

2.1 ALTERNATIVES DEVELOPMENT PROCESS

This EIS has been prepared in compliance with the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508). According to CEQ guidelines, “Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant” (CEQ 1981). Additionally, the CEQ requires an explanation of why other alternatives, which may have been considered, were eliminated from detailed study (40 CFR 1502.14). This chapter describes the multi-step process (Table 2.1.1, Alternative Screening Process) used to identify a Preferred Alternative.

Initially, a range of Corridor Alternatives was developed. The Corridor Alternatives included a No Action Alternative and numerous alternatives for the entire corridor. The Corridor Alternatives were evaluated to identify those that did not address purpose and need or that contained unacceptable environmental consequences. As a result of this first screening, it was determined that a four-lane highway was required to meet the project purpose and need. Auxiliary and climbing lanes would also be required in some sections.

After the first screening of Corridor Alternatives, the corridor was segmented into 12 numbered sections. A feasibility study and the Environmental Assessment (EA) prepared for this project assisted in determining a reasonable range of alternatives. Feasibility Alternatives, taken primarily from the feasibility study and EA phase of this project, were developed for each section. Feasibility Alternatives are identified by a letter designation within each numbered section. The Feasibility Alternatives were also evaluated to determine if they satisfied the project purpose and need or would result in unacceptable impacts to the social or natural environment. Alternatives carried forward from this second screening were called Preliminary Alternatives.

After the second screening, the 12 sections were combined into four sections. These four sections are Grandview (Sections 1-4), Florida Mesa and Valley (Sections 5 and 6), Dry Creek and Gem Village (Sections 7-10), and Bayfield (Sections 11 and 12). Preliminary Alternatives were created from combinations of the Feasibility Alternatives carried forward. The third screening evaluated the Preliminary Alternatives based on impacts and Section 404(b)(1) practicability criteria. This screening resulted in the alternatives that were advanced for detailed evaluation in the EIS.

The final analysis of the Advanced Alternatives was to identify the environmental and engineering impacts related to each alternative. Design options were developed at this stage to avoid, reduce, or minimize impacts. These design options included the use of retaining walls, reduced median widths, increased bridge lengths, and adjustment of intersecting roadways. After comparing the Advanced Alternatives, a Preferred Alternative was identified in each section.

Within the US 160 project corridor, several roadways connect with US 160 in two locations. To avoid confusion as to which intersection is being referred to, the intersection is designated as (west) or (east). In the case of US 550, which runs in a north to south direction, the designator is US 550 (south). The US 160/US 550 (north) intersection is outside the project corridor and is not used. This designator will only be used in reference to the intersection, not to the road itself. For example, “Alternative 1F would cross CR 232 before connecting to US 160 approximately 1.5 miles east of the existing US 160/US 550 (south) intersection.”

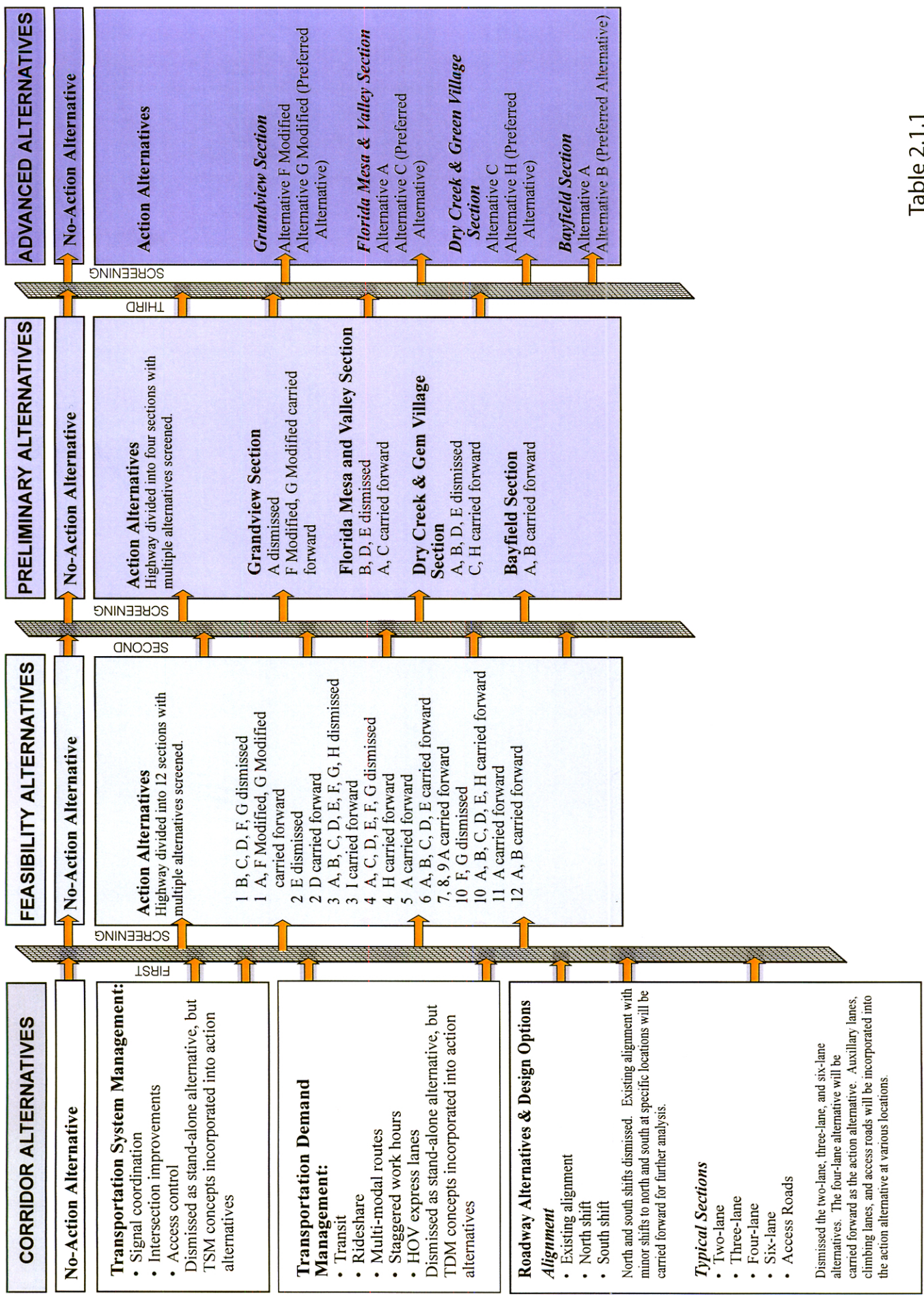


Table 2.1.1

Several different types of intersections and interchanges are also referred to throughout the EIS. An intersection is where two roadways intersect at the same level. They can be unsignalized or signalized. If not identified, intersections should be considered unsignalized. An interchange is where two roadways intersect but are on different levels, or “grade separated.” There are several different types of interchanges. When viewed from above, the ramps of a diamond interchange form a diamond shape around the intersection. Diamond interchanges were considered in the US 160 project corridor but not advanced. A trumpet interchange has at least one “loop” ramp, which merges with the intersecting roadway or connects at a signalized intersection. An example of this interchange type is the US 160/US 550 (south) interchange in the Grandview Section Alternative G Modified. A third type of interchange is called a single-point urban interchange. In this type of interchange, the ramps and connecting roadway intersect at a single signalized intersection. An example of this interchange type is the SH 172/CR 234 interchange with US 160 in the Grandview Section Alternative G Modified.

2.1.1 NEPA/404 Merger Process

FHWA and CDOT conducted early coordination with the Sacramento District of the USACE, Region VIII Environmental Protection Agency (EPA), and other agencies, including the US Fish and Wildlife Service (USFWS), the US Bureau of Land Management (BLM), and the Colorado Division of Wildlife (CDOW) to assure involvement of participating and cooperating agencies. It was determined during this coordination effort that a USACE Section 404(b)(1) Evaluation was necessary to analyze and describe impacts from discharges of dredged or fill material into the waters of the US from proposed highway improvements on US 160. This evaluation supports the requirements of Section 404 of the CWA [Public Law (PL) 92-500, as amended], EPA regulations (40 CFR Part 230 *et seq.*), and the most recent guidance documented in the Memorandum of Agreement (MOA) among the USACE, FHWA, and CDOT dated January 2005.

Evaluation of alternatives under the Section 404(b)(1) guidelines, in conjunction with NEPA regulations, is often referred to as the NEPA/404 Merger Process. The merger process is intended to demonstrate to the USACE that the Least Environmentally Damaging Practicable Alternative (LEDPA) is the Preferred Alternative. This process provides the USACE the ability to adopt the FHWA/CDOT NEPA documentation for determining whether the proposed project complies with the CWA and for determining USACE compliance with NEPA. Criteria from the NEPA/404 Merger Process MOA was applied during the alternatives analysis process. This assures that the LEDPA has not been eliminated from consideration in this EIS.

2.2 CORRIDOR ALTERNATIVES

Numerous Corridor Alternatives were developed at the first stage of alternative development. In addition to a No Action Alternative, the Corridor Alternatives ranged from those intended to improve safety and capacity without major highway construction, to reconstruction of the entire highway. The Corridor Alternatives were evaluated and were eliminated if they did not meet the purpose and need for the project or would result in unacceptable environmental consequences. The Corridor Alternatives described in this section are listed in the first column of Table 2.1.1, Alternative Screening Process.

2.2.1 No Action Alternative

Under the No Action Alternative, construction of capacity improvements on US 160 would not be completed. US 160 would remain largely unchanged except at specific locations where safety improvements may be constructed, as warranted by traffic and safety data. Two safety improvement projects have recently been completed in the project corridor. Impacts from these projects were previously considered in other environmental documents and are not included as a part of this EIS. These projects are briefly described as follows:

- The US 160/CR 233 (west) intersection has been improved to a signalized intersection to accommodate development of a new hospital and proposed development north of US 160. The Southern Ute Indian Tribe (SUIT) Growth Fund and CDOT are developing this intersection project jointly. The project consolidated accesses south of US 160 for approximately 1,320 feet east and approximately 1,340 feet west of the proposed intersection. As this connection to US 160 will primarily serve the new Three Springs Development, the road will be renamed Three Springs Boulevard. CR 233 has been realigned and no longer intersects with US 160, but with Three Springs Boulevard north of US 160. However, due to local convention, this EIS will continue to refer to the US 160/Three Springs Boulevard intersection as the US 160/CR 233 (west) intersection.
- CDOT has constructed a westbound auxiliary lane and a continuous center-turn lane on US 160 through Grandview from the CR 233 (west) intersection to the SH 172/CR 234 intersection. This project is commonly known as the “Fourth Lane.”

The No Action Alternative fails to satisfy the purpose and need for the project because there would be no capacity improvements, the planned safety and access improvement projects would not address corridor-length deficiencies, and travel demand anticipated for 2025 would not be accommodated, creating more congestion in the project corridor.

The No Action Alternative must be considered pursuant to CEQ requirements and provides a baseline for comparison with the other alternatives. Therefore, the No Action Alternative will be carried through the EIS for analysis and comparison.

2.2.2 Corridor Alternatives

The Corridor Alternatives ranged from alternatives to smooth traffic flow [Transportation System Management (TSM)] and reduce traffic demand [Transportation Demand Management (TDM)] without major highway reconstruction, to alternatives for reconstructing the highway. The following sections describe in greater detail the alternatives that were developed and the rationale for elimination or advancement.

2.2.2.1 *Transportation System Management Alternative*

TSM incorporates strategies to smooth traffic flow and make efficient use of existing transportation facilities, such as signal coordination, intersection improvements, and access control. These strategies are described below.

Signal Coordination

Including the recently completed US 160/CR 233 (west) signalized intersection, there are five signalized intersections on the 16.2-mile project corridor. Due to the great distance between these intersections, it was determined that signal coordination would have little or no impact on traffic flow, and therefore would not meet purpose and need.

Intersection Improvements

Intersection improvements on US 160 were considered at US 550 (south), SH 172/CR 234, US 160B (west), US 160B (east), and at each of the 13 county road intersections. County road intersections on US 160 include CR 232 (west) and CR 232 (east), CR 233 (west) and CR 233 (east), CR 229, CR 222/CR 223 (west), CR 223 (east), CR 508, CR 507, CR 506, CR 502, and CR 501. There is also an unsignalized intersection at US 550/CR 220.

Improvements at each intersection were evaluated and discussed in coordination with the City of Durango, La Plata County, Gem Village, and Bayfield. Some intersections would require only minor improvements to improve capacity and safety, such as right-turn and left-turn lanes, signalization, and side road approach reconstruction to improve grades or geometry. Other intersections would require significant improvements, including interchanges. Some intersections were eliminated or combined to improve access control and meet spacing requirements. Table 2.2.1, Intersection Improvements, shows the proposed improvements to each intersection.

**Table 2.2.1
Intersection Improvements**

Intersection	Proposed Improvements
CR 220	Improve intersection
US 550 (south)	Reconstruct as an interchange
CR 232 (west) and (east)	Right-in/right-out to access road
CR 233 (west)	Reconstruct as an interchange
CR 233 (east)	Remove intersection and grade separate
SH 172/CR 234	Reconstruct as an interchange
CR 229	Right-in/right-out to access road
CR 222/CR 223 (west)	Relocate and signalize intersection
CR 223 (east)	Relocate intersection
CR 508	Right-in/right-out to access road
CR 507	Right-in/right-out
Gem Village East Road	Unsignalized intersection at new location
CR 506/ CR 502/US 160B (west)	Combine into one unsignalized intersection
CR 501/CR 521	Reconstruct as a roundabout
US 160B (east)	Improve intersection

Intersection improvements fail to satisfy purpose and need because there would be no capacity improvements, and safety and access improvement projects would not address corridor-length

deficiencies, such as narrow shoulders, insufficient clear zones, poor sight distance, or steep grades.

Intersection improvements were incorporated into each of the Feasibility Alternatives. These improvements are detailed in Section 2.3, Feasibility Alternatives.

Access Control

Access control is used to systematically control the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. Access control plans may also address median treatments, auxiliary lanes, and the appropriate spacing of signals. The purpose of access control is to provide vehicular service to adjacent land development in a safe and orderly manner. Access control is particularly important for major arterials such as US 160 where it is necessary to provide safe movement of traffic and access to property. Typical access control strategies used could include:

- Constructing access or frontage roads parallel to the major arterial
- Regulating the location, spacing, and design of driveways
- Limiting the number of driveways per lot (generally, one per parcel)
- Locating driveways away from intersections
- Connecting parking lots and consolidating driveways so that vehicles can travel between parcels without re-entering an arterial
- Providing residential access through neighborhood streets (residential driveways should generally not connect directly to arterials)
- Increasing minimum lot frontage on major streets (minimum lot sizes on major arterials should be larger than on minor streets)
- Promoting a connected street system (avoiding street networks that force all local traffic onto arterials)
- Encouraging internal access to out parcels (i.e., locations in shopping centers located on arterial streets)

Access control fails to satisfy purpose and need because there would be no capacity improvements, and access improvement projects by themselves would not address all of the corridor-length safety deficiencies, such as narrow shoulders, insufficient clear zones, poor sight distance, or steep grades. Access control measures were incorporated into the Feasibility Alternatives as needed. Wherever possible, existing accesses would be consolidated, and full-movement access would be limited to 1-mile spacing.

Transportation System Management Alternative Summary

TSM strategies, such as signal coordination, intersection improvements, and access control, may provide modest improvements in traffic flow and safety within the project corridor. Additional capacity, safety, and access control improvements would be required to meet purpose and need. Therefore, the TSM alternative was dismissed from further analysis. However, TSM strategies were incorporated into each of the Feasibility Alternatives.

2.2.2.2 Transportation Demand Management Alternative

TDM incorporates strategies to reduce the peak hour demand on the roadway by altering the time or means by which trips occur. These strategies include promoting transit and rideshare programs, creating multi-modal routes, encouraging staggered work hours, and creating high-occupancy vehicle (HOV) express lanes. These strategies are described below.

Transit

Transit improvements are generally focused on providing a greater incentive for commuters to use mass transit, resulting in reduced demand on the existing roadway system. These improvements may include adding or improving bus service, providing bus stop amenities (such as benches and shelters), providing park-and-ride facilities, and offering reduced-rate monthly or yearly passes.

Part of this effort could include coordination with the Southwest Transportation Planning Region to develop a transit service between Bayfield and Durango. The City of Durango and the Southern Ute Community Action Program (SUCAP) provide the current transit services in the project corridor. Currently, the Durango Lift Bus service is limited to within the city limits, which end just west of US 550 at Farmington Hill on US 160. SUCAP provides service between Ignacio and Durango.

The transit alternative fails to satisfy purpose and need because there would be no safety or access improvements, and reduction of capacity demand would not be sufficient to eliminate the need for capacity improvements. Transit accommodations, such as park-and-ride lots, would be considered as the area develops to support future transit improvements. Determining locations of the park-and-ride lots would be a collaborative effort with the county and local agencies to determine the most appropriate locations. Other accommodations, such as bus stop pull-off areas, shelters, disabled access ramps, parking, and other features, would be addressed during the final design phase.

Rideshare

Rideshare programs promote car and van pooling by providing means for potential rideshare participants to meet, promoting ridesharing through incentives for employers and individuals, and providing parking locations for rideshare participants. Some strategies might include:

- Promoting car/van pooling through a joint City of Durango/La Plata County marketing program
- Involving major local employers through circulating rideshare information, appointing a rideshare coordinator, and providing financial and administrative support to the city/county program
- Establishing park-and-ride lots at strategic meeting points on the project corridor
- Establishing computer kiosks at park-and-ride lots for individuals to seek carpooling matches
- Encouraging employers to establish an employer-based and financed vanpooling program

The rideshare alternative fails to satisfy purpose and need because there would be no safety or access improvements, and reduction of capacity demand would not be sufficient to eliminate the

need for capacity improvements. Car/van pooling is expected to have minimal impact on reducing traffic volumes in the project corridor due to the geographic size, sprawled development, and employment and workforce characteristics of Durango and La Plata County. La Plata County is approximately 1,690 square miles and contains three incorporated cities or towns (Durango, Bayfield, and Ignacio). The 2000 US Census reported a county population of 43,941, of which more than half (27,801) live outside incorporated areas. If 50 percent of the projected vehicles traveling the US 160 project corridor during the peak hour participated in a rideshare program, the reduction in traffic volume would still not be sufficient to eliminate the need for capacity improvements.

Multi-modal Routes

Multi-modal routes are generally paved paths that can be used by a variety of users, which includes experienced and novice cyclists, pedestrians, and individuals in wheelchairs and on other non-motorized forms of transportation. Multi-modal routes may be constructed as separate facilities or as a part of the highway facility. Multi-modal facilities must meet requirements in both the *AASHTO Guide for the Development of Bicycle Facilities*, 3rd edition (AASHTO 1999), and the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* as amended September 2002, to be considered truly multi-modal.

CDOT collaborated with the Safe Multimodal Aesthetic Regional Transportation (SMART) 160 Committee, a grassroots effort of concerned citizens and representatives from the city, county, and Trails 2000. SMART 160 requested that considerations for novice bicyclists and pedestrians be included as part of the project.

The multi-modal alternative fails to satisfy purpose and need because there would be no safety or access improvements, and reduction of capacity demand would not be sufficient to eliminate the need for capacity improvements. Multi-modal access and routes would result in negligible reduction of traffic volumes on US 160 based on distances of approximately 20 miles for commuters from Bayfield, and 18 miles for commuters from Gem Village. Multi-modal accommodations were incorporated into each of the alternatives, as follows:

- When reconstructed, US 160 would have 10-foot shoulders that would provide a multi-modal route for experienced cyclists.
- CDOT would work in collaboration with SMART 160 and local agencies on a shared use path between Dominguez Drive, approximately 1.2 miles west of the US 160/US 550 (south) intersection, and Grandview. The path would link the Animas River Trail system and Escalante Middle School area with the Grandview area. Another entity would be responsible for ROW acquisition, design, and construction of the path.
- Where additional ROW is available, CDOT would allow another entity to fund, construct, and maintain a shared use path in the US 160 ROW. Shared use path undercrossings would also be located along the project corridor, and bicyclists and pedestrians could use these undercrossings.

Staggered Work Hours

Staggered work hours reduce peak hour demand not by reducing the number of vehicles on the roadway, but by distributing those vehicles over a longer time period. This could be

accomplished by encouraging some of the larger employers in the project corridor, such as the US Forest Service (USFS), BLM, City of Durango, La Plata County, Mercy Medical Center, and CDOT to offer employees staggered work schedules. Incentives might include tax benefits and reduced overhead costs for equipment, office space, and parking, because these items could be shared among participants.

The staggered work hours alternative fails to satisfy purpose and need because there would be no safety or access improvements, and reduction of capacity demand would not be sufficient to eliminate the need for capacity improvements. Staggered work hours would be expected to have minimal impact on reducing traffic volumes on the project corridor because there are no exceptionally large employers that would significantly reduce US 160 traffic volumes.

High-Occupancy Vehicle Express Lanes

This alternative would provide express lanes to allow priority treatment for HOVs (i.e., van/car pools, transit vehicles, or buses). HOV express lanes increase vehicle occupancy by requiring at least two people in each vehicle, and reduce the number of vehicles on the road by encouraging carpooling.

HOV lanes could be constructed in the median or outside the existing lanes, depending on available space. Additional ROW would be required if space were not available. Future (2025) traffic volumes in the project corridor are projected to be two to three times the existing volumes. At the same time, the percentage of HOVs in the project corridor is expected to be minimal. Although the addition of HOV lanes would reduce demand, there would still be a high number of single-occupant vehicles in the existing lanes. In addition, no safety or access improvements would be made to the existing roadway. Therefore, the HOV express lanes alternative would not satisfy purpose and need and was dismissed as a stand-alone alternative.

Transportation Demand Management Alternative Summary

TDM strategies, such as transit, rideshare, multi-modal routes, staggered work hours, and HOV express lanes, may provide modest improvements in level of service (LOS) and may reduce vehicle miles traveled (VMT) within the project corridor. Year 2025 traffic projections along segments of the project corridor exceed 50,000 vehicles per day, a volume that warrants a four-lane roadway to achieve an acceptable LOS. As such, capacity improvements on the project corridor would still be required even with the most optimistic assumptions for trip diversions due to TDM implementation.

For the reasons stated above, it was determined that the TDM alternative would not address the project purpose and need. Therefore, the TDM alternative was dismissed from further consideration.

2.2.2.3 Corridor Alignment Alternatives

Three corridor alignment alternatives were identified and are described as follows:

1. Corridor alignment on the existing highway centerline.
2. Realignment of the US 160 project corridor north of its existing alignment, utilizing existing county road alignments (CR 223, CR 230, and CR 506) where possible.

3. Realignment of the US 160 project corridor south of its existing alignment, utilizing existing portions of CR 220, SH 172, and CR 510 where possible.

A 300-foot average ROW width was used for comparison of the three corridors. A 300-foot ROW would generally accommodate any of the typical section alternatives considered. Additional ROW would be required at some intersections and for some cut-and-fill slopes.

Existing Alignment Alternative

The US 160 project corridor would remain on its existing alignment and would incorporate existing US 160 ROW, which varies in width from 120 feet to 300 feet. Therefore, ROW acquisition would occur in areas adjacent to the existing US 160 ROW where additional ROW is necessary.

Land use along US 160 includes areas of commercial and residential development, as well as areas with primarily agricultural and rural residential use. The existing development along US 160 includes areas with urban densities in Grandview, Gem Village, and portions of Bayfield, as well as rural residential areas and undeveloped properties.

A reconstructed highway on the existing alignment designed to improve capacity, safety, and access would address the purpose and need. The environmental impacts associated with new river and stream crossings, and impacts to existing development, would be least if the US 160 project corridor remains essentially on its existing alignment.

The existing alignment alternative was advanced for detailed analysis in this EIS.

North Shift Alternative

The US 160 project corridor would be shifted 0.5 mile to 2 miles north of its existing alignment, and would include one or more of the county roads (CR 230, CR 223, and CR 506) that parallel US 160 within the project limits to minimize ROW acquisition. Impacts would result from widening and providing connections between these roadway corridors.

Existing county roads occupy about one-third of the 16.2-mile corridor, so this alternative would result in the development of previously undeveloped agricultural and residential properties throughout much of the project corridor. The county road ROW is typically 60 feet in width. Therefore, additional ROW acquisition would occur even in areas where county road ROW may be utilized.

The north shift alternative would provide adequate capacity, control access, and meet current design standards on the new alignment. However, the safety and access issues associated with the existing US 160 alignment would remain. The numerous closely spaced, uncontrolled full movement access points remaining on the existing US 160 alignment would continue to be a safety and access control issue. Therefore, this alternative fails to meet project purpose and need. In addition, this alternative would have more impacts to the natural environment than the existing alignment alternative. Construction of a major highway corridor through this relatively undeveloped area would result in the loss and segmentation of wildlife habitat, create major visual impacts from construction of a new roadway in a relatively undeveloped area, and require numerous residential relocations. Therefore, the north shift alternative was dismissed from consideration for further analysis.

South Shift Alternative

The US 160 project corridor would be shifted approximately 3 miles south of its existing alignment and would include portions of CR 220, SH 172, and CR 510 ROW that parallel US 160 within the project limits to minimize ROW acquisition to the extent possible. Impacts would result from widening and providing connections between these roadway corridors. The entire corridor would be relocated to within the external boundary of the SUIT Reservation.

SH 172 and CR 510 occupy about two-thirds of the 16.2-mile corridor. Development along the south shift is sparse and land use is primarily agricultural and rural residential. Constructing a new US 160 along this alignment would impact previously undeveloped agricultural and residential properties along approximately 6 miles of the new corridor. The CR 510 ROW is typically 60 feet in width and the SH 172 ROW is approximately 120 feet in width. Therefore, additional ROW would be needed even in areas where county road ROW may be utilized.

The south shift alternative would provide adequate capacity, control access, and meet current design standards on the new alignment. However, the safety and access issues associated with the existing US 160 alignment would remain. The numerous closely spaced, uncontrolled full movement access points remaining on the existing US 160 alignment would continue to be a safety and access control issue. Therefore, this alternative fails to meet project purpose and need. In addition, this alternative would have more impacts to the natural environment than the existing alignment alternative. Construction of a major highway corridor through this relatively undeveloped area would result in the loss and segmentation of wildlife habitat, create major visual impacts from construction of a new roadway in a relatively undeveloped area, and require numerous residential relocations. Therefore, the south shift alternative was dismissed from consideration for further analysis.

Corridor Alignment Alternatives Summary

The impacts to existing development and the natural environment would be least if the US 160 project corridor remains on its existing alignment. North and south alignment shifts would have the most impacts to the natural environment and do not meet the purpose and need for the project. Therefore, the north and south shift alignment alternatives were dismissed from further analysis. The existing alignment will be utilized to the extent possible as improvements are made to US 160. Minor shifts of the alignment will be considered where appropriate to minimize impacts.

2.2.3 Summary of Corridor Alignment Alternatives

A summary of the corridor alignment alternatives analysis is shown in Table 2.2.2, Summary of Corridor Alternatives. The No Action and Existing Alignment Alternatives were carried forward to the second screening.

**Table 2.2.2
Summary of Corridor Alternatives**

Alternative	Result	Reason(s)
No Action		
No Action	Carried Forward	The No Action Alternative must be considered to satisfy NEPA requirements and provide a baseline for comparison with the other alternatives.
Transportation System Management		
Signal Coordination	Dismissed	Signal coordination would not improve traffic flow to meet capacity requirements due to the large distance between intersections.
Intersection Improvements	Dismissed	Intersection improvements would not improve capacity or meet safety and access needs associated with corridor-length deficiencies. Intersection and interchange improvements would be included in the Feasibility Alternatives.
Access Control	Dismissed	Access control would not improve capacity or meet the safety and access needs associated with corridor-length deficiencies.
Transportation Demand Management		
Transit	Dismissed	Transit would not meet safety and access needs. Furthermore, transit would not sufficiently reduce demand to eliminate the need for capacity improvements.
Rideshare	Dismissed	Ridesharing would not meet safety and access needs. Furthermore, ridesharing would not reduce demand enough to eliminate the need for capacity improvements.
Multi-modal Routes	Dismissed	Multi-modal routes would not meet safety and access needs. Furthermore, multi-modal routes would not reduce demand enough to eliminate the need for capacity improvements.
HOV Express Lanes	Dismissed	HOV express lanes would not meet safety and access needs. HOV lanes would not remove enough traffic from the normal travel lanes to reduce the congestion to an acceptable LOS.
Corridor Alignment Alternatives		
Existing Alignment	Carried Forward	The existing alignment alternative meets the purpose and need and would have fewer environmental impacts than either the north shift or south shift alternatives. Minor north and south shifts for short highway segments will be considered.
North Shift	Dismissed	A north shift of the US 160 project corridor fails to meet the purpose and need because of the remaining safety and access control issues on the existing US 160 roadway. A north shift also has more impacts to the natural environment.
South Shift	Dismissed	A south shift of the US 160 project corridor fails to meet the purpose and need because of the remaining safety and access control issues on the existing US 160 roadway. A south shift also has more impacts to the natural environment.

2.2.4 Typical Sections

A typical section is the number of lanes, median widths, shoulder widths, side slopes, and other roadway elements commonly found on and adjacent to a highway. Four typical sections were considered for the project corridor. The options were a two-lane, three-lane, four-lane, and six-lane section. Access roads were considered where necessary to restore access. Auxiliary,

climbing, and weaving lanes were also considered where necessary. Each of the typical sections would be applied throughout the project corridor.

For all the typical sections, safety would be improved by the elimination of highway deficiencies during highway reconstruction. Adequate shoulders would be provided for disabled vehicles to pull out of the traveling lanes. The increased roadway width would allow drivers room to maneuver to avoid conflicts with other vehicles or animals. Adequate obstacle-free zones with gentle side slopes would be provided adjacent to the roadway, which would provide an opportunity for errant vehicles to recover without rolling or striking fixed objects. Highway design characteristics, such as sight distance, curve radii, and grades, would generally be improved.

Two-Lane Typical Section

The two-lane typical section would provide one 12-foot travel lane in each direction and 10-foot outside shoulders (see Figure 2.2.1, Two-Lane, Three-Lane, and Access Road Typical Sections). The ROW width required to accommodate this section is approximately 90 feet. Additional width would be necessary at intersections or where turn lanes are required. At intersections that provide right-turn and left-turn lanes for each travel direction, the approximate additional width would be 36 feet (126 feet total width). Additional width would also be necessary in hilly terrain where cut or fill slopes are necessary to minimize the highway grade.

The two-lane typical section would be an undivided highway (without medians), except at intersections where widening is necessary to accommodate a left-turn lane. Highway access outside of intersections would be unrestricted, with left turns allowed at all accesses to provide access to property owners along the corridor. Existing access would be maintained and no new access roads would be required.

Future 2025 traffic analysis indicates that a two-lane typical section would not satisfy the capacity need (Appendix A, Traffic Report). Therefore, the two-lane typical section does not meet the project purpose and need and was dismissed from further consideration.

Three-Lane Typical Section

The three-lane typical section would provide one 12-foot travel lane in each direction, a 12-foot center-passing lane, a 4-foot median between opposing travel lanes, and 10-foot outside shoulders (see Figure 2.2.1, Two-Lane, Three-Lane, and Access Road Typical Sections). The ROW width required to accommodate this section is approximately 104 feet. Additional width would be necessary at intersections or where turn lanes are required. At intersections that provide right-turn and left-turn lanes for each travel direction, some additional width may be required. Additional width would also be necessary in hilly terrain where cut or fill slopes are necessary to minimize the highway grade.

The three-lane typical section would have a center-passing lane designed for use by only one travel direction at a time. Directional assignment of the passing lane would be based on location-specific needs, such as climbing lanes. The passing lane would also serve as a left-turn lane at intersections. Highway access outside of intersections would be unrestricted, with left turns allowed at all accesses to provide access to property owners along the project corridor. Existing access would be maintained and no new access roads would be required.

Future 2025 traffic analysis indicates that a three-lane typical section would not satisfy the capacity need. Although the direction of travel with the passing lane would have an improved level of service, the single travel lane in the opposing direction would result in unacceptable levels of service. This is due to the inability to pass in the single lane of travel (Appendix A, Traffic Report). Therefore, the three-lane typical section does not meet the project purpose and need and was dismissed from further consideration.

Four-Lane Typical Section

The four-lane typical section would provide two 12-foot travel lanes in each direction, 10-foot outside shoulders, and 4-foot inside shoulders. The median width would vary from 10 feet to 46 feet. A 10-foot median would be used in conjunction with access roads through Gem Village [see Figure 2.2.2, Four-Lane Typical Section (Gem Village)]. Medians of 16 or 25 feet would be used in conjunction with curb, gutter, and a stormwater collection and treatment system to reduce ROW needs in the urban areas of Grandview and Bayfield (see Figure 2.2.3, Four-Lane Typical Section (Grandview and Bayfield)). A 46-foot median would be used at intersections and in rural areas to provide an adequate turning radius for tractor-trailer sized vehicles to negotiate U-turns, and to allow drainage into the median without impacting the roadway subgrade materials. A 36-foot median would be used in areas where U-turn movements are not allowed [see Figure 2.2.4, Four-Lane Typical Section (Depressed Median)]. The ROW width required to accommodate these typical sections is approximately 170 feet. Additional width would be necessary at intersections or where turn lanes are required. At intersections that provide right-turn and left-turn lanes for each travel direction, some additional width may be required. Additional width would also be necessary in hilly terrain where cut or fill slopes are necessary to minimize the highway grade.

With the exception of Grandview and Bayfield, highway access would generally be restricted to right-in/right-out, except at interchanges, intersections, and median openings, spaced at approximate 1-mile intervals where full-movement access would be permitted. The maximum out-of-direction travel for motorists wanting to make left-turn movements from a right-in/right-out access would be 2 miles. Access consolidation would be used where necessary to provide adequate spacing and meet CDOT and AASHTO requirements for public roadways. Where access is consolidated, access roads would be used to maintain access to properties. ~~In Bayfield, all ranges of access possibilities, as allowed under the code at the time, will be evaluated for access to the Little Pine River Park and Commerce Drive.~~ In Bayfield, the Commerce Drive and Little Pine River Park accesses will remain as full movement as long as they meet the state Highway access code (CDOT 2002) requirements and do not become a safety hazard.

Future 2025 traffic analysis indicates that a four-lane typical section would satisfy the project purpose and need for future highway capacity needs (Appendix A, Traffic Report). From the west project limit to the US 160/US 550 (south) intersection, a westbound auxiliary lane and an eastbound climbing lane would be required. A westbound auxiliary lane would be required to allow for safe merging of traffic from US 160 to US 550 (south) and to prevent conflicts with weaving movements of vehicles traveling west. An eastbound climbing lane is needed to prevent traffic congestion related to slow moving vehicles in an eastbound direction.

Six-Lane Typical Section

The six-lane typical section would be the same as the four-lane typical section, with an additional 12-foot travel lane in each direction. The median widths would vary from 10 feet to 46 feet in the same locations as described in the four-lane section. The ROW width required to accommodate this typical section is approximately 190 feet. Additional width would be necessary at intersections or where turn lanes are required. At intersections that provide right-turn and left-turn lanes for each travel direction, some additional width may be required. Additional width would be necessary in hilly terrain where cut or fill slopes are necessary to minimize the highway grade.

Future 2025 traffic analysis indicates that a six-lane typical section would satisfy the project purpose and need for future highway capacity needs (Appendix A, Traffic Report). However, this alternative was not carried forward because the additional impacts expected from the six-lane typical section are not justified when compared to the four-lane typical section that also meets purpose and need.

Access Roads

Access roads were considered in the US 160 project corridor to reduce the number of areas where turning movements conflict. This reduction would increase the safety for all traffic on US 160, as well as traffic entering and exiting the highway. Access roads would be provided in locations throughout the project corridor as necessary to consolidate multiple accesses. In some areas, access roads would utilize existing county roads or local streets. The access roads would consist of one 12-foot travel lane in each direction and 6-foot outside shoulders (see Figure 2.2.1, Two-Lane, Three-Lane, and Access Road Typical Section).

The access roads are intended to address access, not capacity needs, and were therefore not included in the traffic analysis. However, if included in an alternative, the potential environmental impacts of access roads were considered in this EIS.

Typical Section Summary

In summary, the two-lane and three-lane typical sections were dismissed from further consideration because they would not meet the capacity need for the project corridor. The six-lane and four-lane sections would meet the capacity need. The six-lane section was not carried forward because of additional impacts expected over the four-lane typical section. The four-lane section would be utilized throughout the project corridor, with auxiliary and climbing lanes considered as needed. Access roads would be utilized where necessary to restore access to properties.

2.3 FEASIBILITY ALTERNATIVES

In developing the Feasibility Alternatives, the project corridor was divided into 12 numbered sections due to the wide range of conditions that exist along the US 160 project corridor. These conditions include variable topography, land use, type and density of development, existing highway improvements, access, traffic volumes, and environmental constraints. Alternatives within each section were assigned a letter designation (A, B, C, etc.) in conjunction with a

section number designation (e.g., Alternative 1G, Alternative 2C, etc.). Figures 2.3.1 and 2.3.2 show the Feasibility Alternatives by section.

The existing alignment alternative carried forward from the Corridor Alternatives screening was the basis for the development of the Feasibility Alternatives. However, minor shifts of the alignment were considered in several sections. Some of the Feasibility Alternatives originated from the feasibility study and EA phases of this project. Because of land use/development changes that occurred in the corridor between the EA and the DEIS, many of these alternatives no longer meet purpose and need or would result in substantial environmental consequences. For this reason, an additional screening was performed to determine which of the Feasibility Alternatives were no longer reasonable and which should be advanced to the Preliminary Alternatives stage.

2.3.1 Feasibility Alternatives Screening Criteria

After development of the Feasibility Alternatives, each alternative was evaluated using purpose and need and unacceptable impacts to the social or natural environment as the screening criteria. These criteria and a description are shown in Table 2.3.1, Feasibility Alternative Screening Criteria. A summary of the Feasibility Alternatives analysis is shown on page 2-27 in Table 2.3.2, Summary of Feasibility Alternatives Screening. Feasibility Alternatives that met purpose and need and had no unacceptable impacts to the social or natural environment were advanced to the next phase of analysis. Alternatives not advanced were considered to be unreasonable and not practicable.

**Table 2.3.1
Feasibility Alternative Screening Criteria**

Criterion	Description
Capacity	Provide a 2025 peak hour LOS D for urban highway sections and LOS C for rural highway sections.
Safety	Improve existing design and safety deficiencies to current standards and not create an unsafe condition by increasing conflict opportunities between vehicles, vehicles and wildlife, or between vehicles and other objects.
Access control	Meet or exceed the minimum CDOT, FHWA, and AASHTO spacing, access, and operational requirements.
Unacceptable environmental or social impacts as compared to other alternatives	Unacceptable environmental or social impacts were identified as broad impacts to the undisturbed natural environment, impacts to the aquatic ecosystem double that of other alternatives, or broad community disruption to residential neighborhoods and important community centers.

Unacceptable impacts to the social or natural environment are based on logistics and ~~the environmental consequences of~~ practicability in terms of environmental consequences. The impacts were looked at on a gross scale and considered broad impacts to the undisturbed natural environment, impacts to the aquatic ecosystem double that of other alternatives, or broad community disruption to residential neighborhoods and important community centers such as the new Mercy Medical Center.

2.3.2 Feasibility Alternatives

Existing conditions, Feasibility Alternatives, and the screening results for each of the 12 sections are described in the following paragraphs.

2.3.2.1 Section 1 – US 550 from CR 220 to US 160

Section 1 is US 550 from CR 220 to US 160 and includes the intersection with US 160. In this section, US 550 is a two-lane roadway. From the intersection with CR 220, US 550 proceeds northwest along the western edge of the Florida Mesa. At the approach to US 160, US 550 transitions to three lanes. The US 160/US 550 (south) intersection is signalized. Wilson Gulch runs parallel to US 160 and crosses US 160 just west of the US 160/US 550 (south) intersection.

Section 1 Feasibility Alternatives

Eight Feasibility Alternatives were evaluated in Section 1. Two alternatives, 1A and 1B, would remain on the existing US 550 alignment. Due to the geometry of the existing US 160 alignment, both of these alternatives have a 40 mph design speed and up to 6 percent grades. At the US 160/US 550 (south) intersection, Alternative 1A would be an interchange, while Alternative 1B would be an intersection.

The remaining six alternatives within Section 1 would be located to the east of the existing US 550 alignment on the Florida Mesa. They vary in alignment and the interchange location with US 160. They all have a 46-foot median, 60 mph design speed, a maximum grade of 4 percent, and an interchange where they connect to US 160.

Alternatives 1C, 1D, 1F, and 1F Modified would each cross the top of the Florida Mesa east of the existing US 550 alignment. There is no Feasibility Alternative 1E. Alternative 1C would connect to US 160 approximately 0.5 mile east of the existing US 160/US 550 (south) intersection. Alternative 1D would connect to US 160 approximately 1.0 mile east of the existing US 160/US 550 (south) intersection. Alternative 1F would cross CR 232 before connecting to US 160 approximately 1.5 miles east of the existing US 160/US 550 (south) intersection. Alternative 1F Modified would connect to US 160 at CR 233 (west), approximately 1.5 miles east of the existing US 160/US 550 (south) intersection.

Alternatives 1G and 1G Modified would be east of the existing US 550 alignment, but located along the western edge of the Florida Mesa. Alternative 1G would connect to US 160 approximately 0.5 mile east of the existing US 160/US 550 (south) intersection. Alternative 1G Modified would connect to US 160 approximately 0.6 mile east of the existing US 160/US 550 (south) intersection.

Section 1 Screening

Alternative 1B was eliminated because the proposed intersection would operate at LOS F and therefore not meet the capacity need. In alternatives 1C, 1D and 1F, the US 160/US 550 (south) interchange would require all US 550 traffic entering and exiting the Grandview area to be directed onto US 160 west of CR 233 (west). The distance between the US 160/US 550 (south) interchange and CR 233 (west) for these alternatives is too short to safely accommodate the conflicting vehicle movements required by the US 160 main lanes, the US 550 eastbound ramp, and traffic exiting to Grandview. This creates an unsafe condition, which does not meet the safety need. Alternatives 1A, 1G, 1G Modified and 1F Modified avoid creating an unsafe

condition because there is at least a mile between the US 160/US 550 (south) interchange and CR 233 (west) or there is a direct connection into Grandview that does not require ramping and weaving on US 160. Alternatives 1C, 1D and 1F were eliminated for this reason. Alternative 1C was also eliminated because it has poor geometry, and sharp, low-speed curves. Alternative 1G meets purpose and need. However, 1G was changed to 1G Modified because moving the alignment slightly to the east allowed for a better approach grade to US 160, impacts one less business, and reduces impacts to wildlife habitat by approximately 5 acres. Alternative 1G was not carried forward for further analysis because it is essentially the same alternative as 1G Modified with more environmental impacts and a steeper approach grade. The remaining three alternatives (1A, 1F Modified, and 1G Modified) meet the purpose and need and were advanced for further analysis.

2.3.2.2 Section 2 – West Project Limit to CR 232 (west)

Section 2 is US 160 from MP 87.5 to MP 89.4, not including the US 160/US 550 (south) intersection. US 160 is four lanes from the west project limit to the US 160/US 550 (south) intersection. There are two eastbound lanes, a single westbound lane, and a continuous left turn lane from US 550 that becomes a westbound through lane. From the US 550 (south) intersection to the CR 232 (west) intersection, US 160 has two eastbound lanes and one westbound lane, for a total of three lanes. Access roads would be required at the east end of this section.

Section 2 Feasibility Alternatives

Two Feasibility Alternatives, 2D and 2E, were evaluated in Section 2. There are no alternatives 2A, 2B, and 2C.

In Alternative 2D, US 160 would remain on the existing alignment. A 36-foot median would be used to separate opposing travel lanes. In Alternative 2E, US 160 would be realigned north of the existing alignment through the Grandview area. A 46-foot median would be used to separate opposing travel lanes.

Section 2 Screening

Although both alternatives in Section 2 meet the purpose and need, Alternative 2E would be located on a new alignment through the Grandview area. This new alignment would result in proximity impacts to a 212,000-square-foot new regional hospital and a 155,000-square-foot medical office building currently being built in the Grandview area. Alternative 2E would also result in impacts to the proposed Three Springs Development in the Grandview area including a medium-density residential development and associated infrastructure (water, sewer, utilities) that are already underway. Wetlands associated with Wilson Gulch with high functional value for wildlife habitat and sediment and nutrient retention would also be impacted by the new alignment through undisturbed portions of the gulch. Alternative 2E has unacceptable social and environmental impacts and therefore is considered not to be practicable or reasonable. It also has greater wetland impacts as compared to Alternative 2D, which would remain on the existing US 160 alignment. Therefore, Alternative 2E was eliminated and Alternative 2D advanced for further analysis.

2.3.2.3 Section 3 – CR 232 (west) to SH 172/CR 234

Section 3 is from MP 89.4 to MP 91.2. US 160 is a four-lane roadway in this section. The US 160/CR 233 (west) intersection is signalized, with left-turn lanes on all legs. Access roads would be constructed throughout this section.

Section 3 Feasibility Alternatives

Nine Feasibility Alternatives were evaluated in Section 3. Four alternatives, 3A, 3B, 3D, and 3G, would realign US 160 to the north. In Alternative 3A, US 160 would be realigned approximately 800 feet to the north onto CR 233. In Alternative 3B, US 160 would be realigned approximately 400 feet to the north, between CR 233 and the existing US 160. In this alternative, CR 233 and the existing US 160 would become access roads. Alternative 3D would be the same as Alternative 3B, with the addition of right-in/right-out access allowed at the US 160/CR 232 (west) intersection. A 25-foot median would be used to separate opposing travel lanes in all the alternatives.

Alternatives 3E and 3G would shift the existing alignment slightly. Alternative 3E would be widened to the south, and Alternative 3G would be widened to the north. For both alternatives, continuous access roads would be constructed both north and south of the highway. A 25-foot median would be used to separate opposing travel lanes. Signalized intersections would be constructed at both ends of the alignment, with right-in/right-out access allowed at the US 160/CR 232 (west) intersection.

Alternative 3F would be a split one-way pair. The eastbound lanes would be on the existing US 160 alignment. The westbound lanes would be approximately 400 feet to the north between CR 233 and the existing US 160. Signalized intersections would be constructed at both ends of the alignment.

Alternatives 3C, 3H, and 3I would all remain on the existing US 160 alignment. Alternative 3C would have a 25-foot median. A signalized intersection would be constructed at CR 233 (west), and right-in/right-out access would be allowed at the CR 232 (west) intersection. Alternative 3H would have a 16-foot median. A single-point urban intersection would be constructed at CR 233 (west). Alternative 3I would be the same as Alternative 3H, except that there would be a single-point urban interchange at CR 233 (west).

Section 3 Screening

Alternatives 3A, 3B, 3C, 3D, 3E, 3F, 3G, and 3H were eliminated because the intersections proposed in each of these alternatives would operate at LOS F and not meet the capacity need. Alternative 3I, a single-point urban interchange, would meet the purpose and need and was advanced for further analysis.

2.3.2.4 Section 4 – SH 172/CR 234 Intersection

Section 4 is the intersection of US 160 with SH 172/CR 234. The existing signalized intersection is situated east of Grandview atop the Florida Mesa, with SH 172 extending to the south and CR 234 extending to the north. SH 172 and CR 234 provide access to the Florida Mesa area, the Durango-La Plata County Airport, and the town of Ignacio. These roads link several residential areas to the north and provide a connection to CR 240, an important alternate route into Durango.

On US 160, there are four lanes at the intersection. East of the intersection, US 160 transitions to a two-lane highway. West of the intersection, there is a center turn lane in addition to the four lanes. SH 172 and CR 234 are both two-lane roads at the intersection with US 160. There are left-turn lanes in both directions on US 160 and two on SH 172. Crestview Memorial Gardens is located in the southwest corner of the SH 172/CR 234 intersection with US 160.

Section 4 Feasibility Alternatives

Seven Feasibility Alternatives were evaluated in Section 4. The alternatives ranged from a signalized intersection to a single-point urban interchange. All the alternatives would have access roads. Two new intersections would be created where the access roads connect to SH 172 and CR 234.

Three of the alternatives include signalized intersections. Alternative 4A would be an intersection at the existing SH 172/CR 234 intersection location. All four legs of the intersection would have left- and right-turn lanes, with double left-turn lanes on SH 172. Alternative 4D would be the same intersection as Alternative 4A, except shifted 1,400 feet to the west. Alternative 4E would also be the same intersection as Alternative 4A, but shifted 500 feet to the east. There is no Alternative 4B.

Alternative 4C would be a diamond interchange at the existing intersection of US 160 with SH 172/CR 234.

Alternatives 4F, 4G, and 4H would be single-point urban intersections or interchanges. Alternative 4G would be a single-point urban intersection at the existing intersection of US 160 with SH 172/CR 234. Alternative 4F would be a single-point urban intersection shifted 500 feet to the north. Alternative 4H would be a single-point urban interchange at the existing intersection of US 160 with SH 172/CR 234.

Section 4 Screening

Alternatives 4A, 4D, 4E, 4F, and 4G were eliminated because the intersections proposed in each of these alternatives would operate at LOS F and therefore fail to meet the capacity need. Alternative 4C meets the purpose and need. However, the proposed diamond interchange, Alternative 4C, would have a larger footprint than Alternative 4H, a single-point urban interchange. Alternative 4H operates better than Alternative 4C and would have the same or less environmental impacts than 4C. Therefore, Alternative 4C was eliminated and Alternative 4H was advanced for further analysis.

2.3.2.5 Section 5 – SH 172/CR 234 to CR 222/CR 223 (west)

Section 5 is from MP 91.8 to MP 92.8. In this section, US 160 is a two-lane highway through a predominantly rural area. However, several residential developments and businesses have developed in recent years, primarily along the south side of US 160.

Section 5 Feasibility Alternatives

Three alternatives, 5A, 5B, and 5C, were initially considered in this section. Alternative 5A would remain centered on the existing alignment, Alternative 5B would be shifted to the north, and Alternative 5C would be shifted to the south. For all the alternatives, continuous access roads would be constructed both north and south of the highway. Medians of 46 feet would be

used to separate opposing travel lanes in all alternatives. These three alternatives were combined into one alternative that avoided residential structures on the north side of US 160 and the Griffin Dairy Farm complex on the south side of US 160. The barn on the farm property has been determined eligible for the National Register of Historic Places (NRHP). The combined alternative is referred to as Alternative 5A.

Section 5 Screening

Alternative 5A meets the purpose and need and will be advanced for further analysis.

2.3.2.6 Section 6 – CR 222/CR 223 (west) Intersection

Section 6 is from MP 92.8 west of the CR 222/CR 223 (west) intersection with US 160 to east of the Florida River at MP 94.2. Land use is mostly rural. However, there are several homes along CR 222 and CR 223 near US 160, and there are three gas wells in the Florida River valley a short distance from the highway.

The CR 222/CR 223 (west) intersection with US 160 is an unsignalized intersection. The existing geometric characteristics at this intersection make some of the turning movements undesirable. Both county roads climb from the Florida River valley to the top of the Florida Mesa, parallel to US 160 until they intersect with it at a sharp angle. This makes it difficult to see oncoming US 160 traffic. US 160 has a steep grade from the CR 222/CR 223 (west) intersection east to the Florida River valley. The grade and vertical curve contribute to the inadequate sight distance condition at the CR 222/CR 223 (west) intersection.

Section 6 Feasibility Alternatives

Five Feasibility Alternatives were evaluated in Section 6. All of the alternatives would remain on the existing US 160 alignment and would use a 46-foot median to separate opposing travel lanes. The alternatives differ in their treatment of the CR 222/CR 223 (west) intersection with US 160.

All of the alternatives would realign CR 222 and CR 223 and connect to US 160 in new locations. Alternatives 6A, 6B, and 6C would construct new intersections with US 160. In Alternative 6A, CR 222 and CR 223 would be realigned and connected to US 160 approximately 500 feet west of the existing CR 222/CR 223 (west) intersection with US 160. In Alternative 6B, CR 222 and CR 223 would be realigned and connect to US 160 approximately 2,900 feet east of the existing CR 222/CR 223 (west) intersection with US 160. In Alternative 6C, CR 222 and CR 223 would be realigned and connect with access roads on both sides of US 160. A new intersection with US 160 would be created approximately 4,500 feet east of the existing intersection. Because this intersection would be on the east side of the Florida River, new roadway connections would be made to CR 510 on the south and CR 223 on the north.

Alternatives 6D and 6E would construct new interchanges with US 160. In Alternative 6D, CR 222 and CR 223 would be realigned and connected to US 160 approximately 1,100 feet east of the existing CR 222/CR 223 (west) intersection with US 160. US 160 would go under the CR 222/CR 223 (west) intersection. In Alternative 6E, CR 222 and CR 223 would be realigned and connected to US 160 approximately 1,900 feet east of the existing CR 222/CR 223 (west) intersection with US 160. US 160 would go over the CR 222/CR 223 (west) intersection.

Section 6 Screening

All five alternatives in Section 6 meet the purpose and need and were advanced for further analysis.

2.3.2.7 Sections 7, 8, 9 – CR 222/CR 223 (west) to Gem Village

Sections 7, 8, and 9 were originally established as three separate sections due to differences in alignment characteristics. However, due to the similarities in land use, topography, and access issues, these three sections were analyzed together as a single highway section. These sections are on US 160 from MP 94.2 to MP 99.8.

Currently, this section is a two-lane, undivided highway for the entire length except where a third passing lane exists for eastbound traffic east of the Florida River, and a passing lane for westbound traffic west of Gem Village. Land use along this section is mostly rural with very low density, except for the growing residential development in the vicinity of Village East Road and along CR 223.

Section 7, 8, and 9 Feasibility Alternative

In Feasibility Alternative 7, 8, and 9A, US 160 would generally remain on its existing alignment, with improvements for curvature, grades, and sight distance. To minimize impacts to high quality wetlands, CR 223 would be realigned and connect to US 160 approximately 1,500 feet west of the existing US 160/CR 223 (east) intersection. In addition, a 36-foot median would be used from MP 98 to MP 99. A 46-foot median would be used in all other areas. Access roads would be provided on both sides of US 160 between MP 94 and 95, and on the north side of US 160 between MP 96 and MP 97 to consolidate direct highway access and reduce out-of-direction travel.

Section 7, 8, and 9 has only one Feasibility Alternative. Other alternatives, such as the nearby county roads, were considered in the north and south shift corridor alternatives. These alternatives were dismissed from further consideration because they did not meet purpose and need and would have unacceptable environmental impacts (see Section 2.2.2.3, Corridor Alignment Alternatives). Minor shifts of the alignment to avoid impacts in the Section 7, 8, and 9A alternative have been made as part of the design process. Examples of this process are access changes made to avoid impacts to the Narrow Gauge Mobile Home Park and moving CR 223 (east) to minimize wetland impacts.

Section 7, 8, and 9 Screening

Alternative 7, 8, and 9A meets the purpose and need and was advanced for further analysis.

2.3.2.8 Section 10 – Gem Village

Section 10 is from MP 99.8 west of Gem Village to MP 101.6 near the US 160/US 160B (west) intersection. The existing highway through Gem Village consists of a two-lane, undivided roadway with narrow frontage roads immediately adjacent to the highway on both sides. The frontage roads connect to US 160 at the east and west ends of Gem Village. The posted speed limit through Gem Village is 50 mph.

Section 10 Feasibility Alternatives

Eight Feasibility Alternatives were evaluated in Section 10. The alternatives fall into two categories — those that would stay on the existing alignment through Gem Village, and those that would bypass Gem Village on a new alignment. For the alternatives that stay on the existing alignment, a 10-foot median and 60 mph design speed is proposed. For the alternatives that bypass Gem Village, a 46-foot median and 70 mph design speed is proposed. The narrower median was used to reduce impacts to Gem Village.

Alternatives 10A, 10B, and 10C would all stay on the existing alignment through Gem Village. Alternative 10A is centered and would widen equally to both sides of US 160. Alternative 10B would widen to the north, and Alternative 10C would widen to the south. For all of these alternatives, access roads would be constructed on both sides of US 160 and full movement access would be provided at the west end of Gem Village.

Alternative 10E is the same as Alternative 10A, except that the access roads would be realigned to provide access at the back of the properties adjacent to the highway.

Alternatives 10D and 10H would realign US 160 and bypass Gem Village to the south. Both alternatives would leave US 160 on the west side of Gem Village near MP 100. Alternative 10D would rejoin US 160 at the US 160/US 160B (west) intersection. Alternative 10H would rejoin US 160 near MP 101. No access roads would be provided in either alternative. For both alternatives, full-movement access would be provided at the east end of Gem Village, and a one-way slip ramp would provide access for westbound traffic to US 160 at the west end of Gem Village.

Alternatives 10F and 10G would realign US 160 and bypass Gem Village to the north. Both alternatives would leave US 160 on the west side of Gem Village near MP 99. Alternative 10F would rejoin US 160 approximately 1,700 feet east of the existing US 160/US 160B (west) intersection. Alternative 10G would rejoin US 160 at the US 160/CR 506 intersection. No access roads would be provided for either alternative.

Section 10 Screening

All eight alternatives evaluated in Section 10 meet the purpose and need. However, Alternatives 10F and 10G would be on new alignments north of the existing US 160 and would have broad impacts to the undisturbed natural environment and would have approximately double the impacts to wetlands of other alternatives. These alternatives are not practicable or reasonable as compared to other alternatives carried forward that meet purpose and need, and have less impacts to wetlands and the natural environment.

The remaining six alternatives (10A, 10B, 10C, 10D, 10E, and 10H) were advanced for further analysis.

2.3.2.9 Section 11 – Gem Village to East Project Limit

Section 11 is from MP 101.6 east of the US 160/US 160B (west) intersection through the town of Bayfield to the east project limit at MP 104.2. In this area, US 160 consists primarily of a two-lane, undivided roadway with minimal shoulders. Several roads intersect the highway in this section, including US 160B (west), CR 506, CR 502, CR 501, Commerce Drive, and US 160B (east). The highway crosses the Los Pinos River just east of CR 502. Near CR 502 there is a

westbound climbing lane. Commerce Drive, located approximately 1,900 feet east of CR 501, is the primary access to the commercial areas north of US 160.

Section 11 Feasibility Alternative

Only one alternative was evaluated in Section 11. Alternative 11A would remain on the existing alignment, with improvements for curvature, grades, and sight distance. It would consolidate three closely spaced intersections [US 160B (west), CR 506, and CR 502] into a single intersection. CR 502 would be realigned and connected to US 160 approximately 1,500 feet west of the existing US 160/CR 502 intersection. The realigned CR 502 would intersect CR 506 north of US 160 and continue south of US 160 to intersect with US 160B. This realignment would eliminate both of the existing US 160 intersections with CR 502 and CR 506. Access to US 160B would be maintained through an access road on the south side of US 160.

Section 11 has only one Feasibility Alternative. Other alternatives, such as the nearby county roads, were considered in the north and south shift corridor alternatives. These alternatives were dismissed from further consideration because they did not meet purpose and need and would have unacceptable environmental impacts (see Section 2.2.2.3, Corridor Alignment Alternatives). Minor shifts of the alignment to avoid impacts in the Section 11 alternative have been made as part of the design process.

Section 11 Screening

Alternative 11A meets the purpose and need and was advanced for further analysis.

2.3.2.10 Section 12 – CR 501 Intersection

The US 160/CR 501 intersection is located in the town of Bayfield and is key to the town's circulation, access, and connectivity across US 160. The existing signalized intersection has acceleration/deceleration lanes, left-turn lanes, and right-turn lanes.

The operation of the intersection is directly affected by the intersections of US 160B/CR 501 and US 160B/CR 521, which are located approximately 300 feet south of US 160. These two T-intersections are approximately 150 feet apart. The predominant movement through these intersections is in the north/south direction, which results in a dogleg movement. Poor operation of these intersections during peak periods results in delays when crossing or exiting US 160.

Section 12 Feasibility Alternatives

Two Feasibility Alternatives, 12A and 12B, were considered at the US 160/CR 501 intersection. In Alternative 12A, CR 501 would be realigned and connected to US 160 approximately 800 feet west of the existing US 160/CR 501 intersection. This new intersection with US 160 would be a diamond interchange. From US 160 to the US 160B/CR 521 intersection, the existing CR 501 would be eliminated.

In Alternative 12B, the US 160/CR 501 intersection would remain a signalized intersection at its present location. The intersections of US 160B/CR 501 and US 160B/CR 521 would be reconstructed as a roundabout.

Section 12 Screening

Alternatives 12A and 12B meet the purpose and need and were advanced for further analysis.

2.3.3 Summary of Feasibility Alternatives

The majority of Feasibility Alternatives eliminated in the second screening did not meet purpose and need, primarily due to an inadequate level of service. This is because intersections in the Grandview area would not provide enough capacity to meet the traffic demand. A summary of the Feasibility Alternatives and the screening criteria is shown in Table 2.3.2, Summary of Feasibility Alternatives Screening.

**Table 2.3.2
Summary of Feasibility Alternatives Screening**

Section/Alternative	Purpose and Need			Unacceptable Environmental/ Social Impacts	Screening Result
	Capacity/LOS	Safety	Access Control		
1A	Yes	Yes	Yes	None	Carried Forward
1B	No	Yes	Yes	None	Dismissed
1C	Yes	No	Yes	None	Dismissed
1D	Yes	No	Yes	None	Dismissed
1F	Yes	No	Yes	None	Dismissed
1F Modified	Yes	Yes	Yes	None	Carried Forward
1G	Yes	Yes	Yes	None	Dismissed – similar to 1G Modified but has greater impacts
1G Modified	Yes	Yes	Yes	None	Carried Forward
2D	Yes	Yes	Yes	None	Carried Forward
2E	Yes	Yes	Yes	Environmental and Social	Dismissed
3A	No	Yes	Yes	None	Dismissed
3B	No	Yes	Yes	None	Dismissed
3C	No	Yes	Yes	None	Dismissed
3D	No	Yes	Yes	None	Dismissed
3E	No	Yes	Yes	None	Dismissed
3F	No	No	Yes	None	Dismissed
3G	No	Yes	Yes	None	Dismissed
3H	No	Yes	Yes	None	Dismissed
3I	Yes	Yes	Yes	None	Carried Forward
4A	No	Yes	Yes	None	Dismissed
4C	Yes	Yes	Yes	None	Dismissed – similar to 4H but has greater impacts
4D	No	Yes	Yes	None	Dismissed
4E	No	Yes	Yes	None	Dismissed
4F	No	Yes	Yes	None	Dismissed
4G	No	Yes	Yes	None	Dismissed
4H	Yes	Yes	Yes	None	Carried Forward
5A	Yes	Yes	Yes	None	Carried Forward

**Table 2.3.2
Summary of Feasibility Alternatives Screening**

Section/Alternative	Purpose and Need			Unacceptable Environmental/ Social Impacts	Screening Result
	Capacity/LOS	Safety	Access Control		
6A	Yes	Yes	Yes	None	Carried Forward
6B	Yes	Yes	Yes	None	Carried Forward
6C	Yes	Yes	Yes	None	Carried Forward
6D	Yes	Yes	Yes	None	Carried Forward
6E	Yes	Yes	Yes	None	Carried Forward
7, 8, and 9A	Yes	Yes	Yes	None	Carried Forward
10A	Yes	Yes	Yes	None	Carried Forward
10B	Yes	Yes	Yes	None	Carried Forward
10C	Yes	Yes	Yes	None	Carried Forward
10D	Yes	Yes	Yes	None	Carried Forward
10E	Yes	Yes	Yes	None	Carried Forward
10F	Yes	Yes	Yes	Environmental	Dismissed
10G	Yes	Yes	Yes	Environmental	Dismissed
10H	Yes	Yes	Yes	None	Carried Forward
11A	Yes	Yes	Yes	None	Carried Forward
12A	Yes	Yes	Yes	None	Carried Forward
12B	Yes	Yes	Yes	None	Carried Forward

2.4 PRELIMINARY ALTERNATIVES

In the third screening, the 12 sections identified previously were grouped into four sections. This simplified the alternatives analysis and allowed for analysis in natural geographic areas. The Feasibility Alternatives carried forward from the second screening were then combined in each of the four sections to create the Preliminary Alternatives. Alternatives within each section were assigned a letter designation (A, B, C, etc.) in conjunction with a section name (e.g., Grandview Alternative G, Bayfield Alternative B, etc.). The letter designation was retained from the Feasibility Alternative carried forward from the second screening.

2.4.1 Preliminary Alternative Screening Criteria

In the third level screening, the Preliminary Alternatives were evaluated based on NEPA and Section 404(b)(1) criteria. The criteria for the US 160 project were adapted from the Section 404(b)(1) merger agreement between CDOT, FHWA, and the USACE. The criteria are divided into three main categories — Logistics, Cost, and Environmental Consequences. Criteria within these categories, such as relocations and wetland impacts, were chosen based on their importance in the project area and distinguishing characteristics.

For each criteria, a measure for comparing alternatives was developed. Each criterion and the associated measure are shown in Table 2.4.1, Preliminary Alternatives Screening Criteria. The Preliminary Alternatives were evaluated for reasonableness and practicability based on the data

collected. The reasonable and practicable Preliminary Alternatives were advanced for detailed evaluation in this EIS.

**Table 2.4.1
Preliminary Alternatives Screening Criteria**

Screening Category	Criterion Description	Rationale/Basis for Screening Criterion
Practicability – Logistics		
	L1 Construction mobility	Maintain access and provide mobility during construction.
	L2 Social feasibility	Avoid and minimize impacts to minority and low-income households, community cohesion, residences, and businesses as compared to other alternatives.
Practicability – Cost		
	C1 Estimated construction cost	The estimated cost should not be substantially greater than other alternatives or similar projects.
Environmental Consequences		
	EC2 Aquatic ecosystem	Avoid and minimize impacts to the aquatic ecosystem as compared to other alternatives. An alternative may be screened if there is a similar alternative that performs the same function but has a better opportunity to avoid and minimize direct and indirect impacts to the aquatic ecosystem.
	EC3 Natural environment	Avoid and minimize impacts to the natural environment, such as drainage, native soils, or wildlife habitat. To advance, an alternative must not result in unacceptable environmental impacts to the natural environment as compared to other alternatives that perform the same function with less impacts to the environment.

Within each criterion, data for each Preliminary Alternative were collected to equally compare the alternatives. For construction mobility, the ease of traffic movement during construction was considered. Impacts to this criterion were considered to be major or minor. For social feasibility, the number of residential and business relocations were estimated. Community cohesion, public input, and major constraints were also considered in this criterion. For cost, the construction cost was estimated and compared for order of magnitude differences. The estimated construction cost does not include ROW acquisition costs. For the aquatic ecosystem, the quantity of wetlands and waters of the US was estimated. This estimate included all potential wetlands and waters of the US, regardless of jurisdictional status. For the natural environment criterion, two different quantities, irrigated farmland and wildlife habitat, were used. These two quantities were selected because of their importance in the project corridor.

2.4.2 Preliminary Alternatives

Existing conditions, Preliminary Alternatives, and the screening results for each of the four sections are described in the following paragraphs.

2.4.2.1 Grandview Section (Sections 1 - 4)

The Grandview section contains US 160 from the west project limit to the SH 172/CR 234 intersection and US 550 from CR 220 to US 160. This section includes Grandview and Farmington Hill, and the Three Springs Development.

Feasibility Alternatives 2D, 3I, and 4H were the only alternatives carried forward in their respective sections. As a result, the Preliminary Alternatives vary only in the Feasibility Alternatives in the Grandview section carried forward from Section 1. These alternatives varied in the location of the US 160/US 550 (south) interchange. The three Preliminary Alternatives in the Grandview section are Preliminary Alternatives A, F Modified, and G Modified. The interchange location varies from the existing US 160/US 550 (south) intersection in Preliminary Alternative A to the existing US 160/CR 233 (west) intersection in Preliminary Alternative F Modified.

2.4.2.2 Grandview Section Screening

Because it would remain on the existing US 550 alignment, Preliminary Alternative A would have the least impacts to the irrigated farmlands of the Florida Mesa. However, Alternative A is not considered to be practicable because of constructability logistics. In the other Preliminary Alternatives, the new US 550 could be constructed without disruption to the existing US 550 traffic. Alternative A, however, would require detouring of traffic onto CR 220. CR 220 parallels US 160 approximately 1 mile to the south and is a narrow county road with poor sight distance, no shoulders, and numerous access points for residential driveways. Under Alternative A, CR 220 would have to be reconstructed and new signals would have to be installed at the CR 220/US 550 and CR 220/SH 172 intersections. Conflicts with through-moving traffic and residential driveways on CR 220 would create unsafe conditions during construction. In addition, Alternative A would not be considered to be the least damaging to the environment because it has greater impacts to wetlands than several of the other alternatives (Table 2.4.2). Alternative A was also not considered to be a reasonable alternative because it has very poor geometry which combines 6 percent grades, sharp curves and maximum super-elevation on a north-facing slope that will create icing conditions and hazards in the winter. It also requires excavation in an area of known subsurface water problems, which may create drainage and possible slope instabilities. Because of these reasons, Alternative A was not considered to be reasonable or practicable and was dismissed from further consideration.

Preliminary Alternative F Modified would have the most impacts to wetlands compared to the other preliminary alternatives because it crosses the Florida Farmers' Ditch. It was carried forward for detailed analysis because it is a reasonable alternative that has less wildlife habitat impacts than other alternatives carried forward. Preliminary Alternative G Modified was advanced as it has the least impact to the aquatic ecosystem and is reasonable. Therefore, Preliminary Alternatives F Modified and G Modified were advanced for further analysis.

2.4.2.3 Florida Mesa and Valley Section (Sections 5 and 6)

The Florida Mesa and Valley section is US 160 from the SH 172/CR 234 intersection to the CR 222/CR 223 (west) intersection near the Florida River.

One Feasibility Alternative, 5A, was carried forward from Section 5. As a result, the Preliminary Alternatives in the Florida Mesa and Valley section differ only in the Section 6

Feasibility Alternatives carried forward and their treatment of the CR 222/CR 223 (west) intersection with US 160. The five Preliminary Alternatives in this section are Preliminary Alternatives A, B, C, D and E. Preliminary Alternative A would realign the intersection to the west, Preliminary Alternative B would align the intersection adjacent to the Florida River to the west, Preliminary Alternative C would align the intersection approximately 4,500 feet east of the current intersection location, Preliminary Alternative 6D would be an interchange approximately 1,100 feet east of the existing intersection, and Preliminary Alternative 6E would be an interchange approximately 1,900 feet east of the existing intersection with US 160.

2.4.2.4 Florida Mesa and Valley Section Screening

Preliminary Alternative B has the least impacts to residential relocations as compared to the other preliminary alternatives. Alternative B also has less acres of impact to the aquatic ecosystem, irrigated farmlands and wildlife habitat than several of the other preliminary alternatives. Preliminary Alternative B, however, would impact the riparian area next to the Florida River, which is an important bald eagle winter concentration area and contains Southwestern willow flycatcher habitat. Because of the legal protection placed on these species and their habitat under the Endangered Species Act, this alternative was not considered to be practicable and reasonable as compared to the other alternatives. In addition, Alternative B would relocate the CR 222/CR 223 (west) intersection with US 160 to the bottom of a hill with a 4 percent grade, which would cause a problem for vehicles coming to a stop at the intersection in icy, winter conditions. For these reasons, Preliminary Alternative B was dismissed from further consideration.

Preliminary Alternatives D and E were also dismissed from further consideration. Preliminary Alternatives D and E would have the most impacts to the aquatic ecosystem. Because of impacts to the aquatic ecosystem, these alternatives were not considered to be practicable. Alternatives D and E were also not considered to be reasonable because of other impacts and constructability issues including a higher number of residential relocations, greater costs and higher impacts to wildlife habitat and irrigated farmlands. These alternatives would also require relocation of natural gas wells. For these reasons, Preliminary Alternatives D and E were dismissed from further consideration.

Preliminary Alternatives A and C were carried forward for detailed analysis. These alternatives have the least environmental impacts to the aquatic ecosystem and less impacts to wildlife habitat than the other alternatives eliminated from further consideration.

2.4.2.5 Dry Creek and Gem Village Section (Sections 7 - 10)

The Dry Creek and Gem Village section is US 160 from the CR 222/CR 223 (west) intersection to the east side of Gem Village near the US 160/US 160B (west) intersection.

One Feasibility Alternative was advanced in Section 7, 8, and 9. As a result, the Preliminary Alternatives in the Dry Creek and Gem Village section vary only in the Feasibility Alternatives carried forward from Section 10, or how the alternatives go through Gem Village. The six Preliminary Alternatives in the Dry Creek and Gem Village section are Preliminary Alternatives A, B, C, D, E, and H. Preliminary Alternatives A, B, C and E would remain on the existing US 160 alignment. Preliminary Alternatives D and H would bypass Gem Village on the south.

2.4.2.6 Dry Creek and Gem Village Section Screening

Preliminary Alternatives D and E would have the most impacts to wetlands of all the alternatives in this section. These alternatives were not considered to be practicable and were eliminated from further consideration because of environmental consequences. Preliminary Alternatives A, B, and C would all have the least impacts to the aquatic ecosystem and irrigated farmlands because they would remain on the existing US 160 alignment. However, these alternatives have the most business and residential relocations and impact community cohesion. Because it would have the least impacts of the alternatives through Gem Village, Preliminary Alternative C was carried forward for further analysis. Alternatives A and B were not considered to be practicable or reasonable because of their social impacts.

Of the Preliminary Alternatives that bypass Gem Village, Preliminary Alternative H would have ten fewer residential and three fewer business relocations than Preliminary Alternative D and would impact less acres of wetlands. Preliminary Alternative D was not considered to be practicable because it has the greatest impact to wetlands and has a higher number of residential relocations compared to Preliminary Alternatives C, E and H. In addition, Preliminary Alternative D was not considered to be a reasonable alternative as compared to Preliminary Alternative H because it would require relocating the Bayfield Sewage Treatment Plant and associated piping, and relocating a natural gas well. Relocating the Bayfield Sewage Treatment Plant and natural gas well would result in additional costs and problems not associated with other alternatives. For these reasons, Preliminary Alternative D was not advanced, but Preliminary Alternative H was advanced for further analysis.

2.4.2.7 Bayfield Section (Sections 11 and 12)

The Bayfield section is US 160 from near the US 160/US 160B (west) intersection on the western side of Bayfield to the east project limit.

One Feasibility Alternative, 11A, was carried forward from Section 11. As a result, the Preliminary Alternatives in the Bayfield section differ only in the Section 12 Feasibility Alternatives carried forward. The two Preliminary Alternatives in this section are Preliminary Alternatives A and B, and differ in their treatment of the US 160/CR 501 intersection. In Preliminary Alternative A, the US 160/CR 501 intersection would be improved to a diamond interchange. In Preliminary Alternative B, the US 160/CR 501 intersection would remain a signalized intersection at its present location.

2.4.2.8 Bayfield Section Screening

Both Preliminary Alternatives in the Bayfield section would have three residential and no business relocations. Impacts to construction mobility were considered minor in both alternatives. Preliminary Alternative B would have fewer impacts to the aquatic ecosystem, irrigated farmland, and wildlife habitat.

Both Preliminary Alternatives in the Bayfield section were advanced for detailed analysis.

2.4.3 Summary of Preliminary Alternatives

As a result of the third screening, two Preliminary Alternatives in each of the four sections were carried forward for detailed analysis in this EIS. The alternatives carried forward are called

Advanced Alternatives. A summary of the Preliminary Alternatives and the data collected for each alternative are shown in Table 2.4.2, Summary of Preliminary Alternatives Screening.

**Table 2.4.2
Summary of Preliminary Alternatives Screening**

Section/Alternative	Construction Mobility (L1)	Social Feasibility (L2)	Cost (C1)	Aquatic Ecosystems (EC2)	Environmental Consequences (EC3)	
	Impacts	Residential/Business Relocations	Construction Cost (millions)	Wetlands (acres)	Irrigated Farmland (acres)	Wildlife Habitat (acres)
Grandview						
A	Major	41/15	185.1	7.8	19.9	65.9
F Modified	Minor	43/14	181.4	8.9	49.4	52.7
G Modified	Minor	41/14	211.5	7.3	23.6	68.3
Florida Mesa and Valley						
A	Minor	8/1	53.2	1.5	70.6	6.6
B	Minor	4/0	57.8	1.5	56.6	6.0
C	Minor	6/0	52.4	1.3	55.5	6.9
D	Major	10/1	78.4	2.5	76.6	13.1
E	Minor	8/1	78.2	3.0	75.8	15.4
Dry Creek and Gem Village						
A	Major	21/11	156.6	7.4	16.1	120.1
B	Major	18/8	146.8	7.7	15.5	120.4
C	Major	15/9	144.5	7.3	16.8	129.5
D	Minor	18/3	150.4	10.4	29.3	126.2
E	Major	12/4	166.9	9.3	27.9	125.2
H	Minor	8/0	168.0	8.2	20.7	140.3
Bayfield						
A	Major	3/0	24.4	5.0	24.9	19.2
B	Major	3/0	23.7	4.2	21.4	18.0

2.5 ADVANCED ALTERNATIVES

The Preliminary Alternatives that were carried forward from the third screening were evaluated using a quantitative and qualitative analysis. Quantitative criteria used for alternative comparisons included environmental and engineering impacts. The qualitative analysis included evaluation of constructability issues, public preference, and visual impacts. A summary of the analysis is provided in this section. Figures 2.5.1 and 2.5.2 schematically show all the alternatives advanced for detailed analysis. Figures 2.5.3 through 2.5.44 show the specific alternatives that were advanced through this EIS for quantitative and qualitative analysis. These figures show the ROW required to construct the advanced alternatives based on preliminary engineering. This ROW is conceptual and may be refined during final engineering. The complete analysis of the Advanced Alternatives is included in Chapter 4, Environmental Consequences and Mitigation. A comparison of the analysis results is presented in Table 4.25.1, Impacts to Resources by Alternative.

This analysis identified a Preferred Alternative for each of the four project sections. After reviewing comments received on the DEIS and following the public hearing, a Preferred

Alternative is identified in this FEIS. The final selection of a Preferred Alternative will be made in the ROD.

2.5.1 Grandview Section

Two alternatives, Grandview section alternatives F Modified and G Modified, were advanced for detailed analysis.

Alternative F Modified

US 160 is four lanes from the west project limit to the south intersection with US 550, with an eastbound climbing lane and a westbound auxiliary lane. From the US 550 (south) intersection to the intersection with SH 172/CR 234, US 160 would be four lanes. There would be a single-point urban interchange at SH 172/CR 234. US 160 would remain on the existing alignment except near the SH 172/CR 234 intersection, where it would be shifted north to avoid Crestview Memorial Gardens.

US 550 would be four lanes from CR 220 to the intersection with US 160. US 550 would be realigned to the east of the existing US 550 and cross the top of the Florida Mesa before connecting to US 160 with a single-point urban interchange at the existing US 160/CR 233 (west) intersection location.

Alternative G Modified

US 160 is four lanes from the west project limit to the south intersection with US 550, with an eastbound climbing lane and a westbound auxiliary lane. From the US 550 (south) intersection to the intersection with SH 172/CR 234, US 160 would be four lanes. There would be single-point urban interchanges at CR 233 (west) and SH 172/CR 234. US 160 would remain on the existing alignment except near the SH 172/CR 234 intersection, where it would be shifted north to avoid Crestview Memorial Gardens.

US 550 would be four lanes from CR 220 to the intersection with US 160. US 550 would be realigned to the east of the existing US 550 and skirt the western edge of the Florida Mesa before connecting to US 160 with a trumpet interchange approximately 0.6 mile east of the existing US 160/US 550 (south) intersection.

~~Alternative G Modified is the Preferred Alternative because it provides less out-of-direction travel, fewer relocations, and two access points for traffic entering and exiting Grandview.~~

The main difference between Alternative F Modified and Alternative G Modified is the location of the US 160/US 550 (south) intersection. In Alternative F Modified, US 550 would cross the top of the Florida Mesa. In Alternative G Modified, US 550 would skirt the western edge of the Florida Mesa. While the interchange types at these locations would vary, the key difference is that Alternative G Modified would provide two access points between the existing US 550 (south) and SH 172/CR 234 intersections with US 160, where Alternative F Modified would provide only one. This additional access point would provide reserve capacity and accommodate additional growth beyond 2025 in Alternative G Modified. In comparison, for Alternative F Modified, this interchange would be near capacity in 2025 and would not accommodate additional growth. This additional access point causes Alternative G Modified to have a higher

construction cost. Both alternatives have a similar number of relocations (see Table 2.4.2, Summary of Preliminary Alternatives Screening). Both alternatives affect Wilson Gulch and the associated wetlands. The Florida Mesa is primarily agricultural in use, as evidenced by the presence of the Florida Farmer's Ditch. This ditch, along with its location on top of the Florida Mesa, causes Alternative F Modified to have more impacts to wetlands and irrigated farmlands. Conversely, due to its location along the edge of the mesa, Alternative G Modified has more impacts to wildlife habitat. Based on these reasons and public input, Alternative G Modified is the preferred alternative and appears to be the LEDPA.

2.5.2 Florida Mesa and Valley Section

Two alternatives, Florida Mesa and Valley section alternatives A and C, were advanced for detailed analysis.

Alternative A

US 160 would be four lanes and generally remain on the existing alignment, with slight shifts as necessary to avoid residential structures on the north side of US 160 and the Griffin Dairy Farm complex on the south side of US 160. Continuous access roads would be constructed both north and south of the highway. CR 222 and CR 223 would be realigned and connect to US 160 at a new intersection approximately 500 feet west of the existing CR 222/CR 223 (west) intersection with US 160.

Alternative C

US 160 would be four lanes and generally remain on the existing alignment, with slight shifts as necessary to avoid residential structures on the north side of US 160 and the Griffin Dairy Farm complex on the south side of US 160. Continuous access roads would be constructed both north and south of the highway. CR 222 and CR 223 would be realigned and connect to access roads on both sides of US 160. A new intersection with US 160 would be created approximately 4,500 feet east of the existing CR 222/CR 223 (west) intersection. Because this is on the east side of the Florida River, new roadway connections would be made to CR 510 on the south and CR 223 on the north.

~~Alternative C is the Preferred Alternative for this section because it would provide a better location for the CR 222/CR 223 (west) intersection with US 160. This alternative would be less expensive, is supported by the public, and is included in the La Plata County Comprehensive Traffic Study, 1999.~~

The primary difference between Alternative A and Alternative C is the treatment of the CR 222/CR 223 (west) intersection with US 160. In Alternative A this intersection would be moved to the west, higher onto the Florida Mesa, while realigning the associated county roads. In Alternative C this intersection would be moved into the Florida Valley to the east, to the other side of the Florida River. New connections would be made to the county roads while still maintaining access to the existing county roads through access roads near the existing intersection. As shown in Table 2.4.2, Summary of Preliminary Alternatives Screening, Alternative C has generally similar or fewer impacts than Alternative A, is less expensive, is included in the La Plata County Comprehensive Plan, and appears to be the LEDPA. In

addition, the location of the CR 222/CR 223 (west) intersection with US 160 was considered safer due to improved sight distance and intersection geometry.

2.5.3 Dry Creek and Gem Village Section

Two alternatives, Dry Creek and Gem Village section alternatives C and H, were advanced for detailed analysis.

Alternative C

US 160 would be four lanes and generally remain on the existing alignment with improvements for curvature, grades, and sight distance. CR 223 would be realigned and connect to US 160 approximately 1,500 feet west of the existing US 160/CR 223 (east) intersection. To reduce impacts to high quality wetlands, a 36-foot median would be used at this intersection to separate opposing travel lanes. A 46-foot median would be used in all other areas. Access roads are provided on both sides of US 160 between MP 94 and MP 95 and on the north side of US 160 between MP 96 and MP 97 to consolidate direct highway access and reduce out-of-direction travel. In Gem Village, US 160 would be widened to the south. Access roads would be constructed on both sides of US 160 and access would be provided at the west end of Gem Village.

Alternative H

US 160 would be four lanes and generally remain on the existing alignment with improvements for curvature, grades, and sight distance from the CR 222/CR 223 (west) intersection to the CR 223 (east) intersection. CR 223 would be realigned and connect to US 160 approximately 1,500 feet west of the existing US 160/CR 223 (east) intersection. To reduce impacts to high quality wetlands, a 36-foot median would be used from MP 98 to MP 99 to separate opposing travel lanes. A 46-foot median would be used in all other areas. Access roads are provided on both sides of US 160 between MP 94 and MP 95 and on the north side of US 160 between MP 96 and MP 97 to consolidate direct highway access and reduce out-of-direction travel. East of the US 160/CR 223 (east) intersection, US 160 would be realigned and bypass Gem Village to the south. The realigned US 160 would leave the existing US 160 on the west side of Gem Village near MP 100 and rejoin it near MP 101. No access roads would be constructed, but access would be provided at the east end of Gem Village. A one-way slip ramp would provide access for westbound traffic at the west end of Gem Village.

~~Alternative H is the Preferred Alternative for this section because it would have fewer impacts to residential and commercial properties in Gem Village. Although the environmental impacts would be greater, Alternative C would have greater impacts to community cohesion. As a result, the community overwhelmingly supports Alternative H.~~

Gem Village is the distinguishing factor in the Dry Creek and Gem Village Section. Alternative C follows the existing alignment through Gem Village, while Alternative H bypasses the community. Alternative C would have 15 residential relocations and nine business relocations, as compared to eight residential relocations and no business relocations for Alternative H. Community cohesion in Gem Village would be adversely impacted with Alternative C, as the majority of the community is centered around the existing US 160. Alternative C would remove

approximately 50 percent of the downtown district. Because it is on a new alignment, Alternative H has more environmental impacts and is more expensive (see Table 2.4.2, Summary of Preliminary Alternatives Screening). However, Alternative C is not considered to be practicable when compared to Alternative H because of the severe social impacts. Therefore, Alternative H is the preferred alternative.

2.5.4 Bayfield Section

Two alternatives, Bayfield section alternatives A and B, were advanced for detailed analysis.

Alternative A

US 160 would be four lanes and generally remain on the existing alignment with improvements for curvature, grades, and sight distance. Three closely spaced intersections with US 160 [US 160B (west), CR 506, and CR 502] would be consolidated into a single unsignalized intersection. CR 502 would be realigned and connect to US 160 approximately 1,500 feet west of the existing US 160/CR 502 intersection. The realigned CR 502 would intersect CR 506 north of US 160 and continue south of US 160 to intersect with US 160B. This realignment would eliminate both of the existing US 160 intersections with CR 502 and CR 506. Access to US 160B would be maintained through an access road on the south side of US 160. CR 501 would be realigned and connect to US 160 approximately 800 feet west of the existing US 160/CR 501 intersection. This new intersection with US 160 would be a diamond interchange. From US 160 to the US 160B/CR 521 intersection, the existing CR 501 would be eliminated.

Alternative B

US 160 would be four lanes and generally remain on the existing alignment with improvements for curvature, grades, and sight distance. Three closely spaced intersections with US 160 [US 160B (west), CR 506, and CR 502] would be consolidated into a single unsignalized intersection. CR 502 would be realigned and connect to US 160 approximately 1,500 feet west of the existing US 160/CR 502 intersection. The realigned CR 502 would intersect CR 506 north of US 160 and continue south of US 160 to intersect with US 160B. This realignment would eliminate both of the existing US 160 intersections with CR 502 and CR 506. Access to US 160B would be maintained through an access road on the south side of US 160. The US 160/CR 501 intersection would remain a signalized intersection at its present location. The intersections of US 160B/CR 501 and US 160B/CR 521 would be reconstructed as a roundabout.

~~Alternative B is the Preferred Alternative for this section because it would have fewer impacts to wetlands, irrigated farmland, and wildlife habitat. The public preferred this alternative and it is the least expensive.~~

The essential difference between Alternative A and Alternative B is the US 160/CR 501 intersection. In Alternative A this intersection would remain a signalized intersection. In Alternative B this intersection would be a diamond interchange. Both alternatives would meet the projected traffic demand. As shown in Table 2.4.2, Summary of Preliminary Alternative Screening, Alternative B has fewer impacts to wetlands, irrigated farmland, and wildlife habitat. Alternative B is also less expensive and was supported by the public and the Town of Bayfield.

For these reasons, Alternative B was selected as the preferred alternative and appears to be the LEDPA.

2.5.5 Summary of Preferred Alternatives

Table 2.5.1, Summary of Preferred Alternatives, summarizes the selection criteria for each of the Preferred Alternatives.

**Table 2.5.1
Summary of Preferred Alternatives**

<p><i>Grandview Section Alternative G Modified</i></p>	<ul style="list-style-type: none"> • Meets purpose and need: <ul style="list-style-type: none"> ○ Travel Efficiency/Capacity – Traffic capacity would meet 2025 demand and would be free flowing. Interchanges at US 550 (south), CR 233 (west), and SH 172/CR 234 would meet LOS D. ○ Safety – Would improve safety by providing adequate clear zones, sight distance, and grades and reducing direct highway access and minimizing conflicting vehicle movements. ○ Access Control – Would eliminate access except at interchange locations and provide an additional access point to Grandview. • Would reduce out-of-direction travel. • Would minimize impacts to irrigated farmland on the Florida Mesa. • Preferred by the public. • Would maintain traffic on existing US 550 during construction.
<p><i>Florida Mesa and Valley Section Alternative C</i></p>	<ul style="list-style-type: none"> • Meets purpose and need: <ul style="list-style-type: none"> ○ Travel Efficiency/Capacity – Traffic capacity would meet 2025 demand. ○ Safety – Would improve safety by providing adequate clear zones, sight distance, and grades, and reduce direct highway access. ○ Access Control – Would reduce the number of accesses, but maintain access to major county roads. • CR 222/CR 223 (west) intersection with US 160 complies with guidance in the <i>La Plata County Comprehensive Traffic Study, 1999</i>. • Would have minimal disruption to through traffic.
<p><i>Dry Creek and Gem Village Section Alternative H</i></p>	<ul style="list-style-type: none"> • Meets purpose and need: <ul style="list-style-type: none"> ○ Capacity – Traffic capacity would meet 2025 demand. ○ Safety – Would improve safety by providing adequate clear zones, sight distance, and grades, and reduce direct highway access. ○ Access Control – Would reduce the number of accesses, but maintain access to major county roads. • Would preserve community cohesion in Gem Village. • Would have minimal traffic disruption during construction. • Preferred by the public. • Would have fewer social and economic impacts.

**Table 2.5.1
Summary of Preferred Alternatives**

<p><i>Bayfield Section Alternative B</i></p>	<ul style="list-style-type: none">• Meets purpose and need:<ul style="list-style-type: none">○ Capacity – Traffic capacity would meet 2025 demand.○ Safety – Would improve safety by providing adequate clear zones, sight distance, and grades, and reduce direct highway access.○ Access Control – Would reduce the number of accesses.• Would be less expensive.• Would have fewer impacts to wetlands, irrigated farmland, and wildlife habitat.• Preferred by the public and the Town of Bayfield.
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