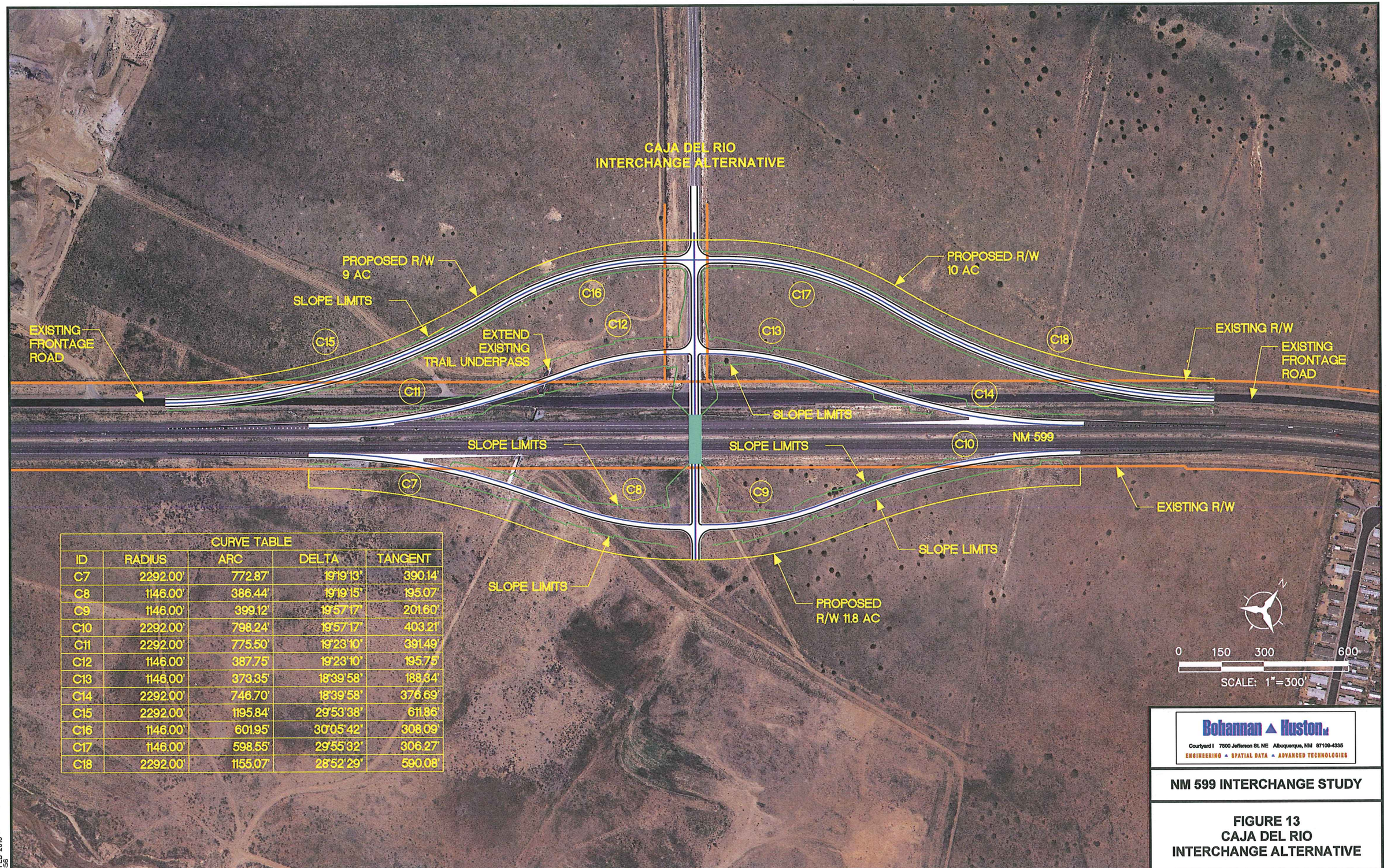

CURVE TABLE				
ID	RADIUS	ARC	DELTA	TANGENT
C7	2292.00'	772.87'	19°19'13"	390.14'
C8	1146.00'	386.44'	19°19'15"	195.07'
C9	1146.00'	399.12'	19°57'17"	201.60'
C10	2292.00'	798.24'	19°57'17"	403.21'
C11	2292.00'	775.50'	19°23'10"	391.49'
C12	1146.00'	387.75'	19°23'10"	195.75'
C13	1146.00'	373.35'	18°39'58"	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.

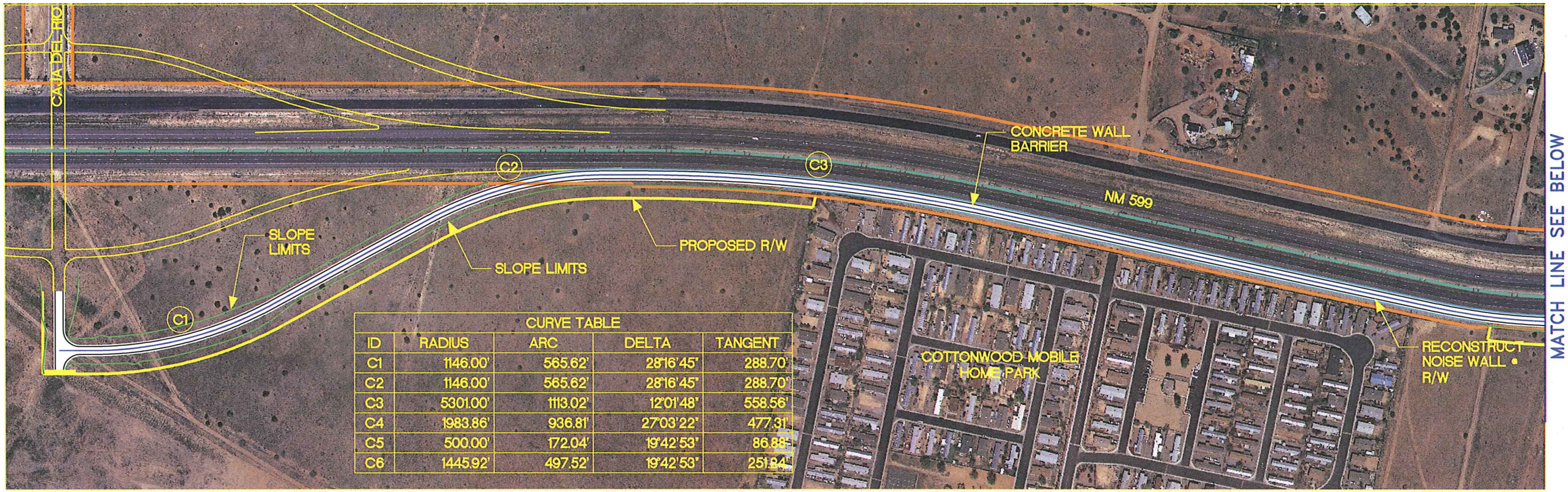
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, and hazardous materials. Consideration of local and regional travel patterns and access modifications would need to be completed.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

12. **Estimated Construction Cost**

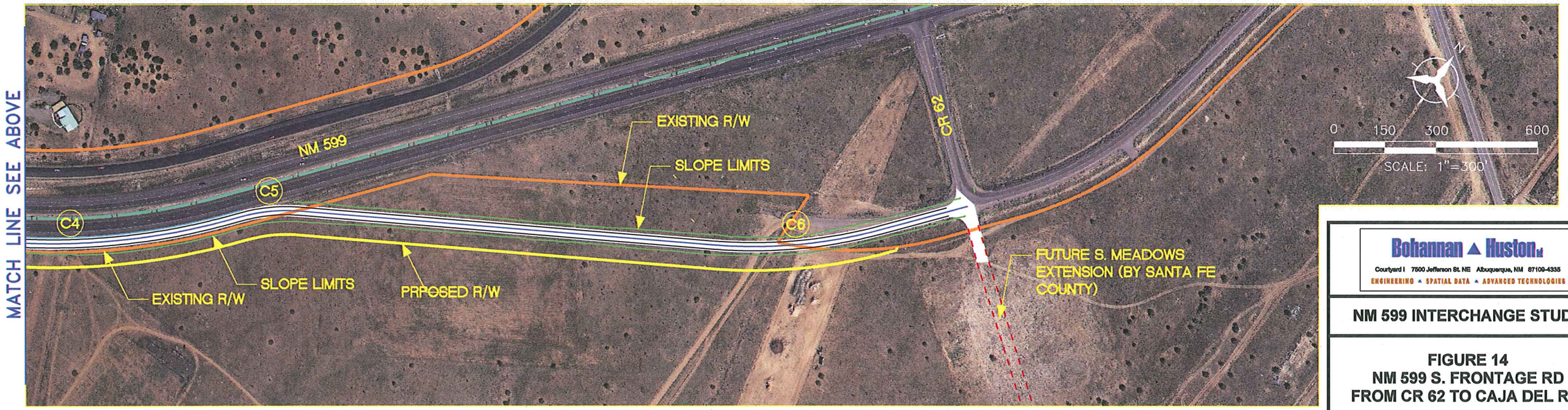
The approximate cost of a frontage road would be $8,000,000 including 8% Engineering and Contingencies and 7.9375% New Mexico Gross Receipts Tax (NMGRT). The construction cost estimate can be found in Appendix N.

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
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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.

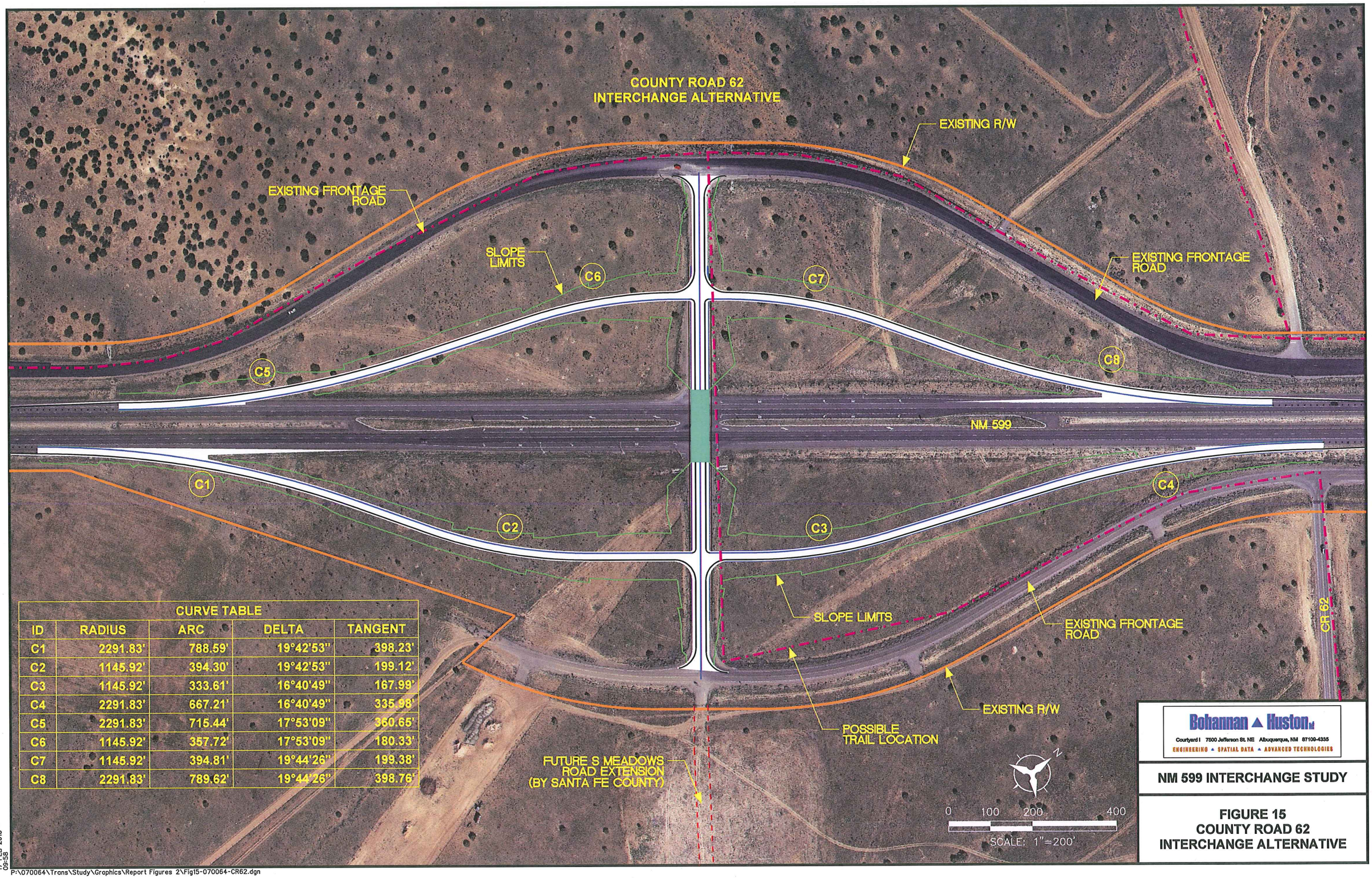
12. **Estimated Construction Cost**

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.

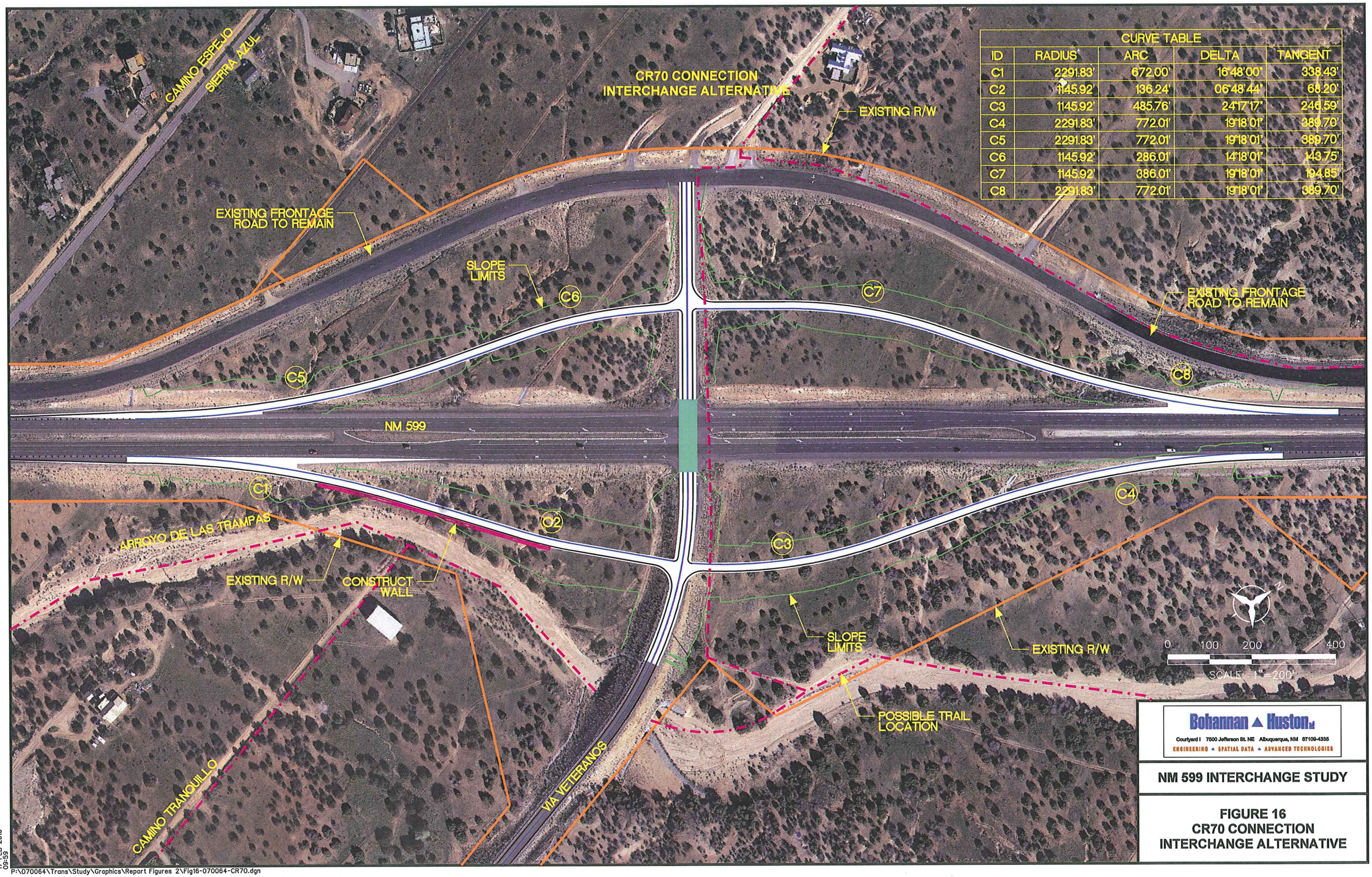
12. **Estimated Construction Cost**

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.

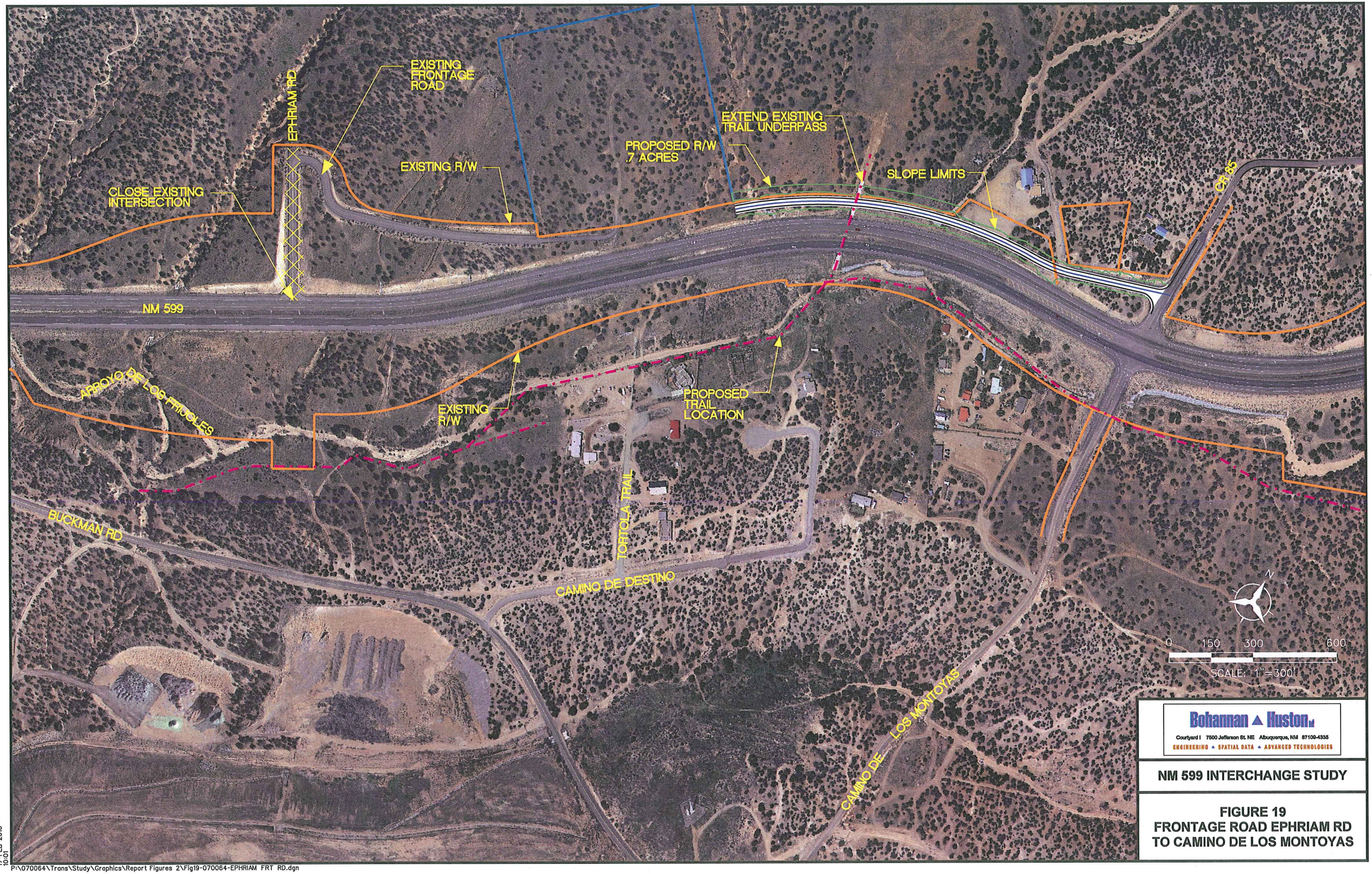
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. The land area required for the construction of this alternative is currently 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.

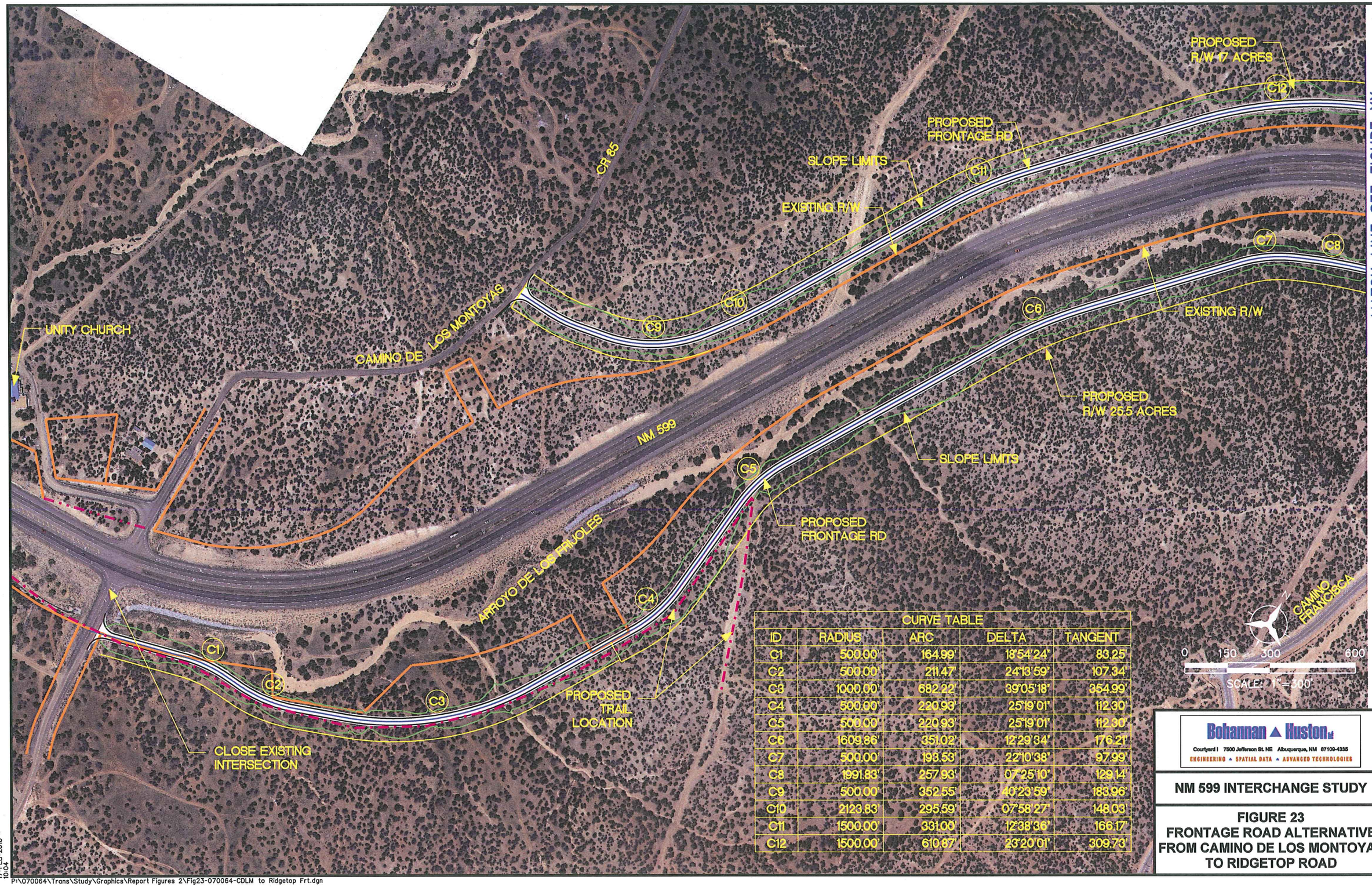
Field surveys would be required to determine the level of impact for the following resource areas: cultural resources, biological resources, threatened and endangered species, flood plains, wetlands, and hazardous materials. Given the potential impact to Arroyo de los Frijoles, further coordination with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