed limited access bypass through Santa Fe NM 599 provides local Santa Fe traffic an additional North South travel corridor and alleviates traffic congestion along Cerrillos Road and St. Francis Drive. However, there is public perception that improvements are needed to increase safety, particularly at intersections. Changes in regional traffic demand and issues related to the alignments of the intersections of other roads with NM 599 have also necessitated the need for additional analysis of the corridor in accordance with the New Mexico Department of Transportation (NMDOT) Location Study Procedures Manual.

The study team for this corridor included representatives of the NMDOT, the City of Santa Fe, Santa Fe County, the Santa Fe Metropolitan Planning Organization, and the Federal Highway Administration.

A Phase A Study for Initial Evaluation of Alternatives was completed in September 2009. All viable alternatives for meeting the needs in the corridor were identified. This study will perform a more detailed analysis of the alternatives and identify a preferred alternative in each location.

This study has been coordinated with two concurrent studies conducted by the NMDOT: the Interstate 25 Corridor Study and the St. Francis Drive Corridor Study. I-25 (from NM 550 to Old Pecos Trail) is a high mobility interstate corridor with interchange connections accessing major arterial streets. St. Francis Drive (US 84/285) (from I-25 to NM 599) is one of the main north–south urban arterials in Santa Fe, providing vehicular and pedestrian access to businesses and institutions, as well as accommodating through travel for north and south destinations. Each of these facilities provides different levels of transportation service and addresses different needs, but the three corridors also accommodate similar and overlapping travel demands. St. Francis Drive and NM 599 both serve north-south through travel. St. Francis provides greater accessibility to property, while NM 599 provides higher mobility. The Interstate 25 corridor provides interstate access to NM 599 and St. Francis Drive, but has the potential to interconnect with other major streets, which could influence the operation of both NM 599 and St. Francis Drive. The executive summaries of the I-25 Corridor Study and the St. Francis Drive Corridor Study can be found in Appendix A.



Bohannan ▲ Huston

Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335

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NM 599 INTERCHANGE STUDY

FIGURE 1
LOCATION MAP

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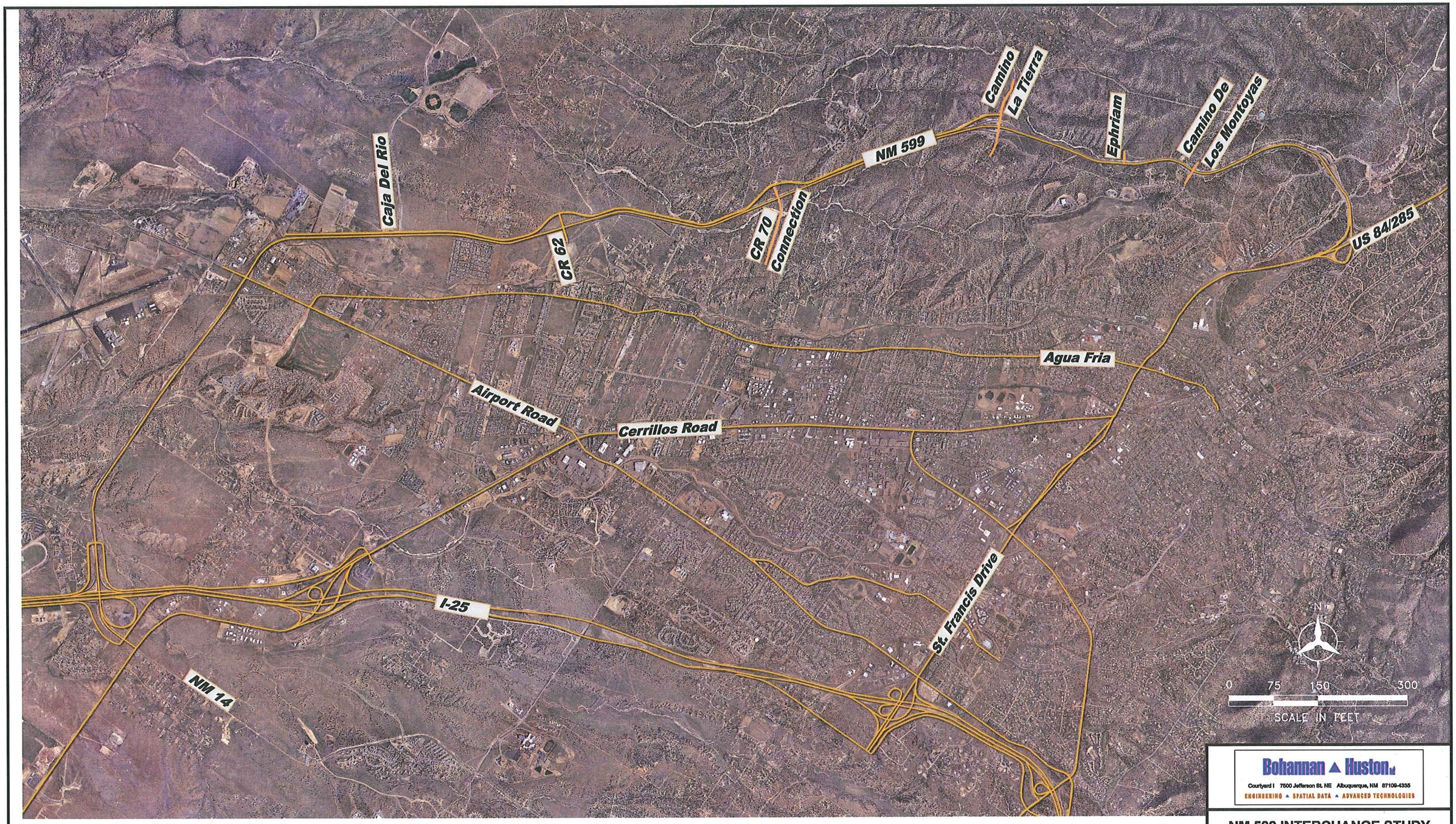

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NM 599 INTERCHANGE STUDY

FIGURE 2
VICINITY MAP

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III. PURPOSE AND NEED

A. Project Need

Improvements to the NM 599 intersections that were planned but not constructed are being re-evaluated. NM 599 was planned to be a future access controlled facility with interchanges at all locations except at NM 14 at the beginning of the route. The original environmental assessment, dated July 1987, identified three needs for the construction of NM 599 which should be considered in the re-evaluation:

- A north south relief route for through traffic traveling from I-25 to the communities north of Santa Fe on US 84/285.
- A WIPP route, carrying hazardous waste from Los Alamos National Laboratory to the Waste Isolation Pilot Project near Carlsbad.
- Congestion relief for the Santa Fe local street network.

In addition to the original purpose and need, the current conditions were evaluated. The NMDOT Location Study Procedures Guidelines lists seven factors that can be the basis for the need of a transportation improvement. These factors are listed below along with their applicability to NM 599.

1. **Physical Deficiencies**

No physical deficiencies have been identified for NM 599 with respect to the design speed of 65 miles per hour (mph) south of Airport Road and 60 mph from Airport Road through the Ridgetop Road Interchange. The horizontal and vertical curvature is adequate for the design speed. The bridges along the route are all in good condition. The lane and shoulder widths meet the recommendations of *A Policy on Geometric Design of Highways and Streets* by the American Association of State Highway and Transportation Officials for the design speed. One issue brought up by the public is that the existing 2 foot wide frontage road shoulders are inadequate for bicycles. The pavement will require maintenance based on its age but it is in good condition.

Physical deficiencies do not contribute to project need.

2. **Travel Demand and Congestion**

One of the original project needs for the construction of NM 599 was to relieve traffic congestion on the Santa Fe street system. The maintenance of NM 599 as a relief route should be considered when assessing projects. The existing roadway operates at a level of service of B during the peak hours indicating that there is no congestion on NM 599. Travel demand will increase as the area surrounding NM 599 continues to develop. Travel demand and congestion do not contribute to the need for a new project on NM 599.

3. **Safety**

The crash rates on NM 599 for the period from 2003 through 2007 were below the statewide average. Fatal crashes on the roadway were all single car crashes mostly occurring at horizontal curves. The fatality rate in 2006 was much higher than the statewide rate because there were four fatalities in one crash.

The lack of gaps in NM 599 traffic during the peak hours causes drivers to take risks to cross or access NM 599 which leads to a public concern about safety at the existing intersections. Addressing the safety concerns is a secondary need for the project.

4. **System Connectivity**

NM 599 serves as a north south relief route for through traffic traveling from I-25 to the communities north of Santa Fe on US 84/285. NM 599 also serves as a WIPP route, carrying low level nuclear waste from Los Alamos National Laboratory to the Waste Isolation Pilot Project near Carlsbad. NM 599 was designed as an access controlled facility with interchanges. There are five interim at-grade intersections along the corridor where right-of-way has been preserved for a future interchange. Two additional access points at Jaguar Road and Caja del Rio have not been constructed.

NM 599 is also used for local circulation, however, the unsignalized intersections are difficult to use during the peak hours. The frontage roads are discontinuous causing traffic to back track in order to reach their destinations. In addition, the local area roadway network is lacking in links between NM 599 and central Santa Fe which is a problem that must be addressed by local government.

Maintaining NM 599 as a relief route is a primary need for the road and must be considered during any project analysis.

5. **Access**

NM 599 is a limited access facility with 12 allowable access points. Thirteen access points were originally included but one was deleted after the public hearing. Two allowable access points at Jaguar Road and Caja del Rio have not been constructed. Access at the unsignalized intersections; CR 62, CR 70 Connection (Via Veteranos) and Camino de los Montoyas, is very poor with the level of service on the cross streets failing during the peak hours. Improved access to or across NM 599 is needed for local multimodal transportation on the north side of Santa Fe including vehicles, future transit, pedestrians and bicycles.

Continued development along the corridor will require improved access to NM 599.

Addressing the access issues is a primary need for a project on NM 599.

6. **Economic Development**

This area of Santa Fe has many approved and proposed plans for the development of both housing and business. Tierra Contenta is an affordable housing development. This economic development is important to Santa Fe to provide the opportunity for Santa Fe's population to live and work in the community. Improved access to NM 599 would support this development by improving the flow of traffic onto and across NM599 from the local area.

Addressing the transportation needs of economic development is a primary need for a project on NM 599.

7. **Legislation**

There have been several legislative actions in response to access issues on NM 599. House Joint Memorial #6 from the Year 2000 2nd special session requested that the New Mexico Department of Transportation (NMDOT), "install traffic signals to provide safe crossings, ingress and egress to the bypass intersections with county roads 62 and 70 and with Camino de los Montoyas and Ephriam Street." The house memorial also requested the NMDOT, "to work with federal and local highway agencies and local communities to improve the safety of the bypass and ensure that future connections are safe and that input and comments from the affected communities are addressed."

In 2002, with House Bill 88, the New Mexico State Legislature appropriated money for planning and preliminary design of the Caja del Rio Road intersection with NM 599 in response to requests from the community and the development of multiple state and municipal facilities on Caja del Rio Road. The NMDOT initiated a location study of the intersection. The project was protested during the public meeting process because members of the public felt that another intersection on NM 599 should not be constructed until the existing intersections were improved. The project was dropped because the Santa Fe Metropolitan Planning Organization decided not to add it to the Transportation Improvement Program. NMDOT made a commitment to perform a study and a project prioritization for the entire corridor. This study is being completed in response to that NMDOT commitment.

B. Statement of Purpose and Need

NM 599 must continue to function as a relief route for the City of Santa Fe and as an alternative for hazardous waste transport from Los Alamos around the populated areas of Santa Fe. Improved access to or across NM 599 is needed for the all modes of travel as the area continues to develop. There is public perception that improvements are needed to address safety concerns, particularly at existing at-grade intersections.

The purpose of the study is to develop a prioritization plan that addresses the access issues and supports economic development, regional transportation and long range planning goals.

Specific to each intersection location or segment of the corridor the following project purpose and need apply:

An overpass is needed at the I-25 N. Frontage Road intersection to improve safety in the corridor and to provide improved access to the planned development on both sides of the corridor. The purpose of the overpass alternative is to meet the need of eventually making NM 599 from I-25 to US 84/285 an access controlled facility.

Construction of the Jaguar Road Interchange is needed to provide direct access to or from Tierra Contenta from NM 599 and to remove traffic from Airport Road The purpose of the interchange is to provide improved access to Tierra Contenta, the Santa Fe Airport and to private development property on the west side of NM 599.

Construction of the Airport Road Interchange is needed to improve the safety of the corridor at the highest crash location The purpose of the interchange is to eliminate an at-grade access point to achieve the goal of an access controlled facility.

Construction of the Caja del Rio Interchange is needed to provide direct access to the public facilities on Caja del Rio. The purpose of the interchange is to provide improved access to Caja del Rio, to provide access to undeveloped property on the south side of NM 599, and to remove traffic from the CR 62 intersection.

Construction of the CR 62 interchange is needed to improve the safety of the corridor, to improve access to and across NM 599 at an existing failing intersection, and to serve the increase in traffic that will occur with the South Meadows Extension. The purpose of the interchange is to provide improved access to the Agua Fria Community, the fire station, the medical center, the community park and to proposed development in the area and to eliminate an at-grade access point to achieve the goal of an access controlled facility.

Construction of the CR 70 Connection (Via Veteranos) interchange is needed to improve access to and across NM 599 at an existing failing intersection and to serve the increase in traffic that will occur with the Siler Road Crossing. The purpose of the interchange is to provide improved access and to eliminate an at-grade access point to achieve the goal of an access controlled facility.

Improvements at the Ephriam intersection are needed to provide access to proposed development in the area. The purpose of the improvement is to eliminate an at-grade access point to achieve the goal of an access controlled facility.

Construction of improvements at the Camino de los Montoyas intersection is needed to improve access to and across NM 599 at an existing failing intersection. The purpose of the improvements is to provide better access to existing and proposed development in the area and to eliminate an at-grade access point to achieve the goal of an access controlled facility.

IV. PUBLIC INVOLVEMENT AND AGENCY COORDINATION

A. Public Involvement

During Phase A of the NM 599 Corridor Study there were two public open houses and a stakeholder's workshop. The public input from the Phase A study is contained in Appendix B.

During Phase B of the study there were two public meetings that are described in the following paragraphs.

1. Public Open Houses and Public Information Meetings

A public information meeting was held on October 6, 2009 at the Genoveva Chavez Community Center in Santa Fe to solicit public input on the Phase A Report and the viable alternatives identified. Approximately 60 members of the public, city, county, and state officials and project study team representatives were present. Prior to the meeting, the Phase A Report was posted on the Santa Fe MPO web site and copies were placed in the three libraries in Santa Fe.

A public information meeting was held March 3, 2010 at the Genoveva Chavez Community Center in Santa Fe to solicit input on the preferred alternatives recommended by the Draft Phase B Detailed Evaluation of Alternatives and the Project Priority Plan. Approximately 48 people attended the meeting. The executive summary and preferred alternative figures were posted on the SF MPO Website prior to the meeting.

Many of the comments at both meetings were clarifying the criteria used to evaluate and prioritize the interchanges. There were concerns regarding travel patterns, land use development plans, and safety. All input has been documented and considered as part of the Location Study Process.

A summary of comments from the public is included in Appendix B.

2. Web Site

A web site was used to keep the public informed. The web site was located on the NMDOT web site at http://nmshtd.state.nm.us and is listed on the site index. The web site contains general corridor information, a list of the study team, the management structure, project status, and a comment form. The Phase A Report for the corridor was posted on the Santa Fe MPO web site for review by the public prior to the October 6, 2009 stakeholder meeting. The executive summary and figures of the preferred alternatives from the Phase B Report were posted to the Santa Fe MPO web site prior to the March 3, 2010 public information meeting.

B. Agency Coordination

1. Santa Fe MPO Committees

The preferred alternatives were presented to the Santa Fe MPO Technical Coordinating Committee on December 7, 2009 and to the Transportation Policy Board on December 10, 2009.

The project priority plan was presented to the Technical Coordinating Committee on January 25, 2010 and to the Transportation Policy Board on February 11, 2010.

V. TRAFFIC FORECASTS

In order to create the traffic forecasts, the Future Forecast VISUM model maintained by the Santa Fe Metropolitan Planning Organization (MPO) was adjusted to create an NMDOT Base model. The MPO model includes S. Meadows Road from Agua Fria Street to the CR 62 / NM 599 Intersection and the Siler Road Extension from Agua Fria Street north to Alameda Street. The South Meadows Extension is in the 2010 – 2013 Transportation Improvement Program. The Siler Road project will be substantially complete in July 2010. The model demographics reflect growth over the next 30 years or more, reflecting more of a build out of the modeled area.

The Santa Fe MPO model was adjusted before the forecasting to create the NMDOT Base model which included the following:

- The Las Soleras socioeconomic data and roadway network from their VISUM runs. Las Soleras is an approved development located on the W. I-25 Frontage Road between Cerrillos Road and Richards Road.
- The Jaguar Interchange with NM 599. A developer is currently negotiating with the New Mexico Department of Transportation to design and construct the Jaguar Interchange using private funding.
- Four lanes on Richards Avenue from Avenida del Sur to Rodeo Road.

The six scenarios that were modeled are described below:

1. **Scenario 1 – Full Regional System includes:**
    - Richards Interchange with Frontage Roads, Camino Carlos Rey Extension, Dinosaur Loop (West)
    - Eldorado connection to College District
    - All NM 599 access points as interchanges
    - Auxiliary lanes on US 84/285 from NM 599 to Guadalupe
    - I-25 Auxiliary Lanes and Interchange Improvements
    - Includes Governor Miles extended to Rodeo Park with connections to Yucca and Galisteo
    - Reduce speed limit on I-25 to 65 MPH
    - Increase speed limit on NM 599 to 65 MPH

    Scenario 1 is the future full build out of all of the system improvements including all interchanges on NM 599.

2. **Scenario 2 –Intermediate Regional System includes:**
    - Same as Scenario 1 without the Richards Interchange

    Scenario 2 was run for the I-25 Corridor Study and will not be analyzed for impacts to NM 599.

3. **Scenario 3 – Near Term Regional System Improvements includes:**
    - I-25 Auxiliary Lanes and Interchange Improvements
    - Eldorado connection to College District
    - Auxiliary lanes on US 84/285 from NM 599 to Guadalupe

    Scenario 3 was run for the I-25 Corridor Study and will not be analyzed for impacts to NM 599.

4. **Scenario 4 – Auxiliary lanes I-25 and US 84/285 - Federal and State improvements only includes:**
    - I-25 Auxiliary Lanes and Interchange Improvements
    - Auxiliary lanes on US 84/285 from NM 599 to Guadalupe
    - All NM 599 at-grade access points and the Caja del Rio access point as signals
    - Reduce speed limit on NM 599 to 45 mph
    - No Eldorado connection to College District

    Scenario 4 included all signals on NM 599. Presumably all signals at the at-grade intersections will impact the ability of NM 599 to function as a bypass road for Santa Fe because of added delays introduced to NM 599 through traffic and as a result it would cause more traffic to use through streets in Santa Fe such as St. Francis Drive and Cerrillos Road.

5. **Scenario 5 – CR 62 and I-25 Frontage Road Interchanges**

    The only improvements in Scenario 5 were interchanges on NM 599 at CR 62 and the I-25 Frontage Roads. The two interchange locations are far enough apart that they should not impact each other so they were able to be included in the same model run.

6. **Scenario 6 – Airport Road and CR 70 Interchange**

    The only improvements in Scenario 6 were interchanges on NM 599 at Airport Road and the CR 70 Connection (Via Veteranos). Again the two interchange locations are far enough apart that they should not impact each other.

    Plots of the model output that will be used for this study analysis can be found in Appendix C.

VI. TRAFFIC ANALYSIS

A. Warrant Analysis at Existing Unsignalized Intersection

There are three existing unsignalized intersections in the NM 599 corridor. A signal warrant analysis was performed during the *Phase A – NM 599 Interchange Corridor Study Initial Evaluation of Alternatives*. Based on criteria from the *Manual on Uniform Traffic Control Devices, 2003 Edition*, signals are warranted at County Road 62 in both the a.m. and p.m. peak hours and at CR 70 Connection (Via Veteranos) in the p.m. peak hour. Experience shows that intersection crash rates frequently increase with signal installation, although the crashes may be less severe. Signalization usually leads to a shift in crash types, with fewer angle and turning collisions and more rear-end collisions.

B. System Impacts of Scenarios

Scenarios 1 and 4 were compared to the DOT Base model to determine their overall impact to the system. The changes in traffic are summarized in Table 2 below.

Table 2 – Scenario 1 and 4 Impacts

Location	Scenario 1 Impact	Scenario 4 Impact
NM 599	7 to 43% increase	4 to 40% decrease
Northbound I-25 north of NM 599	7 to 15% decrease	13 to 15% increase
St. Francis Drive	5 to 7% decrease	5 to 10% increase
Cerrillos Road north of I-25	2 to 5% decrease	No significant change

In Scenario 1, the scenario in which NM 599 intersection / access points are all interchanges and the corridor speed is increased to 65 mph, there is an increase in traffic on NM 599 of up to 43%, a decrease in traffic on northbound I-25 north of NM 599 of 7 to 15%, and a slight decrease on Cerrillos Road and St. Francis Drive away from NM 599 and I-25 of 2 to 7%.

Scenario 4 is the scenario in which all of the existing at-grade intersections and a new at-grade intersection at Caja del Rio on NM 599 are signalized and the corridor speed limit is reduced to 45 mph. In this scenario there is a large decrease in traffic on NM 599 of up to 40%. The area of the largest decrease is between CR 62 and the CR 70 Connection (Via Veteranos). There is an increase in traffic on northbound I-25 north of NM 599 of up to 15%. There is an increase in traffic on St. Francis of 5% to 10%. There is no significant change on Cerrillos Road.

The comparison of the traffic in Scenarios 1 and 4 shows that if NM 599 is going to function efficiently as a relief route for the City of Santa Fe then it needs to have interchanges instead of at-grade signalized intersections.

C. Weave Analysis

Level of service for a weaving segment of a multilane highway is calculated as a density in passenger car per mile per lane. The delay for each level of service is shown in Table 3.

Table 3 – Level of Service Criteria for Weaving Segments	
Level of Service	**Delay for Multilane Weaving Segments**
A	≤ 12.0
B	>12.0 – 24.0
C	>24.0 – 32.0
D	>32.0 – 36.0
E	>36.0 – 40.0
F	>40.0

Concern was expressed during the public open houses and information meetings about the weave on NM 599 between the Ridgetop Road and US 84/285 Interchanges. A weaving analysis was completed for the northbound and southbound directions of NM 599 between the Ridgetop Rd interchange and the junction with US 84/285 using the DOT Base Model Traffic Forecasts and the Scenario 1 Traffic Forecasts. Northbound the ramp junctions are 1270 feet apart. In the northbound direction there is a standard weaving movement with a ramp entering and exiting on the right hand side. HICAP version 2 was used for the analysis. Southbound the ramp junctions are 1215 feet apart. The US 84/285 southbound on-ramp joins with the US 84/285 northbound on-ramp to form a two lane road. It was assumed for the purpose of this analysis that 2/3 of the traffic exiting at Ridgetop Road is coming from Santa Fe. This traffic must weave across the lane formed by the US 84/285 southbound on-ramp to exit at Ridgetop on the right hand side. This analysis was done by hand using the equations in the 2000 version of the Highway Capacity Manual.

The traffic forecast model is calibrated to the PM Peak Hour so only the PM Peak was analyzed. The results of the analysis are shown in the following table. The calculations can be found in Appendix D.

Table 4 – Future Weave Capacity Analysis Results				
	PM Peak – DOT Base Volumes		**PM Peak – Scenario 1 Volumes**	
Ramp	**Delay (pc/mi/ln)**	**LOS**	**Delay (pc/mi/ln)**	**LOS**
NB NM 599 Ridgetop Rd to US 84/285	13.4	B	23.3	C
SB NM 599 US 84/285 to Ridgetop Rd	29.44	C	34.8	D

The analysis shows that the weave operates at an acceptable level of service with the forecast volumes. It is recommended that the New Mexico Department of Transportation periodically reexamine this weave to determine if it remains at an acceptable level of service.

VII. DETAILED EVALUATION OF ALTERNATIVES

A. No Build

The No Build Alternative would mean not making any physical changes to NM 599. No right-of-way would be required and no costs would be associated with this alternative. The No Build does not meet the project need of providing improved access to or across NM 599 for all modes of travel as the area continues to develop. In addition, the No Build does not continue the development of an access controlled facility as was originally planned. For these reasons the No Build is eliminated from further consideration.

B. I-25 W. Frontage Road

An interchange was not planned in this location as part of the original study and design. An overpass could be constructed at the I-25 W. Frontage Road intersection to improve safety in the corridor and to provide improved access to the planned development on both sides of the corridor. Planned development includes the Komis Business Park in the northeast quadrant of the intersection and the La Cienega Commercial District in the northwest quadrant. The Downs of Santa Fe is also being redeveloped just to west along the I-25 Frontage Road. The purpose of the overpass alternative is to meet the need of eventually making NM 599 an access controlled facility from I-25 to US 84/285. This alternative is shown in Figure 3. Through traffic on the I-25 W. Frontage Road would use an overpass to cross NM 599. The existing intersection would be converted to a right-in, right-out so that frontage road traffic could access NM 599. Acceleration and deceleration lanes would be added for the right turn movements.

1. **Traffic Analysis**

The existing I-25 W. Frontage Road / NM 599 Intersection is signalized. The 2009 existing level of service is B in both the a.m. and p.m. peak hours. Level of service B means that the delay averages between 10 and 15 seconds per vehicle which is very good.

A signalized intersection analysis was performed for the future no-build traffic volumes. The turning movements were projected from the existing turning movements. The intersection has a level of service of F with the existing geometry. In order to get an acceptable level of service NM 599 needs to have three lanes in each direction. In addition a right turn bay is needed northbound on NM 599 and westbound on the frontage road.

2. **Safety**

Safety will be increased by eliminating left turns onto NM 599 from the frontage road.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the I-25 overpass alternative is shown in Figure 3 along with the horizontal curve data. The vertical profile data can be found in Appendix E. The design speed of the frontage road is 40 miles per hour.

This alternative includes closing the existing intersection median to eliminate left turn movements. Acceleration and deceleration lanes would be added to NM 599 for the right turn movements. The I-25 southbound off-ramp would be modified to tighten up the free flow right turn movement to approximately a 250' radius.

Recently the NMDOT Access Control Committee approved the realignment of the northeast leg of this intersection with a roundabout to serve the Komis Business Park.

4. **Typical Section**

The typical section of the overpass was assumed to be 2 – 12' lanes with 8' shoulders as shown in Figure 4. The 8' shoulders between the ramps will accommodate multimodal users such as bicyclists, and pedestrians crossing NM 599.

The frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists by the *NMDOT Bicycle-Pedestrian-Equestrian Advisory Plan, January, 2009*. An additional foot is needed because the open graded friction course (OGFC) laps onto the shoulder 1'. The NMDOT is considering making the OGFC full width on shoulders intended for bicycle use. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The main consideration for multi-modal transportation at this location is to link the New Mexico Rail Runner station to the regional trail network in order to complete the alternate transportation route. The City of Santa Fe Parks, Open Space and Trails Map indicates a proposed trail from the Community College district , south of I-25, along the east/southeast side of NM 599 to Via Veteranos. Bicyclists and pedestrians are likely to be the main users at this location. Another trail link would be from the Tierra Contenta network to the pedestrian overpass from the north side of I-25. Considerations should include universal accessibility to the New Mexico Rail Runner station.

6. **Drainage**

There is an existing storm drain system in the NM 599 / I-25 Interchange that should not be impacted by the construction of the I-25 Frontage Road overpass. Additional drop inlets may be required with the changed geometry.

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments

to limit the span length. The following dimensions were used; a bridge length of 252', a bridge width of 43', and a superstructure depth of approximately 75". The bridge length of the existing Interstate 25 bridges over NM 599 would be matched to provide the same sight distance, continuation of the roadside ditches adjacent to NM 599 and to avoid impacting the storm drain system in the interchange.

8. **Utilities**

There is a 12 inch and a 4 inch gas line crossing under NM 599 approximately 1100 feet north of Interstate 25. There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

There is an overhead electric line crossing of the I-25 W. Frontage Road just west of the intersection with NM 599. This electric line is then located between NM 599 and the I-25 W. Frontage Road.

9. **Constructability**

Most of the I-25 frontage road improvements could be constructed without disturbing existing traffic. Single lane closures would be used for constructing the acceleration / deceleration lanes at the intersection and closing the median. NM 599 traffic would need to be shifted to one side in order to place the bridge beams and pour the bridge deck. Flagmen control would be used for ties to the existing frontage road.

10. **Right-of-way**

The I-25 Frontage Road Overpass alternative will fit within the existing right-of-way.

11. **Environmental Factors**

The right-of-way for this future interchange was not cleared under the 1987 EA; however, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

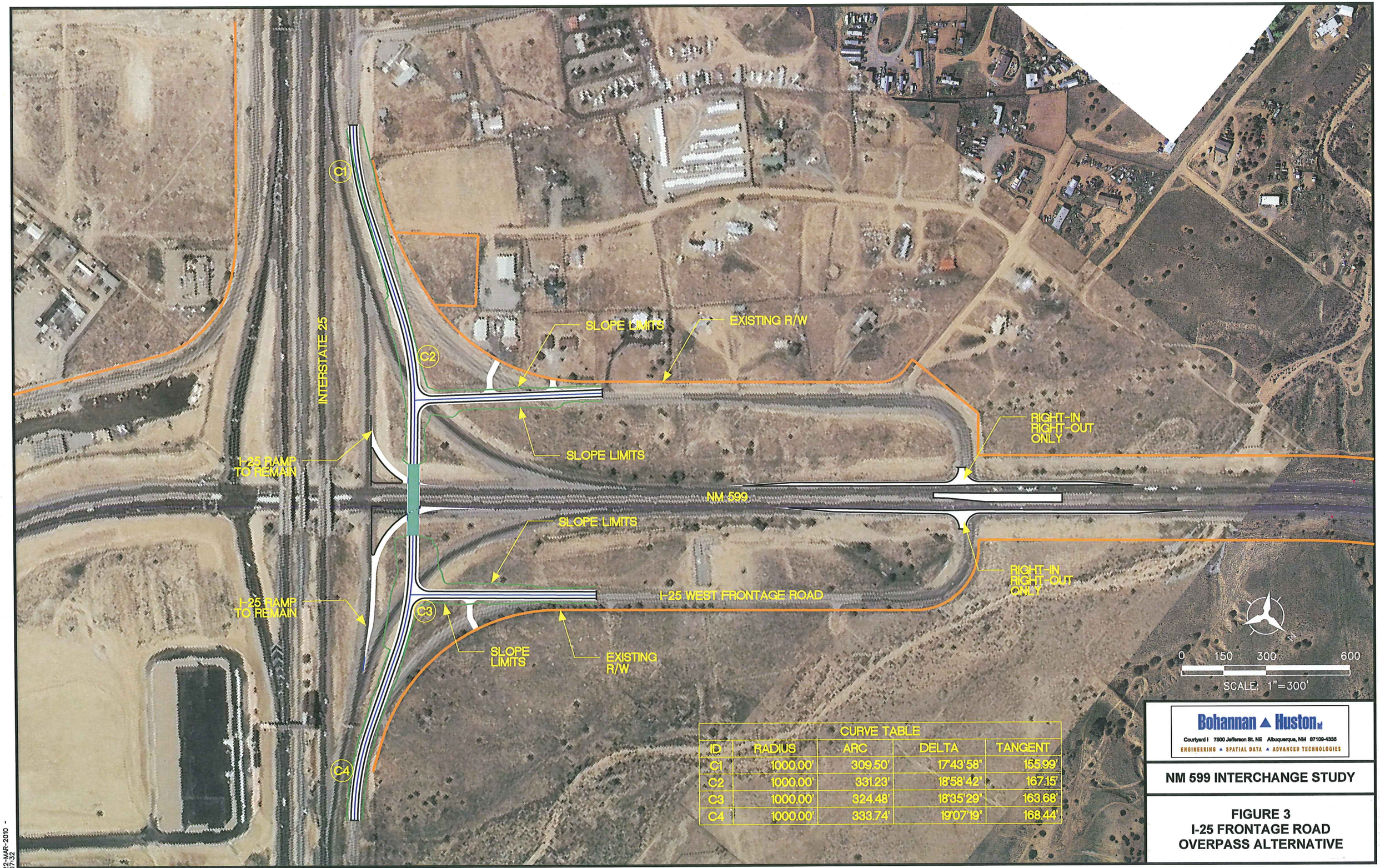
Field surveys would be completed to evaluate potential impacts to cultural resources and biological resources; however, given the proximity to the interstate, they are expected to be minimal. Although no hazardous materials concerns have been identified, further investigation will be required.

12. **Estimated Construction Cost**

The approximate cost of an overpass and intersection improvements would be $6,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix E.

13. **Recommendations**

The preferred alternative at the I-25 Frontage Road Intersection with NM 599 is to install an overpass. The overpass would improve the safety at the existing intersection and meet the purpose and need of eventually making NM 599 an access controlled facility. It is recommended that the I-25 Frontage Road Overpass be prioritized with the other alternatives.



CURVE TABLE				
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C2	1000.00'	331.23'	18°58'42"	167.15'
C3	1000.00'	324.48'	18°35'29"	163.68'
C4	1000.00'	333.74'	19°07'19"	168.44'

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NM 599 INTERCHANGE STUDY

FIGURE 3
I-25 FRONTAGE ROAD
OVERPASS ALTERNATIVE

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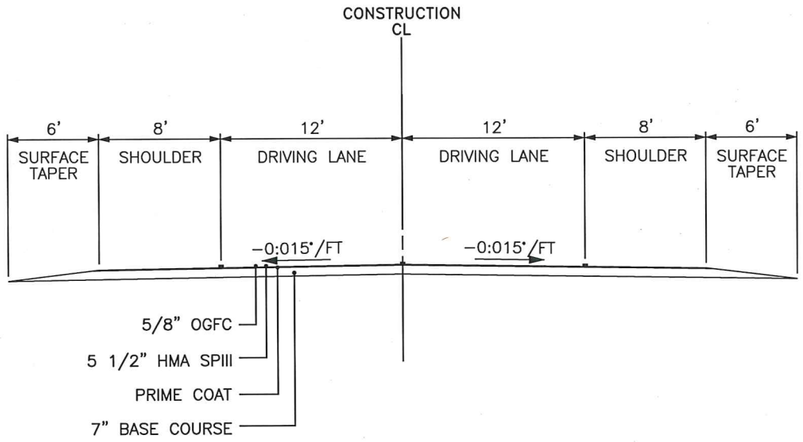
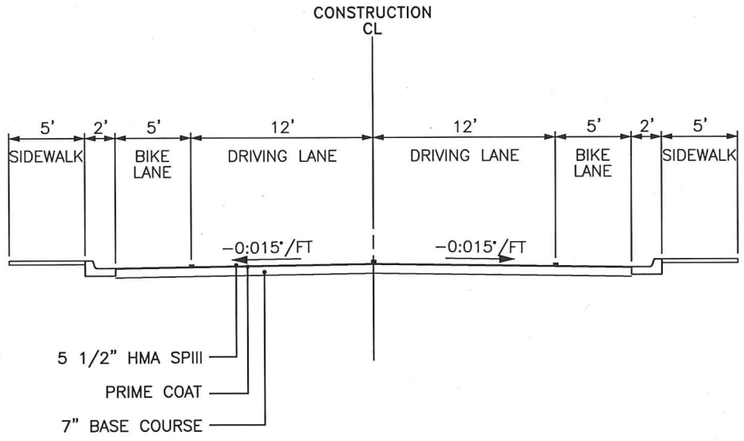


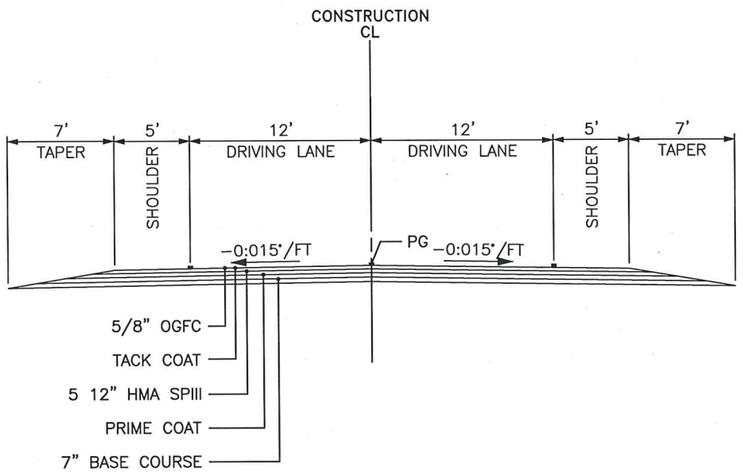
TYPICAL SECTION – OVERPASS

I–25 WEST FRONTAGE ROAD



TYPICAL SECTION – OVERPASS

JAGUAR ROAD
COUNTY ROAD 62
COUNTY ROAD 70 CONNECTION
EPHRIAM ROAD
CAMINO DEL LOS MONTOYAS



FRONTAGE ROAD – TYPICAL SECTION

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NM 599 INTERCHANGE STUDY

FIGURE 4
OVERPASS AND
FRONTAGE ROAD
TYPICAL SECTIONS

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C. Jaguar Road

Construction of the Jaguar Road Interchange is needed to provide direct access to Tierra Contenta from NM 599, to remove traffic from Airport Road, and to provide access to undeveloped land on the west side of NM 599. The purpose of the interchange is to provide improved access to Tierra Contenta, the Santa Fe Airport and to private development property on the west side of NM 599. This alternative is shown in Figure 5. An interchange was planned at Jaguar Road in the original study and environmental document.

1. Traffic Analysis

The Jaguar Interchange was included in the NMDOT base model so no traffic analysis was done as part of this study.

2. Safety

Construction of the Jaguar interchange will presumably take existing Tierra Contenta traffic off of the Airport Road intersection so the safety of that intersection and other intersections on Airport Road will be improved.

3. Horizontal and Vertical Alignment

The horizontal layout of the Jaguar Interchange is shown in Figure 5 along with the horizontal curve data. The vertical profile data can be found in Appendix F. The design speed of the overpass is 25 miles per hour.

4. Typical Section

The typical section of the overpass was assumed to be 2 – 12' lanes with 5' bicycle lanes, curb & gutter and 5' sidewalks as shown in Figure 4. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course is not needed because the cross streets will have a design speed of less than 40 mph. The ramp typical section shown in Figure 6 was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. Multi-modal Transportation

Trail considerations at the Jaguar interchange are to provide shoulders to accommodate bike lanes and sidewalks on the bridge for universal accessibility. This will facilitate alternate modes of transportation for residents of the developments southeast of the interchange, including Tierra Contenta, and for future development on the northwest side. Equestrians would be better served on a multi-use trail such as a potential extension of the Arroyo Chamisos Trail which could provide universal access. Currently, there is heavy informal use of the arroyo as a trail from Wagon Road to

points well beyond NM 599 in a southwestern direction. The 2007 draft Trails Map for the City of Santa Fe and Santa Fe County have listed this extension as a proposed trail

6. **Drainage**

The drainage in the vicinity of the Jaguar interchange drains from north to south. There are three median drains in NM 599 Drainage structures crossing under NM 599 in the vicinity of the Jaguar interchange. One of these will have to be extended under the proposed ramps. The existing structures are shown in Table 5.

Table 5 – Existing Drainage Structures in the vicinity of Jaguar Interchange

Pipe Size	Additional length required (ft)	Remarks
7 – 10'X10' CBC	72	Arroyo de los Chamisos, extend for ramp tapers.
24"	0	Median drainage, drains beyond ramp toe of slope.
24"	0	Median drainage, outlet will be contained within ramp gore.
24"	142	Extend under southbound off ramp and northbound on-ramp.

In addition to the existing structures, drop inlets will be required under the southbound on-ramp and the northbound off-ramp to drain the gores. It is assumed that drop inlets with 30 inch culvert pipe will be used as shown in Table 6.

Table 6 – Proposed Drainage Structures in the vicinity of Jaguar Interchange

Pipe Size	Length Required (ft)	Remarks
30"	118	Drop inlet
30"	91	Drop inlet

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 36 inch sanitary sewer line crossing under NM 599 approximately 1150 feet north of the Jaguar overpass location. This sewer line is suspended on a bridge on the west side of NM 599.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

9. **Constructability**

Most of the interchange could be constructed without disturbing existing traffic. Single lane closures would be needed on NM 599 to tie the ramps into the mainline. The ramp alignments can be used to detour NM 599 traffic around the bridge for placing the beams and pouring the bridge deck.

10. **Right-of-way**

The Jaguar Interchange Alternative will fit within the existing right-of-way.

11. **Environmental Factors**

Under the 1987 EA, the right-of-way was cleared for a future interchange at this location. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

As part of the Re-Evaluation, field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de Los Chamisas, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require some level of permitting by the USACE. Further along in project design, the area of impact would need to be established and a determination of whether this could be included under a Nationwide permit or require an Individual permit would be completed.

Consideration of local and regional travel patterns and access modifications would need to be completed. Although the area is currently undeveloped, there are approved development plans. Coordination with these plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

There has been some public opposition to the construction of this interchange as a result of the potential direct and indirect modification to traffic patterns that could result.

12. **Estimated Construction Cost**

The approximate cost of an interchange would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix F.

13. **Recommendations**

The preferred alternative at the Jaguar location is to construct an interchange. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, it improves safety at the Airport Road Intersection, and it would provide improved access to Tierra Contenta, the Santa Fe Airport and undeveloped areas east and west of NM 599. It is recommended that the Jaguar Interchange be prioritized with the other alternatives.

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	2291.83'	750.24'	18°45'22"	378.51'
C2	1145.92'	342.07'	17°06'13"	172.32'
C3	1145.92'	136.06'	06°48'11"	68.11'
C4	1145.92'	132.08'	06°36'14"	66.11'
C5	2291.83'	650.77'	16°16'09"	327.59'
C6	2291.83'	750.07'	18°45'06"	378.42'
C7	1145.92'	411.65'	20°34'56"	208.07'
C8	11759.16'	121.87'	00°35'38"	60.93'
C9	11759.16'	37.50'	00°10'58"	18.75'
C10	1145.92'	328.74'	16°26'14"	165.51'
C11	2291.83'	600.43'	15°00'38"	301.94'

JAGUAR ROAD
INTERCHANGE ALTERNATIVE

SEWER LINE

EXISTING R/W

SLOPE LIMITS

C6 C7 C8 C9 C10 C11

NM 599

C1 C2 C3 C4 C5

ARROYO DE LOS CHAMISAS

POSSIBLE TRAIL LOCATION

TIERRA CONTENTA
MASTER PLANNED AREA

N

0 100 200 400

SCALE: 1"=200'

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NM 599 INTERCHANGE STUDY

FIGURE 5
JAGUAR ROAD
INTERCHANGE ALTERNATIVE

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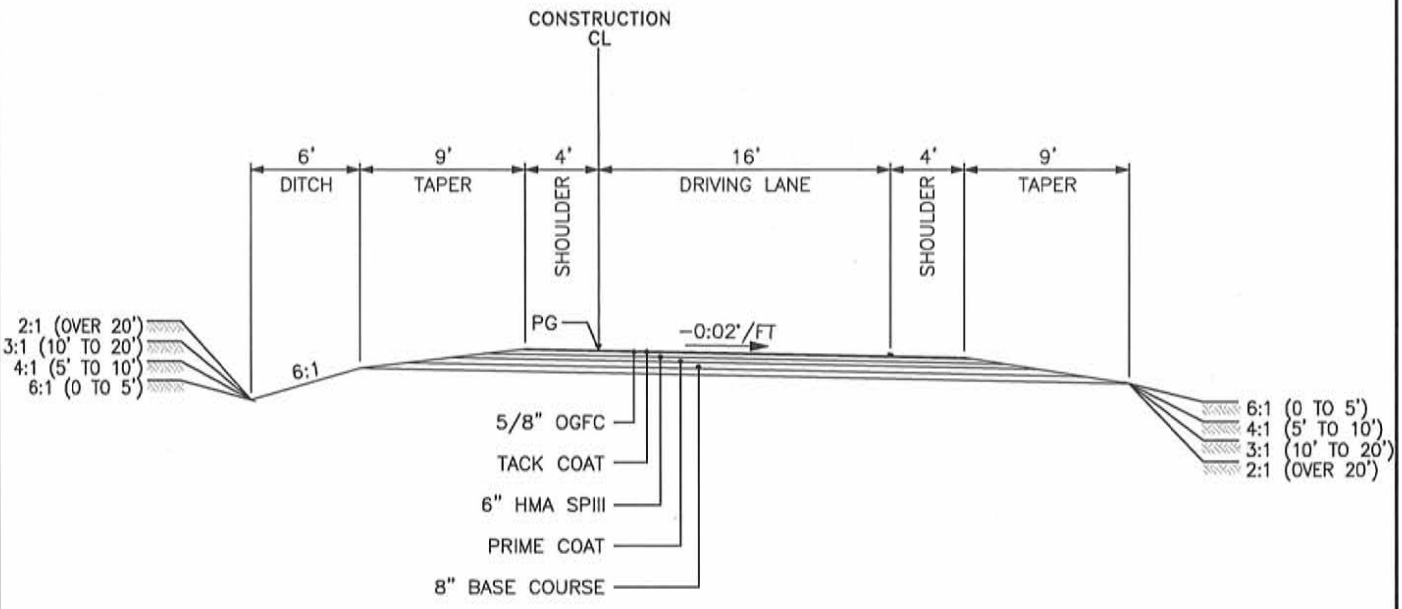
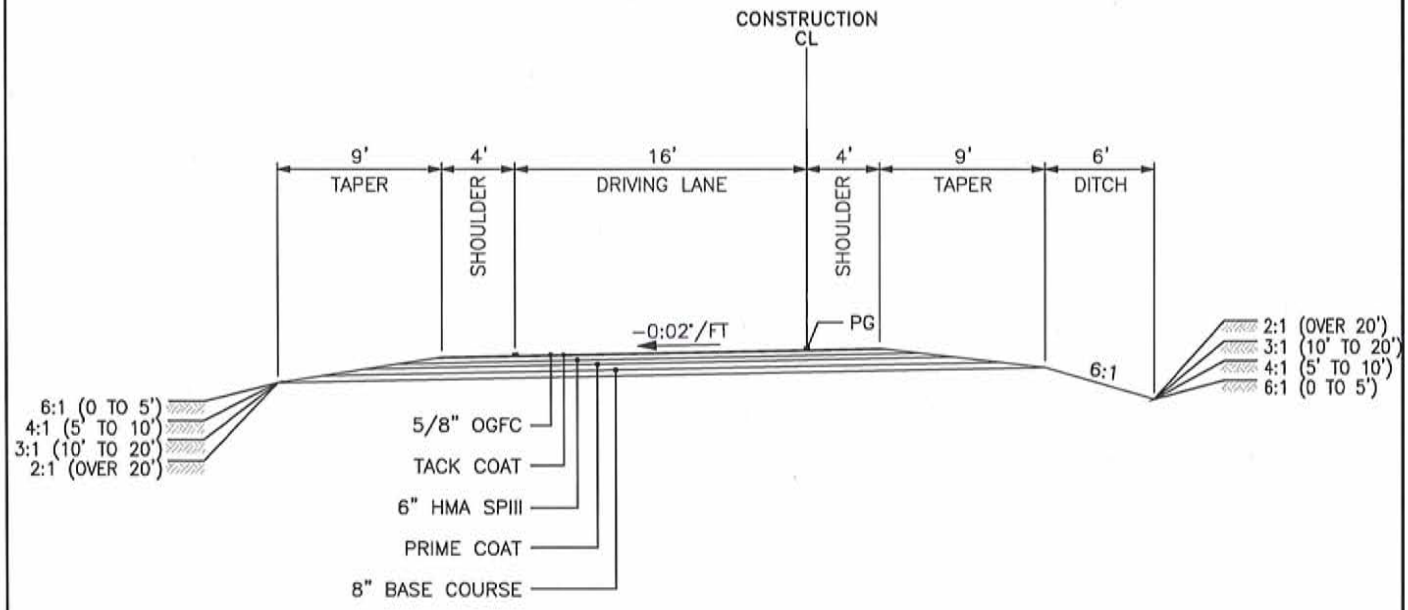


TYPICAL NORTHBOUND RAMP SECTION



TYPICAL SOUTHBOUND RAMP SECTION

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NM 599 INTERCHANGE STUDY

FIGURE 6
RAMP TYPICAL SECTIONS

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D. NM 599 W. Frontage Road from I-25 to Jaguar

This alternative consists of a west frontage road from the I-25 N. Frontage Road Intersection to the Jaguar Road location as shown in Figure 7 and 8. The frontage road could be adjacent to NM 599 or located further away on private property.

1. **Traffic Analysis**

The W. Frontage Road from I-25 to Jaguar would serve new developments west of NM 599. It would funnel traffic to the Jaguar Interchange and the I-25 N. Frontage Road intersection. This additional traffic is included in the traffic forecast model and will be part of the intersection analysis.

2. **Safety**

This alternative will only serve new development so it will not improve the safety of any existing intersections.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the W. Frontage Road from I-25 to Jaguar alternative is shown in Figures 7 and 8 along with the horizontal curve data. The vertical profile data can be found in Appendix G. The design speed of the frontage road is 40 miles per hour.

4. **Typical Section**

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The proposed bike lane on the frontage road in this section would serve bicyclists, providing access to Jaguar Road and to areas west of NM 599. Pedestrians and equestrians would be better served on a multi-use trail such as a potential extension of the Arroyo Chamisos Trail which could provide universal access. Currently, there is heavy informal use of the arroyo as a trail from Wagon Road to points well beyond NM 599 in a southwestern direction. The 2007 draft Trails Map for the City of Santa Fe and Santa Fe County have listed this extension as a proposed trail.

6. **Drainage**

The drainage between the I-25 Frontage Road intersection and the Jaguar Interchange location drains from north to south and from east to west. There are four existing median drains crossing under NM 599 on the west side in this area. All four of these will need to be extended. In addition, there are two pipes and two concrete box culvert structures that will need to be extended in order to construct the frontage road. The existing structures are shown in Table 7.

Table 7 – Existing Drainage Structures between I-25 Frontage Road and Jaguar on Westside		
Pipe Size	**Additional length required (ft)**	**Remarks**
7 – 10'X10' CBC	65	Arroyo Hondo
24"	45	Median drainage (west)
24"	74	Median drainage (west)
36"	36	
30"	33	
24"	39	Median drainage (west)
24"	55	Median drainage (west)
7 – 10'X10' CBC	69	Arroyo de los Chamisos

It was assumed that median drains would be needed approximately every 2000 feet between NM 599 and the frontage road. Drop inlets can be added to the existing median drains in three locations. An additional median drain consisting of a drop inlet and a 24 inch culvert pipe would be needed. A structure would also be needed to drain the gore area between the Jaguar southbound on-ramp and the frontage road. The proposed structures are summarized in Table 8.

Table 8 – Proposed Drainage Structures between I-25 Frontage Road and Jaguar on Westside		
Pipe Size	**Length Required (ft)**	**Remarks**
24"	0	Add drop inlet
24"	0	Add drop inlet
24"	73	Drop inlet
24"	0	Add drop inlet
24"	60	Drop inlet

7. **Utilities**

There is a 12 inch and a 4 inch gas line crossing under NM 599 approximately 1100 feet north of Interstate 25. There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north. There is a 2 inch gas line crossing of NM 599 approximately 4000 feet north of the I-25 W. Frontage Road intersection.

There is a 36 inch sanitary sewer line crossing under NM 599 approximately 1150 feet north of the Jaguar overpass location. This sewer line is suspended on a bridge on the west side of NM 599.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

There is an overhead electric line crossing of the I-25 W. Frontage Road just west of the intersection with NM 599. This electric line is then located between NM 599 and the I-25 W. Frontage Road.

8. **Constructability**

Most of the frontage road could be constructed without disturbing existing traffic. Flagmen control would be used to tie into the existing road.

9. **Right-of-way**

The W. Frontage Road from I-25 to Jaguar would require approximately 18 acres of right-of-way. The majority of this right-of-way is owned by the La Cienega Estates development. Most of the frontage road will be located within the existing right-of-way.

Access control would need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of the frontage road was cleared; however, an additional 18 acres would require further investigations. Within the existing right-of-way, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. Due to the expanded footprint of the proposed frontage road the recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo Hondo and Arroyo de Los Chamisas, further coordination with the United States Corp of Engineers (USACE) will be necessary. These features are expected to be jurisdictional as Waters of the United States and would, therefore, require some level of permitting by the USACE. Further along in project design, the area of impact would need to be established and a determination of whether improvements could be included under a Nationwide permit or require an Individual permit would be completed.

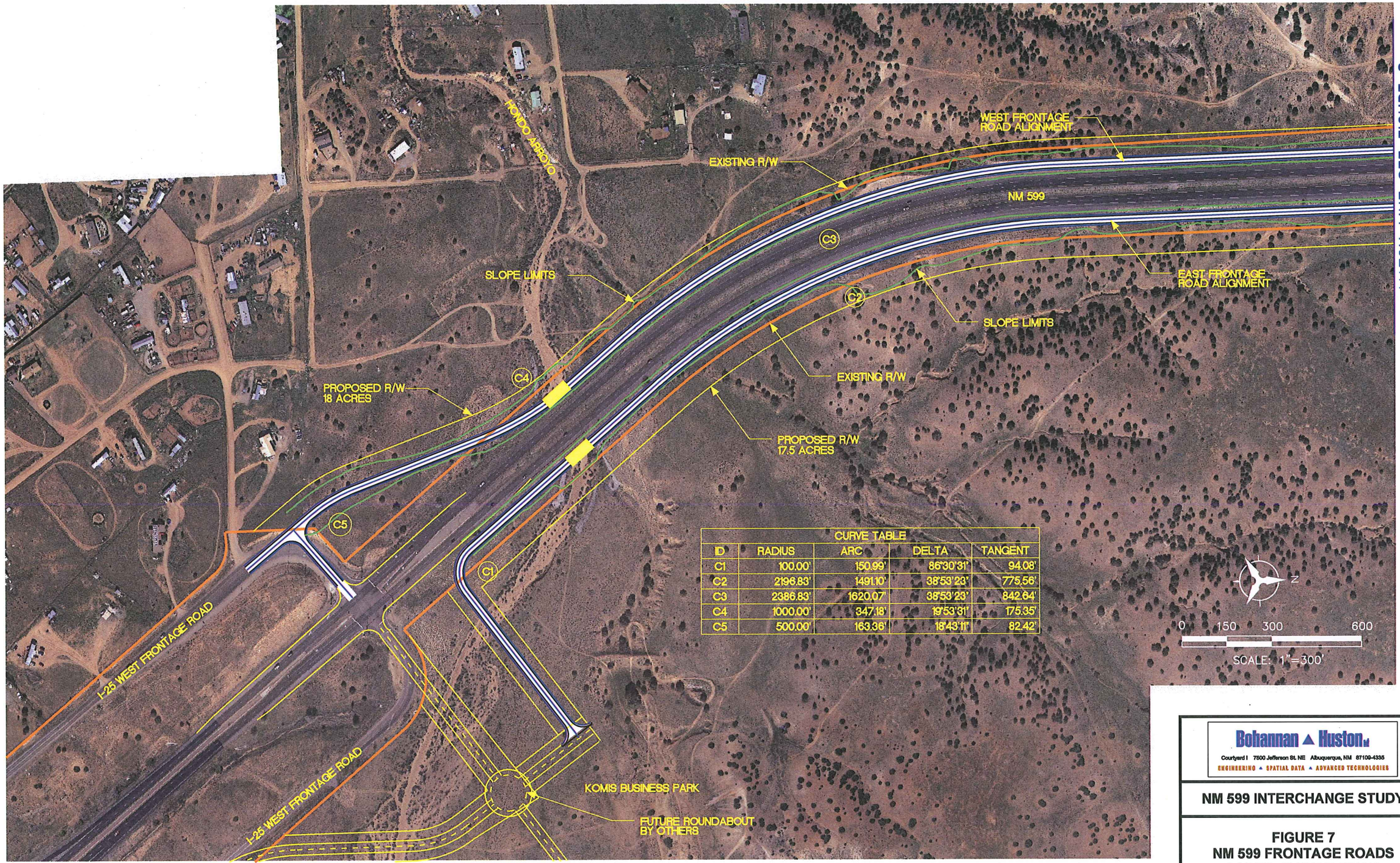
Consideration of local and regional travel patterns and access modifications would need to be completed. Coordination with approved and existing development plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $6,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix G.

12. **Recommendations**

The W. Frontage Road from I-25 to Jaguar Road would improve access to undeveloped lands west of NM 599. However, the owner of the land has plans to develop a north-south circulation road further away from NM 599 which would serve the same purpose. It is recommended that the alternative be eliminated.



MATCH LINE SEE FIGURE 8

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	100.00'	150.99'	86°30'31"	94.08'
C2	2196.83'	1491.10'	38°53'23"	775.56'
C3	2386.83'	1620.07'	38°53'23"	842.64'
C4	1000.00'	347.18'	19°53'31"	175.35'
C5	500.00'	163.36'	18°43'11"	82.42'

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NM 599 INTERCHANGE STUDY

FIGURE 7
NM 599 FRONTAGE ROADS
I-25 TO JAGUAR ROAD

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E. NM 599 E. Frontage Road from I-25 to Jaguar

This alternative consists of an east frontage road from the I-25 N. Frontage Road Intersection to the Jaguar Road location as shown in Figures 7 and 8.

1. **Traffic Analysis**

The E. Frontage Road from I-25 to Jaguar would serve new developments. It would funnel traffic to the Jaguar Interchange and the I-25 N. Frontage Road intersection. This additional traffic is included in the traffic forecast model and will be part of the intersection analysis.

2. **Safety**

This alternative will only serve new development so it will not improve the safety of any existing intersections.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the W. Frontage Road from I-25 to Jaguar alternative is shown in Figures 7 and 8 along with the horizontal curve data. The vertical profile data can be found in Appendix H. The design speed of the frontage road is 40 miles per hour.

A retaining wall will be needed to retain the slope and avoid impacting homes adjacent to NM 599. The wall will be approximately 770 feet long and vary from 7 to 10.5 feet tall.

4. **Typical Section**

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The proposed bike lane on the frontage road in this section would serve bicyclists, providing access to Jaguar Road and to areas west of NM 599. Pedestrians and equestrians would be better served on a multi-use trail such as a potential extension of the Arroyo Chamisos Trail which could provide universal access. Currently, there is heavy informal use of the arroyo as a trail from Wagon Road to points well beyond NM 599 in a southwestern direction. The 2007 draft Trails Map for the City of Santa Fe and Santa Fe County have listed this extension as a proposed trail.

6. **Drainage**

The drainage between the I-25 Frontage Road intersection and the Jaguar Interchange location drains from north to south and from east to west. There are two existing median drains crossing under NM 599 on the east side in this area. Both of these will need to be extended. In addition, there

are two pipes and two concrete box culvert structures that will need to be extended in order to construct the frontage road. The existing structures are shown in Table 9.

Table 9 – Existing Drainage Structures between I-25 Frontage Road and Jaguar on Eastside

Pipe Size	Additional length required (ft)	Remarks
7 – 10'X10' CBC	56	Arroyo Hondo
24"	32	Median drainage (east)
36"	44	
30"	37	
7 – 10'X10' CBC	72	Arroyo de los Chamisos
24"	90	Median drainage (east)

It was assumed that median drains would be needed approximately every 2000 feet between NM 599 and the frontage road. Drop inlets can be added to the existing median drains in two locations and to the existing 30 inch culvert pipe. An additional median drain consisting of a drop inlet and a 24 inch culvert pipe would be needed. One of the existing median drains is placed so that it can be extended to drain the gore area between the Jaguar northbound off-ramp and the frontage road. The proposed structures are summarized in Table 10.

Table 10 – Proposed Drainage Structures between I-25 Frontage Road and Jaguar on Eastside

Pipe Size	Length Required (ft)	Remarks
24"	56	Add drop inlet
24"	9	Add drop inlet
30"	90	Add drop inlet
24"	0	Add drop inlet

7. **Utilities**

There is a 12 inch and a 4 inch gas line crossing under NM 599 approximately 1100 feet north of Interstate 25. There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north. There is a 2 inch gas line crossing of NM 599 approximately 4000 feet north of the I-25 W. Frontage Road intersection.

There is a 36 inch sanitary sewer line crossing under NM 599 approximately 1150 feet north of the Jaguar overpass location. This sewer line is suspended on a bridge on the west side of NM 599.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

8. **Constructability**

Most of the frontage road could be constructed without disturbing existing traffic. Flagmen control would be used to tie into the existing road.

9. **Right-of-way**

The E. Frontage Road from I-25 to Jaguar would require approximately 17.5 acres of right-of-way. Most of the frontage road will be located within the existing right-of-way. All of the right-of-way is privately owned. Impacted properties include the Komis Business Park Development. A retaining wall will be needed to avoid right-of-way takes from three residences.

Access control will need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of the frontage road was cleared; however, an additional 17.5 acres would require further investigations. Within the existing right-of-way, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. Due to the expanded footprint of this proposed alternative, the recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo Hondo and Arroyo de Los Chamisas, further coordination with the United States Corp of Engineers (USACE) will be necessary. These features are expected to be jurisdictional as Waters of the United States and would, therefore, require some level of permitting by the USACE. Further along in project design, the area of impact would need to be established and a determination of whether improvements could be included under a Nationwide permit or require an Individual permit would be completed.

Consideration of local and regional travel patterns and access modifications would need to be completed. Coordination with approved and existing development plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $7,500,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix H.

12. **Recommendations**

The E. Frontage Road from I-25 to Jaguar meets the purpose and need of improving circulation around NM 599. It would provide improved access to undeveloped areas east of NM 599. It is recommended that the frontage road be prioritized with the other alternatives.

MATCH LINE SEE FIGURE 7

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1146.00'	582.96'	29°08'45"	297.93'
C2	1146.00'	587.62'	29°22'43"	300.42'
C3	1000.00'	607.10'	34°47'04"	313.23'
C4	1000.00'	638.19'	36°33'57"	330.39'
C5	12059.16'	134.35'	00°38'18"	67.18'

PROPOSED R/W

JAGUAR ROAD

C5

C4

C3

WEST FRONTAGE ROAD ALIGNMENT

SLOPE LIMITS

PROPOSED R/W 2.3 ACRES

EXISTING R/W

NM 599

C1

EXISTING R/W

CONSTRUCT WALL

ARROYO DE LOS CHAMISAS

C2

SLOPE LIMITS

PROPOSED R/W 9 ACRES

EAST FRONTAGE ROAD ALIGNMENT

PROPOSED R/W 7 ACRES

POSSIBLE TRAIL LOCATION

N

0 150 300 600

SCALE: 1"=300'

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NM 599 INTERCHANGE STUDY

FIGURE 8
NM 599 FRONTAGE ROADS
I-25 TO JAGUAR ROAD

24-FEB-2010 - 09:13

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F. NM 599 W. Frontage Road from Jaguar to Airport Road

This alternative consists of a west frontage road from the Jaguar Road location to Airport Road as shown in Figure 9.

1. Traffic Analysis

The W. Frontage Road from Jaguar to Airport Road would serve new developments. It would funnel traffic to the Jaguar Interchange and the Airport Road intersection. This additional traffic is included in the traffic forecast model and will be part of the intersection analysis.

2. Safety

This alternative will only serve new development so it will not improve the safety of any existing intersections.

3. Horizontal and Vertical Alignment

The horizontal alignment of the W. Frontage Road from Jaguar to Airport Road alternative is shown in Figure 9 along with the horizontal curve data. North of Jaguar Road the alignment of the frontage road varies to keep it out of the arroyo bottom.

The vertical profile data can be found in Appendix I. The frontage road has to go under the existing sanitary sewer line that bridges the arroyo. The design speed of the frontage road is 40 miles per hour.

4. Typical Section

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. Multi-modal Transportation

The proposed shoulder on the west frontage road in this section would serve bicyclists, providing access to Jaguar Road and to areas west of NM 599. Pedestrians and equestrians would be better served on a multi-use trail such as a potential extension of the Arroyo Chamisos Trail which could provide universal access. Currently, there is heavy informal use of the arroyo as a trail from Wagon Road to points well beyond NM 599 in a southwestern direction.

6. Drainage

The drainage between the Jaguar Interchange and Airport Road drains from north to south and from east to west. There is a tributary of the Arroyo de los Chamisos on the eastside that is between NM 599 and the frontage road for approximately 1000 feet. There are four pipe structures that will

need to be extended in order to construct the frontage road. The existing structures are shown in Table 11.

Table 11 – Existing Drainage Structures between Jaguar and Airport on Westside		
Pipe Size	**Additional length required (ft)**	**Remarks**
30"	62	
2 - 54"	100	
30"	70	
2 – 48"	0	Distance to frontage road requires separate pipes.

It was assumed that median drains would be needed approximately every 2000 feet between NM 599 and the frontage road. Only one median drop inlet will be needed and it is assumed that it can be added to the existing 30 inch pipe. The tributary of the Arroyo de los Chamisos crosses the frontage road twice. It was assumed that two 60 inch pipes will be needed. The smaller arroyo with 2-48 inch pipes will also need to be conveyed under the frontage road. The proposed structures are summarized in Table 12.

Table 12 – Proposed Drainage Structures between Jaguar and Airport on Westside		
Pipe Size	**Length Required (ft)**	**Remarks**
2 – 60"	300	Tributary to Arroyo de los Chamisos
2 – 60"	240	Tributary to Arroyo de los Chamisos
30"	0	Add drop inlet
2 – 48"	67	

7. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

In Airport Road there are gas lines, fiber optic communications and sanitary sewer lines. There is an overhead electric line on the north side of Airport Road

8. **Constructability**

Most of the frontage road could be constructed without disturbing existing traffic. Flagmen control would be used to tie into the existing road.

9. **Right-of-way**

Approximately 15 acres of right-of-way will be required to construct the W. Frontage Road between Jaguar and Airport Road. This right-of-way is currently owned by the City of Santa Fe and the Hart Business Park.

Access control would need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of the frontage road was cleared; however, an additional 15 acres would require further investigations. Within the existing right-of-way, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de Los Chamisas, further coordination with the United States Corp of Engineers (USACE) will be necessary. These features are expected to be jurisdictional as Waters of the United States and would, therefore, require some level of permitting by the USACE. Further along in project design, the area of impact would need to be established and a determination of whether improvements could be included under a Nationwide permit or require an Individual permit would be completed.

Consideration of local and regional travel patterns and access modifications would need to be completed. Coordination with approved development plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $5,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix I.

12. **Recommendations**

The W. Frontage Road from Jaguar Road to Airport would improve access to undeveloped lands west of NM 599. However, the land is already master planned with an access road further to the west. This alternative frontage road would provide better access given the grades of the proposed frontage road adjacent to NM 599. It is recommended that the alternative be eliminated.

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1146.00'	561.56'	28°04'32"	286.53'
C2	1146.00'	646.75'	32°20'07"	332.24'
C3	5822.00'	658.20'	06°28'39"	329.45'
C4	1000.00'	516.71'	29°36'18"	264.26'
C5	500.00'	258.35'	29°36'18"	132.13'
C6	12059.16'	640.58'	03°02'37"	320.37'
C7	500.00'	133.02'	15°14'35"	66.91'
C8	500.00'	222.63'	25°30'40"	113.19'
C9	500.00'	368.12'	42°11'01"	192.85'
C10	5634.58'	445.34'	04°31'43"	222.79'
C11	500.00'	262.89'	30°07'31"	134.56'
C12	500.00'	183.22'	20°59'45"	92.65'

HART BUSINESS PARK

JAGUAR ROAD

SEWER LINE

WEST FRONTAGE ROAD ALIGNMENT

PROPOSED R/W 15 ACRES

EXISTING R/W

AIRPORT ROAD

AVIATION DRIVE

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12

NM 599

PROPOSED R/W 8 ACRES

EXISTING R/W

EAST FRONTAGE ROAD ALIGNMENT

CONSTRUCT WALL

PROPOSED R/W 2.5 ACRES

TIERRA CONTENTA MASTER PLANNED AREA

ARROYO DE LOS CHAMISAS

0 200 400 800

SCALE: 1"=400'

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NM 599 INTERCHANGE STUDY

FIGURE 9
NM 599 FRONTAGE ROADS
JAGUAR ROAD
TO AIRPORT ROAD

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G. NM 599 E. Frontage Road from Jaguar to Airport Road

This alternative consists of an east frontage road from the Jaguar Road location to Airport Road as shown in Figure 9.

1. **Traffic Analysis**

The E. Frontage Road from Jaguar to Airport Road would serve new developments. It would funnel traffic to the Jaguar Interchange and the Airport Road intersection. This additional traffic is included in the traffic forecast model and will be part of the intersection analysis.

2. **Safety**

This alternative will only serve new development so it will not improve the safety of any existing intersections.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the W. Frontage Road from Jaguar to Airport Road alternative is shown in Figures 9 along with the horizontal curve data. The vertical profile data can be found in Appendix J. The design speed of the frontage road is 40 miles per hour.

A wall is need adjacent to the neighborhood south of Airport Road to avoid impacting the homes. This wall is approximately 290 feet long and varies from 3 to 10 feet tall.

4. **Typical Section**

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

Tierra Contenta has a planned network of trails that are proposed to serve non-motorized travel. It is recommended that universal accessibility be provided on some of the trails. A trail could be constructed within the right-of-way from Tierra Contenta to Old Airport Road. This would connect into the trail network planned in the City of Santa Fe proposed trail network.

6. **Drainage**

The drainage between the Jaguar Interchange and Airport Road drains from north to south and from east to west. There are two median drains and three pipe structures that will need to be extended in order to construct the frontage road. The existing structures are shown in Table 13.

Table 13 – Existing Drainage Structures between Jaguar and Airport on Eastside		
Pipe Size	**Additional length required (ft)**	**Remarks**
30"	33	
2 – 54"	90	
24"	61	Median drop inlet
30"	62	
24"	55	Median drop inlet
2 – 48"	0	Distance to frontage road requires separate pipes.

It is assumed that one drop inlet and 500 feet of 24" storm drain pipe will be needed for the frontage road in the area where there is no swale. In addition a drop inlet was assumed to be added in two places to drain the swale between NM 599 and the frontage road. Two structures are needed to convey the historic flow through the area. The proposed structures are summarized in Table 14.

Table 14 – Proposed Drainage Structures between Jaguar and Airport on Eastside		
Pipe Size	**Length Required (ft)**	**Remarks**
24"	114	Required to drain area between ramp and frontage road.
24"	84	In line with existing crossing structure
30"		Add drop inlet, extend with 30" culvert pipe
24"		Add drop inlet
24"	500	Drop Inlet, storm drain pipe
2 – 48"	71	In line with existing 48" pipes

7. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

In Airport Road there are gas lines, fiber optic communications and sanitary sewer lines. There is an overhead electric line on the north side of Airport Road

8. **Constructability**

Most of the frontage road could be constructed without disturbing existing traffic. Flagmen control would be used to tie into the existing road.

9. **Right-of-way**

Approximately 10.5 acres of right-of-way will be required to construct the E. Frontage Road between Jaguar and Airport Road. This right-of-way is currently owned by the Tierra Contenta Corporation, the New Mexico Department of Transportation, and Domain Home Furnishings.

Access control would need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of the frontage road was cleared; however, an additional 10.5 acres would require further investigations. Within the existing right-of-way, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo Hondo and Arroyo de Los Chamisas, further coordination with the United States Corp of Engineers (USACE) will be necessary. These features are expected to be jurisdictional as Waters of the United States and would, therefore, require some level of permitting by the USACE. Further along in project design, the area of impact would need to be established and a determination of whether improvements could be included under a Nationwide permit or require an Individual permit would be completed.

Consideration of local and regional travel patterns and access modifications would need to be completed. Coordination with approved and existing development plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts. In addition, there would be one relocation of a business near Airport Road.

There has been some public opposition to the construction of this frontage road due to the right-of-way required and travel pattern modifications that may result.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $4,500,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix J.

12. **Recommendations**

The E. Frontage Road from Jaguar Road to Airport would improve access to Tierra Contenta and undeveloped lands east of NM 599. Tierra Contenta is already master planned with an access road within their property. The Tierra Contenta access road provides access to the remaining undeveloped land in the area. The Tierra Contenta Corporation has asked that the alternative be eliminated since it requires right-of-way from their property that is already platted for commercial and community development. It is recommended that the alternative be eliminated.

H. Airport Road

Construction of the Airport Road Interchange is needed to improve the safety of the corridor at the highest crash location The purpose of the interchange is to eliminate an at-grade access point to achieve the goal of an access controlled facility.

This alternative is shown in Figure 10. An interchange was planned at Airport Road as part of the original design. Right-of-way is tight requiring a tight diamond or single point urban interchange.

1. Traffic Analysis

The existing Airport Road / NM 599 Intersection is signalized. The 2009 existing level of service is B in both the a.m. and p.m. peak hours. Level of service B means that the delay is between 10 and 20 seconds per vehicle which is good.

A future signalized intersection traffic analysis was done using the volumes from the NMDOT base traffic model. Turning movements were projected using the same percentage of left and right turn movements as in the existing conditions. The intersection will have a level of service of F with the existing geometry. In order to have an acceptable level of service NM 599 would need to have three lanes in each direction. In addition, dual left turn bays would be needed northbound and southbound on NM 599.

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 15 – Airport Ramp Analysis

Ramp	Level of Service
NB off ramp	B
NB on ramp	C
SB off ramp	B
SB on ramp	C

2. Safety

The Airport Road Intersection has the highest number of crashes along the corridor so replacing the intersection with an interchange would improve the safety of NM 599.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Airport Road Interchange alternative is shown in Figure 10 along with the horizontal curve data. The interchange was analyzed with NM 599 over Airport Road although it could be designed with Airport Road as the overpass. The vertical profile data can be found in Appendix K. The design speed of the NM 599 overpass is 65 mph.

Walls will be needed to avoid impacts to Paseo de River which is a street just west of NM 599. The wall will be approximately 605 feet long and approximately 3 feet in height.

4. **Typical Section**

The typical sections for NM 599 over Airport Road are shown in Figure 11. The typical section for Airport Road under NM 599 is shown in Figure 11.

5. **Multi-modal Transportation**

The proposed trail loop in Tierra Contenta, particularly the western side of the loop, could serve non-motorized transportation purposes if it is constructed as planned. The interchange at Airport should be designed to accommodate bicyclists and to provide universal access in both crossing NM 599 and continuing along Airport Road.

6. **Drainage**

The drainage on the south side of Airport Road drains from east to west and towards the south. The drainage on the north side of Airport Road drains west toward the Santa Fe River. There is one median drain and 3 pipes crossing NM 599 in this area that will have to be extended to construct an interchange. The existing structures are shown in Table 16.

Table 16 – Existing Drainage Structures in Airport Road Interchange Location

Pipe Size (inches)	Additional length required (ft)	Remarks
2 – 48"	110	
24"	41	Median drop inlet
30"	122	
36"	0	

In addition to extending the existing pipes, drop inlets will be required to drain the ramp gores. Two drop inlets were assumed on the existing 2-48" culvert pipes, one drop inlet was assumed on the existing 30" culvert pipe. Drop inlets and structures will also be needed from the northeast gore to the west side of NM 599 and under the southbound off-ramp. The proposed structures are shown in Table 17.

Table 17 – Proposed Drainage Structures in Airport Interchange Location

Pipe Size	Length Required (ft)	Remarks
24	55	Attach drop inlet to existing 48" culvert pipe
24	16	Attach drop inlet to existing 48" culvert pipe
24	62	Under proposed southbound off-ramp
24	252	Under NM 599
30	0	Add drop inlet

7. **Bridge**

This alternative would have two bridges. The bridges were assumed to be prestressed concrete girders with concrete decks. Each bridge would have two spans with a pier in the Airport median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 116', a bridge width of 41', and a superstructure depth of approximately 48".

8. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is an overhead electric line crossing of NM 599 approximately 800 feet south of Airport Road.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

In Airport Road there are gas lines, fiber optic communications and sanitary sewer lines. There is an overhead electric line on the north side of Airport Road

There are high pressure gas and sanitary sewer lines in the Paseo de River Street alignment.

9. **Constructability**

NM 599 would need to be reduced to one lane in each direction in order to construct the Airport Interchange. Crossovers would be constructed in the median used to detour traffic to one side. One half of the interchange can be built while traffic is detoured to the other side. Then traffic can be switched and the remaining half constructed.

Single lane closures would be used to construct the bridge piers and abutments adjacent to Airport Road. Traffic would be detoured to one side or the other at the adjacent intersections in order to construct improvements on Airport Road and to place the bridge beams and pour the bridge deck.

10. **Right-of-way**

No new right-of-way would be needed to construct the Airport Road Interchange.

11. **Environmental Factors**

Under the 1987 EA, the right-of-way was cleared for a future interchange at this location. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, and threatened/endangered species; however, due to the adjacent development, the potential for impact to the natural environment is limited. Although, no specific concerns regarding hazardous materials have been identified, given the proximity to industrial development, further hazardous materials investigations would be required.

Consideration of local and regional travel patterns and access modifications would need to be completed. Coordination with approved and existing development plans has been initiated and will need to be maintained as part of the project design process. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

12. **Estimated Construction Cost**

The approximate cost of an interchange would be $11,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix K.

13. **Recommendations**

The preferred alternative at the Airport Intersection is to construct an interchange. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, and it improves safety at the Airport Road Intersection. It is recommended that the Airport Interchange be prioritized with the other alternatives.

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	2292.00'	746.40'	18°39'31"	376.53'
C2	1146.00'	202.99'	10°08'55"	101.76'
C3	1146.00'	361.43'	18°04'13"	182.23'
C4	2292.00'	540.52'	13°30'44"	271.52'
C5	1953.86'	439.27'	12°52'53"	220.57'
C6	1050.00'	151.94'	08°17'28"	76.10'
C7	1050.00'	243.57'	13°17'28"	122.33'
C8	1146.00'	265.03'	13°15'02"	133.11'
C9	1865.86'	825.32'	25°20'36"	419.52'

CR 56
AVIATION DR
AIRPORT ROAD
INTERCHANGE ALTERNATIVE
POSSIBLE TRAIL LOCATION
SLOPE LIMITS
SLOPE LIMITS
CONSTRUCT WALL
EXISTING R/W
PASEO DE RIVER ST
C1
C2
C3
C4
C5
C6
C7
C8
C9
EXISTING R/W
CONSTRUCT WALL
SLOPE LIMITS
SLOPE LIMITS
EXISTING R/W
OLD AIRPORT RD
AIRPORT RD
BACA LN
OLIVER RD
0 100 200 400
SCALE: 1"=200'

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NM 599 INTERCHANGE STUDY

FIGURE 10
AIRPORT ROAD
INTERCHANGE ALTERNATIVE

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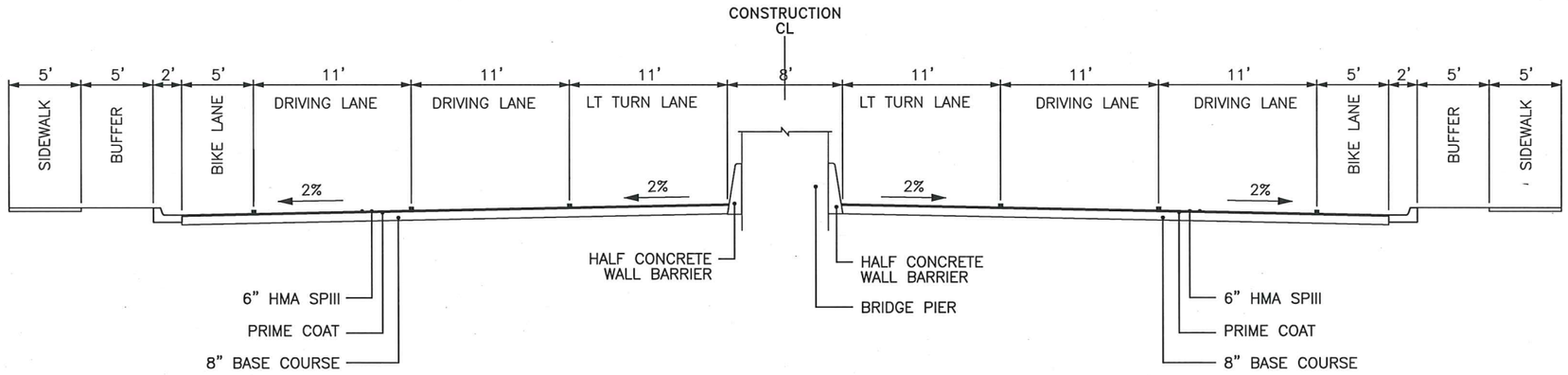
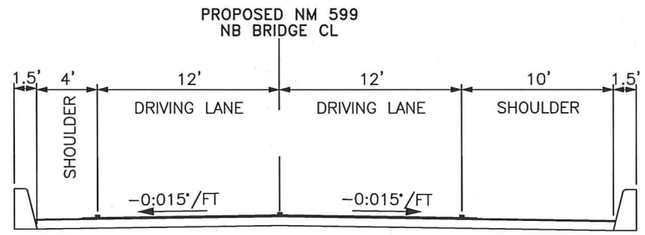
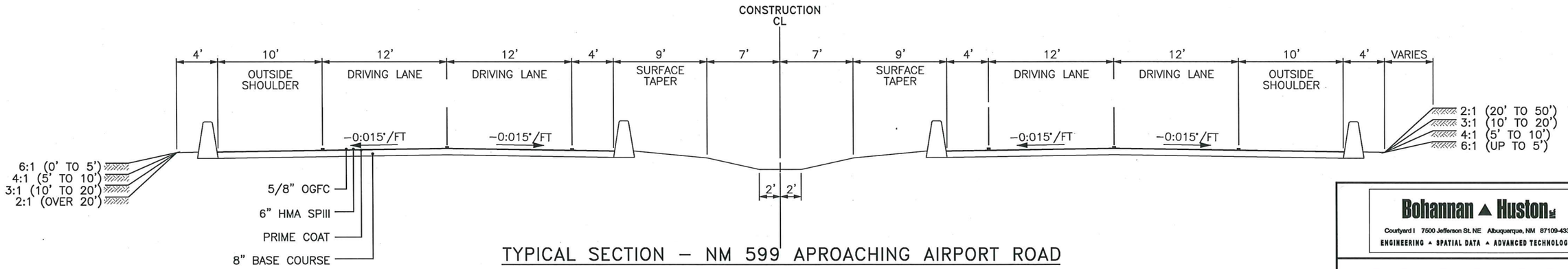


TYPICAL SECTION – AIRPORT ROAD UNDER NM 599



TYPICAL SECTION – NM 599 NB BRIDGE OVER AIRPORT ROAD



TYPICAL SECTION – NM 599 APROACHING AIRPORT ROAD

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NM 599 INTERCHANGE STUDY

FIGURE 11
NM 599 TYPICAL SECTIONS

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I. Extend NM 599 W. Frontage Road Across Santa Fe River

The existing frontage road on the west side of NM 599 stops at the Santa Fe River. On the south side of the river there is an existing local street called Paseo de River Street that leads through the Airport District Business Park. This local street is partly within NMDOT right-of-way. There is an existing ford of the Santa Fe River approximately 400 feet to the west of the frontage road. Traffic, including trucks, was observed to regularly use this ford to get to and from the frontage road. This alternative, shown in Figure 12, is to extend the frontage road across the Santa Fe River and improve the cross section of Paseo de River Street.

1. Traffic Analysis

The W. Frontage Road extension across the Santa Fe River would take traffic off of the County Road 62 intersection. Existing Caja del Rio traffic that wants to head southbound must either go north to the County Road 62 intersection or drive across the Santa Fe River at an existing ford just north of NM 599. Construction of the frontage road would improve the operation at the existing CR 62 intersection by removing some eastbound to southbound right turn movements. The level of operation at the intersection would still be F.

2. Safety

This frontage road would take some traffic off of the CR 62 intersection so it would improve safety at that location. The crashes on CR 62 tend to be severe crashes with injuries. Traffic would increase on the intersection of Colony Drive and Airport Road; however, Airport Road has a lower speed than NM 599 so crashes at that location would typically be less severe.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Frontage Road across the Santa Fe River alternative is shown in Figures 12 along with the horizontal curve data. The vertical profile data can be found in Appendix L. The design speed of the frontage road is 40 miles per hour at the north end and 25 miles per hour at the south end through the industrial park.

4. Typical Section

The north frontage road typical section is assumed to be 2-12 foot lanes with 5 foot shoulders as shown in Figure 4. A minimum of 4 foot of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1 foot. In areas with guardrails or walls the shoulders are recommended to be 6 feet. The section through the Airport District Business Park is assumed to be an urban section with curb and gutter instead of surfacing tapers in order to fit within the existing right-of-way. The 5 foot shoulder would be maintained. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The informal river crossing is currently used by motorized and non-motorized traffic. The improvement at this location is a proposed bridge that will include bike lanes; however accommodations should be made for pedestrians and equestrians. The closest underpass is almost one mile northeast of the river crossing, which is too far away to be a practical alternative. The Santa Fe River Trail is a multi-use, universally accessible trail that is to extend west of NM 599; locations for crossing the river are currently being sought by the County Open Space and Trails staff.

6. **Drainage**

There is one existing 36 inch culvert pipe under Paseo de River. It is assumed that this culvert pipe does not need to be extended. There are two median drop inlets and a storm drain system to discharge drainage to the river between NM 599 and Paseo de River within 900 feet of the Santa Fe River. It appears that one of these median drop inlets will have to be reconstructed in order to widen the existing road.

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the river to match the existing river crossing. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 165', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection. There is a water line crossing of NM 599 just south of the Santa Fe River Bridge.

There are high pressure gas, fiber optic cable and sanitary sewer lines in the Paseo de River Street alignment. There is an underground electric line on the east side of the street. After crossing under the Santa Fe River the underground electric line is located on the northwest side of the NM 599 Frontage Road. There is also an overhead electric line crossing approximately 1300 feet north of Airport Road.

9. **Constructability**

Most of the frontage road can be constructed without impacting existing traffic. Flagmen control can be used to tie into the existing roads.

10. **Right-of-way**

Approximately 2 acres of right-of-way will be required to construct the W. Frontage Road across the Santa Fe River.

Access control would need to be established between the frontage road and NM 599.

11. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of this frontage road was cleared; however, additional right-of-way and bridge structure would require further investigations. However, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, and wetlands. Given the potential impact to Santa Fe River, further coordination with the United States Corp of Engineers (USACE) will be necessary. The Santa Fe River is considered jurisdictional as Waters of the United States; therefore, it is expected that the construction of a new structure across the Santa Fe River would require an individual permit by the USACE.

There has been some public support for the construction of this frontage road as a result of the improved local connectivity this alternative would provide.

12. **Estimated Construction Cost**

The approximate cost of a frontage road with a river bridge would be $4,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix L.

13. **Recommendations**

The extension of the frontage road across the Santa Fe River meets the purpose and need of improving circulation in the area of NM 599. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. It is recommended that the alternative be prioritized with the other alternatives.

CURVE TABLE

ID	RADIUS	ARC	DELTA	TANGENT
C1	225.00'	289.05'	73°36'21"	168.34'
C2	500.00'	155.22'	17°47'15"	78.24'
C3	2038.86'	173.25'	04°52'07"	86.68'
C4	2008.78'	1815.65'	51°47'14"	975.13'

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NM 599 INTERCHANGE STUDY

FIGURE 12
EXTEND NM 599 FRONTAGE ROAD ACROSS SF RIVER

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P:\070064\Trans\Study\Graphics\Report Figures 2\Fig12-070064-SF River bridge.dgn

J. Caja del Rio

An interchange at Caja del Rio was not planned in the original design but it was an allowable access point in the original environmental document. The access points were approved by resolution of the Santa Fe City Council and the Santa Fe County Commission in 1988. This alternative is shown in Figure 13.

Access at Caja del Rio would serve the Municipal Recreation Complex, the Animal Shelter, Marty Sanchez Links de Santa Fe Golf Course, the County Landfill, and the Department of U.S. Fish and Wildlife. Other developments are planned on Caja del Rio in the near future.

1. Traffic Analysis

There is no existing intersection of Caja del Rio and NM 599. The traffic model shows that if both the CR 62 and Caja del Rio interchanges were constructed then most of the traffic coming from and going to the south would use the Caja del Rio Interchange. Most of the traffic coming from and going to the north would use the CR 62 Interchange.

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 18 – Caja del Rio Ramp Analysis

Ramp	Level of Service
NB off ramp	C
NB on ramp	C
SB off ramp	B
SB on ramp	C

2. Safety

There is no existing intersection at Caja del Rio and NM 599 so safety would not be improved at Caja del Rio. The Caja del Rio Interchange would take traffic off of the CR 62 intersection so safety would be improved in that location.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Caja del Rio Interchange alternative is shown in Figure13 along with the horizontal curve data. The vertical profile data can be found in Appendix M. The design speed of the overpass is 25 miles per hour.

4. Typical Section

The typical section of the overpass was assumed to be 2 – 12' lanes with 5' bicycle lanes, sidewalk, curb and gutter as shown in Figure 4. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section, shown in Figure 6, was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The existing trail underpass west of Caja del Rio could easily accommodate equestrians, pedestrians and mountain bicyclists. Road bicyclists are not likely to ride on the soft surface trails, but would use the bike lanes on the overpass. Currently the trails are not formalized, however clear desire lines are evident on the aerial and from the ground. The County trail map indicates a proposed trail that will lead to the Municipal Recreation Complex from the Santa Fe River Trail and link to trails farther south. Recreationally, this is one of the most critical links in the Santa Fe Trail Network as it will lead to many points of interest. Universal access should be provided at this location to facilitate use of recreational public facilities.

6. **Drainage**

The drainage in the area of the Caja del Rio Interchange flows from east to west. Most of the flow is conveyed in two ten foot bottom ditches between NM 599 and the north frontage road and on the south side of NM 599 from the first pipe to the west that were constructed with NM 599. There is a storm drain pipe that conveys the ditch flow on the north side around the trail underpass. The existing structures are shown in Table 19.

Table 19 – Existing Drainage Structures in Caja del Rio Interchange Location		
Pipe Size (inches)	**Additional length required (ft)**	**Remarks**
24"		Median drop inlet
10' x 14' U channel		Trail underpass
24"		Median drop inlet
42"		Storm drain between NM 599 and north frontage road
12"		Trail underpass drain on south side of NM 599.
24"		Median drop inlet
24"		Median drop inlet
24"		Median drop inlet

One of the existing median drop inlet pipes and the trail underpass will have to be extended in order to construct an interchange. In addition, structures will be needed under the ramps on the west side in order to drain the gores. A structure will also be needed under Caja del Rio on the north side. The proposed structures are shown in Table 20.

Table 20 – Proposed Drainage Structures in Caja del Rio Interchange Location		
Pipe Size	**Length Required (ft)**	**Remarks**
24"	22	Extend median drop inlet pipe.
10' x 14' U channel	293	Extend U channel to new slope limits.
10' x 14' U channel	200	Taper U channel to meet existing ground.
42"	900	Storm drain to convey flow on south side over trail underpass.
30"	76	Drop inlet plus pipe under southbound on-ramp.
30"	105	Drop inlet plus pipe under northbound off-ramp
24"	120	Pipe under Caja del Rio between ramps and NM 599.

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 24 inch water line on the north side of NM 599 that starts at the northwest corner of the Caja del Rio / NM 599 W. Frontage Road and goes east. There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection.

9. **Constructability**

Most of the interchange could be constructed without disturbing existing traffic. Single lane closures would be needed on NM 599 to tie the ramps into the mainline. The ramp alignments can be used to detour NM 599 traffic around the bridge for placing the beams and pouring the bridge deck.

10. **Right-of-way**

Approximately 31 acres of right-of-way would be needed to construct the Caja del Rio Interchange. This property is owned by the state land office.

A construction maintenance easement will be needed to construct the trail underpass outside of the proposed right-of-way on the south side of NM 599

Access control will need to be established between the interchange and the frontage road.

11. **Environmental Factors**

The right-of-way for this future interchange was not cleared under the 1987 EA; however, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, and hazardous materials. Consideration of local and regional travel patterns and access modifications would need to be completed. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

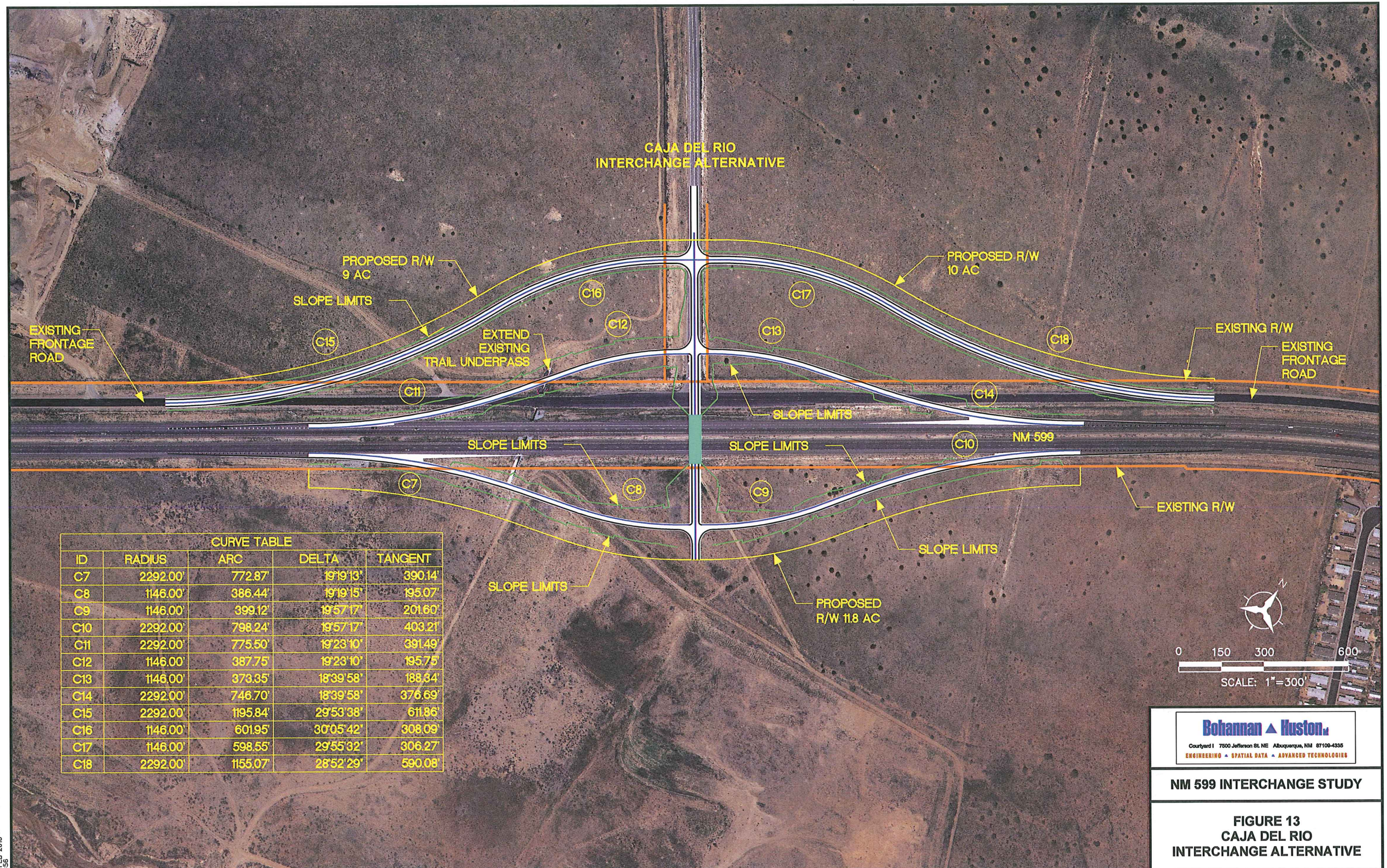
There has been some public support for the construction of this interchange as a result of the improved local and regional connectivity this alternative would provide.

12. **Estimated Construction Cost**

The approximate cost of an interchange and frontage road realignment would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix M.

13. **Recommendations**

The preferred alternative for the Caja del Rio Location is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. The estimated construction cost for the interchange is approximately the same as the cost for the south frontage road but it provides improved access both north and south. The frontage road only provides access to the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.



CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C7	2292.00'	772.87'	19°19'13"	390.14'
C8	1146.00'	386.44'	19°19'15"	195.07'
C9	1146.00'	399.12'	19°57'17"	201.60'
C10	2292.00'	798.24'	19°57'17"	403.21'
C11	2292.00'	775.50'	19°23'10"	391.49'
C12	1146.00'	387.75'	19°23'10"	195.75'
C13	1146.00'	373.35'	18°39'58"	188.34'
C14	2292.00'	746.70'	18°39'58"	376.69'
C15	2292.00'	1195.84'	29°53'38"	611.86'
C16	1146.00'	601.95'	30°05'42"	308.09'
C17	1146.00'	598.55'	29°55'32"	306.27'
C18	2292.00'	1155.07'	28°52'29"	590.08'

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NM 599 INTERCHANGE STUDY

FIGURE 13
CAJA DEL RIO
INTERCHANGE ALTERNATIVE

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K. NM 599 S. Frontage Road from CR 62 to Caja del Rio

This alternative is to construct a frontage road on the south side of NM 599 from the CR 62 Intersection to Caja del Rio as shown in Figure 14. This alternative could be used as an alternative to construction the Caja del Rio Interchange to provide access to the south side of NM 599. There is a parcel on the south side of NM 599 that only has access to the Santa Fe River and not to any road.

1. Traffic Analysis

The S. Frontage Road from CR 62 to Caja del Rio would serve new development. The frontage road would funnel traffic to the CR 62 intersection. This future development is included in the traffic forecasting model and will be included in the intersection analysis.

2. Safety

A frontage road from CR 62 to Caja del Rio would serve new development so safety would not be improved.

3. Horizontal and Vertical Alignment

The horizontal alignment of the S. Frontage Road from Caja del Rio to CR 62 alternative is shown in Figure14 along with the horizontal curve data. The vertical profile data can be found in Appendix N. The design speed of the frontage road is 40 miles per hour.

4. Typical Section

The south frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A concrete wall barrier would be needed between NM 599 and the frontage road. A half concrete wall barrier and a noise wall would be needed between the frontage road and the Cottonwood Mobile Home Park.

A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. Multi-modal Transportation

The shoulder on the south frontage road would accommodate road bicyclists; however, the right-of-way becomes restricted halfway between Caja del Rio and County Road 62. It is possible that the Santa Fe River Trail could serve as an alternate route for pedestrians, equestrians and mountain bicyclists. There is an existing trail underpass just west of Caja del Rio that provides a reasonable crossing of NM 599.

6. **Drainage**

The existing structures under NM 599 are not impacted by the frontage road alternative. A storm drain with drop inlets would be needed for the frontage road where it is adjacent to NM 599. It was assumed that the drop inlets were 1000 feet apart for the estimate. In addition a pipe would be needed under Caja del Rio. The proposed structures are shown in Table 21.

Table 21 – Proposed Drainage Structures for S. Frontage Road between Caja del Rio and CR 62

Pipe Size	Length Required (ft)	Remarks
24"	120	Under Caja del Rio
30"	1696	Storm drain
36"	1696	Storm drain
42"	1696	Storm drain
24"	40	Connect 8 drop inlets to storm drain.

7. **Noise Wall**

The existing noise wall between NM 599 and the Cottonwood Mobile Home Park will have to be replaced with this alternative. The existing wall is approximately 7 feet tall and 2200 feet long. The wall is placed on a berm which adds approximately 6' to the height. The existing berm would need to be removed to construct the frontage road. A post and panel retaining/noise wall system is recommended to replace this wall. The system consists of drilled concrete shafts (approximately 36" diameter by 20 to 25 feet deep) with steel shape reinforcement embedded to the full depth of the concrete shaft. These posts would be spaced at approximately 20 feet on center. Precast concrete panels are then placed between the posts.

8. **Utilities**

There is a Gas Company of New Mexico 20 inch gas line which crosses under NM 599 and the I-25 frontage roads approximately 1300 feet north of Interstate 25. A 20 inch gas line goes north within the right-of-way from a point between NM 599 and the frontage road to the west side of the Cottonwood mobile home park near Caja del Rio. The line then crosses under NM 599 and goes north.

There is a 16 inch water line within the NM 599 right-of-way which starts on the outside of the I-25 W. Frontage Road and then goes north to the northwest corner of the Caja del Rio / NM 599 W. Frontage Road intersection. There is a 24 inch water line crossing of NM 599 approximately 200 feet north of the Cottonwood Mobile Home Park. There are three parallel 12 inch water lines which cross NM 599 approximately 1600 feet northeast of the Caja del Rio / NM 599 W. Frontage Road intersection.

9. **Constructability**

The frontage road can be constructed without impacting existing traffic.

10. **Right-of-way**

Approximately 15.5 acres will be needed to construct the S. Frontage Road from Caja del Rio to CR 62. The property is owned by the State Land Office or privately owned.

Access control will need to be established between the frontage road and NM 599.

11. **Environmental Factors**

The right-of-way for this future frontage road was not cleared under the 1987 EA; however, the engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

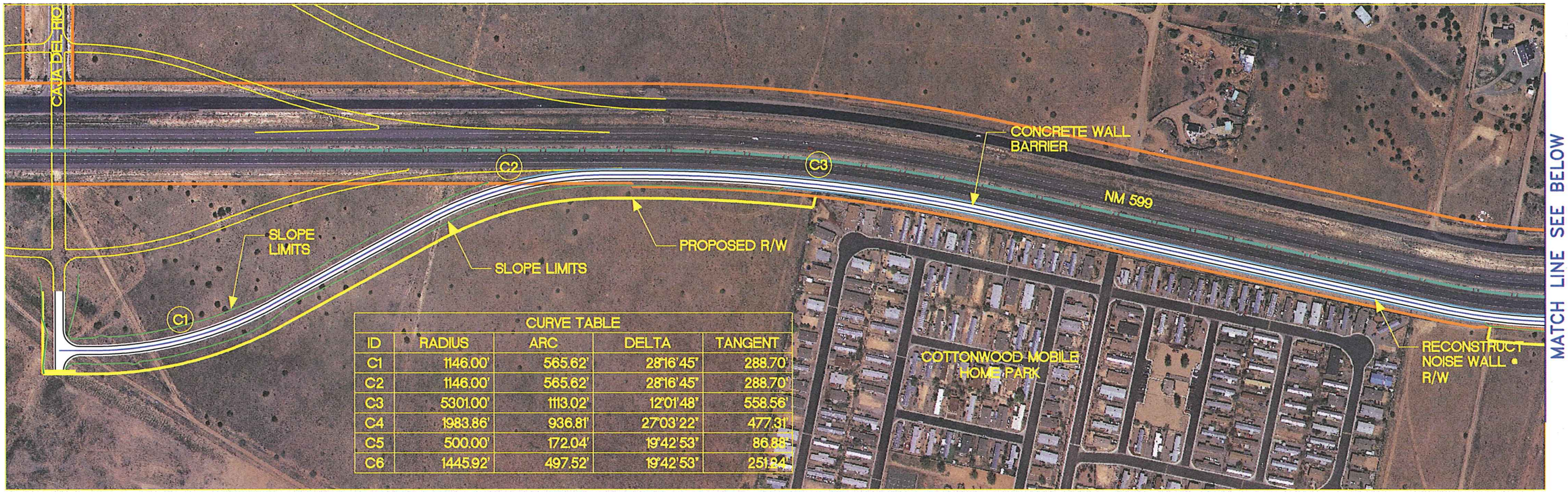
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, and hazardous materials. Consideration of local and regional travel patterns and access modifications would need to be completed. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

12. **Estimated Construction Cost**

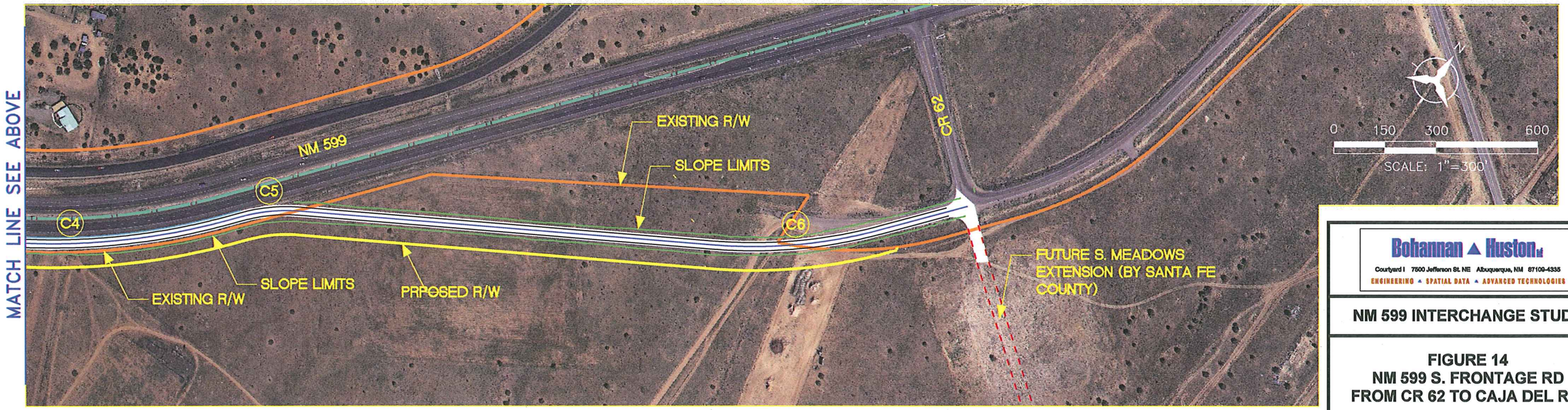
The approximate cost of a frontage road would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix N.

13. **Recommendations**

The preferred alternative for the Caja del Rio Location is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. The estimated construction cost for the interchange is approximately the same as the cost for the south frontage road but it provides improved access both north and south. The frontage road only provides access to the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.



CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1146.00'	565.62'	28°16'45"	288.70'
C2	1146.00'	565.62'	28°16'45"	288.70'
C3	5301.00'	1113.02'	12°01'48"	558.56'
C4	1983.86'	936.81'	27°03'22"	477.31'
C5	500.00'	172.04'	19°42'53"	86.88'
C6	1445.92'	497.52'	19°42'53"	251.24'



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NM 599 INTERCHANGE STUDY

FIGURE 14
NM 599 S. FRONTAGE RD
FROM CR 62 TO CAJA DEL RIO

17-FEB-2010 - 09:57
P:\070064\Trans\Study\Graphics\Report Figures 2\Fig14-070064-Caja-S frt rd.dgn

L. County Road 62

The CR 62 Interchange alternative is shown in Figure 15. An interchange at CR 62 would provide improved access to a fire station, Agua Fria Community Park, the Nancy Rodriguez Community Center, the La Familia Medical Center. The interchange would also provide improved access to the government facilities along Caja del Rio.

1. Traffic Analysis

Scenario 5 of the traffic forecasting model gave the following results. The CR 62 interchange reduces the traffic using the CR 70 Connection (Via Veteranos) by 15% and the Via Abajo by 10%.

The existing intersection currently has a failing level of service for the cross street. A signal is warranted in this location with existing traffic. In the Year 2010 the South Meadows Extension will connect to the intersection from the south thereby increasing the traffic.

In the interim before funding is available for an interchange the NMDOT is considering other options such as a signal or flashers. A traffic signal would improve the existing level of service to B. However, experience shows that intersection crash rates frequently increase with signal installation, although the crashes may be less severe. Signalization usually leads to a shift in crash types, with fewer angle and turning collisions and more rear-end collisions.

An analysis of the signalized intersection using the traffic projections from the NMDOT base model shows that an additional through lane and a right turn bay would be needed both eastbound and westbound on CR 62. These geometry changes would give a level of service B with future traffic.

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 22 – County Road 62 Ramp Analysis

Ramp	Level of Service
NB off ramp	B
NB on ramp	C
SB off ramp	B
SB on ramp	C

2. Safety

Safety would be improved if an interchange were constructed at CR 62. The existing intersection has the third highest crash rate in the corridor and a high rate of injuries.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the CR 62 Interchange alternative is shown in Figure15 along with the horizontal curve data. The vertical profile data can be found in Appendix O. The design speed of the overpass is 25 miles per hour.

4. **Typical Section**

The typical section of the overpass was assumed to be 2 – 12' lanes with 5' bicycle lanes, sidewalk, curb and gutter as shown in Figure 4. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. **Multi-modal Transportation**

An interchange at CR 62 should accommodate all trail users since it is directly connected to a proposed trail from Agua Fria to the Municipal Recreation Complex. An alternative route for equestrians could be the Santa Fe River Trail to the underpass that is south of Caja del Rio. Road bicyclists and pedestrians may prefer to utilize the overpass that provides universal access.

6. **Drainage**

Drainage in the area of the CR 62 Interchange flows from east to west. Only one existing structure will need to be extended to construct the CR 62 interchange. The existing structures are shown in Table 23.

Table 23 – Existing Drainage Structures in CR 62 Interchange Location

Pipe Size (inches)	Additional length required (ft)	Remarks
30"	0	Median drop inlet
30"	Remove existing pipe	Under CR 62
30"	62	Median drop inlet

Drainage structures will be needed under the southbound on-ramp and the northbound off-ramp to drain the ramp gores. It was assumed that a drop inlet would be included with each pipe. The proposed structures are shown in Table 24.

Table 24 – Proposed Drainage Structures in CR 62 Interchange Location		
Pipe Size (inches)	**Length Required (ft)**	**Remarks**
30"	117	Under southbound on-ramp to drain gore with drop inlet
30"	114	Under northbound off-ramp to drain gore with drop inlet

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There is street lighting in the existing intersection so there is underground electrical in the vicinity of the CR 62 intersection.

9. **Constructability**

The interchange bridge could be offset slightly from the existing roadway or detour roadway could be built for the existing intersection. One lane closures would be needed on NM 599 to construct the bridge pier in the median and to tie in the ramps to the mainline. CR 62 traffic could be detoured to the CR 70 Connection (Via Veteranos) for short term total closures. Overnight total closures would be needed on NM 599 to place the bridge beams and to pour the bridge deck. NM 599 traffic could be detoured using the ramp alignments.

10. **Right-of-way**

The CR 62 interchange will fit within the existing right-of-way.

11. **Environmental Factors**

Under the 1987 EA, the right-of-way was cleared for a future interchange at this location. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

As part of the Re-Evaluation, field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, and hazardous materials. Consideration of local and regional travel patterns and access modifications would need to be completed. Evaluations will need to include both traffic and access impacts as well as potential noise and visual impacts.

Public support has been expressed for the construction of this interchange due to the improved local and regional connectivity with existing and future public services in this area that would result from this alternative.

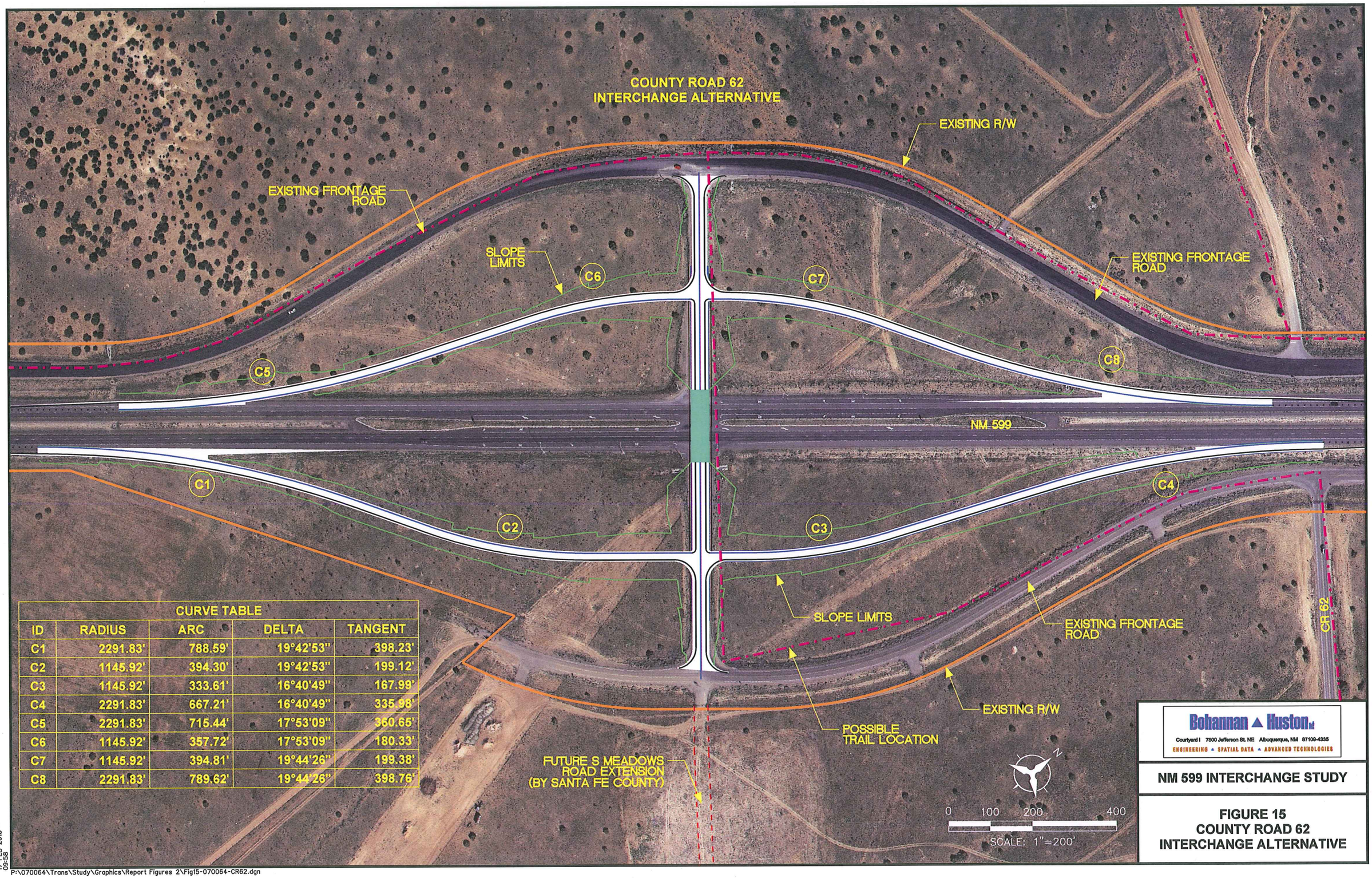
12. **Estimated Construction Cost**

The approximate cost of an interchange would be $6,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix O.

13. **Recommendations**

The preferred alternative for the CR 62 Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 an access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. It is recommended that the alternative be prioritized with the other alternatives.

In the interim before funding is available for an interchange the NMDOT is considering other options such as installing signals or flashers at the intersection.



CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	2291.83'	788.59'	19°42'53"	398.23'
C2	1145.92'	394.30'	19°42'53"	199.12'
C3	1145.92'	333.61'	16°40'49"	167.99'
C4	2291.83'	667.21'	16°40'49"	335.98'
C5	2291.83'	715.44'	17°53'09"	360.65'
C6	1145.92'	357.72'	17°53'09"	180.33'
C7	1145.92'	394.81'	19°44'26"	199.38'
C8	2291.83'	789.62'	19°44'26"	398.76'

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NM 599 INTERCHANGE STUDY

FIGURE 15
COUNTY ROAD 62
INTERCHANGE ALTERNATIVE

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M. CR 70 Connection (Via Veteranos)

The CR 70 Connection (Via Veteranos) Interchange alternative is shown in Figure 16. This alternative would provide improved access to the neighborhoods north and south of NM 599.

1. Traffic Analysis

Scenario 6 of the traffic forecasting model gave the following results. The CR 70 Connection interchange reduces the traffic using CR 62 by 8% and the Via Abajo by 4%.

The existing intersection currently has a failing level of service for the cross street in the PM Peak Hour. A signal is warranted in this location with existing traffic. The intersection would operate at a level of service of A with a traffic signal.

The intersection operates satisfactorily with the NMDOT base model traffic projections with the existing geometry.

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 25 – CR 70 Connection Ramp Analysis

Ramp	Level of Service
NB off ramp	C
NB on ramp	C
SB off ramp	C
SB on ramp	C

2. Safety

Construction of an interchange would improve the safety at the intersection of CR 70 (Via Veteranos) and NM 599. The existing intersection has a lower crash rate than the CR 62 intersection but all of the crashes involved injuries. A recent fatality occurred at the intersection when a vehicle turned left in front of a southbound vehicle.

3. Horizontal and Vertical Alignment

The horizontal alignment of the CR 70 Connection (Via Veteranos) Interchange alternative is shown in Figure16 along with the horizontal curve data. The vertical profile data can be found in Appendix P. The design speed of the overpass is 25 miles per hour.

A slope retaining wall will be needed for the northbound on ramp because of the arroyo. This wall will be approximately 575 feet long and vary from 7.5 to 22 feet high.

4. **Typical Section**

The typical section of the overpass was assumed to be 2 – 12' lanes with 5' bicycle lanes, sidewalk, curb and gutter as shown in Figure 4. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. **Multi-modal Transportation**

The distance between existing underpasses near Caja del Rio and the other near Aldea from CR 70 is quite large, so it is likely that more trail users will prefer to utilize this interchange. The informal trails both north and south of NM 599 in this section are numerous; they are aligned with arroyos, drainage ways and dirt roads. Many equestrians may prefer to go the extra distance in order to use the underpasses rather than travel beside motorized traffic; however, it is not uncommon for them to share the road with vehicles. Accommodations for road bicyclists and universal access should be considered in the design of the overpass.

6. **Drainage**

Drainage in the area of the CR 70 Connection (Via Veteranos) Interchange generally flows from north to south and east to west. The Arroyo de las Trampas comes into the area of the interchange in the southwest quadrant. There are four drainage structures under NM 599 that will need to be extended. The existing structures are shown in Table 26.

Table 26 – Existing Drainage Structures in CR 70 Connection Interchange Location

Pipe Size (inches)	Additional length required (ft)	Remarks
36"	86'	
36"	118	
48"	341	
60"	445	

Drainage structures will be needed to drain the ramp gores in addition to extending the existing structures. It was assumed that drop inlets and 24 inch culvert pipe can be connected to the 36 inch pipes under the southbound on-ramp and the northbound off-ramp. A 36 inch culvert pipe is also needed under the southbound on-ramp to maintain the historic flow. The proposed structures are shown in Table 27.

Table 27 – Proposed Drainage Structures in CR 70 Connection Interchange Location		
Pipe Size	**Length Required (ft)**	**Remarks**
24"	133	Under southbound on-ramp, Drop Inlet
24"	162	Under northbound off-ramp, Drop Inlet
36"	133	Under southbound on-ramp

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There is street lighting in the existing intersection so there is underground electrical in the vicinity of the CR 70 Connection (Via Veteranos) intersection.

9. **Constructability**

The interchange bridge could be offset slightly from the existing roadway or detour roadway could be built for the existing intersection. One lane closures would be needed on NM 599 to construct the bridge pier in the median and to tie in the ramps to the mainline. CR 70 traffic could be detoured to the CR 62 for short term total closures. Overnight total closures would be needed on NM 599 to place the bridge beams and to pour the bridge deck. NM 599 traffic could be detoured using the ramp alignments.

10. **Right-of-way**

The CR 70 Connection (Via Veteranos) Interchange will fit within the existing right-of-way.

11. **Environmental Factors**

Under the 1987 EA, the right-of-way was cleared for a future interchange at this location. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de las Trampas, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would; therefore, permitting will be required by the USACE. Considering the estimated area of impact, it is expected to be an Individual permit.

Public support has been expressed for the construction of this interchange due to the improved local and regional connectivity that would result from this alternative.

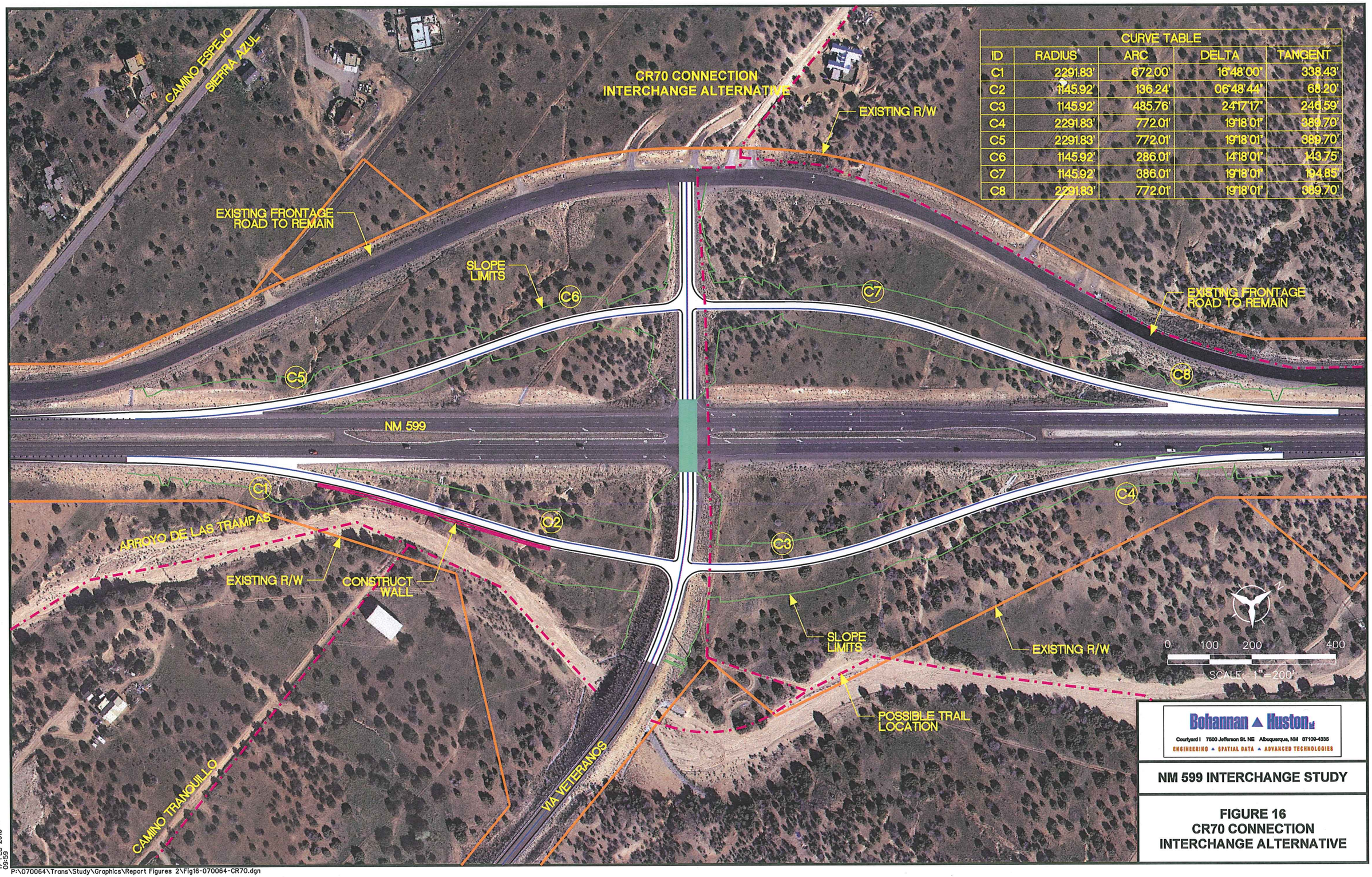
12. **Estimated Construction Cost**

The approximate cost of an interchange would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix P.

13. **Recommendations**

The preferred alternative for the CR 70 Connection (Via Veteranos) Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. It is recommended that the alternative be prioritized with the other alternatives.

In the interim before funding is available for an interchange it is recommended that intersection warning signs with flashers be installed on the approaches. This should improve the visibility of the intersection and make drivers more aware of turning movements.



CURVE TABLE				
ID	RADIUS'	ARC	DELTA	TANGENT
C1	2291.83'	672.00'	16°48'00"	338.43'
C2	1145.92'	136.24'	06°48'44"	68.20'
C3	1145.92'	485.76'	24°17'17"	246.59'
C4	2291.83'	772.01'	19°18'01"	389.70'
C5	2291.83'	772.01'	19°18'01"	389.70'
C6	1145.92'	286.01'	14°18'01"	143.75'
C7	1145.92'	386.01'	19°18'01"	194.85'
C8	2291.83'	772.01'	19°18'01"	389.70'

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NM 599 INTERCHANGE STUDY

FIGURE 16
CR70 CONNECTION
INTERCHANGE ALTERNATIVE

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N. Ephriam Road

An interchange, as shown in Figure 17, was planned at Ephriam as part of the original NM 599 project. At that time there were housing developments planned for the north side of NM 599. Now all of the property is City of Santa Fe Open Space with the exception of one piece of undeveloped private property where six homes are planned. Because of this private parcel access is still needed to this area.

There are three alternatives for improvements to the Ephriam intersection to maintain the goal of NM 599 becoming a controlled access facility; construct an interchange, an overpass to Buckman Road or a frontage road from the Camino de los Montoyas Interchange.

Alternative 1 – the Ephraim Interchange would have the following elements:

1. Traffic Analysis

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The volume did not assign any analysis to the northbound on ramp or the southbound off ramp. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 28 – Ephriam Ramp Analysis

Ramp	Level of Service
NB off ramp	B
NB on ramp	N/A
SB off ramp	N/A
SB on ramp	C

2. Safety

The existing intersection has no safety problems because there is no existing traffic on the intersection.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Ephriam Interchange alternative is shown in Figure17 along with the horizontal curve data. The vertical profile data can be found in Appendix Q. The design speed of the overpass is 25 miles per hour.

4. Typical Section

The typical section of the overpass was assumed to be 2 – 12' lanes with 5' bicycle lanes, sidewalk, curb and gutter as shown in Figure 4. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra

interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. **Multi-modal Transportation**

Ephriam Road is within reasonable distance to the trail underpass locates 4000' northeast of the existing Ephriam intersection; so it is likely that most equestrians and mountain bicyclists would prefer to use the underpass. The shoulders and sidewalks on the overpass would accommodate road bicyclists and pedestrians. There are numerous trails in this section including the well-used Arroyo de los Frijoles.

6. **Drainage**

Drainage in the area of the Ephriam Interchange generally flows from north to south and east to west. The Arroyo de los Frijoles comes into the area of the interchange in the southwest quadrant. The existing structures are shown in Table 29.

Table 29 – Existing Drainage Structures in Ephriam Interchange Location

Pipe Size (inches)	Additional length required (ft)	Remarks
24"	10	
3 – 112" x 75"	164	
2 – 48"	0	
72"	160	

Drainage structures will be needed to drain the ramp gores in addition to extending the existing structures. It was assumed that drop inlets and 24 inch culvert pipe can be connected to the 112" x 75" arch pipes under the southbound on-ramp and the northbound off-ramp. Two 48 inch culvert pipes are also needed under the southbound on-ramp to maintain the historic flow.

The proposed structures are shown in Table 30.

Table 30 – Proposed Drainage Structures in Ephriam Interchange Location

Pipe Size	Length Required (ft)	Remarks
2 – 48"	300	
24"	178	Drop inlet under southbound on-ramp for gore drainage
24"	17	Drop inlet under northbound off-ramp for gore drainage

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There are no known utility crossings in the vicinity of the Ephriam intersection.

9. **Constructability**

No detour will be needed for the existing intersection since there is no existing traffic. One lane closures would be needed on NM 599 to construct the bridge pier in the median and to tie in the ramps to the mainline. Overnight total closures would be needed on NM 599 to place the bridge beams and to pour the bridge deck. NM 599 traffic could be detoured using the ramp alignments.

10. **Right-of-way**

The Ephriam Interchange will fit within the existing right-of-way.

11. **Environmental Factors**

Under the 1987 EA, the right-of-way was cleared for a future interchange at this location. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it is expected to be an Individual permit.

12. **Estimated Construction Cost**

The approximate cost of an interchange would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix Q.

13. **Recommendations**

The preferred alternative for the Ephriam Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is the least expensive alternative; however, the interchange alternative provides access to the existing private land on the north side of NM 599 and to City of Santa Fe owned land on the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.

EPHRIAM ROAD
INTERCHANGE ALTERNATIVE

EXISTING FRONTAGE ROAD

EXISTING R/W

SLOPE LIMITS

C5

C6

C7

C4

NM 599

C3

C1

C2

SLOPE LIMITS

EXISTING R/W

ARROYO DE LOS FRIJOLES

POSSIBLE TRAIL LOCATION

TORTOLA TRAIL

BUCKMAN RD

CAMINO DE DESTINO

N

0 100 200 400

SCALE: 1" =200'

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	2864.79'	740.99'	14°49'11"	372.57'
C2	763.94'	409.08'	30°40'52"	209.57'
C3	2348.86'	748.17'	18°15'00"	377.28'
C4	881.47'	477.76'	31°03'17"	244.91'
C5	1145.92'	423.77'	21°11'18"	214.33'
C6	763.94'	155.59'	11°40'10"	78.07'
C7	2291.83'	972.53'	24°18'48"	493.70'

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NM 599 INTERCHANGE STUDY

FIGURE 17
EPHRIAM ROAD
INTERCHANGE ALTERNATIVE

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O. Ephriam Road Alternative 2 – Overpass of NM 599 to Buckman Road

This alternative is to construct on overpass instead of an interchange and connect the cross street to Buckman Road as shown in Figure 18.

1. Traffic Analysis

The Ephriam Road overpass would serve new development so no traffic analysis was done on this alternative.

2. Safety

The existing intersection has no safety problems because there is no existing traffic using the intersection.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Ephriam Overpass alternative is shown in Figure18 along with the horizontal curve data. The vertical profile data can be found in Appendix Q. The design speed of the overpass is 25 miles per hour.

4. Typical Section

The typical section of the overpass was assumed to be 2 – 12' lanes with 8' shoulders as shown in Figure 4. The 8' shoulders between the ramps will accommodate bicyclists, pedestrians and equestrians crossing NM 599. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

5. Multi-modal Transportation

The existing trail underpass located 4000' northeast of the Ephriam intersection is within a reasonable distance and is likely the preferred route for most trail users. The shoulders on the new overpass will accommodate road bicyclists. Sidewalks on the overpass would provide universal accommodations.

6. Drainage

No existing drainage structures will be affected by the construction of an overpass at NM 599. The overpass will need to cross the Arroyo de los Frijoles. The drainage structure was assumed to be 3 – 108" culvert pipes based on the size of upstream pipes. The proposed drainage structure is shown in Table 31.

Table 31 – Proposed Drainage Structures in Ephriam Overpass Location

Pipe Size	Length Required (ft)	Remarks
3 – 108"	213	Arroyo de los Frijoles

7. **Bridge**

The bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There are no known utility crossing in the vicinity of the Ephriam intersection.

9. **Constructability**

No detour will be needed for the existing intersection since there is no existing traffic. One lane closures would be needed on NM 599 to construct the bridge pier in the median and to tie in the ramps to the mainline. Overnight total closures would be needed on NM 599 to place the bridge beams and to pour the bridge deck. NM 599 traffic could be detoured using the ramp alignments.

10. **Right-of-way**

The Ephriam Overpass alternative will require approximately 1.5 acres of right-of-way near Buckman Road. This right-of-way is owned by the City of Santa Fe.

11. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of this alternative was cleared; however, additional right-of-way and bridge structure would require further investigations. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de Los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it is expected to be an Individual permit. The land area required for the construction of this alternative is currently owned by the City of Santa Fe as Open Space; therefore, further consideration of potential Section 4(f) impacts is required.

12. **Estimated Construction Cost**

The approximate cost of an overpass would be $5,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix Q.

13. **Recommendations**

It is recommended to eliminate the Ephriam Road overpass alternative. The preferred alternative for the Ephriam Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is the least expensive alternative; however, the interchange alternative provides access to the existing private land on the north side of NM 599 and to City of Santa Fe owned land on the south side of NM 599. It is recommended that the interchange alternative be prioritized with the other alternatives.

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	500.00'	100.98'	11°34'16"	50.66'

EPHRIAM ROAD
OVERPASS ALTERNATIVE

EXISTING FRONTAGE ROAD

EXISTING R/W

SLOPE LIMITS

NM 599

EXISTING R/W

ARROYO DE LOS FRIJOLES

SLOPE LIMITS

C1

PROPOSED TRAIL LOCATION

TORTOLA TRAIL

PROPOSED R/W

BUCKMAN RD

CAMINO DE DESTINO

N

0 100 200 400

SCALE: 1"=200'

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FIGURE 18
EPHRIAM ROAD
OVERPASS ALTERNATIVE

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P. Ephriam Road Alternative 3 –- Frontage Road north of NM 599 Ephriam Road to Camino de los Montoyas

This alternative is to construct a frontage road on the north side of NM 599 from Ephriam Road to Camino de los Montoyas as shown in Figure 19. The frontage road would only need to provide access to the private property shown just northwest of Ephriam. The remainder of the area is City of Santa Fe Open Space. The City of Santa Fe does not desire this access for their open space. This frontage road would be constructed instead of the interchange alternative. The existing intersection would be closed.

1. **Traffic Analysis**

The Frontage Road from Ephriam Road to Camino de los Montoyas would serve new development. The frontage road would funnel traffic to the Camino de los Montoyas intersection. This future development is included in the traffic forecasting model and will be included in the intersection analysis.

2. **Safety**

The existing intersection has no safety problems because there is no existing traffic using the intersection.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the Ephriam Frontage Road alternative is shown in Figure19 along with the horizontal curve data. The vertical profile data can be found in Appendix R. The design speed of the frontage road is 25 miles per hour.

4. **Typical Section**

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The existing trail underpass located 4000' northeast of the existing Ephriam intersection is within a reasonable distance and is likely the preferred route for most trail users. Shoulders on the frontage road will accommodate road bicyclists.

6. **Drainage**

The existing drainage in the area of the frontage road flows north to south and east to west. Two existing drainage structures and the trail underpass would need to be lengthened in order to construct the frontage road. The existing structures are shown in Table 32. No additional pipes would be needed.

Table 32 – Existing Drainage Structures in Ephriam Frontage Road Location		
Pipe Size (inches)	**Additional length required (ft)**	**Remarks**
72"	160	
10' x 14' U Channel	94	Trail Underpass
10' x 14' U Channel	100'	Taper to existing ground
2 – 95" x 67"	57	

7. **Utilities**

There are water line crossings in the vicinity of the existing Camino de los Montoyas Intersection and Ridgetop Road.

8. **Constructability**

The frontage road could be constructed without disturbing existing traffic except where it ties to the existing road near the Camino de los Montoyas intersection. Flagmen control can be used to construct the tie in.

9. **Right-of-way**

Construction of a frontage road in this area would require approximately .7 acres of right-of-way. This property is currently City of Santa Fe Open Space except for the northwest quadrant which is a residence.

10. **Environmental Factors**

Under the 1987 EA, a portion of the right-of-way that would be required for the construction of this alternative was cleared; however, additional right-of-way would require further investigations. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

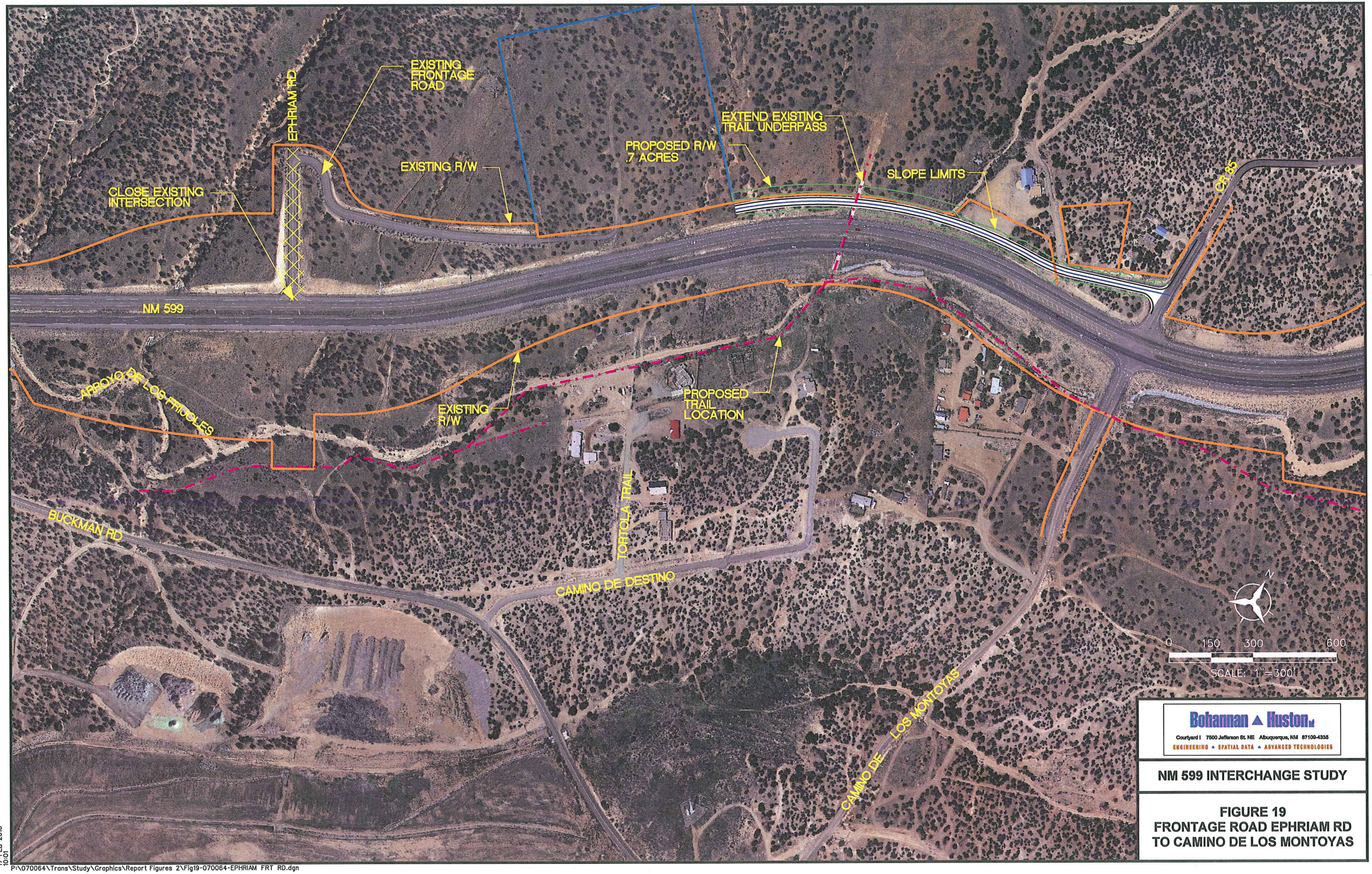
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. The land area required for the construction of this alternative is currently owned by the City of Santa Fe as Open Space; therefore, further consideration of potential Section 4(f) impacts is required.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $3,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix R.

12. **Recommendations**

It is recommended to eliminate the Ephriam Frontage Road Alternative. The preferred alternative for the Ephriam Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is the least expensive alternative; however, the interchange alternative provides access to the existing private land on the north side of NM 599 and to City of Santa Fe owned land on the south side of NM 599. It is recommended that the interchange alternative be prioritized with the other alternatives.



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NM 599 INTERCHANGE STUDY

FIGURE 19
FRONTAGE ROAD EPHRIAM RD TO CAMINO DE LOS MONTOYAS

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Q. Camino de los Montoyas

There are three alternatives for improvements at the Camino de los Montoyas intersection; Construct an interchange 1/3 mile north of the existing intersection where right-of-way has already been purchased with Alternative 1 - a frontage road on the south side to the new interchange location as shown in Figure 20, or Alternative 2 - an overpass to the north side where the connecting road already exists as shown in Figure 21. A third alternative is Alternative 3 – Construct the Ephriam Interchange with a frontage road from the north side of the existing Camino de los Montoyas intersection as shown in Figure 22. In all three alternatives the existing intersection would be closed.

Alternative 1 – the Camino de los Montoyas Interchange with a frontage road on the south side to connect the existing interchange would have the following elements:

1. **Traffic Analysis**

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 33 – Camino de los Montoyas Ramp Analysis

Ramp	Level of Service
NB off ramp	B
NB on ramp	B
SB off ramp	B
SB on ramp	B

2. **Safety**

Construction of an interchange would improve safety at the Camino de los Montoyas location. The existing intersection has a low crash rate.

3. **Horizontal and Vertical Alignment**

The horizontal alignment of the Camino de los Montoyas Interchange alternative is shown in Figure20 along with the horizontal curve data. The vertical profile data can be found in Appendix S. The design speed of the overpass is 25 miles per hour. The design speed of the frontage road is 40 mph.

The frontage road must be designed to be outside of the existing arroyo and above the 100 year flood plain.

4. **Typical Section**

The typical section of the overpass was assumed to be 2 – 12' lanes with 8' shoulders as shown in Figure 4. The 8' shoulders between the ramps will accommodate bicyclists, pedestrians and equestrians crossing NM 599. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt

type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. **Multi-modal Transportation**

The existing trail underpass is within a reasonable distance from Camino de los Montoyas and is likely the preferred route for most trail users. The shoulders on the new overpass and on the south frontage road will accommodate road bicyclists. Sidewalks on the overpass would provide universal access. There are many trails and City Open Space north of NM 599 so trail access is highly desired at this location.

6. **Drainage**

Drainage in the area of the Camino de los Montoyas Interchange generally flows from north to south and east to west. Four drainage structures under NM 599 would have to be extended in order to construct the interchange. The Arroyo de los Frijoles comes into the area of the interchange in the southwest and southeast quadrants. The existing structures are shown in Table 34. The proposed structures are shown in Table 35.

Table 34 – Existing Drainage Structures in Camino de los Montoyas Interchange

Pipe Size (inches)	Additional length required (ft)	Remarks
30"	6	
24"	0	
24"	0	
36"	52	
24"	74	
24"	20	

Table 35 – Proposed Drainage Structures in Camino de los Montoyas Interchange

Pipe Size	Length Required (ft)	Remarks
24"	140	Under southbound on-ramp
36"	139	Under southbound off-ramp
108"	800	Arroyo de los Frijoles under northbound ramps.
		Manhole in 108" pipe
24"	127	Drop inlet from gore of southbound on-ramp
24"	116	Drop inlet from gore of northbound off-ramp

7. **Bridge**

The overpass bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There are water line crossings in the vicinity of the existing Camino de los Montoyas Intersection and Ridgetop Road.

9. **Constructability**

Since the interchange is located 1/3 mile north of the existing intersection, the intersection could continue to operate for most of the construction. One lane closures would be needed on NM 599 to construct the bridge pier in the median and to tie in the ramps to the mainline. Overnight total closures would be needed on NM 599 to place the bridge beams and to pour the bridge deck. NM 599 traffic could be detoured using the ramp alignments. The existing intersection would need to be closed before the southbound ramps could be used as detours.

10. **Right-of-way**

The Camino de los Montoyas Interchange will fit within the existing right-of-way preserved for an interchange. Approximately 7 acres will be needed in order to construct a connection to the south side of existing Camino de los Montoyas for construction of the new Frontage Road to tie back/connect with Camino de los Montoyas.

11. **Environmental Factors**

Under the 1987 EA, much of the right-of-way was cleared for a future interchange at this location; however, additional right-of-way, for the connection to the south, will require further investigation. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it has the potential to be an Individual permit. Evaluations will need to include both traffic and access impacts as well as local development patterns and potential noise and visual impacts.

12. **Estimated Construction Cost**

The approximate cost of an interchange and frontage road would be $10,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix S.

13. **Recommendations**

The preferred alternative for the Camino de los Montoyas Intersection is to construct an interchange with a frontage road to provide access on the south side. An interchange meets the purpose and need of eventually making NM 599 an access controlled facility. The frontage road alternative is less expensive than the overpass alternative #2, described in Section S. The interchange also provides better access to the area than alternative #3, described in Section T, to use the overpass with a frontage road back to the Ephriam Interchange. It is recommended that alternative #1, the Camino de los Montoyas Interchange with a frontage road on the south side, be prioritized with the other alternatives.

CAMINO DE LOS MONTOYAS
INTERCHANGE 1/3 MILE
NORTH ALTERNATIVE

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1145.92'	748.02'	37°24'03"	387.88'
C2	763.94'	320.00'	24°00'00"	162.38'
C3	1145.92'	253.67'	12°41'00"	127.36'
C4	2000.00'	726.15'	20°48'09"	367.12'
C5	763.94'	278.97'	20°55'22"	141.06'
C6	881.47'	461.54'	30°00'01"	236.19'
C7	572.96'	261.86'	26°11'09"	133.26'
C8	1145.92'	340.00'	17°00'00"	171.26'
C9	500.00'	164.99'	18°54'24"	83.25'
C10	500.00'	211.47'	24°13'59"	107.34'
C11	1000.00'	682.22'	39°05'18"	354.99'
C12	62.00'	97.39'	90°00'00"	62.00'

CR 95

CAMINO DE LOS MONTOYAS

EXISTING R/W

SLOPE LIMITS

C6 C7 C8 C5 C4

C9 C10 C1 C2 C3

ARROYO DE LOS FRIJOLES

NM 599

C11 C12

NEW FRONTAGE ROAD

PROPOSED R/W
6.8 ACRES

SLOPE LIMITS

EXISTING R/W

PROPOSED TRAIL LOCATION

N

0 100 200 400

SCALE: 1"=200'

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FIGURE 20
CAMINO DE LOS MONTOYAS
INTERCHANGE W/ S. FRT ROAD
ALTERNATIVE #1

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CAMINO DE LOS MONTOYAS INTERCHANGE W/ OVERPASS ALTERNATIVE

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1145.92'	748.02'	37°24'03"	387.88'
C2	763.94'	320.00'	24°00'00"	162.38'
C3	1145.92'	253.67'	12°41'00"	127.36'
C4	2000.00'	726.15'	20°48'09"	367.12'
C5	763.94'	278.97'	20°55'22"	141.06'
C6	881.47'	461.54'	30°00'01"	236.19'
C7	572.96'	261.86'	26°11'09"	133.26'
C8	1145.92'	340.00'	17°00'00"	171.26'

FRONTAGE ROAD TO EPHRIAM
PROPOSED R/W .1 ACRE
SLOPE LIMITS
CR 85
CAMINO DE LOS MONTOYAS
SLOPE LIMITS
PROPOSED R/W .3 ACRES
SLOPE LIMITS
PROPOSED R/W .3 ACRES
SLOPE LIMITS
EXISTING R/W
SLOPE LIMITS
C6
C7
C8
C5
C4
NM 599
C1
C2
C3
ARROYO DE LOS FRIJOLES
EXISTING R/W
SLOPE LIMITS
PROPOSED TRAIL LOCATION

0 100 200 400
SCALE: 1"=200'

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NM 599 INTERCHANGE STUDY

FIGURE 21
CAMINO DE LOS MONTOYAS INTERCHANGE W/OVERPASS ALTERNATIVE #2

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CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1000.00'	166.09'	09°31'00"	83.24'
C2	1556.77'	1153.07'	42°26'15"	604.42'
C3	500.00'	150.15'	17°12'23"	75.65'

EPHRIAM RD
EXISTING R/W
EXISTING FRONTAGE ROAD
NEW FRONTAGE ROAD
PROPOSED R/W 1.3 ACRES
EXTEND EXISTING TRAIL UNDERPASS
SLOPE LIMTS
UNITY CHURCH
PROPOSED R/W 1 ACRES
C1
C2
C3
NM 599
PROPOSED R/W .3 ACRES
SLOPE LIMITS
ARROYO DE LOS FRIJOLES
SLOPE LIMITS
POSSIBLE TRAIL LOCATION
PROPOSED R/W .3 ACRES
EXISTING R/W
PROPOSED R/W .3 ACRES
BUCKMAN RD
TORTOLA TRAIL
CAMINO DE DESTINO
CAMINO DE LOS MONTOYAS
N
0 150 300 600
SCALE: 1"=300'

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NM 599 INTERCHANGE STUDY

FIGURE 22
CDLM OVERPASS W/ FRT RD TO EPHRIAM INTERCHANGE ALT #3

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R. Camino de los Montoyas Alternative 2 - Overpass in existing location with Camino de los Montoyas Interchange

This overpass would be constructed in addition to the interchange 1/3 mile north in order to provide access to Camino de los Montoyas on the south side of NM 599 as shown in Figure 21. If an overpass is constructed, then an access road would not be needed on the south side. The existing intersection would be closed.

1. Traffic Analysis

A ramp analysis using Scenario 1 volumes shows that all of the ramps will operate satisfactorily with the future traffic volumes. The analysis can be found in Appendix D. The analysis is summarized in the following table:

Table 36 – Camino de los Montoyas Ramp Analysis

Ramp	Level of Service
NB off ramp	B
NB on ramp	B
SB off ramp	B
SB on ramp	B

2. Safety

Construction of an interchange would improve safety at the Camino de los Montoyas location. The existing intersection has a low crash rate.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Camino de los Montoyas Interchange with overpass alternative is shown in Figure 21 along with the horizontal curve data. The vertical profile data can be found in Appendix S. The design speed of the overpasses is 25 miles per hour.

4. Typical Section

The typical section of the overpasses was assumed to be 2 – 12' lanes with 8' shoulders as shown in Figure 4. The 8' shoulders between the ramps will accommodate bicyclists, pedestrians and equestrians crossing NM 599. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The ramp typical section was assumed to be 1-16' lane with 4' shoulders to match the existing Camino la Tierra interchange. The pavement section was also assumed to match the Camino la Tierra interchange at 5/8 inches of OGFC and 6 inches of hot mix asphalt type SP-III over 8 inches of base course.

5. Multi-modal Transportation

The existing trail underpass is within a reasonable distance from Camino de los Montoyas and is likely the preferred route for most trail users. The shoulders on the overpasses will accommodate

road bicyclists. Sidewalks on the overpass would provide universal access. There are many trails and City Open Space north of NM 599 so trail access is highly desired at this location.

6. **Drainage**

Drainage in the area of the Camino de los Montoyas Interchange and overpass generally flows from north to south and east to west. The Arroyo de los Frijoles comes into the area of the interchange in the southwest and southeast quadrants. The overpass would also need to cross this arroyo. The existing structures are shown in Table 37.

Table 37 – Existing Drainage Structures in Camino de los Montoyas Interchange and Overpass Location

Pipe Size (inches)	Additional length required (ft)	Remarks
30"	6	
24"	0	
24"	25	
36"	70	
24"	100	
24"	20	
108"	0	Under overpass

Since the Arroyo de los Frijoles goes through the south half of the interchange, the drainage will have to be carried in a riprap channel or in a pipe. It was assumed that the drainage can be carried in a 108" culvert pipe. The proposed structures are shown in Table 38.

Table 38 – Proposed Drainage Structures in Camino de los Montoyas Interchange and Overpass Location

Pipe Size	Length Required (ft)	Remarks
24"	140	Under southbound on-ramp
36"	139	Under southbound off-ramp
108"	800	Arroyo de los Frijoles under northbound ramps.
		Manhole in 108" pipe
24"	127	Drop inlet from gore of southbound on-ramp
24"	116	Drop inlet from gore of northbound off-ramp

7. **Bridge**

This alternative would require two bridges. The bridges were assumed to be prestressed concrete girders with concrete decks. The bridges would have two spans with piers in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used for both bridges; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There are water line crossings in the vicinity of the existing Camino de los Montoyas Intersection and Ridgetop Road.

9. **Constructability**

Since the interchange is located 1/3 mile north of the existing intersection, the intersection could continue to operate for most of its construction. One lane closures would be needed on NM 599 to construct the bridge piers in the median and to tie in the ramps to the mainline. Overnight total closures would be needed on each side of NM 599 to place the bridge beams and to pour the bridge deck.

The overpass bridge could be offset slightly from the existing intersection in order to maintain traffic on the intersection as long as possible. NM 599 traffic would be reduced to one lane in each direction and use crossovers in the median to close one side of NM 599 in order to place the beams and to pour the bridge decks on the bridges.

10. **Right-of-way**

The Camino de los Montoyas Interchange would fit within the existing right-of-way. Approximately 1 acre of right-of-way would be needed to construct the overpass at the existing road.

11. **Environmental Factors**

Under the 1987 EA, a majority of the required right-of-way was cleared but not an overpass structure. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it has potential to be an Individual permit. The land area required for the construction of this alternative is currently owned by the City of Santa Fe as Open Space; therefore, further consideration of potential Section 4(f) impacts is required. Evaluations will need to include both traffic and access impacts as well as local development patterns and potential noise and visual impacts.

12. **Estimated Construction Cost**

The approximate cost of an interchange and overpass would be $12,500,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix S.

13. **Recommendations**

It is recommended that this alternative be eliminated. The preferred alternative for the Camino de los Montoyas Intersection is to construct an interchange with a frontage road to provide access on the south side. An interchange meets the purpose and need of eventually making NM 599 an access controlled facility. The frontage road alternative is less expensive than the overpass alternative #2, described in Section S. The interchange also provides better access to the area than alternative #3, described in Section T, to use the overpass with a frontage road back to the Ephriam Interchange. It is recommended that alternative #1, the Camino de los Montoyas Interchange with a frontage road on the south side, be prioritized with the other alternatives.

S. Camino de los Montoyas Alternative 3 – Overpass plus Frontage Road to Ephriam Interchange Location

This alternative, which is shown in Figure 22, is to construct an overpass in the existing intersection location and construct a frontage road from Camino de los Montoyas to the Ephriam Interchange location with a frontage road on the north side of NM 599. This alternative would provide access to the existing Camino de los Montoyas traffic. Access to the Northwest Quadrant Development could only be provided by connecting to Camino de los Montoyas and Ridgetop Road. The existing intersection would be closed.

1. Traffic Analysis

The Frontage Road from Ephriam Road to Camino de los Montoyas would serve new development. The frontage road would funnel traffic to the Ephriam intersection. This future development is included in the traffic forecasting model and will be included in the intersection analysis.

2. Safety

Construction of an interchange would improve safety at the Camino de los Montoyas location. The existing intersection has a low crash rate.

3. Horizontal and Vertical Alignment

The horizontal alignment of the Camino de los Montoyas overpass with frontage road to Ephriam alternative is shown in Figure22 along with the horizontal curve data. The vertical profile data can be found in Appendices Q and R. The design speed of the overpass and frontage road is 25 miles per hour.

4. Typical Section

The typical section of the overpass was assumed to be 2 – 12' lanes with 8' shoulders as shown in Figure 4. The 8' shoulders between the ramps will accommodate bicyclists, pedestrians and equestrians crossing NM 599. The pavement section is assumed to be 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads. Open graded friction course (OGFC) is not needed because the cross streets will have a design speed of less than 40 mph.

The north frontage road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. **Multi-modal Transportation**

The existing trail underpass approximately ½ mile south of Camino de los Montoya is likely the preferred route for most trail users including equestrians. The shoulder on the overpass and on the west frontage road will accommodate road bicyclists. Sidewalks on the overpass would provide universal access. There are many trails and City Open Space north of NM 599 so trail access is highly desired at this location.

6. **Drainage**

Drainage in the area of the Camino de los Montoyas overpass and frontage road back to Ephriam Road generally flows from north to south and east to west. The overpass will have to cross the Arroyo de los Frijoles on the south side of NM 599. The existing structures are shown in Table 39. No additional structures will be needed.

Table 39 – Existing Drainage Structures in Camino de los Montoyas Overpass and Frontage Road Location

Pipe Size (inches)	Additional length required (ft)	Remarks
108"	28	Under Overpass
72"	160	Under frontage road
10' x 14' U Channel	94	Trail Underpass
10' x 14' U Channel	100'	Taper to existing ground
2 – 95" x 67"	57	Under frontage road

7. **Bridge**

The overpass bridge was assumed to be prestressed concrete girders with a concrete deck. The bridge would have two spans with a pier in the NM 599 median. Costs assume MSE walls at the abutments to limit the span length. The following dimensions were used; a bridge length of 194', a bridge width of 43', and a superstructure depth of approximately 65".

8. **Utilities**

There are no known utilities in the vicinity of the frontage road. There are water line crossings in the existing Camino de los Montoyas intersection.

9. **Constructability**

The overpass bridge could be offset slightly from the existing intersection in order to maintain traffic on the intersection as long as possible. NM 599 traffic would be reduced to one lane in each direction and use crossovers in the median to close one side of NM 599 in order to place the beams and to pour the bridge decks on the bridges.

10. **Right-of-way**

Approximately 1.7 acres of right-of-way would be needed to construct the overpass and the frontage road. The right-of-way in the northeast quadrant is City of Santa Fe Open Space. The property in the southeast quadrant of the overpass is owned by the City of Santa Fe Northwest Quadrant Development. The remainder of the property is privately owned.

Access control would need to be established between the frontage road and NM 599.

11. **Environmental Factors**

Under the 1987 EA, a majority of the required right-of-way was cleared but not an overpass structure or frontage road facility. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is a Re-Evaluation.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it has potential to be an Individual permit. The land area required for the construction of this alternative is currently owned by the City of Santa Fe as Open Space; therefore, further consideration of potential Section 4(f) impacts is required. Evaluations will need to include both traffic and access impacts as well as local development patterns and potential noise and visual impacts.

12. **Estimated Construction Cost**

The approximate cost of an overpass and frontage road would be $7,500,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix S.

13. **Recommendations**

It is recommended that this alternative be eliminated. The preferred alternative for the Camino de los Montoyas Intersection is to construct an interchange with a frontage road to provide access on the south side. An interchange meets the purpose and need of eventually making NM 599 an access controlled facility. The frontage road alternative is less expensive than the overpass alternative #2, described in Section S. The interchange also provides better access to the area than alternative #3, described in Section T, to use the overpass with a frontage road back to the Ephriam Interchange. It is recommended that alternative #1, the Camino de los Montoyas Interchange with a frontage road on the south side, be prioritized with the other alternatives.

T. NM 599 W. Frontage Road from Camino de los Montoyas to Ridgetop Road

This alternative is to construct a frontage road on the north side of NM 599 from Camino de los Montoyas to Ridgetop Road as shown in Figure 23 and 24. This frontage road could be constructed with or without the Camino de los Montoyas Interchange.

1. Traffic Analysis

The W. Frontage Road from Camino de los Montoyas to Ridgetop Road would serve new development. The frontage road would funnel traffic to the Camino de los Montoyas intersection and the Ridgetop Road Interchange. This future development is included in the traffic forecasting model and will be included in the intersection analysis.

2. Safety

The frontage road would serve new development so safety would not be improved.

3. Horizontal and Vertical Alignment

The horizontal alignment for the W. Frontage Road from Camino de los Montoyas to Ridgetop Road is shown in Figure 23 and 24. Much of the alignment follows an existing dirt road.

The vertical profile for the frontage road can be found in Appendix T. There is a 40 foot cut that would have to be made near Ridgetop Road to tie in this frontage road. The design speed for the frontage road is 40 mph.

Retaining walls will be needed to maintain the right-of-way at a constant width and minimize additional right-of-way takes near the existing southbound on ramp at Ridgetop Road. These walls will be approximately 800 feet long and vary in height from 3 feet to 19 feet.

4. Typical Section

The W. Frontage Road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. Multi-modal Transportation

The existing trail underpass approximately ½ mile south of Camino de los Montoya is likely the preferred route for most trail users including equestrians. The shoulder on the west frontage road will accommodate road bicyclists. There are many trails and City Open Space north of NM 599 so trail access is highly desired at this location.

6. **Drainage**

Drainage in the area of the W. Frontage Road from Camino de los Montoyas to Ridgetop Road generally flows from north to south and east to west. None of the structures need to be extended to construct the frontage road on the north side of NM 599. However, the structures will have to be continued under the frontage road. The existing structures are shown in Table 40.

Table 40 – Existing Drainage Structures in W. Frontage Road Camino de los Montoyas to Ridgetop Location

Pipe Size (inches)	Additional length required (ft)	Remarks
24"	0	
24"	0	
24"	0	
24"	0	
24"	0	
24"	0	Median drainage to south
42"	0	
24"	0	
36"	0	

The proposed structures are shown in Table 41.

Table 41 – Proposed Drainage Structures in W. Frontage Road Camino de los Montoyas to Ridgetop Location

Pipe Size	Length Required (ft)	Remarks
24"	98	
24"	83	
24"	72	
24"	81	
24"	80	
42"	72	
24"	81	
36"	72	

7. **Utilities**

There are water line crossings in the vicinity of the existing Camino de los Montoyas Intersection and Ridgetop Road.

8. **Constructability**

Most of the frontage road can be constructed without disturbing existing traffic. Flagmen control can be used to tie to the existing roads on either end.

9. **Right-of-way**

Approximately 17 acres of right-of-way will be needed for the construction of the W. Frontage Road between Camino de los Montoyas and Ridgetop Road. This property is owned by the City of Santa Fe except for a private parcel in the northwest quadrant of the Ridgetop Road Interchange.

Access control will need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a frontage road in this location was not cleared. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

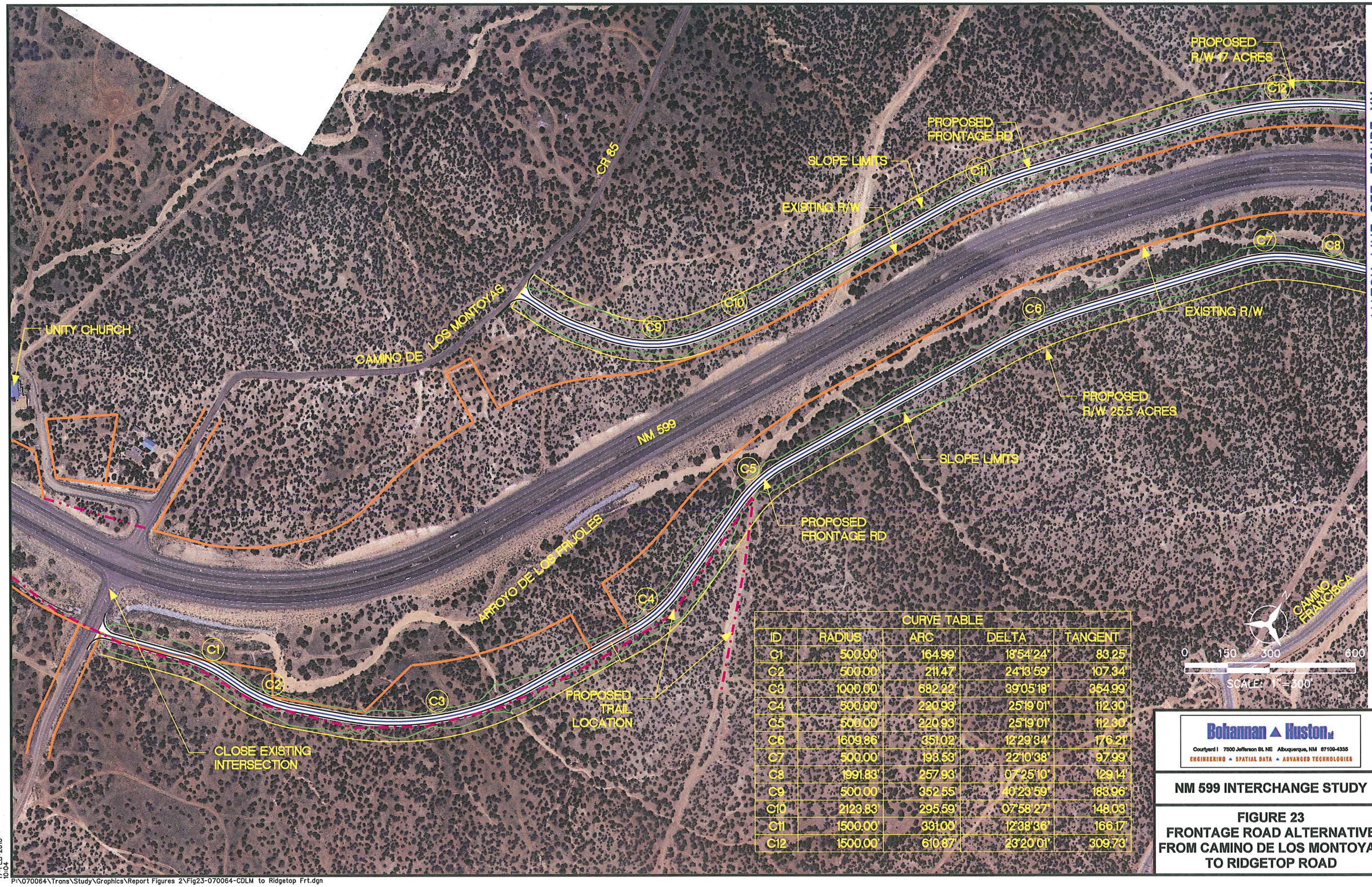
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it has potential to be an Individual permit. The land area required for the construction of this alternative is currently owned by the City of Santa Fe as Open Space; therefore, further consideration of potential Section 4(f) impacts is required. Evaluations will need to include both traffic and access impacts as well as local development patterns and potential noise and visual impacts.

11. **Estimated Construction Cost**

The approximate cost of a frontage road would be $5,500,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix T.

12. **Recommendations**

The W. Frontage Road from Camino de los Montoyas to Ridgetop would meet the purpose and need of providing improved circulation in the NM 599 corridor. However, the undeveloped area is mainly City of Santa Fe open space. The city does not have a need for improved access. There is a private development parcel on the northwest corner of the Ridgetop Road Interchange. The developer of that parcel has plans to access Ridgetop Road. For these reasons it is recommended that the alternative be eliminated.



CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	500.00'	164.99'	18°54'24"	83.25'
C2	500.00'	211.47'	24°13'59"	107.34'
C3	1000.00'	682.22'	39°05'18"	354.99'
C4	500.00'	220.93'	25°19'01"	112.30'
C5	500.00'	220.93'	25°19'01"	112.30'
C6	1609.86'	351.02'	12°29'34"	176.21'
C7	500.00'	193.53'	22°10'38"	97.99'
C8	1991.83'	257.93'	07°25'10"	129.14'
C9	500.00'	352.55'	40°23'59"	183.96'
C10	2123.83'	295.59'	07°58'27"	148.03'
C11	1500.00'	331.00'	12°38'36"	166.17'
C12	1500.00'	610.87'	23°20'01"	309.73'

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NM 599 INTERCHANGE STUDY

FIGURE 23
FRONTAGE ROAD ALTERNATIVE FROM CAMINO DE LOS MONTOYAS TO RIDGETOP ROAD

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MATCH LINE SEE FIGURE 23

PROPOSED R/W 17 ACRES

SLOPE LIMITS

EXISTING R/W

CONSTRUCT WALL

CONSTRUCT WALL

C3

C4

C1

C2

PROPOSED R/W 25.5 ACRES

SLOPE LIMITS

EXISTING R/W

N RIDGETOP RD

NM 599

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C1	1991.83'	523.53'	15°03'35"	263.28'
C2	845.92'	385.23'	26°05'33"	196.01'
C3	1500.00'	281.62'	10°45'25"	141.22'
C4	500.00'	323.51'	37°04'19"	167.65'

0 250 500 1000

SCALE: 1"=500'

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NM 599 INTERCHANGE STUDY

FIGURE 24
FRONTAGE ROAD ALTERNATIVE
FROM CAMINO DE LOS MONTOYAS
TO RIDGETOP ROAD

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U. NM 599 E. Frontage Road from Camino de los Montoyas to Ridgetop Road

This alternative is to construct a frontage road on the south side of NM 599 from Camino de los Montoyas to Ridgetop Road as shown in Figure 23 and 24. This frontage road could be constructed with or without the Camino de los Montoyas Interchange.

1. Traffic Analysis

The E. Frontage Road from Camino de los Montoyas to Ridgetop Road would serve new development. The frontage road would funnel traffic to the Camino de los Montoyas intersection and the Ridgetop Road Interchange. This future development is included in the traffic forecasting model and will be included in the intersection analysis.

2. Safety

This frontage road would serve new development so safety would not be improved.

3. Horizontal and Vertical Alignment

The horizontal alignment for the E. Frontage Road from Camino de los Montoyas to Ridgetop Road is shown in Figure 23 and 24. The frontage road was located to avoid the Arroyo de los Frijoles.

The vertical profile for the frontage road can be found in Appendix U. The design speed for the frontage road is 40 mph.

4. Typical Section

The E. Frontage Road typical section is assumed to be 2-12' lanes with 5' shoulders as shown in Figure 4. A minimum of 4' of clear space is recommended for bicyclists. An additional foot is needed because the open graded friction course laps onto the shoulder 1'. In areas with guardrails or walls the shoulders are recommended to be 6'. The pavement section is assumed to be 5/8 inches of open graded friction course and 5 1/2 inches of hot mix asphalt type SP-III over 7 inches of base course to match the existing frontage roads.

5. Multi-modal Transportation

The existing trail underpass approximately ½ mile south of Camino de los Montoyas is likely the preferred route for most trail users including equestrians. The shoulder on the east frontage road will accommodate road bicyclists. There are many trails and City Open Space north of NM 599 so trail access is highly desired at this location.

6. Drainage

Drainage in the area of the E. Frontage Road Camino de los Montoyas to Ridgetop generally flows from north to south and east to west. The Arroyo de los Frijoles is located between NM 599 and the frontage road for much of the area so the existing structures under NM 599 are not impacted.

It was assumed that all of the proposed structures were 24" culvert pipe like those used in the existing condition except in one condition where there are sizeable arroyos shown on the aerial photography. In those cases it was assumed that a 48" culvert pipe would be used. No drainage analysis was included in this study. The proposed structures are shown in Table 42.

Table 42 – Proposed Drainage Structures in E. Frontage Road Camino de los Montoyas to Ridgetop Location

Pipe Size	Length Required (ft)	Remarks
24"	99	
24"	61	
24"	68	
24"	62	
48"	101	
24"	75	
48"	75	
24"	94	
24"	90	
24"	193	

7. **Utilities**

There are water line crossings in the vicinity of the existing Camino de los Montoyas Intersection and Ridgetop Road.

8. **Constructability**

Most of the frontage road can be constructed without disturbing existing traffic. Flagmen control can be used to tie to the existing roads on either end.

9. **Right-of-way**

Approximately 25.5 acres of right-of-way will be needed to construct the E. Frontage Road between Camino de los Montoyas and Ridgetop Road. The right-of-way in the area is owned by the City of Santa Fe Northwest Quadrant Development.

Access control will need to be established between the frontage road and NM 599.

10. **Environmental Factors**

Under the 1987 EA, a frontage road in this location was not cleared. The engineering, social, economic, and environmental investigations conducted thus far on this build alternative have not disclosed any potentially significant impacts on the quality of the human or natural environment. The recommended level of effort for the construction of this alternative is an Environmental Assessment.

Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with

the United States Corp of Engineers (USACE) will be necessary. This feature is expected to be jurisdictional as Waters of the United States and would, therefore, require permitting by the USACE. Considering the estimated area of impact, it has potential to be an Individual permit. Evaluations will need to include both traffic and access impacts as well as local development patterns and potential noise and visual impacts.

11. **Estimated Construction Cost**

The approximate cost of an frontage road would be $4,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix U.

12. **Recommendations**

The E. Frontage Road from Camino de los Montoyas to Ridgetop Road would provide improved circulation in the NM 599 corridor. However, the existing development plan for the Northwest Quadrant is approved without access at Camino de los Montoyas. There is no way to provide a frontage road in this area without providing a connection from Camino de los Montoyas to the Northwest Quadrant development which is currently not allowed. In addition, the Northwest Quadrant Development has a circulation road in the plan further away from NM 599 that serves the same purpose. For these reasons, it is recommended that the frontage road alternative be eliminated.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The detailed analysis of the alternatives is summarized in Table 43.

Table 43 – Summary of Alternative Evaluation

Interchange Location	Fig	Right-of-way required (acres)[1]	Construction Cost not incl. Right-of-way	Relocations Required	Improves Safety at existing intersections[2]	Existing Intersection LOS = F	Removes traffic from adjacent intersections[3]	Environmental Impact	Preferred Alternative
No Build	n/a	0	$0	0	n/a	No	n/a	None	No
I-25 Frontage Road Overpass	3	0	$6,000,000	0	5	No	1	Low	Yes
Jaguar Rd									
Interchange at Jaguar	5	0	$8,000,000	0	n/a	No	3	Low	Yes
NM 599 W. Frt Rd to I-25	7&8	18 acres $2,700,000	$6,000,000	0	n/a	No	3	Med	No
NM 599 E. Frt Rd to I-25	7&8	17.5 acres $2,625,000	$7,500,000	0	n/a	No	3	Med	Yes
NM 599 W. Frt Jaguar to Airport	9	15 acres $2,250,000	$5,000,000	1	n/a	No	3	Med	No
NM 599 E. Frt Jaguar to Airport	9	10.5 acres $1,575,000	$4,500,000	0	n/a	No	3	Med	No
Airport Rd	10	0	$11,000,000	0	5	No	2	Low	Yes
Caja del Rio									
Extend Frontage Rd across Santa Fe River	12	2 acres $300,000	$4,000,000	0	n/a	No	3	Med	Yes
Interchange at Caja del Rio	13	31 acres $4,650,000	$8,000,000	0	n/a	No	5	Med	Yes
NM 599 S Frt Rd Caja to CR 62	14	15.5 acres $2,325,000	$8,000,000	0	n/a	No	1	Low	No
CR 62	15	0	$6,500,000	0	5	Yes	5	Low	Yes

Interchange Location	Fig	Right-of-way required (acres)[1]	Construction Cost not incl. Right-of-way	Relocations Required	Improves Safety at existing intersections[2]	Existing Intersection LOS = F	Removes traffic from adjacent intersections[3]	Environmental Impact	Preferred Alternative
CR 70 Connection	16	0	$8,000,000	0	3	Yes	5	Low	Yes
Ephriam Rd									
Ephriam Rd Interchange	17	0	$8,000,000	0	1	No	1	Med	Yes
Ephriam Rd Overpass	18	1.5 acres $225,000	$5,000,000	0	1	No	1	Med	No
N Frt Rd Ephriam to Camino de los Montoyas	19	.7 acres $105,000	$3,000,000	0	1	No	5	Med	No
Camino de los Montoyas									
Interchange w/ Frt Rd	20	7 acres $1,050,000	$10,000,000	0	1	Yes	1	Med	Yes
Interchange w/ Overpass	21	1 acres $150,000	$12,500,000	0	1	Yes	1	Med	No
Overpass w/ Frt Rd to Ephriam	22	1.7 acres $255,000	$7,500,000	0	1	Yes	1	Med	No
W Frt Rd CR 85 to Ridgetop	23	17 acres $2,550,000	$5,500,000	0	1	Yes	3	Low	No
E Frt Rd CR 85 to Ridgetop	24	25.5 acres $3,825,000	$4,000,000	0	1	Yes	3	Med	No
Total Cost of Preferred Alternatives		**$8,625,000**	**$77,000,000**						**$85,625,000**

[1] Assumes $150,000 per acre
[2] Scale of 1 to 5 with 1 being the least impact and 5 being the greatest impact
[3] Scale of 1 to 5 with 1 being the least impact and 5 being the greatest impact

The information shown in Table 43 above gives estimated costs for the construction of each alternative and an estimated right-of-way cost based on $150,000 per acre. The NM 599 E. Frontage Road from Jaguar to Airport Road would require the relocation of a business near Airport Road.

Improvements to safety are evaluated for each alternative on a scale of 1 to 5 with 1 being the least and 5 being the greatest. Since the Caja del Rio and Jaguar intersections do not exist, improvements were not applicable. The safety column attempts to take into account both the crash rate and the number of injuries at a given location. Airport Road and the I-25 N. Frontage Road were given a 5 because they are the intersections with the highest crash rate. The CR 62 intersection was also given a 5 with the third highest crash rate and a high number of injuries. The CR 70 Connection has fewer crashes but all of the crashes involved injuries so it was assigned a 4.

The next column in the table assesses traffic levels of service in the corridor. The existing unsignalized intersections of CR 62, CR 70 Connection and Camino de los Montoyas all have a failing level of service during the peak hours. The signalized intersections have acceptable levels of service.

Some of the alternatives will improve traffic at multiple locations because the intersections are interconnected outside of NM 599. Therefore improvements at one intersection will improve the operation and safety at the adjacent intersections as shown in the next column. For example, improvements at the CR 62 intersection will affect both the Caja del Rio and CR 70 Connection locations.

The environmental impact column assesses the level of environmental effort that will be needed for construction. The engineering, social, economic, and environmental investigations conducted thus far have not disclosed any potentially significant impacts on the quality of the human or natural environment so none of the locations were given a high rating. Locations where new right-of-way is located that has not been cleared previously or where arroyos will be impacted were given a medium rating.

The last column in the table indicates whether or not the alternatives are the preferred alternative or if they have been eliminated. The recommendations for each location are summarized below:

1. **I-25 Frontage Road** - The preferred alternative at the I-25 Frontage Road Intersection with NM 599 is to install an overpass. The overpass would improve the safety at the existing intersection and meet the purpose and need of eventually making NM 599 an access controlled facility. It is recommended that the I-25 Frontage Road Overpass be prioritized with the other alternatives.

2. **Jaguar Road** - The preferred alternative at the Jaguar location is to construct an interchange. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, it improves safety at the Airport Road Intersection, and it would provide improved access to Tierra Contenta, the Santa Fe Airport and undeveloped areas east and west of NM 599. It is recommended that the Jaguar Interchange be prioritized with the other alternatives.

3. **The W. Frontage Road from I-25 to Jaguar Road** would improve access to undeveloped lands west of NM 599. However, the owner of the land has plans to develop a north-south circulation road further away from NM 599 which would serve the same purpose. It is recommended that the alternative be eliminated.

4. **The E. Frontage Road from I-25 to Jaguar** meets the purpose and need of improving circulation around NM 599. It would provide improved access to undeveloped areas east of NM 599. It is recommended that the frontage road be prioritized with the other alternatives.

5. **The W. Frontage Road from Jaguar Road to Airport** would improve access to undeveloped lands west of NM 599. However, the land is already master planned with an access road further to the west. This alternative frontage road would provide better access given the grades of the proposed frontage road. It is recommended that the alternative be eliminated.

6. **The E. Frontage Road from Jaguar Road to Airport** would improve access to Tierra Contenta and undeveloped lands east of NM 599. Tierra Contenta is already master planned with an access road further to the west. The Tierra Contenta access road provides access to the remaining undeveloped land in the area. The Tierra Contenta Corporation has asked that the alternative be eliminated since it requires right-of-way from their property that is already platted for commercial and community development. It is recommended that the alternative be eliminated.

7. **Airport Road** – The preferred alternative at the Airport Intersection is to construct an interchange. The interchange meets the purpose and need of eventually making NM 599 an access controlled facility, and it improves safety at the Airport Road Intersection. It is recommended that the Airport Interchange be prioritized with the other alternatives.

8. **Extension of Frontage Road across Santa Fe River** - The extension of the frontage road across the Santa Fe River meets the purpose and need of improving circulation in the area of NM 599. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order to go southbound. It is recommended that the alternative be prioritized with the other alternatives.

9. **Caja del Rio** - The preferred alternative for the Caja del Rio Location is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. This alternative would take traffic off of the existing CR 62 intersection which would improve the safety at that location. In addition it improves the traffic flow from the Caja del Rio intersection with the NM 599 frontage road that currently has to go out of direction by approximately three miles in order

to go southbound. The estimated construction cost for the interchange is approximately the same as the cost for the south frontage road but it provides improved access both north and south. The frontage road only provides access to the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.

10. **CR 62** - The preferred alternative for the CR 62 Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. It is recommended that the alternative be prioritized with the other alternatives. In the interim before funding is available for an interchange the NMDOT is considering other options such as a signal or flashers.

11. **CR 70 Connection** - The preferred alternative for the CR 70 Connection (Via Veteranos) Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. It would improve the safety at the existing intersection which has a high injury rate. It would also improve the existing level of service which is failing. In the interim before funding is available for an interchange the NMDOT is considering other options such as a signal or flashers.

12. **Ephriam Road** - The preferred alternative for the Ephriam Intersection is to construct an interchange. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is the least expensive alternative; however, the interchange alternative provides access to the existing private land on the north side of NM 599 and to City of Santa Fe owned land on the south side of NM 599. It is recommended that the alternative be prioritized with the other alternatives.

13. **Camino de los Montoyas** - The preferred alternative for the Camino de los Montoyas Intersection is to construct an interchange with a frontage road to provide access on the south side. An interchange meets the purpose and need of eventually making NM 599 and access controlled facility. The frontage road alternative is less expensive than the overpass alternative. The interchange also provides better access to the area than the alternative to use the overpass with a frontage road back to the Ephriam Interchange. It is recommended that the alternative be prioritized with the other alternatives.

14. **The W. Frontage Road from Camino de los Montoyas to Ridgetop** would meet the purpose and need of providing improved circulation in the NM 599 corridor. However, the undeveloped area is mainly City of Santa Fe open space. The city does not have a need for improved access. There is a private development parcel on the northwest corner of the Ridgetop Road Interchange. The developer

of that parcel has plans to access Ridgetop Road. For these reasons it is recommended that the alternative be eliminated.

15. **The E. Frontage Road from Camino de los Montoyas to Ridgetop Road** would provide improved circulation in the NM 599 corridor. However, the existing development plan for the Northwest Quadrant is approved without access at Camino de los Montoyas. There is no way to provide a frontage road in this area without providing a connection from Camino de los Montoyas to the Northwest Quadrant development which is currently not allowed. In addition, the Northwest Quadrant Development has a circulation road in the plan further away from NM 599 that serves the same purpose. For these reasons, it is recommended that the frontage road alternative be eliminated.

IX. PROJECT PRIORITY PLAN

There were ten projects identified in the *NM 599 Interchange Corridor Study Detailed Evaluation of Alternatives* as preferred alternatives. The purpose of this plan is to prioritize the preferred alternatives for public funding. Projects were prioritized based on their ability to satisfy the purpose and need, public input, and cost. The NM 599 Corridor must continue to function primarily as a relief route for the City of Santa Fe and as an alternative for hazardous waste transport from Los Alamos around the populated areas of Santa Fe. All of the alternatives help to maintain NM 599 as a bypass by eventually making it a fully access controlled facility. Improved access to or across NM 599 is needed for the all modes of travel as the area continues to develop. The factors of existing and proposed traffic volumes and traffic level of service are used to address this need. There is public perception that improvements are needed to address safety concerns, particularly at existing at-grade intersections. This is addressed by examining intersection crash rates and severity.

A. Safety at the existing at-grade intersections

Crash data was obtained from the NMDOT Traffic Safety Bureau for the period from 2003 to 2007 during the development of the *NM 599 Interchange Corridor Study Initial Evaluation of Alternatives*. The crash rates during that period of time were below the statewide crash rate. None of the fatalities during the time period occurred at the at-grade intersections. In 2009 there was one fatality at the CR 70 intersection.

The two locations with the highest crash rates are Airport Road and the I-25 N. Frontage Road. CR 62 and the CR 70 Connection are also of interest because although they had a lower number of crashes, the crashes were all injury crashes indicating that crashes at these locations are more likely to be severe than at other locations. The crash information is summarized in the table below. A Weighted Crash Rate was determined by multiplying the Crash Rate by the percent of injuries. The intersections were then ranked with number one having the worst Weighted Crash Rate.

Table 44 – Intersection Crash Rates

Intersection	Crash Rate	% Injuries	Weighted Rate	Rating from worst to best
I-25 N. Frontage Road	103.65	64	66.34	2
Airport Road	118.08	56	66.12	3
CR 62	96.19	96	92.34	1
CR 70 Connection	60.19	100	60.19	4
Ephriam	0	0	0	6
Camino de los Montoyas	22.67	33	7.48	5

B. Access to and across NM 599

A traffic analysis of the existing signalized and unsignalized intersections was done during the Phase A, *NM 599 Interchange Corridor Study Initial Evaluation of Alternatives*. All of the signalized intersections operate at acceptable levels of service. The unsignalized intersections all have level of service F movements for the side street during the peak hours. The intersections at CR 62, CR 70, and Camino de Los Montoyas, experience significant delays along the minor roadway approaches. There are not enough gaps along the NM 599 mainline to allow for these vehicles to cross and enter the flow of traffic along NM 599.

Intersection delay will be used to help prioritize the intersections in this plan. Since an interim traffic signal is being considered at CR 62 a signalized intersection analysis was performed for that intersection. Traffic volumes for the CR 62 analysis were generated by the 2006 MPO Traffic model assuming that the South Meadows Extension has been built. The capacity analysis can be found in Appendix D. A summary of the average peak hour delay and level of service can be found in the following table. The intersections were ranked from 1 to 6 with 1 being the worst delay. Intersections that don't currently exist were given the next ranking of 7.

Table 45 – Intersection Traffic Analysis

Location	Existing condition	Average Delay	Level of Service	Rating
I-25 Frontage Road	Signalized	11.5	B	4
Jaguar Rd Interchange	No intersection			7
NM 599 E. Frt Rd to I-25	No frontage road			7
Airport Rd Interchange	Signalized	14.3	B	3
Extend Frontage Rd across Santa Fe River	No frontage road			7
Caja del Rio Interchange	No intersection			7
CR 62 Interchange	If signalized (w/ S. Meadows extension	13.3	B	2
CR 70 Connection Interchange	Unsignalized	28.75	C	1
Ephriam Rd Interchange	Unsignalized	0	A	6
Camino de los Montoyas Interchange w/ Frt Rd	Unsignalized	1.7	A	5

C. Improving circulation around NM 599

Another element of the purpose and need is to improve circulation around NM 599. The results are summarized in Table 46. Additional frontage roads have the ability to improve circulation by providing an alternative route to NM 599. Only two pieces of frontage road are preferred alternatives. Of these two frontage road alternatives, the extension of the existing frontage road across the Santa Fe River was deemed to be the more important alternative because existing traffic uses the ford in this location to cross the river. The proposed frontage road from the I-25 W. Frontage Road intersection to Jaguar Road would serve new development. All of the other alternatives were given a ranking of 3 because they do not improve circulation around NM 599.

Table 46 – Improves Circulation Around NM 599

Location	Improves Circulation	Rating
I-25 Frontage Road	No	3
Jaguar Rd Interchange	No	3
NM 599 E. Frt Rd to I-25	Yes	2
Airport Rd Interchange	No	3
Extend Frontage Rd across Santa Fe River	Yes	1
Caja del Rio Interchange	No	3
CR 62 Interchange	No	3
CR 70 Connection Interchange	No	3
Ephriam Rd Interchange	No	3
Camino de los Montoyas Interchange w/ Frt Rd	No	3

D. Volume of traffic served

Total traffic volume served was used to prioritize the alternatives. Intersections with higher entering volumes of traffic were given a higher priority. Existing traffic counts were collected during the *NM 599 Corridor Study Initial Evaluation of Alternatives*. Since the counts were performed at different times the volumes were extrapolated to 2009 assuming a 3% growth rate. The adjusted PM Peak Hour traffic volumes are shown in Table 47.

Table 47 – Existing PM Peak Hour Traffic Volumes		
Location	**Existing traffic volume entering**	**Total volume from greatest to least**
I-25 Frontage Road Overpass	1984	2
Jaguar Rd Interchange	0	n/a, 7
NM 599 E. Frt Rd to I-25	0	n/a, 7
Airport Rd Interchange	2200	1
Extend Frontage Rd across Santa Fe River	Est. 251	6
Caja del Rio Interchange	0	n/a, 7
CR 62 Interchange	1802	3
CR 70 Connection Interchange	1786	4
Ephriam Rd Interchange	0	n/a, 7
Camino de los Montoyas Interchange w/ Frt Rd	1766	5

Projected traffic volumes from the NMDOT Scenario 1 traffic forecasting model were also used to prioritize the intersections as shown in Table 48. Scenario 1 is the future full build out of all of the system improvements including all interchanges on NM 599. The traffic forecasting model produces PM Peak hour counts.

Table 48 – Projected PM Peak Hour Traffic Volumes		
Location	**Projected traffic volume entering Scenario 1**	**Total volume from greatest to least**
I-25 Frontage Road Overpass	5140	6
Jaguar Rd Interchange	4860	7
NM 599 E. Frt Rd to I-25	Unknown	9
Airport Rd Interchange	6090	1
Extend Frontage Rd across Santa Fe River	Unknown	9
Caja del Rio Interchange	5260	4
CR 62 Interchange	5790	2
CR 70 Connection Interchange	5750	3
Ephriam Rd Interchange	5180	5
Camino de los Montoyas Interchange w/ Frt Rd	4130	8

E. Public Input

Public input was taken at the open houses, public information meetings and through written comments. All of the preferred alternatives have support from the public except for two negative comments about the Jaguar Interchange. At the public information meeting at the conclusion of the Phase A Study the public was asked to choose their top two priorities for improvements. That information along with all of the written and recorded comments was used to rank the public support for the alternatives as shown in Table 49.

Table 49 – Summary of Public Input

Location	Input at Public Open House October 2006	Input at Public Open House January 2009	Input at Stakeholders Meeting April 2009	Input at Public Information Meeting October 2009	Total Public Support	Rating of public input from greatest to least
I-25 Frontage Road Overpass				1	1	8
Jaguar Rd Interchange	1		1		2	7
NM 599 E. Frt Rd to I-25						10
Airport Rd Interchange				5	5	5
Extend Frontage Rd across Santa Fe River	2	1	1	2	6	4
Caja del Rio Interchange	2	1	4	13	20	2
CR 62 Interchange	1	2	5	25	33	1
CR 70 Connection Interchange			1	6	7	3
Ephriam Rd Interchange			1		1	8
Camino de los Montoyas Interchange w/ Frt Rd		2	2		4	6

F. Cost

Cost estimates were prepared for each alternative during the *NM 599 Interchange Corridor Study Detailed Evaluation of Alternatives*. Construction cost estimates include 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). Right-of-way was estimated at $150,000 per acre. The total estimated costs are summarized in Table 50. The alternatives were rated from least expensive to most expensive.

Table 50 – Construction Cost Estimates				
Location	**Construction Cost**	**Right-of-way Cost**	**Total Cost**	**Rating of Total Cost from least to greatest**
I-25 Frontage Road Overpass	$6,000,000	0	$6,000,000	2
Jaguar Rd Interchange	$8,000,000	0	$8,000,000	4
NM 599 E. Frt Rd to I-25	$7,500,000	17.5 acres $2,625,000	$10,125,000	7
Airport Rd Interchange	$11,000,000	0	$11,000,000	8
Extend Frontage Rd across Santa Fe River	$4,000,000	2 acres $300,000	$4,300,000	1
Caja del Rio Interchange	$8,000,000	31 acres $4,650,000	$12,650,000	10
CR 62 Interchange	$6,500,000	0	$6,500,000	3
CR 70 Connection Interchange	$8,000,000	0	$8,000,000	4
Ephriam Rd Interchange	$8,000,000	0	$8,000,000	4
Camino de los Montoyas Interchange w/ Frt Rd	$10,000,000	7 acres $1,050,000	$11,050,000	9

G. Summary of Alternative Ratings

The seven factors listed above are summarized in Table 51 on the following page. The project priority ratings from each factor were totaled to find the highest priority project for public funding. If private funding becomes available then any of these projects could be constructed. The projects with the least priority do not require an interchange or frontage road unless necessitated by development in which case they would be privately funded.

Table 51 – Summary of Project Priority Ratings for Public Funding									
Interchange Location	**Crash Rating**	**Existing Traffic Volumes**	**Projected Traffic Volumes**	**Total Cost**	**Public Input**	**Traffic Level of Service**	**Improves Circulation around NM 599**	**Total**	**Priority**
I-25 Frontage Road Overpass	2	2	6	2	8	4	3	27	4
Jaguar Rd Interchange	n/a, 6	n/a, 7	7	4	7	n/a, 7	3	41	8
NM 599 E. Frt Rd Jaguar Rd to I-25	n/a, 6	n/a, 7	9	7	10	n/a, 7	2	48	10
Airport Rd Interchange	3	1	1	8	5	3	3	24	3
Extend Frontage Rd across Santa Fe River	n/a, 6	6	9	1	4	n/a, 7	1	34	5
Caja del Rio Interchange	n/a, 6	n/a, 7	4	10	2	n/a, 7	3	39	6
CR 62 Interchange	1	3	2	3	1	2	3	15	1
CR 70 Connection Interchange	4	4	3	4	3	1	3	22	2
Ephriam Rd Interchange	n/a, 6	n/a, 7	5	4	8	6	3	39	6
Camino de los Montoyas Interchange w/ Frt Rd	5	5	8	9	6	5	3	41	8

The top priority project for the NM 599 Corridor is the CR 62 Interchange. The CR 62 Interchange meets the project purpose and need of improving safety at the existing intersections, improving access to and across NM 599, and maintaining NM 599 as a relief route for the City of Santa Fe. The interchange is one of the least expensive alternatives at an estimated $6,500,000 for construction. No right-of-way is required for the interchange. The existing intersection has the third highest traffic volume in the corridor and the location has the second highest projected volume. The existing traffic volumes will be increased when the S. Meadows Extension is constructed to CR 62 in the year 2010. In addition, the CR 62 Interchange has a great deal of public support. It provides access to public facilities such as the fire station, Agua Fria Community Park, Community Center and the municipal facilities on Caja del Rio. The public does not support a signal at the existing intersection except as an interim solution until funding is available to construct an interchange.

The second priority project is the CR 70 Connection Interchange. The CR 70 Connection Interchange meets the project purpose and need of improving safety at the existing intersections, improving access to and across NM 599, and maintaining NM 599 as a relief route for the City of Santa Fe. The interchange has a higher cost than the CR 62 Interchange in part because a wall and erosion protection will be required to construct the northbound off ramp adjacent to the existing arroyo. No right-of-way is required for the interchange. The existing intersection has the fourth highest traffic volume in the corridor and the third highest projected volume. The Siler Road River Crossing project that was recently completed increased the attraction of the CR 70 intersection to access NM 599. There is public support for an interchange in this location.

The third priority project is the Airport Road Interchange. The Airport Road Interchange meets the project purpose and need of improving safety at the existing intersections, and maintaining NM 599 as a relief route for the City of Santa Fe. The existing Airport Road intersection has the highest traffic volumes in the corridor and the highest number of crashes; however, there are fewer injury crashes than the CR 62 and CR 70 Connection Intersections. Airport Road has one of the highest construction costs but no right-of-way would be required to construct the interchange.

The NM 599 projects in order of priority are shown in Table 52. The total cost of all projects is $85,625,000.

Table 52 – NM 599 Priority for Public Funding		
Location	**Priority**	**Total Cost**
CR 62 Interchange	1	$6,500,000
CR 70 Connection Interchange	2	$8,000,000
Airport Road Interchange	3	$11,000,000
I-25 Frontage Road Overpass	4	$6,000,000
Extend NM 599 Frontage Road across SF River	5	$4,300,000
Caja del Rio Interchange	6	$12,650,000
Ephriam Rd Interchange	6	$8,000,000
Camino de los Montoyas Interchange w/ Frt Rd	8	$11,050,000
Jaguar Rd Interchange	8	$8,000,000
NM 599 E. Frt Rd to I-25	10	$10,125,000
	Total Cost	**$85,625,000**

H. Prioritization Ranking Check

To make sure that too much weight was not given to any one rating, all of the columns were eliminated one at a time to see how the priority would change. The results are shown in Appendix V. The highest priority project was the same in each case. The second through fourth priorities were very similar with only one or two changes in the ranking when one criterion was eliminated. This exercise indicated that the project priority ratings were valid.