APPENDIX F

ALTERNATIVE DEVELOPMENT AND SCREENING TECHNICAL REPORT

BORDER HIGHWAY EAST STUDY

CSJ: 0924-06-090

EL PASO COUNTY, TEXAS

TEXAS DEPARTMENT OF TRANSPORTATION

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

Border Highway East

SEPTEMBER 2014

Texas Department of Transportation

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1.0 INTRODUCTION

In May 2013, the Texas Department of Transportation – El Paso District (TxDOT) began the Border Highway East (BHE) Planning and Environmental Linkages (PEL) Study to identify the purpose and need for improvements within the BHE study area, determine possible viable alternatives for a long-term solution, and recommend preferred alternatives that can be carried forward seamlessly into a National Environmental Policy Act (NEPA) study.

The BHE PEL study area or "study area" is located within the southwest portion of El Paso County in an area known as the Lower Valley. The communities of the Lower Valley include Socorro, San Elizario, Town of Clint, Fabens and Tornillo Census Designated Places. The northern limit of the study area is Loop 375 (Americas Avenue) between the Zaragoza International Port of Entry (POE) and Interstate 10 (I-10). The study area extends approximately 20 miles in a southeasterly direction to just south of the Fabens International POE (future Tornillo-Guadalupe International POE). The western limit is the Rio Grande and the eastern limit is I-10. The study area is shown in **Figure 1**.

Previous planning studies, including the *1997 Border Highway Extension Feasibility Study* (TxDOT 1997) identified a need for transportation improvements in the study area. The study concluded that based on travel demand in the study area, a new highway would best serve the corridor. The most feasible route would connect with Loop 375 to its terminus at Manuel F. Aguilera Highway (FM 3380). However, none of these efforts resulted in projects that were advanced to the environmental study process. The BHE PEL Study links the previous planning efforts with current technical analysis and evaluation, while incorporating input from stakeholders, the public, and agencies to develop and recommend alternatives for improvements within the BHE study area with the intention of advancing the alternatives to more detailed environmental studies.

As documented in the *BHE PEL Study Purpose and Need Technical Report* (TxDOT 2014) (**Appendix C**), the BHE PEL Study intends to identify improvements to the existing transportation network to address the following needs:

- Lack of direct access/connectivity to I-10 and Loop 375;
- Congestion along east-west arterials;
- High volumes of truck traffic along the existing east-west arterials;
- At-grade train crossings along the study area that cause delay and impede traffic movement;
- Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements; and
- Lack of other modes of transportation (buses, bicycle lanes, etc.).

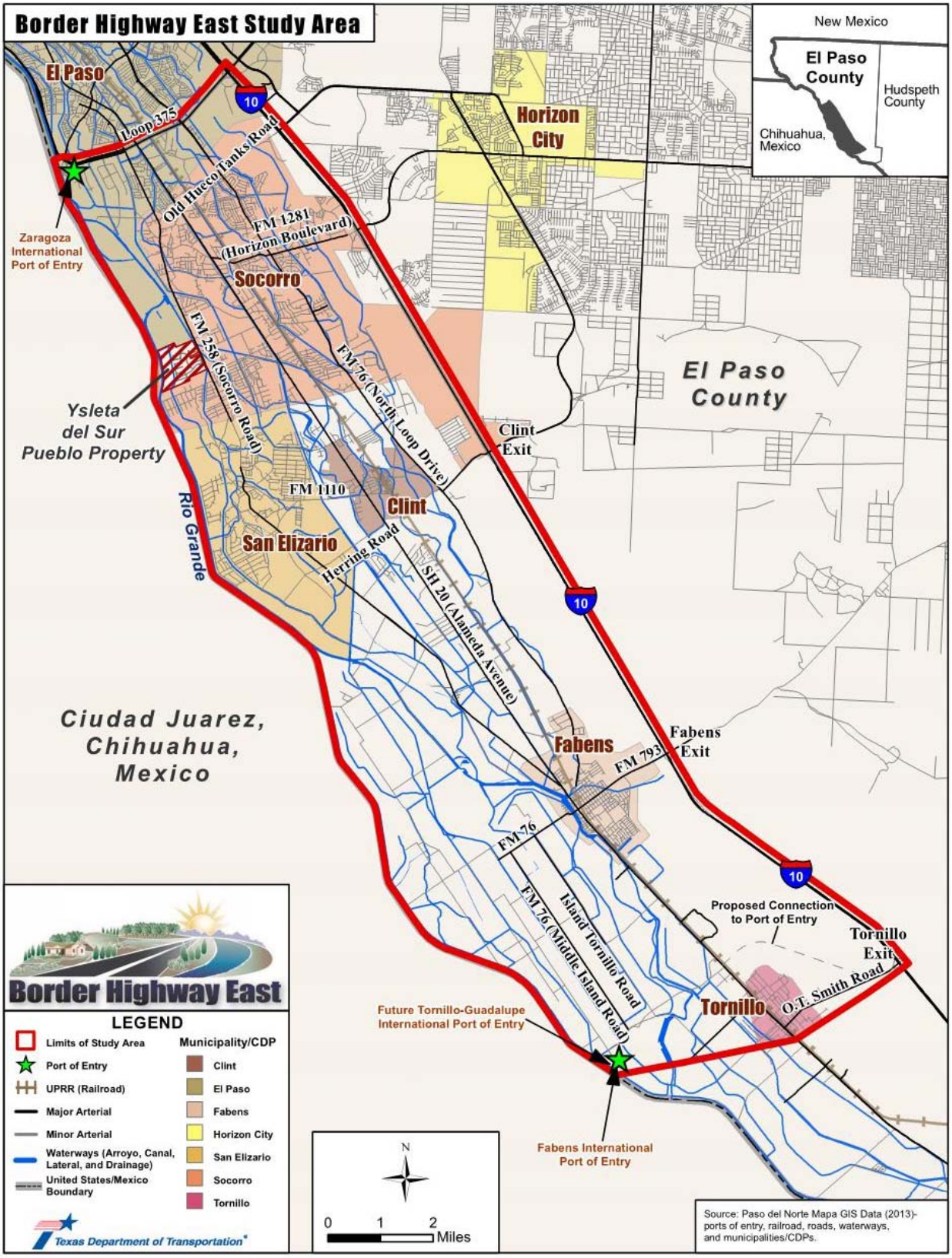
These issues lead to increased vehicle delay to area residents, commuters, businesses, and emergency vehicles.

The purpose of the BHE PEL Study is to develop conceptual transportation alternatives that would address transportation system capacity, system linkage, and modal connectivity issues mentioned above by:

- Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;
- Improving the level of service (LOS) along the primary east-west transportation arterials;
- Implementing Transportation Systems Management (TSM), Transportation Demand Management (TDM), and/or Intelligent Transportation Systems (ITS) improvements;
- Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and
- Integrating existing transportation facilities to complement other modes of transportation.

The El Paso Metropolitan Planning Organization's (MPO) *Horizon 2040 Metropolitan Transportation Plan* (MTP) has identified two new two-lane divided roadways within the study area referred to as the "Loop 375 Border Highway East". These projects would extend from Loop 375 to the Herring Road extension and from Herring Road to the Fabens International POE (future Tornillo-Guadalupe International POE). The projects would be funded by El Paso County and are planned to be open to traffic by 2030 and 2040, respectively. The PEL process may determine that further refinements to the MTP are required as other project(s) are identified and recommended in coordination with El Paso MPO, other agencies, local communities and the public.

Figure 1: BHE PEL Study Area



2.0 DEVELOPMENT OF ALTERNATIVES

This section describes the alternative development process for the BHE PEL Study, including descriptions of each of the Universe of Alternatives. Alternatives were developed to meet the needs of the study area and included alternatives parallel to I-10, connecting to I-10, and non-roadway alternatives. A discussion of the alternative screening and evaluation methodology is provided in later sections. Note that any mention of the term “alternatives” in this section refers to conceptual corridor-level alternatives and not project-level alignment alternatives.

2.1 Alternative Development Process

The Universe of Alternatives for the BHE PEL Study was developed utilizing the following precedents and processes:

- Reference and guiding documents, including:
  - *1997 Border Highway Extension Feasibility Study*,
  - 2006 El Paso County Border Highway Extension-East*;*
  - *Horizon 2040 MTP*;
  - BHE PEL Study precedent documents, such as the travel demand modeling validation for the study area, *BHE PEL Study Purpose and Need Technical Report* (**Appendix C**), the *BHE PEL Study Alternative Screening Methodology* (*ASM*) (**Attachment A**), and the *BHE PEL Study Environmental Constraints Report* (**Appendix B**);
- Input from the Technical Work Group (TWG) and Early Coordination Public Meetings; and
- Follow-up coordination with individual stakeholder groups.

Both the *BHE PEL Study Purpose and Need Technical Report* (**Appendix C**) and the *BHE PEL Study Alternative Screening Methodology* (**Attachment A**) served as the guiding documents for the alternative groupings based on the primary needs identified for the BHE study area: system capacity, system linkage, and modal connectivity.

System Capacity addresses transportation mobility and access for the primary arterials running parallel to I-10, which traverse the study area from the northwest (El Paso and Loop 375) to the southeast (Tornillo, O.T. Smith Road (FM 1109), and the Manuel F. Aguilera Highway). Alternative corridors were identified to address system capacity in the study area along both existing primary roadway facilities in addition to potential new location corridors parallel to I-10. New location corridors to address system capacity were developed referencing the key corridor constraints and influences documented in the *BHE PEL Study Environmental Constraints Report* (**Appendix B**), as well as from stakeholder input received at both the TWG and Early Coordination Public Meetings.

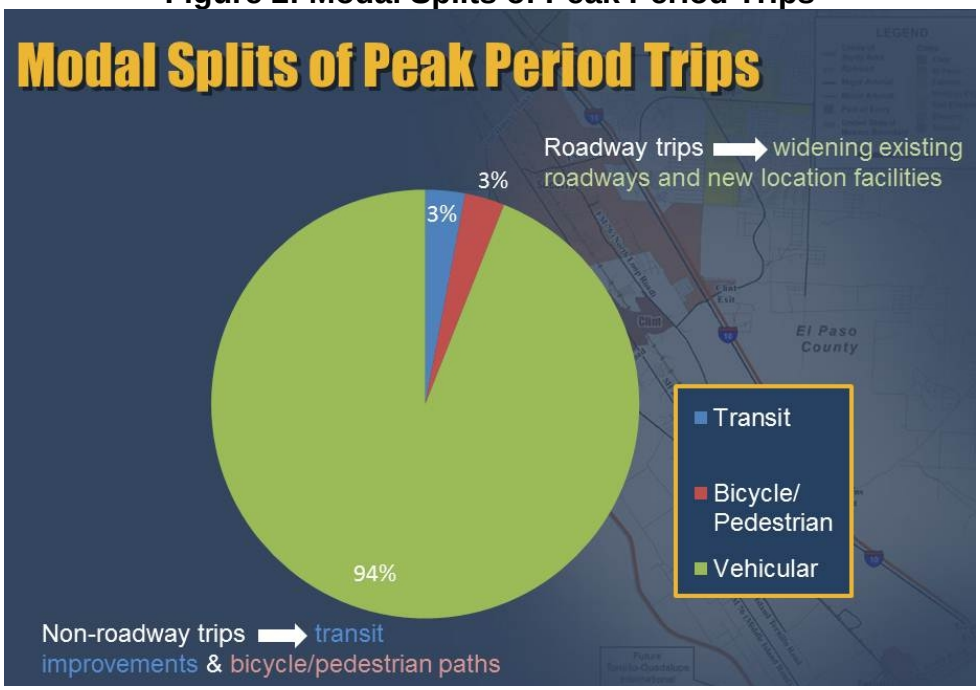
System Linkage addresses the need for improved cross connections within the study area linking border communities and the POEs in the study area (Zaragoza International POE and Fabens International POE (future Tornillo-Guadalupe International POE)) to Loop 375 and I-10. Alternatives were identified to address system linkage in the study

area along both existing roadways as well as potential new location corridors, generally running perpendicular to the border and I-10. New location corridors to address system linkage were developed referencing the key corridor constraints and influences documented in the *BHE PEL Study Environmental Constraints Report* (**Appendix B**), as well as from stakeholder input received at both the TWG and Early Coordination Public Meetings.

Modal Connectivity addresses the need to provide improved modal integration and connections within the study area serving major transportation generators (such as the Zaragoza International POE, the Fabens International POE (future Tornillo-Guadalupe International POE), and Sun Metro and El Paso County Rural Transit bus routes) across the spectrum of transportation modes: vehicular, truck, freight, transit, bicycle, and pedestrian. Modal Connectivity alternatives focused on non-roadway connections which focused on addressing potential gaps in the future transportation network serving transit, bicycle and pedestrian users. Alternative modal connections were developed referencing the *Horizon 2040 MTP*, the key corridor constraints and influences documented in the *BHE PEL Study Environmental Constraints Report* (**Appendix B**), as well as from stakeholder input received at both the TWG and Early Coordination Public Meetings.

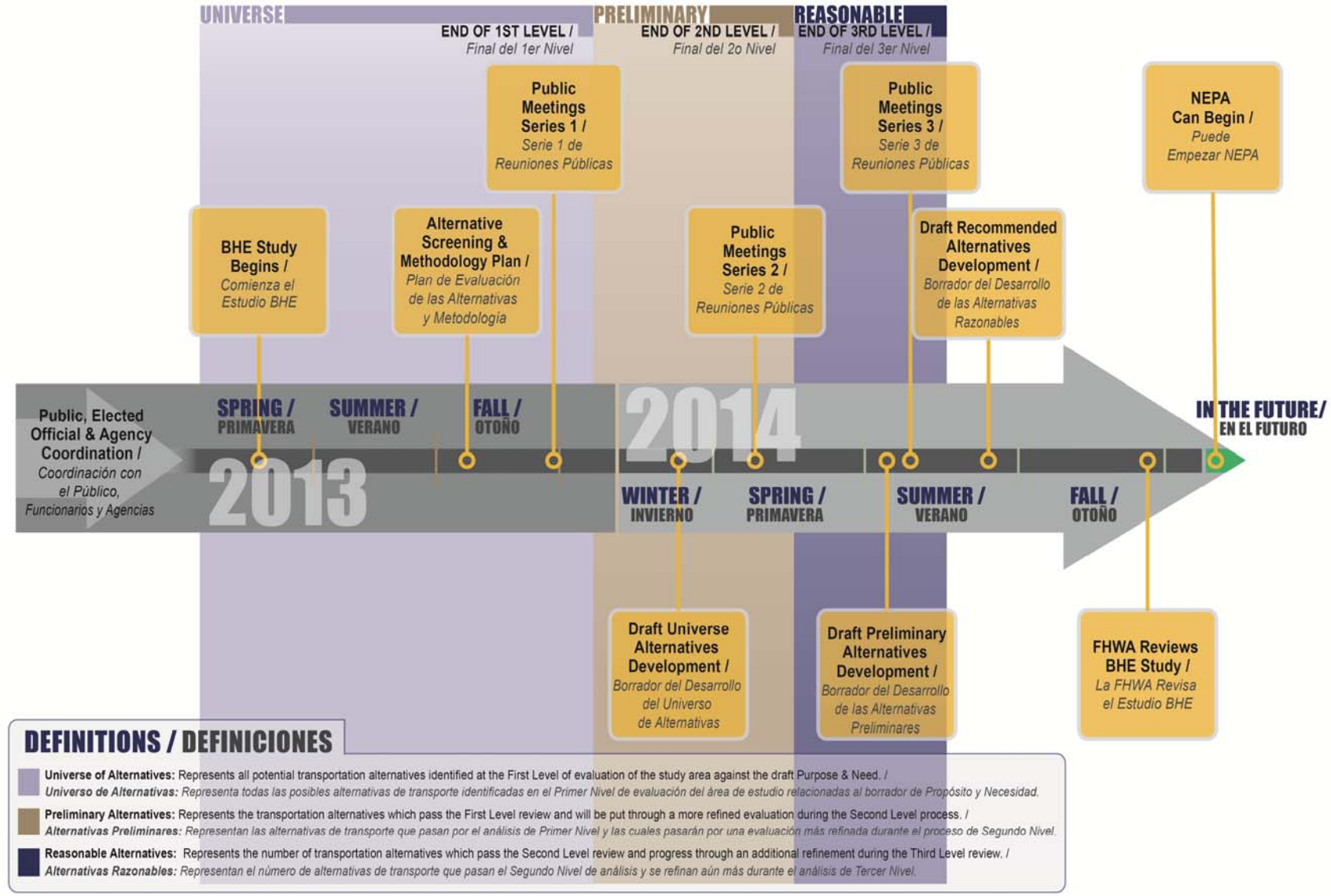
The El Paso MPO's travel demand model was used to determine where people live and work and the various route options residents have. The travel demand model was also utilized to determine how the streets and freeways in the study area operate. From the travel demand model, which assumed reasonable transit operational improvements, it was determined that 94 percent of trips in the study area are vehicular, while 3 percent of trips are on transit and 3 percent of the remaining trips are on foot or on bicycle, as shown on **Figure 2**. It should be noted that in order for the area to attain 3 percent use of transit and bicycle/pedestrian modes each, the existing facilities serving these transportation modes would need to be enhanced. This modal split (which demonstrated a modal preference of 94 percent for roadway users) was the basis for focus on roadway alternatives as a primary means of addressing system capacity needs, while non-roadway alternatives (transit, bicycle and pedestrian facilities/strategies) were identified to provide improved modal connections.

Figure 2: Modal Splits of Peak Period Trips



A graphical representation of the BHE PEL Study timeline and alternative development is presented in **Figure 3**. The alternative screening process was utilized to narrow down the number of alternatives from the Universe of Alternatives to the final outcome of the Recommended Alternatives. The evaluation of the remaining alternatives was done in greater detail as the study progressed to subsequent levels of screening. Definitions of the various screening levels and the alternative screening process are shown graphically in **Figure 4**.

Figure 3: BHE PEL Study Process and Timeline



Note: Figure summarizes the alternative screening process defined in the *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**).

Figure 4: Alternative Screening Process

Note: Figure summarizes the three levels of alternative screening defined in the *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**).

2.2 Alternative Labeling

Alternatives that have been proposed as corridors parallel to I-10 have been given a numerical designation (i.e., Alternative 1, Alternative 2, etc.). Alternatives that have been proposed as corridors that are perpendicular or connect to I-10 have been given an alphabetical designation (i.e., Alternative A, Alternative B, etc.).

There are two categories of non-roadway modal connection alternatives: transit alternatives and bicycle/pedestrian alternatives. Transit alternatives have been given a designation of “TR” and bicycle and pedestrian alternatives have been given a designation of “BP.”

2.3 Description of the Universe of Alternatives

This section provides a brief description of the Universe of Alternatives that includes 24 roadway alternatives parallel to I-10, 37 roadway alternatives connecting to I-10, and seven non-roadway alternatives. The initial qualitative fatal flaw analysis for each of these alternatives is provided in **Section 3.3 – Level I Screening Results**. The proposed typical sections for the roadway alternatives are included in **Attachment B**.

2.3.1 No-Build Alternative

The No-Build Alternative represents the baseline condition in the study area as if no additional improvements are implemented other than those already programmed (fiscally constrained in *Horizon 2040 MTP*). The No-Build Alternative provides a baseline to gauge how effective various build alternatives will be at accomplishing the purpose and need of the project. This alternative is required to be considered in PEL and NEPA analyses.

The No-Build Alternative includes the preservation of the existing transportation network and any programmed transportation improvements that have been identified as fiscally constrained in the MTP. As such, the No-Build Alternative includes all of the short-term operational improvements currently underway and planned within the study area, in addition to all other programmed transportation projects in the region that are contained in the MTP.

2.3.2 Roadway Alternatives Parallel to I-10

Roadway alternatives are illustrated on **Exhibit 1** in **Attachment B**.

<u>Widening of Existing Roadways that Parallel I-10</u>

Alternative 1 is a proposed corridor parallel to I-10 utilizing the existing Farm-to-Market 258 (FM 258) (Socorro Road) alignment from Loop 375 to Herring Road. Currently, Socorro Road is a two-lane, urban minor arterial without shoulders. Socorro Road traverses south from Loop 375, intersects Buford Road, Vineyard Road, Passmore Road, San Elizario Road (FM 1110) and passes through the City of San Elizario.

This alternative proposes to improve the LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 1 is approximately 9.3 miles long and intersects FM 1110.

Alternative 2 is a proposed corridor parallel to I-10 utilizing the existing Socorro Road alignment from Herring Road to State Highway 20 (SH 20) (Alameda Avenue). Socorro Road is a two-lane, urban/rural collector without shoulders. Socorro Road traverses south from Herring Road, intersects Hole in the Wall Road, and terminates at Alameda Avenue north of Fabens.

Alternative 2 would connect with Alternative 1 at Herring Road and extend southeast to Fabens. This alternative proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 2 is approximately 6.3 miles long and crosses the Franklin Canal near the terminus in Fabens.

Alternative 3 is a proposed corridor parallel to I-10 utilizing the existing Alameda Avenue alignment from Loop 375 to Herring Road. Alameda Avenue is a four-lane, urban principal arterial with shoulders. Alameda Avenue traverses south from Loop 375 crossing S. Moon Road, through the City of Socorro, intersects Horizon Boulevard (FM 1281), Vineyard Road, and Passmore Road, passes through Clint where it intersects FM 1110, and terminates at Herring Road.

Alternative 3 proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 3 is approximately 8.8 miles long and improves connectivity through its intersections with Horizon Boulevard and FM 1110.

Alternative 4 is a proposed corridor parallel to I-10 utilizing the existing Alameda Avenue alignment from Herring Road to Tornillo. Alameda Avenue from Herring Road to Fabens is a four-lane roadway classified as a rural major collector with shoulders. Alameda Avenue from Fabens to the southern limit of the study area in Tornillo is a two-lane, rural major collector with shoulders. Alameda Avenue traverses south from Herring Road, intersects Cuadrilla Road, passes through Fabens, where it terminates in Tornillo at the end of the study area.

Alternative 4 connects with Alternative 3 at Herring Road and extends to Tornillo. This alternative proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 4 is approximately 12.7 miles long and crosses several El Paso County Water Improvement District (EPCWID) laterals. Alternative 4 parallels the Franklin Canal immediately north of Fabens for approximately 4.25 miles.

Alternative 5 is a proposed corridor parallel to I-10 utilizing the existing North Loop Drive (FM 76) alignment from Loop 375 to Clint Cutoff Road (FM 1110). North Loop Drive is a two-lane, rural major arterial with shoulders. North Loop Drive traverses south from Loop 375 intersecting with Old Hueco Tanks Road, N. Moon Road, and Horizon Boulevard in the City of Socorro, continuing south and terminating at Clint Cutoff Road. The *Horizon 2040 MTP* includes a programmed project on North Loop Drive between Loop 375 and Horizon Boulevard.

Alternative 5 proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 5 is approximately 8.8 miles long. Constraints for this alternative include several lateral crossings and portions of the corridor lie within the 100-year floodplain.

Alternative 6 is a proposed corridor parallel to I-10 utilizing existing North Loop Drive from Clint Cutoff Road to Alameda Avenue, in Fabens. North Loop Drive is a two-lane, rural major arterial with shoulders. North Loop Drive traverses south from Clint Cutoff Road where it turns south to connect to Alameda Avenue in Fabens. Alternative 6 would cross the Union Pacific Railroad (UPRR) with a grade-separated railroad crossing.

Alternative 6 proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 6 is approximately 6.6 miles long. Constraints for this alternative include crossing several drainage features and portions of the corridor lie within the 100-year floodplain. Additionally, the Alternative 6 alignment would be adjacent to a soccer field and Fabens City Park.

Alternative 7 is the widening of I-10 from Loop 375 to Fabens Street (FM 793) in Fabens. Alternative 7 proposes to improve LOS by constructing one travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 7 is approximately 15.7 miles long.

Alternative 19 is a proposed corridor parallel to I-10 utilizing the existing Socorro Road alignment from Loop 375 to Alameda Avenue. Alternative 19 is a combination of Alternatives 1 and 2, is approximately 15.5 miles long, and retains the same characteristics and constraints as described for Alternatives 1 and 2.

Alternative 20 is a proposed corridor parallel to I-10 utilizing the existing Alameda Avenue alignment from Loop 375 to Tornillo. Alternative 20 is a combination of Alternatives 3 and 4, is approximately 21.4 miles long, and retains the same characteristics and constraints as described for Alternatives 3 and 4.

Alternative 21 is a proposed corridor parallel to I-10 utilizing the existing North Loop Drive alignment from Loop 375 to Alameda Avenue in Fabens. Alternative 21 is a combination of Alternatives 5 and 6, is approximately 15.5 miles long, and retains the same characteristics and constraints as described for Alternatives 5 and 6.

Alternative 22 is an extension of Alternative 7, where Alternative 7 terminates Alternative 22 continues to the existing FM 1109 (O.T. Smith Road) interchange, the proposed Manuel F. Aguilera Highway. Alternative 22 is approximately 21.7 miles long.

New Location Parallel to I-10 Roadways

This section describes the proposed alternatives parallel to I-10 that are on new location. Although corridors have been described, the type of facility for each alternative have not yet been determined.

Alternative 8 is a proposed new location roadway parallel to I-10 within the northwestern portion of the study area. This alternative is a proposed four-lane

extension of Southside Road from Loop 375 to Socorro Road. Alternative 8 would be the northwestern most segment of the Border Highway Extension[1], connecting to the Border Highway West at Loop 375. Alternative 8 utilizes portions of existing Southside Road from Loop 375 to Pan American Drive, along the 1997 BHE preferred alternative. Alternative 8 transitions from the 1997 BHE alignment, north of Rio Bosque Wetland Park, and parallels and crosses the Franklin Drain on new location, merging into Socorro Road near Cougar Park in Socorro. Alternative 8 is approximately 3.3 miles long and parallels the Southside Feeder Lateral and Franklin Drain.

Alternative 9 is a proposed new location roadway parallel to I-10 within the northwestern portion of the study area. Alternative 9 would be the northwestern most segment of the Border Highway Extension[1], connecting to the Border Highway West at Loop 375. This alternative is a proposed four-lane facility, which would include widening Pan American Road from Loop 375 to Southside Road and new location from Southside Road to Socorro Road. Alternative 9 utilizes portions of the 1997 BHE preferred alternative from Southside Road, east of Rio Bosque Park, where it parallels the Franklin Drain before merging into Socorro Road near Cougar Park in Socorro. Alternative 9 is approximately 3.3 miles long and parallels and crosses the Franklin Drain.

Alternative 10 is a proposed two-lane, eastbound frontage along I-10. This alternative proposes to extend the existing I-10 eastbound frontage road from the current terminus at Clint Cutoff Road to Fabens Street in Fabens. This alternative is approximately 6.7 miles long.

Alternative 11 is a proposed two-lane, westbound frontage road along I-10. This alternative proposes to extend the existing I-10 westbound frontage roads from the current terminus at Clint Cutoff Road to Fabens Street in Fabens. This alternative is approximately 6.7 miles long.

Alternative 12 is a proposed new location roadway parallel to I-10 beginning in San Elizario just south of the Socorro/San Elizario boundary. Alternative 12 would be a segment of the Border Highway Extension[1]. This alternative is a proposed four-lane facility, which begins at Socorro Road in San Elizario and turns west to parallel the international border throughout the town of San Elizario. The alternative then turns east and parallels the Island Drain and Robinson Road to Manuel F. Aguilera Highway terminating at the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 12 is approximately 15.4 miles long and traverses a predominately rural area. This alternative crosses or parallels several drains and laterals.

Alternative 13 is a proposed new location roadway parallel to I-10. Alternative 13 would be a segment of the Border Highway Extension. This alternative is a proposed

[1] The Border Highway Extension is defined as a new location roadway connecting the Border Highway West via Loop 375 to the Manuel F. Aguilera Highway (FM 3380) near the Fabens International POE (future Tornillo-Guadalupe International POE).

four-lane facility which begins along Socorro Road at Herring Road in San Elizario and turns west generally following the Lee Moore Intercepting Drain then veering slightly south to parallel the Island Drain to its terminus on Manuel F. Aguilera Highway at the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 13 is approximately 10.7 miles long and traverses a predominately rural area. This alternative crosses or parallels several drains and laterals.

Alternative 13 Modified (Mod) is a proposed four-lane new location roadway parallel to I-10. This alternative would connect to Alternative 12 south of Herring Road at the River Drain lateral and travel southeast to connect with Alternative 13 at Hole in the Wall Road where it follows the alignment of Alternative 13 to its terminus on Manuel Aguilera Highway at the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 13 Mod would be a segment of the Border Highway Extension. Alternative 13 Mod is approximately 10.2 miles long and traverses a predominately rural area. Alternative 13 Mod is illustrated on **Exhibit 3** in **Attachment B**.

Alternative 14 is a proposed new location roadway parallel to I-10. Alternative 14 would be a segment of the Border Highway Extension. This alternative is a proposed four-lane facility, which begins at Socorro Road north of Fabens at Roy Rice Road. The alternative follows Roy Rice Road and continues to Island-Tornillo Road. The alternative follows Island-Tornillo Road to its terminus at Manuel F. Aguilera Highway near the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 14 is approximately 6.9 miles long and traverses a predominately rural area.

Alternative 14 Mod is a proposed four-lane new location roadway parallel to I-10 on new location. Alternative 14 Mod would be a segment of the Border Highway Extension. Alternative 14 Mod connects to Alternative 13 near the Lee Moore Intercepting Drain, where it travels southeast along the Riverside Canal for a short distance to meet the Alternative 14 alignment along Island Tornillo Road to its terminus at Manuel F. Aguilera Highway near the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 14 Mod is approximately 6.0 miles long and traverses a predominately rural area. Alternative 14 Mod is illustrated on **Exhibit 3** in **Attachment B**.

Alternative 15 is a proposed two-lane, eastbound frontage road along I-10. This alternative proposes to extend the existing I-10 eastbound frontage roads from the terminus of Alternative 10, at Fabens Street, to O.T. Smith Road in Tornillo. This alternative is approximately 6.0 miles long.

Alternative 16 is a proposed two-lane, westbound frontage road along I-10. This alternative proposes to extend the existing I-10 westbound frontage roads from the terminus of Alternative 10, at Fabens Street, to O.T. Smith Road in Tornillo. This alternative is approximately 6.0 miles long.

Alternative 17 is a proposed four-lane new location roadway parallel to I-10. Alternative 17 begins near the northeast corner of Rio Bosque Park at the terminus of

Alternatives 8 and 9 and continues parallel to the Southside Feeder Lateral. It then crosses the Northside Lateral to begin paralleling the Riverside Intercepting Drain, terminating at the San Elizario Wasteway #1. Alternative 17 is approximately 4.8 miles long and crosses Ysleta del Sur Pueblo lands before reconnecting with Alternative 12 just west of the San Elizario Historical District.

Alternative 18 is a proposed four-lane new location roadway parallel to I-10 on new location. This alternative follows the Border Highway Extension alignment set forth in the 1997 Feasibility Study which begins at Loop 375 and traverses generally southeast where it terminates at the Manuel F. Aguilera Highway. This alignment utilizes Southside Road at Loop 375, where it traverses south to run adjacent to the Rio Grande in San Elizario. Alternative 18 would utilize Robinson Road, south of Fabens, and terminate at the Fabens International POE (future Tornillo-Guadalupe International POE), located along the Manuel F. Aguilera Highway.

2.3.3 Roadway Alternatives Connecting to I-10

Roadway alternatives are illustrated on **Exhibit 1** in **Attachment B**.

<u>Widening of Existing Connecting Roadways</u>

Alternative A2 is a proposed corridor that connects to I-10 utilizing a portion of the existing Old Hueco Tanks Road alignment (via use of Alternative A1, as described below). Old Hueco Tanks Road is a four-lane rural minor arterial without shoulders. Alternative A2 would utilize the existing Old Hueco Tanks Road alignment between North Loop Drive and N. Moon Road.

Alternative A2 is approximately 0.74 miles long and provides additional capacity to the roadway network. If implemented with Alternative A1, the corridor would provide system connectivity to North Loop Drive and I-10. This alignment has been identified as a funded project in the *2013 El Paso County Comprehensive Mobility Plan*.

Alternative B is a proposed corridor that runs perpendicular to I-10 utilizing the existing N. Moon Road alignment. N. Moon Road is a two-lane, local roadway without shoulders. Alternative B begins at Old Hueco Tanks Road and traverses west, crossing the UPRR with a grade-separated crossing, intersecting with Alameda Avenue, and terminating at Socorro Road. Alternative B would require the implementation of both Alternative A2 and Alternative A1 to connect to I-10.

Alternative B is approximately 1.0 mile long and provides additional capacity by widening N. Moon Road one lane in each direction to the roadway network as well as enhancing system connectivity to Alameda Avenue and Socorro Road. This alternative would cross the Franklin Canal.

Alternative C is a proposed corridor that connects to I-10 utilizing the existing Horizon Boulevard alignment. Horizon Boulevard is a four-lane, urban principal arterial with

shoulders. Alternative C begins at I-10 and traverses west, intersecting with North Loop Drive, crossing the UPRR with a grade-separated crossing, possibly following Buford Road and terminating at Alameda Avenue.

Alternative C is approximately 3.0 miles long and provides additional capacity to the roadway network as well as system connectivity to North Loop Drive. This alternative would cross several laterals. A portion of Alternative C is included in the *Horizon 2040 MTP* and in the Transportation Improvement Plan (TIP). The project includes widening existing Horizon Boulevard, between North Loop Drive and Alameda Avenue, from two-lanes, to a four-lane roadway.

Alternative D is a proposed four-lane corridor that runs perpendicular to I-10 utilizing the existing Buford Road alignment. Buford Road is a two-lane, urban collector without shoulders. Alternative D begins at Alameda Avenue, at the terminus of Alternative C, and traverses northwest to intersect with Socorro Road and would require the implementation of Alternative C to connect to I-10. Alternative D is approximately 1.0 mile long and would cross the Franklin Canal.

Alternative E is a proposed four-lane corridor that runs perpendicular to I-10 utilizing the existing FM 1110. Alternative E would require the implementation of Alternatives N1 and N2 to connect to I-10. FM 1110 is a two-lane, urban collector with shoulders. Alternative E begins at Hansard Drive, west of Alameda Avenue, traverses northwest, crossing the Franklin Canal, and terminates at Socorro Road in San Elizario. Alternative E is approximately 2.1 miles long and would cross the Franklin Canal.

Alternative F is a proposed four-lane corridor that runs perpendicular to I-10 utilizing the existing Herring Road alignment. Alternative F would require the implementation of Alternatives M, N1 and N2 to connect to I-10. Herring Road is a two-lane, local roadway without shoulders. Alternative F begins at Alameda Avenue, south of Clint, and traverses southwest, crossing the Franklin Canal, intersecting Socorro Road near San Elizario High School and Sambrano Elementary School and terminating at the proposed Border Highway Extension. Alternative F is approximately 2.6 miles long and would cross the Franklin Canal. The *2040 Horizon MTP* includes a project utilizing Herring Road to connect to the proposed Border Highway Extension to Alameda Avenue.

Alternative G is a proposed four-lane corridor that connects to I-10 utilizing the existing Fabens Street alignment. Fabens Street is a two-lane, rural major collector/principal arterial with shoulders. Alternative G would begin at I-10, traverse southwest through Fabens, cross the UPRR with a grade-separated crossing, intersect Alameda Avenue, and terminate at Island Tornillo Road.

Alternative G is approximately 4.1 miles long. Alternative G provides connectivity to Alameda Avenue and nearby connection to Socorro Road and North Loop Drive via Alameda Avenue.

Alternative H is a proposed four-lane corridor that runs perpendicular to I-10 utilizing portions of the existing Manuel F. Aguilera Highway alignment. The existing Manuel F. Aguilera Highway is a two-lane, major collector with shoulders. Alternative H would begin at Alameda Avenue and traverse southwest, intersect Island Tornillo Road, Middle Island Road and terminate at the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative H is approximately 2.8 miles long and provides connectivity to the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative H would require the implementation of Alternative S to connect to I-10.

Alternative N2 is a proposed four-lane corridor that would widen the existing roadway segment of FM 1110, between North Loop Drive and I-10. Alternative N2 would connect to Alternative N1 near North Loop Drive. In combination with Alternative N1 it would form a continuous widened and realigned section of FM 1110 between Alameda Avenue and I-10. Alternative N2 is approximately 0.65 miles in length. The Alternative N corridor has been identified as a programmed project in the *2040 Horizon MTP*. The project includes constructing a new two-lane roadway from Alameda Avenue to North Loop Drive and improving existing FM 1110 between North Loop Drive and I-10.

Alternative V is a proposed four-lane corridor that runs perpendicular to I-10 utilizing the existing Jess Harris Road alignment. Jess Harris Road is a two-lane, local roadway without shoulders. Alternative V begins at Island Tornillo Road and traverses west to intersect with the proposed Border Highway Extension. Alternative V is approximately 0.4 miles long and would connect Alternative G to future BHE alternative corridors (Alternative 18 and Alternative 12).

Alternative W is a proposed four-lane corridor that runs perpendicular to I-10 utilizing the existing N. Moon Road alignment. N. Moon Road is a two-lane, local roadway without shoulders. Alternative W begins at Mesa Spur Drain and traverses northwest, intersecting North Loop Drive, and terminating at Alternative B. Alternative W is approximately 1.7 miles long and provides connectivity between Alameda Avenue, North Loop Drive, and I-10 (via Alternative X).

<u>New Location Connecting Roadways</u>

Alternative A1 is a proposed four-lane northeastern extension of Old Hueco Tanks Road, that would generally align with the existing pavement section between North Loop Drive and Gateway East Boulevard/I-10. Alternative A1 is approximately 1.55 miles long and provides additional linkage and capacity to the roadway network. If implemented, the Alternative A1/A2 corridor would provide system connectivity to North Loop Drive and I-10. This alignment has been identified as a funded project in the *2013 El Paso County Comprehensive Mobility Plan*.

Alternative I is a proposed new location corridor extension of Old Hueco Tanks Road from North Loop Drive to Alameda Avenue near S. Nevarez Road. Alternative I is a proposed four-lane facility that includes a grade-separated railroad crossing and a

Middle Drain crossing. Alternative I is approximately 1.0 mile long. Alternative I in conjunction with Alternative A would provide connectivity between I-10, North Loop Drive, and Alameda Avenue.

Alternative J is a proposed new location roadway corridor originating at the Mesa Drain along Horizon Boulevard (Alternative C) and terminating at Buford Road. Alternative J would begin at Horizon Boulevard and traverse north, paralleling Mesa Drain, and to North Rio Vista Road, where the alignment turns west, to complete the connection to Buford Road (Alternative D). Alternative J is approximately 2.2 miles long. The new location alignment would include a grade-separated crossing of the UPRR and would cross several laterals and the Franklin Canal.

Alternative K is a proposed new location, four-lane roadway originating at the Ysleta Lateral and Alternative L intersection (near Trent Road), traversing northwest, and terminating at the intersection of Socorro Road and Tiwa Boulevard. Alternative K is approximately 2.9 miles long and would provide connectivity to Alameda Avenue. Alternative K would cross the Franklin Canal and would include a grade-separated crossing of the UPRR. Alternative K was developed based on public comments received at the first series of public meetings held in November 2013.

Alternative L is a proposed new location roadway originating at a proposed I-10 interchange approximately 2 miles north of FM 1110 and generally following the southern Socorro City limits to it terminus at the proposed Border Highway Extension approximately 0.5 miles south of the Socorro City limits. This new location roadway would create new roadway links to I-10, North Loop Drive, Alameda Avenue, Socorro Road and the proposed Border Highway Extension. Alternative L is approximately 5.0 miles in length. Alternative L would cross the Franklin Canal and other laterals, include a grade-separated crossing of the UPRR, and include a new interchange with I-10. This proposed alternative is included in the *2040 Horizon MTP* as various projects known as Tiwa Boulevard. The various projects are for a corridor that would include a new interchange with I-10 and extend west to the proposed Border Highway Extension.

Alternative M is a proposed new location, four-lane roadway originating at the proposed realignment of Clint Cutoff Road (Alternative N) just east of Alameda Avenue, at Richfield Street, and traversing southwest to Herring Road (Alternative F). The total length of Alternative M is 0.6 miles long and would provide new system linkage from Herring Road to FM 1110.

Alternative N1 includes the new location segment realignment of FM 1110 that begins west of Alameda Avenue and continues east to North Loop Drive. At its beginning near Alameda Avenue, Alternative N1 would connect to the existing FM 1110 near Hansard Drive (Alternative E). In combination with Alternative N2, it forms the Alternative N corridor, a continuous widened and realigned section of FM 1110 between Alameda Avenue and I-10. The Alternative N corridor has been identified as a programmed project in the *2040 Horizon MTP*. The project includes constructing a new two-lane

roadway from Alameda Avenue to North Loop Drive and improving existing FM 1110 between North Loop Drive and I-10.

The proposed new location of FM 1110 would provide ease of access to I-10 in conjunction with Alternative N2 and Alternative E. Alternative N1 is approximately 2.25 miles in length. This alternative would require a new grade-separated crossing of the UPRR.

Alternative O is a proposed extension of Hole in the Wall Road, beginning at Alameda Avenue (connecting to Alternatives E and M) and traversing southwest to connect to the existing Hole in the Wall Road. The proposed corridor would cross the Middle Drain/Coffin Lateral and the Franklin Canal. This alternative, in conjunction with Alternatives M and N, would provide greater access to the farming communities south of San Elizario, FM 1110, and I-10. Alternative O is approximately 2.2 miles in length. Alternative O was developed based on public comments received at the first series of public meetings held in November 2013.

Alternative P is a proposed new location, four-lane roadway beginning at a proposed I-10 interchange and terminating at the proposed Border Highway Extension. The proposed alignment would begin at I-10 and traverse west, crossing North Loop Drive, the UPRR, Alameda Avenue, Socorro Road, and eventually connecting to Alternative 12, or the proposed Border Highway Extension. Alternative P would provide new access to I-10, North Loop Drive, Alameda Avenue, and Socorro Road. Alternative P would provide improved access to farming communities between San Elizario and Fabens. Alternative P is approximately 4.5 miles in length and would cross the Franklin Canal and other laterals, include a grade-separated crossing of the UPRR, and include a new interchange with I-10.

Alternative Q is a proposed new location, four-lane roadway beginning at I-10 and terminating at Jess Harris Road. Alternative Q would begin at I-10 at FM 793 and traverse northwest, intersect North Loop Drive, Alameda Avenue, and Socorro Road, and eventually connect to Jess Harris Road. Alternative Q is approximately 4.5 miles in length and would cross the Franklin Canal and other laterals, as well as a grade-separated crossing of the UPRR.

Alternative R is a proposed new location, four-lane roadway beginning at I-10 and terminating at Middle Island Road. Alternative R would begin at I-10 at FM 793 and traverse southwest, intersect Alameda Avenue and Island Tornillo Road, and cross the UPRR. Alternative R is approximately 5.3 miles in length.

Alternative S is a proposed new location, four-lane roadway beginning at I-10 at O.T. Smith Road and terminating at Alameda Avenue. The corridor begins at O.T. Smith Road and traverses northwest to connect to Manuel F. Aguilera Highway at Alameda Avenue. Alternative S would improve access to the Fabens International POE (future Tornillo-Guadalupe International POE) and I-10. Alternative S is approximately 3.8 miles in length. Alternative S has been identified as a programmed project in the *2040*

Horizon MTP and in the TIP. The project includes a two-lane, undivided roadway from Alameda Avenue to I-10 at O.T. Smith Road and includes an overpass at Alameda Avenue/UPRR.

Alternative T is a proposed new location, two-lane connection between I-10 and the Angel Park development. Alternative T is approximately 0.3 miles long and would provide increased access for Angel Park. Angel Park currently has one access point into the community via Breeway Drive and Alternative T would provide needed access for emergency services. Alternative T was developed based on public comments received at the first series of public meetings held in November 2013.

Alternative U is a proposed new location, two-lane connection between Socorro Road and the Rio Bosque Park. Alternative U is approximately 0.3 miles long and would provide increased access to the park facilities and proposed enhancements. Alternative U was identified as a Rios Bosque Park planned improvement at the first series of public meetings held in November 2013.

Alternative X is a proposed new location, four-lane roadway extending N. Moon Road from the Mesa Spur Drain northeast to I-10. Alternative X, in conjunction with Alternatives B and W, would provide new access and connectivity from a proposed I-10 interchange to Socorro Road. Alternative X is approximately one mile in length.

2.3.4 Multi-Modal Connection Alternatives

In addition to the bicycle and pedestrian connection alternatives listed below, all roadway improvements proposed under the Universe of Alternatives would provide accommodation for pedestrian and bicycle users through a combination of sidewalks and wide outside lanes for shared use. Non-roadway alternatives are illustrated on **Exhibit 2** in **Attachment B**.

Alternative TR-1 is a proposed bus rapid transit route (BRT) along Alameda Avenue from Loop 375 to Horizon Boulevard and also includes enhancing the existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road in Tornillo.

Alternative TR-2 is a proposed extension of the current El Paso County Rural Transit Route 40 from Stop 5 beginning at Alameda Avenue at the Manuel F. Aguilera Highway (FM 3380) and terminating at the Fabens International POE (future Tornillo-Guadalupe International POE).

Alternative BP-1 is a proposed bicycle/pedestrian connection from the proposed border trails along Old Hueco Tanks Road and Horizon Boulevard to stops along El Paso County Rural Transit Routes 30, 40, and 84, terminating at North Loop Drive.

Alternative BP-2 proposes to provide a bicycle/pedestrian footbridge connection to Rio Bosque Park from a parking lot across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.

Alternative BP-3 proposes to provide a bicycle/pedestrian connection from the proposed border trails along the Rio Grande to Socorro Road for improved access to the Socorro Entertainment Center.

Alternative BP-4 proposes to provide an additional bicycle/pedestrian connection from a proposed bike trail in San Elizario to the current El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.

Alternative BP-5 proposes to provide an additional bicycle/pedestrian connection from the Fabens International POE (future Tornillo-Guadalupe International POE) to the current El Paso County Rural Transit Route 40 along the Manuel F. Aguilera Highway (FM 3380) terminating at the O.T. Smith Road at Alameda Avenue.

3.0 LEVEL 1 ALTERNATIVE SCREENING METHOD AND RESULTS

This section describes the Level 1 screening method that was used to evaluate alternatives. The purpose of the Level 1 screening process was to identify those alternatives that passed the fatal flaw evaluation. Qualitative fatal flaw criteria was utilized to evaluate and screen the Universe of Alternatives against the purpose and need. Alternatives that were determined to meet the purpose and need were carried through to the next development phase of the study as Preliminary Alternatives for further development and evaluation. The detailed screening methodology is provided in the *BHE PEL Study Alternative Screening Methodology* (**Attachment A**).

3.1 Level 1 Screening Approach

Each of the alternatives in the Universe of Alternative was taken through the Level 1 screening analysis and examined with regard to several broad factors, or screening criteria, that were related to the purpose and need of the project. Information regarding the screening criteria used at this stage of analysis is discussed further in Section 3.2. After this fatal flaw screening, the alternatives were then grouped into two distinct categories:

- **Alternatives Eliminated from Further Study** – Defined as those alternatives that were considered to not adequately address the purpose and need of the study. These alternatives were not recommended to be carried forward for further analysis in the BHE PEL study.

- **Preliminary Alternatives to be Carried Forward for Further Study** – Defined as those alternatives considered to have the potential to adequately address the purpose and need of the study. These alternatives were recommended to be carried forward for further evaluation in Level 2 of the alternative development and screening process.

The output of the Level 1 screening analysis was used as a basis for further qualitative evaluation in Level 2 of the alternative development and screening process.

3.2 Level 1 Screening Criteria and Methodology

The screening criteria utilized in the Level 1 screening approach was defined in the *BHE PEL Study Alternative Screening Methodology* (**Attachment A**) and focused on general transportation measures that were directly related to the purpose and need of the project. These broad factors sought only to provide a fatal flaw analysis to differentiate between those alternatives with a high probability of meeting the purpose and need, and those alternatives which would not meet the purpose and need and thus should be eliminated from further study.

The transportation issues identified in the study area are documented in the *BHE PEL Study Purpose and Need Technical Report* (**Appendix C**). The BHE purpose and need statement is show in **Table 1**.

Table 1: BHE Purpose and Need

	Need (Problem)	Purpose (Solution)
System Capacity	• Congestion and heavy truck volumes along primary arterials parallel to I-10	• Improving the LOS along the primary arterials parallel to I-10 • Implementing TSM, TDM, and/or ITS improvements
System Linkage	• Lack of direct access/connectivity to I-10 and Loop 375 • At-grade train crossings along the study area that cause delay and impede traffic movement	• Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel
Modal Connectivity	• Increasing demand on area transportation infrastructure associated with the increasing international and interregional trade and freight rail movements • Lack of other modes of transportation (buses, bicycle lanes, etc.)	• Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system • Integrating existing transportation facilities to complement other modes of transportation

Source: *BHE PEL Study Purpose and Need Technical Report* (TxDOT 2014) (**Appendix C**)

The problems or needs presented above were used to develop the following broad measures utilized during the Level 1 screening. The criteria sought to answer a series of questions for each alternative. **Table 2** presents the questions and the rating system utilized for each.

Table 2: Level 1 Qualitative Fatal Flaw Measures

General Study Need	Measure	Rating[1]
System Capacity	How well does the alternative improve the LOS of primary arterials (parallel to I-10)?	++,+,0, -,- -
	Does the alternative include or accommodate congestion management strategies such as TDM, TSM, ITS?	Y/N
System Linkage	Does the alternative improve access/connectivity?	Y/N
	Does the alternative include or accommodate connections from the border communities and future POE to I-10/Loop 375 and provide the addition of railroad crossing grade-separations?	Y/N
Modal Connectivity	Does the alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?	Y/N
	Does the alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?	Y/N

Source: *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**)
Note: 1. See Table 4 for the definitions of the alternative rating system. Y = Yes alternative meets the measure; N = No, alternative does not meet the measure

As shown in the table above, each alternative was examined with regard to the measures listed above, and a determination was made to assign either a “Yes” or “No” for each of the assessment criteria, except for the LOS criteria. The rating for the LOS criteria was assigned as follows:

- Alternatives that provide a connection between Loop 375 and Tornillo without utilizing an existing primary arterial were rated the highest (++).
- Alternatives that provide improvements to existing facilities that are projected to be congested in the future (LOS D or worse) were rated as beneficial (+).
- Cross-connecting alternatives were considered to have a marginal impact on the LOS of primary arterials parallel to I-10 (+/0).
- Alternatives that provide improvements to existing facilities that are not projected to be congested in the future (LOS C or better) were rated as neutral (0).
- Cross-connecting alternatives that do not directly tie to primary arterials were rated as neutral (0).
- Cross-connecting alternatives that may have the ability to increase traffic on primary parallel arterials, because of improved connectivity, were considered to have a negative impact to LOS on those primary arterials (0/-).
- No alternatives were assigned the lowest rating (- -) for LOS at this level of screening.

Alternatives that received all positive answers (Yes, 0, +, or ++) were determined to have met the purpose and need of the study. Generally, alternatives that received negative answers (No) for both of the system linkage criteria were determined to have not met the purpose and need of the study.

3.3 Level 1 Screening Results

This section presents the results from the Level 1 screening process and provides rationale as to why alternatives were either eliminated or carried forward for further study into the Level 2 evaluation.

Alternatives that did not meet the purpose and need of the project were eliminated from further study. Eight roadway alternatives were eliminated from further study. None of the non-roadway (multi-modal) alternatives were eliminated. **Table 3** presents the evaluation ratings assigned to the eliminated alternatives. The remainder of this section provides the rationale as to why these alternatives were eliminated from further consideration. **Attachment C** includes the detailed Level 1 screening matrices.

The alternatives moving forward from the Level 1 screening were identified as Preliminary Alternatives for subsequent refinement and screening. This set of alternatives included 19 roadway alternatives parallel to I-10, 34 roadway alternatives connecting to I-10, and seven multi-modal connection alternatives. **Exhibit 3** in **Attachment B** depicts the preliminary roadway alternatives and **Exhibit 4** in **Attachment B** depicts the preliminary multi-modal connection alternatives.

Table 3: Alternatives Eliminated from Further Study

Alternative	System Capacity		System Linkage		Modal Connectivity	
	LOS of primary arterials	Congestion management strategies[1]	Access/ connectivity	Connectivity between communities, POEs, and I-10/ Loop 375	Expansion of transit, bus, and pedestrian options[2]	Multi-modal connectivity[3]
	++,+,0,-,- -	Y/N	Y/N	Y/N	Y/N	Y/N
Roadway Alternatives Parallel to I-10						
Alt 2	0	Y	N	N	Y	Y
Alt 6	0	Y	N	N	Y	Y
Alt 19	0	Y	N	Y	Y	Y
Alt 21	0	Y	N	Y	Y	Y
Alt 14	0	Y	Y	N	Y	Y
Cross-Connecting Roadway Alternatives						
Alt B	0	Y	N	N	Y	Y
Alt W	0	Y	N	N	Y	Y
Alt X	0	Y	N	N	Y	Y

Notes: 1. It was assumed that all alternatives would include congestion management strategies.
2. It was assumed that all alternatives would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared use lanes for bicyclists, which in turn would improve the corridor for transit opportunities.
3. It was assumed all alternatives, except for those on interstates, would include the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.

Alternative 2 was given a neutral rating for improving LOS because the existing facility is anticipated to operate at LOS A in 2040 for the roadway segments within this corridor. Although Alternative 2 (as previously defined in Section 2.3.2) would widen the connection of Socorro Road between San Elizario and Fabens, the additional capacity is not warranted based on the projected traffic volumes. Alternative 2 would not significantly improve access or connectivity in the southern portion of the study area beyond the ability of the existing facility.

Alternative 6 was given a neutral rating for improving LOS because the existing facility is anticipated to operate at LOS B in 2040 for the roadway segments within this corridor. Although Alternative 6 (as previously defined in Section 2.3.2) would widen the connection of North Loop Drive between Clint and Fabens, the additional capacity is not warranted based on the projected traffic volumes. Alternative 6 would not significantly improve access or connectivity in the southern portion of the study area beyond the ability of the existing facility.

Alternative 19 (as previously defined in Section 2.3.2) is the combination of Alternatives 1 and 2. Because Alternative 2 was not determined to be a critical improvement, Alternative 19 was eliminated from further consideration.

Alternative 21 (as previously defined in Section 2.3.2) is the combination of Alternatives 5 and 6. Because Alternative 6 was not determined to be a critical improvement, Alternative 21 was eliminated from further consideration.

Alternative 14 (as previously defined in Section 2.3.2) would provide a new, four-lane roadway, connecting to Socorro Road south of Herring Road. This corridor would have limited effectiveness because improvements to Socorro Road at this location have been eliminated. A modification to Alternative 14 was proposed that would link to Alternative 13, offering a more effective corridor in providing capacity relief.

Alternative B (as previously defined in Section 2.3.3) would only improve N. Moon Road located in the northeastern portion of the study area, between Alameda Avenue and Socorro Road. While this alternative would provide a marginal localized capacity improvement in northern Socorro, the effectiveness of this alternative is constrained due to limited connectivity to the overall roadway network and surrounding constraints, including impacts associated with a grade-separated railroad crossing.

Alternative W (as previously defined in Section 2.3.3) would widen N. Moon Road from Old Hueco Tanks Road to Mesa Spur Drain, between Alternative B and Alternative X. The alternative is dependent on other alternatives for connectivity to the existing primary arterials, limiting the alternative's effectiveness to improve overall system linkages.

New Location Cross-Connecting Roadways

Alternative X (as previously defined in Section 2.3.3) would provide an additional connection to the I-10 frontage roads, between the existing connections at Old Hueco Tanks Road and Horizon Boulevard, connecting to N. Moon Road and Alternative W. While Alternative X, if implemented with other alternatives, could provide additional capacity to the area, other proposed alternative corridors are better suited to more effectively connect to I-10. Other proposed alternative corridors in this vicinity, utilize existing roadways that are better suited to provide connectivity between I-10 and the border communities.

4.0 LEVEL 2 ALTERNATIVE SCREENING METHOD AND RESULTS

The Level 2 alternative development and screening process involved the evaluation of the Preliminary Alternatives resulting from the Level 1 screening. The following sections will describe the method used for further refining, evaluating, and differentiating between the alternatives that were determined in Level 1 screening to meet the purpose and need of the study. The Level 2 alternative screening criteria were developed from the study goals, presented in Section 4.1.

4.1 Level 2 Screening Approach

The Level 2 alternative screening included evaluating the Preliminary Alternatives against detailed screening criteria (developed from the study goals) to identify those alternatives suitable for further evaluation. Each Preliminary Alternative was developed to a level of detail to define the corridor's general location and basic right-of-way (ROW) requirements. This level of alternative development was sufficient to allow for a qualitative evaluation of a range of criteria and measures that were based on the study goals. As presented in the *BHE PEL Study Purpose and Need Technical Report* (**Appendix C**), the goals of the study are to:

- Enhance east-west mobility;
- Improve local and regional access;
- Provide pedestrian and bicycle friendly facilities;
- Ensure compliance with the MTP*;*
- Provide transportation solutions that help reduce delay and congestion caused by incidents on I-10 and parallel arterials;
- Ensure an open public participation process;
- Minimize disruption to traffic during construction;
- Maximize cost efficiency;
- Develop a design that coexists with border security;
- Avoid and/or minimize impacts to the human and natural environment;
- Develop the facility utilizing context sensitive solutions;
- Optimize opportunities for economic development, including creating Transportation Reinvestment Zones (TRZ); and
- Accelerate delivery through innovative financing options.

In addition to the study goal criteria, the Level 2 alternative screening included evaluating input received from the TWG and the second series of Early Coordination Meetings. Methodologies developed in the *BHE PEL Study Alternative Screening Methodology*, (**Attachment A**) qualitative screening criteria, and applicable ratings were used to identify alternatives suitable for further evaluation.

4.2 Level 2 Screening Criteria and Methodology

As noted above, the evaluation criteria for the Level 2 analysis were defined in the *BHE PEL Study Alternative Screening Methodology* (**Attachment A**) and developed based on the BHE PEL Study goals. The study goals were divided into four categories, including engineering, cost feasibility/effectiveness, environmental, and public involvement. The criteria and measures used to evaluate the alternatives are presented in **Table 4**.

Table 4: Level 2 Alternative Screening Criteria

Study Goals	Criteria		Measure
Engineering			
Enhance east-west mobility	Travel Performance	Level of Service (LOS)	LOS from travel demand model results with implementation of example roadway alternatives *
		Travel Times/ Average Speed	Average Speeds along Major Roadways
Improve local and regional access	Access within/through the study area		Assessment of connections between I-10 and other E/W roadways and to heavy traffic locations in the study area.
Provide pedestrian and bicycle friendly facilities	Bicycle and pedestrian accommodation		Qualitative assessment of Bike/Pedestrian accommodation through shared use or dedicated lanes/sidewalks
Reduce incidents delay/ congestion on I-10/ parallel roadways	Incident management		Reduces potential impact of incidents in study area *
Minimize disruption to traffic during construction	Construction Impacts		Impacts to motorists, complexity of new construction or reconstruction *
Develop a design that coexists with border security	Border security compatibility		Compliments and supports border security initiatives
Cost Feasibility/Effectiveness			
Maximize cost efficiency	Construction Cost		Conceptual Cost Estimate ($)
	ROW Acquisition		ROW Requirements *
	Utilities and Infrastructure		Impact to major utilities and infrastructure
Accelerate delivery through innovative financing options	Financing Opportunities		Accommodates innovative financing and accelerated project delivery
Optimize opportunities for economic development	Economic Development Opportunities		Accommodates/supports development of TRZ
Environmental			
Develop the facility utilizing context sensitive solutions	Community Impacts	Neighborhood Characteristics	Impacts to existing and proposed neighborhoods
Avoid and/or minimizing impacts to the human and natural environment		Context Sensitive Solutions (CSS)	Design incorporates CSS principles (community needs and regional character), while also balancing system goals
		Socioeconomic and Environmental	Impact to environmental justice populations

Study Goals	Criteria		Measure
	Cultural Resource Impacts	Archaeological Sites	Number of recorded archaeological sites and high probability areas potentially impacted
		Tigua Land	Potential to impact Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land.
		Historic Resources	Number of National Register of Historic Places (NRHP), NRHP-eligible, historic-age properties
	Natural Resource Impacts	Park Land	Impacts to known public parks *
		Water Resources	Number of surface water/wetland crossings *
		Drainage Features	Affect to irrigation channels, canals, laterals, viaducts, etc. *
		Floodplains **	Affect to floodplains
		Biological Resources	Potential to impact listed and non-listed, species and/or habitat, rare locally important species. *
		Agricultural Resources	Existing agriculture land, farmland, grazing lands, or orchards converted to transportation use. *
	Other Impacts	Hazardous Materials	Number of existing hazardous material sites. *
		Air Quality	Assessment of land use directly adjacent to alternative. *
		Traffic Noise	Assessment of land use directly adjacent to alternative. *
Public Involvement			
Ensure an open public participation process	Public Input		Assessment of public meeting comments and local resolutions of support. *
Ensure compliance with the MTP			Compatibility with programmed improvements.

Source: *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**)
Notes: * Method to evaluate alternatives for the measure was modified after approval of the *BHE PEL Study Alternative Screening Methodology*.
** New criteria added after the January 2014 approval of the *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014).

Generally, this level of screening qualitatively assessed LOS, average travel speeds, incident management, cost per mile, right-of-way requirements, impacts to surrounding land use, natural terrain, and other constraints. Qualitative ratings, as shown in **Table 5**, were assigned to each criteria for each of the Preliminary Alternatives using the measures noted in **Table 4**. This process determined the alternatives to be carried forward to the next development phase of the study as the Reasonable Alternatives.

Table 5: Level 2 Qualitative Rating System

Rating	Meaning
+ +	Substantial positive effects
+	Some positive effects
0	Neutral
–	Some negative effects
– –	Substantial negative effects

Source: *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**)

The following sections describe each of the criteria utilized during the Level 2 alternative screening process.

Travel Performance - The 2040 Horizon travel Demand model from the El Paso MPO was used to compare the Preliminary Alternatives for evaluation of the two travel performance criteria: LOS and travel time. The road network was modified in the model for the evaluation of 10 roadway alternatives: six parallel to I-10 alternatives and four cross-connecting alternatives. The corridors modeled included combinations of the Preliminary Alternatives to create general roadways for travel performance comparison. The six parallel to I-10 alternatives included the following corridors:

- Constructing a new two-lane Border Highway Extension between Loop 375 and the Fabens International POE (future Tornillo-Guadalupe International POE);
- Constructing a new four-lane Border Highway Extension between Loop 375 and the Fabens International POE (future Tornillo-Guadalupe International POE);
- Widening Socorro Road between Loop 375 and Herring Road;
- Widening Alameda Avenue between Loop 375 and O.T. Smith Road;
- Widening North Loop Drive between Loop 375 and FM 1110; and
- Widening I-10 between Loop 375 and O.T. Smith Road.

The four cross-connecting alternatives included the following corridors:

- Improving and widening Old Hueco Tanks Road between I-10 and Alameda Avenue;
- Widening Horizon Boulevard between I-10 and Socorro Road;
- Widening and realigning FM 1110 between I-10 and Border Highway Extension; and
- Widening Fabens Road between I-10 and Border Highway Extension.

Volume to capacity ratios and levels of service were calculated from future traffic volumes and roadway capacities from the model results. The alternatives were compared to the 2040 base model (No-Build Alternative) to obtain the following:

- The percentage of traffic that shifted from the over-capacity roadways to the newly constructed or widened roadways, and
- The change in the LOS along the improved roadway segments and adjacent roads.

To evaluate the travel time impacts of the improvements, the vehicle hours traveled (VHT) and vehicle miles traveled (VMT) were calculated from the model for the study area. These two measures of effectiveness (MOEs) provided an indication regarding the delays experienced by the drivers. For instance, significant decreases in these MOEs indicates an overall improvement in traffic flows within the study area.

The alternatives were assigned ratings during the Level 2 screening based on the relative improvements between the base model and the modeled corridors.

Regional Access – The Level 2 screening for regional access built on the assessment made during the Level 1 fatal flaw analysis. Regional access was generally the focus of the alternatives that connect to I-10. Alternatives that connect to I-10 and provide enhanced accessibility were rated has having substantial positive effects (++). Alternatives that are parallel to I-10 and provide enhanced accessibility were rated as having some positive effects (+). Additionally, the need for future, additional capacity and how the alternative would connect to the roadway network with the programmed projects was considered in the evaluation process.

Provide pedestrian and bicycle friendly facilities - Alternatives were evaluated for bicycle/pedestrian facilities by reviewing the alternatives' connectivity to ports of entry and to existing transit routes. Alternatives that improved existing roadways and were located in more densely populated areas rated higher than those on new location and in more rural areas.

Incident Management - Alternatives' ability to provide alternate or detour routes to the freeway or already congested roadways was reviewed. Alternatives that provided an alternate route to I-10 were rated as having substantial positive effects (++). Alternatives that provide a new connection to I-10 and also provide an alternate route to existing roadways were rated as having positive effects (+). Alternatives that have limited connectivity or improved existing roadways were rated as neutral (0).

Construction Impacts - Construction impacts were determined by calculating the number of alternative corridor intersections per mile. Also, alternatives that involved reconstruction of an existing roadway were considered to have a greater potential construction impact.

Border Security Compatibility - All alternatives were rated neutral (0) for this criterion. Border security will be an important consideration during the detailed alternative development process in the NEPA phase. Coordination with federal agencies during the BHE PEL Study was ongoing, although due to the general nature of the alternatives, input on specific projects was limited.

Construction Cost - Alternatives construction cost per lane mile was calculated using recent costs per mile for local, new location roadway and roadway widening projects. Average recent construction costs were used as a base cost for each alternative, as shown in **Table 6**. Alternatives that include a grade-separated railroad crossing and/or an interchange with I-10 incurred additional costs. If the cost per lane mile exceeded $1 million the alternative was rated as having substantial negative effect (- -). If the cost per lane mile was between $10,000 and $1 million the alternative was rated as having some negative effect (-). Alternatives that had a cost per lane mile less than $10,000 were rated as neutral (0).

Table 6: Level 2 Alternative Cost Assumptions

Cost Category	New Location		Widen/Reconstruct	
	2 Lanes	4 Lanes	From 2 to 4 Lanes	From 4 to 6 Lanes
Cost per mile	$4M	$6M	$8M	$9M
Cost per lane mile	$2M	$1.5M	$2M	$1.5M
Railroad Grade Separation/Overpass	$8M			
New I-10 Interchange	$12M			

Right-of-Way Acquisition - Alternatives' right-of-way needs, in relation to the proposed typical section, were quantified. Alternatives that would require over 100 acres of right-of-way were rated as having substantial negative effect (- -). Alternatives that would require between 10 and 100 acres were rated as having some negative effect (-). Alternatives that would require less than 10 acres of ROW were rated as neutral (0).

Utilities and Infrastructure - Alternatives were evaluated for this criterion by determining the alternatives' potential impact to existing utilities and infrastructure. For Level 2, the assessment of existing utilities and infrastructure was completed by visual inspection.

Financing Opportunities - Alternatives were evaluated for this criterion by determining the potential opportunities for innovative financing. TxDOT would have the ability to pursue financing techniques through TRZ or vehicle registration tax on all roadway improvement or new roadway projects. Subsequently, most alternatives were rated as having some positive effects (+). Alternatives that have the option for toll revenue, such as managed lanes on I-10 or the proposed Border Highway Extension, were rated as having substantial positive effects (++).

Economic Development Opportunities - Alternatives were evaluated for this criterion by reviewing current land use. Roadway alternatives that would not significantly help economic development along corridor, such as the mainlanes of I-10, were rated has having substantial negative effect (- -). Roadway alternatives that are limited to further commercial development because of existing residential use, environmental constraints, or alternatives that are located far from population centers were rated has having some negative effect (-). Roadway alternatives that have some opportunity for commercial development in proximity to population centers were rated as having some positive effects (+). Roadway alternatives that have the opportunity for commercial development in proximity to population centers and I-10 were rated as having substantial positive effects (++). Roadway alternatives that have limited opportunity for development were rated neutral (0). Non-roadway alternatives were rated as favorable or neutral based on the potential development opportunity near the alternative.

Neighborhood Character - Alternatives were evaluated for this criterion by reviewing subdivision data from Paso del Norte geographic information systems (GIS) data and existing community facilities. Proposed new roadways that bisect neighborhoods were

rated as having substantial negative effect (- -). Existing roadways proposed for widening that are near neighborhoods and other community amenities were rated as having substantial negative effect (- -). Existing roadways proposed for widening that currently bisect existing neighborhoods were rated as having some negative effect (-). Otherwise, the alternative was rated as neutral (0).

Context Sensitive Solutions - All alternatives were rated neutral (0) for this criterion because context sensitive solutions will be considered during the NEPA/design phase at the project level.

Socioeconomic and Environmental/Environmental Justice - Alternatives were evaluated for this criterion by reviewing 2010 census data specific to each alternative. Alternatives that traversed areas with environmental justice (EJ) populations present were rated as having substantial negative effect (- -). Alternatives that traversed areas with populations having income below the poverty level, racial composition mostly minority populations, or populations with limited English proficiency (LEP) greater than the study area median were rated as having some negative effect (-). No LEP or EJ populations were rated as neutral (0).

Archaeological Resources - Alternatives were evaluated for this criterion by reviewing potentially eligible and eligible for listing sites in the National Register of Historic Places (NRHP), which also included cemeteries and Tigua property. Alternatives that traverse through a potentially eligible or eligible for listing site were rated as having substantial negative effect (- -). Alternatives that are adjacent to a potentially eligible or eligible for listing site were rated as having some negative effect (-). Alternatives not in the vicinity of potentially eligible or eligible for listing sites were rated as neutral (0).

Non-Archeological Historic Resources - Alternatives were evaluated for this criterion by reviewing resources located on properties listed in the NRHP or within historic districts as well as those resources identified in previous studies as eligible for listing in the NRHP, potentially eligible for listing in the NRHP, cemeteries, Native American lands, and National Historic Trails. Alternatives proposed to traverse through the non-archeological resources described in the previous sentence were rated as having substantial negative effect (- -). Alternatives that were located adjacent to non-archeological resources identified for the PEL were rated as having some negative effect (-). Alternatives not in the vicinity of non-archeological resources identified for the PEL were rated as neutral (0).

Tigua Land - Alternatives were evaluated for this criterion by reviewing potential impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land. Alternatives that would traverse through these lands were rated as having substantial negative effect (- -); otherwise alternatives were rated as neutral (0).

Park Land – Alternatives were evaluated based on impacts to known mapped parks. Alternatives that bisect a park were rated as having a substantial negative effect

(- -). Alternatives adjacent to parks were rated as having some negative effect (-). All transit and bike/pedestrian alternatives were rated as neutral (0).

Water Resources – Alternatives were evaluated for this criterion by assessing each alternatives' potential to impact National Wetlands Inventory (NWI) mapped water and wetland features. Alternatives that traverse through or are adjacent to water/wetland features were rated as having some negative effect (-). Additionally, alternatives in close proximity to Rio Bosque Park were rated as having some negative effect (-). Alternatives not in the vicinity of wetlands were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Drainage Features – Alternatives were evaluated for this criterion by assessing the number of irrigation channels, canals, laterals, viaducts, etc. crossings. Alternatives that crossed more than eight crossings, or alternatives that are parallel to a drainage feature were rated as having substantial negative effect (- -). Alternatives that perpendicularly cross between one and eight drainage features were rated as having some negative effect (-). Alternatives with no drainage feature crossing were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Floodplains – Alternatives were evaluated on how the alternative crossed the floodplain. Alternatives that bisected a floodplain and/or crossed multiple floodplains were rated as having a substantial negative effect (- -). Alternatives located near the edge of a floodplain were rated as having some negative effect (-). All transit and bike/pedestrian alternatives were rated as neutral (0).

Biological Resources – Alternatives were evaluated on the potential to impact listed and non-listed species and/or habitat, and rare locally important species. Ratings were based on existing habitat present along the alternative. Existing roadways, urban areas, commercial areas, and agricultural fields would typically contain minimal or no wildlife habitat and were rated higher. Undeveloped areas with vegetation, Rio Bosque Park, and native areas would contain potential habitat and were rated lower. All transit and bike/pedestrian alternatives were rated as neutral (0).

Agricultural Resources – Alternatives were evaluated for this criterion by reviewing existing land use. Alternatives that bisect agricultural land use were rated as having substantial negative effect (- -). Alternatives that parallel agricultural land use were rated as having some negative effect (-). Alternatives that do not traverse through any agricultural land use were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Hazardous Materials - Alternatives were evaluated for this criterion by reviewing sites that may negatively affect the construction of an alternative. Potential sites were identified during field surveys, from aerial maps, and from the hazardous materials database search. Ratings were based on the number and type of potential hazardous material sites present. Alternatives adjacent to potentially hazardous materials sites

were rated as having some negative effect (-); otherwise, alternatives were rated as neutral (0).

Air Quality - Alternatives were evaluated for this criterion by reviewing the alternatives' potential impact to air quality. Alternatives located in PM_{10} non-attainment areas were rated as having substantial negative effect (- -). Alternatives that have the potential to increase truck traffic, or are near a multi-modal freight center were rated has having some negative effect (-). Alternatives that have the potential to provide congestion relief or institute a new transit route were rated as having some positive effect (+). Proposed bicycle and pedestrian connections were rated has having substantial positive effect (++). Alternatives that have both positive and negative qualities were rated as neutral (0).

Traffic Noise - Alternatives were evaluated for this criterion by reviewing existing land use. Alternatives that would traverse through mostly residential areas were rated as having substantial negative effect (- -). Alternatives that would traverse through some residential areas were rated as having some negative effect (-). Alternatives that would not traverse through any residential areas were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Assessment of public meeting comments – Comments received from the second series of public meetings held in March 2014 were reviewed for comments pertaining to alternatives. If all comments received pertaining to the alternative were positive the alternative was rated as having substantial positive effects (++). If most of the comments were positive, or the public favored a particular aspect of the alternative the alternative was rated as having some positive effects (+). If most of the comments were negative, or the public opposed a particular aspect of the alternative the alternative was rated as having some negative effects (-). If all comments received pertaining to the alternative were in opposition of the alternative, the alternative was rated as having substantial negative effects (- -). If no comments were received regarding the alternative, the alternative was rated as neutral (0).

Compatibility with Programmed Improvements - Alternatives were evaluated for this criterion by reviewing inclusion in other planning mechanisms. Alternatives that are included in the MTP/TIP were rated as having substantial positive effects (++). Alternatives that are included in other planning mechanisms were rated as having some positive effects (+). If the alternative was not included in any other planning mechanisms, the alternative was rated as neutral (0). Alternatives that were identified as funded projects were eliminated during the Level 2 screening if the funded improvements provided adequate enhancements based on future demand.

4.3 Level 2 Screening Results

This section presents the results from the Level 2 alternative screening process and provides rationale as to why the Preliminary Alternatives were either eliminated or carried forward for further study into the Level 3 alternative screening process.

During the Level 2 alternative screening process, the Study Team held a workshop in El Paso on April 24, 2014 to discuss the findings of this more detailed screening process with the key professionals. TxDOT, HNTB Corporation, Jacobs, and Dannenbaum Engineering attended the workshop. An outcome of this workshop was the modification of several alternatives to better fit the needs of the community and study. These alternatives are denoted with "Mod" in the alternative name and are described below the table. These alternative modifications were noted during Level 2, but were not screened until Level 3 was initiated. **Attachment C** includes the detailed Level 2 screening matrices.

Generally, roadway alternatives were eliminated based on future traffic needs, environmental constraints, strong public opposition, or inclusion as a funded project in the TIP or the El Paso County Comprehensive Mobility Plan (CMP). A summary of the Level 2 alternative screening results are presented in **Table 7**. **Table 7** also denotes the modified alternatives that were developed during the Level 2 screening process. The remainder of this section provides the rationale utilized during the Level 2 alternative screening process and describes the modified alternatives developed during the Level 2 screening process.

Table 7: Level 2 Alternative Screening Overall Ratings

Alternative	Overall Category Ratings				Move to Level 3[1]
	Engineering	Cost	Environmental	Public Involvement	
No Build	- -	-	+	- -	✓
Roadway Alternatives Parallel to I-10					
Socorro Road Widening					
Alt 1	0	- -	- -	- -	X
Alt 1 Mod[2]	To be evaluated in Level 3				✓
Alameda Avenue Widening					
Alt 3	+ +	- -	- -	+	✓
Alt 4	0	- -	- -	+	X
Alt 20	0	- -	- -	+	X
North Loop Drive Widening					
Alt 5	0	-	- -	0	X
Alt 5 Mod[2]	To be evaluated in Level 3				✓
I-10 Widening and Frontage Roads					
Alt 7	0	-	0	0	X
Alt 10	+ +	-	0	-	X
Alt 11	+ +	-	0	-	X
Alt 15	+ +	-	0	-	✓
Alt 16	+ +	-	0	-	✓
Alt 22	0	-	0	0	✓
Border Highway Alignments					

Alternative	Overall Category Ratings				Move to Level 3[1]
	Engineering	Cost	Environmental	Public Involvement	
Alt 8	+ +	0	- -	0	✓
Alt 9	+ +	0	-	0	✓
Alt 12	+	0	-	+	✓
Alt 13	+	-	-	0	X
Alt 13 Mod	+	-	-	+ +	X
Alt 14 Mod	0	0	-	0	X
13 Mod-Rev[2]	To be evaluated in Level 3				✓
Alt 17	+ +	+	- -	0	✓
Alt 18	+ +	0	- -	-	X
Alt U	0	0	-	+	X
Cross-Connecting Roadway Alternatives					
Socorro Improvements					
Alt A1	0	0	-	+	X
Alt A2	0	-	-	-	X
Alt C	+ +	- -	-	+	X
Alt D	+ +	-	-	-	✓
Alt D Mod[2]	To be evaluated in Level 3				✓
Alt I	+ +	-	- -	-	X
Alt I Mod[2]	To be evaluated in Level 3				✓
Alt I Mod-Rev[2]	To be evaluated in Level 3				✓
Alt J	0	-	-	-	X
Alt K	+	0	- -	+	X
Alt L	+ +	0	- -	+ +	✓
Alt T	- -	-	0	-	X
San Elizario/Clint Improvements					
Alt E	+ +	-	-	0	✓
Alt F	+ +	- -	-	+ +	✓
Alt N2	0	0	+	0	✓
Alt N1	+ +	0	-	+ +	✓
Alt V	0	-	0	-	X
Alt M	+ +	+	0	- -	✓
Alt O	0	0	-	0	X
Fabens Connections					
Alt G	0	- -	-	-	X
Alt P	+	0	-	0	✓
Alt Q	+	-	-	-	✓
Alt R	+	-	-	- -	X

Alternative	Overall Category Ratings				Move to Level 3[1]
	Engineering	Cost	Environmental	Public Involvement	
Alt R Mod[2]	To be evaluated in Level 3				✓
Tornillo Connections					
Alt S	+	0	-	+	X
Alt H	0	0	-	-	X
Multimodal (Non-Roadway) Alternatives					
Transit Alternatives					
Alt TR 1	+ +	+ +	0	+	✓
Alt TR 2	+ +	+ +	+ +	-	✓
Bicycle and Pedestrian Alternatives					
Alt BP 1	+ +	0	+	-	✓
Alt BP 2	+ +	+	0	+ +	✓
Alt BP 3	+ +	0	0	-	✓
Alt BP 4	+ +	0	0	-	✓
Alt BP 5	+ +	0	+	-	✓

Notes: 1. ✓ = Alternative moves to Level 3; X = Alternative eliminated.
2. Alternative alignment was modified from the initial Universe of Alternatives during the Level 2 screening process to better serve the needs of the study area and to address public concerns identified during the second series of public meetings held in March 2014.

Alternatives that Progressed to Level 3 Screening

No Build Alternative - Baseline condition, no additional improvements other than those already programmed (fiscally constrained).

Alternative 1 Mod – Widen Socorro Road within the City of El Paso, from Loop 375 to Alternative I Mod, and implement congestion management strategies, TSM, and intersection improvements along the entire corridor. – Because environmental constraints were determined to be a fatal flaw for continuous added capacity widening of Socorro Road, an alternative modification to the original Alternative 1 was developed at the Level 2 Screening Workshop. This alternative was developed to address existing congestion on Socorro Road, while minimizing right-of-way requirements and impacts to the Mission Trail Historic District. Spot improvements and intersection improvements would be implemented as necessary. Alternative 1 Mod is illustrated on **Exhibit 5** in **Attachment B**.

Alternative 3 – Widening Alameda Avenue would provide the additional capacity required for future demand and these improvements were noted as having favorable support from the public.

Alternative 5 Mod – Widen North Loop Drive from Horizon Boulevard to Clint Cutoff Road (FM 1110). – Alternative 5 was eliminated because a portion of the corridor is currently under construction for widening. This alternative modification to the original Alternative 5 was developed at the Level 2 Screening Workshop to address additional capacity needs based on future demand. Alternative 5 Mod would connect to improvements currently being constructed on North Loop Drive, north of Horizon Boulevard. Alternative 5 Mod is illustrated on **Exhibit 5** in **Attachment B**.

Alternatives 8 and 9 – Both of these alternatives provide connectivity from Loop 375 to Socorro Road or connect to the proposed Border Highway Extension (as previously defined in Section 2.3.2). Alternative 8 may involve more potential impacts to drainage, while Alternative 9 may involve more impacts to hazardous materials and utilities. As discussed in the Level 2 Screening Workshop, a previous study completed in 2008 for the Border Highway Extension – East recommended an alternative that utilized Pan American Drive for local traffic and access to Loop 375, while an improved Southside Road provided connectivity to the Border Highway Extension – West via two direct connectors.

Alternative 12 – Alternative 12 (as previously defined in Section 2.3.2) serves as a connection between Alternative 17 and Alternative 13 Mod-Rev.

Alternative 13 Mod-Rev - BHE-southern connection utilizing Middle Island Road (FM 76) and terminating at the Manuel F. Aguilera Highway, east of the future Tornillo-Guadalupe Port of Entry. – Alternative 13 Mod was developed at the Level 2 Screening Workshop as an modification to the original Alternative 13 to utilize the existing TxDOT right-of-way of Middle Island Road (FM 76). Various options of this portion of the Border Highway Extension were evaluated and it was determined to move forward with this alignment using existing TxDOT right-of-way. Alternative 13 Mod-Rev is illustrated on **Exhibit 5** in **Attachment B**.

Alternative 17 - Alternative 17 (as previously defined in Section 2.3.2) is needed to connect Alternatives 8 or 9 to Alternative 13 Mod-Rev.

Alternatives 15 and 16 - New frontage roads would provide additional capacity for I-10, which is forecasted to be over capacity in the future, while having few potential environmental impacts.

Alternative 22 – Widening I-10 mainlanes would provide additional capacity for I-10, which is forecasted to be over capacity in future, while having few potential environmental impacts.

Alternative D – Considering the programmed improvements to Horizon Boulevard, Alternative D would enhance the access between I-10 and Socorro Road via the existing Buford Road alignment. Alternative D scored higher than Alternative J (eliminated) while providing the same improved connectivity on an existing roadway.

Alternative D Mod was developed as a modification of the original Alternative D to extend Buford Road from Alameda Avenue to the proposed Border Highway Extension. Alternative D Mod is illustrated on **Exhibit 5** in **Attachment B**.

Alternatives F and M – During the Level 2 Screening Workshop, these alternatives were combined to form Alternative F, which would connect to FM 1110 at North Loop Drive and extend southwest to the proposed Border Highway Extension.

Alternative I Mod and Alternative I Mod-Rev - New Old Hueco Tanks Road connections with railroad grade-separation. – This new roadway would provide connectivity between I-10 and Alameda Avenue by connecting to the Old Hueco Tanks Road Extension project. At the Level 2 Screening Workshop, a modification to the original Alternative I (Alternative I Mod) was discussed which would extend Alternative I to Socorro Road. This extension was evaluated for traffic demand in the 2040 model and was determined to be attractive to drivers. The modified alternative, **Alternative I Mod**, will be further evaluated in Level 3. **Alternative I Mod-Rev** was also developed as an additional refinement to extend Old Hueco Tanks Road from North Loop Drive to the proposed Border Highway Extension. These two alternative modifications are illustrated on **Exhibit 5** in **Attachment B**.

Alternative L – Alternatives L and K were discussed at the Level 2 Screening Workshop. Because Alternative K would not include connectivity to I-10, the new roadway would not be supported by traffic demand. The new I-10 interchange associated with Alternative L would provide an additional cross-connecting route in the study area. As an outcome of the discussions from the Level 2 Screening Workshop, the ratings for LOS and the MTP compliance where re-evaluated for Alternatives L and K.

Alternatives N1, N2, and E – These three alternatives grouped together would create a direct corridor between I-10 and Socorro Road, utilizing portions of the existing FM 1110 alignment. Alternatives N1 and N2 were rated positively, would increase capacity in San Elizario, and received public support. During the Level 2 Screening Workshop, Alternatives N1 and N2 were combined to form Alternative N.

Alternative P –Alternative P (as previously defined in Section 2.3.3) would provide an additional cross-connecting route in the study area in a part of the study area that has limited connectivity with I-10. Although construction cost estimates were high, due to the interchange, Alternative P received support from the public at the second series of public meetings held in March 2014. As discussed at the Level 2 Screening Workshop, future demand on this alignment is minimal, although from a long-term planning perspective and incident management/safety, this alternative should continue to Level 3.

Alternative Q - Alternative Q (as previously defined in Section 2.3.3) would provide a northern by-pass of Fabens, while providing connectivity between I-10 and the proposed Border Highway Extension.

Alternative R Mod – New location arterial from I-10/FM 793 to future BHE Connection as a southern bypass of Fabens. – Alternative R would provide a southern by-pass of Fabens, while providing connectivity between I-10 and the future BHE alignment. This alignment was discussed at the Level 2 Screening Workshop, and based on public comments and the properties this alignment would traverse, the alternative was re-aligned. The re-aligned alternative, **Alternative R Mod**, would minimize bisecting parcels and would connect directly to the proposed Border Highway Extension. Alternative R Mod is illustrated on **Exhibit 5** in **Attachment B**.

Multimodal Alternatives - All of the original transit and bicycle/pedestrian connection alternatives continued to the Level 3 screening process. These alternatives support the estimated 6 percent of future non-vehicular trips in the study area.

Eliminated Alternatives

Alternative 1 – Although the traffic modeling results demonstrated a need for capacity improvement to Socorro Road, the resulting significant impacts to historic properties along Socorro Road were determined to be too costly in comparison to comparable added capacity alternatives that are not as adversely impactful. See description of **Alternative 1 Mod** above.

Alternatives 4 and 20 – Alameda Avenue, between Herring Road and Tornillo, is not projected to require additional capacity in the future. Alternative 20 (as previously defined in Section 2.3.2) includes Alternative 3 and Alternative 4, and was therefore eliminated.

Alternative 5 – Alternative 5 was eliminated because a portion of the North Loop Drive corridor is currently being widened. See description of **Alternative 5 Mod** above.

Alternative 7 – Alternative 7 (as previously defined in Section 2.3.2) is a sub-section of the widening of I-10 considered in Alternative 22.

Alternatives 10 and 11 – Alternatives 10 and 11 (as previously defined in Section 2.3.2) are a sub-segment of the construction of I-10 frontage roads considered in Alternatives 15 and 16.

Alternative 13, Alternative 13 Mod, and Alternative 14 Mod – These alternatives were eliminated and replaced with Alternative 13 Mod-Rev utilizing existing TxDOT right-of-way on Middle Island Road (FM 76). See description of **Alternative 13 Mod-Rev** above.

Alternative 18 - Alternative 18 scored low compared to the other parallel capacity alternatives. Alternative 18 also received opposition from the public during the second series of public meetings held in March 2014.

Alternatives A1 and A2 – These alternatives (as previously defined in Section 2.3.3) are currently programmed improvements and were shown to operate effectively in future without widening.

Alternative C – Horizon Boulevard, between North Loop Drive and Alameda Avenue, was determined to not require additional capacity in addition to the programmed improvements.

Alternative I – See description of **Alternative I Mod and Alternative I Mod-Rev** above.

Alternative J – Alternative J was eliminated because it is an inefficient cross-connecting route and would require all new ROW.

Alternative G – Alternative G scored lowest of the widen existing cross-connecting alternatives. Alternatives Q and R Mod were evaluated in Level 3 as additional capacity routes in Fabens.

Alternative H - Additional capacity on the Manuel F. Aguilera is not needed based on travel demand model results; planned capacity will be sufficient for future traffic volumes.

Alternative K – This alternative was eliminated because it did not include connectivity to I-10, limiting the future traffic demand on the roadway.

Alternative O – Alternative P is located near this alternative and would provide a better long-term planning solution and enhanced connectivity across the study area with its connection to I-10.

Alternative R – This alignment (as previously defined in Section 2.3.3) was discussed at the Level 2 Screening Workshop, and based on public comments and the properties this alignment would traverse, the alternative was re-aligned. See description of **Alternative R Mod** above.

Alternative S – This alternative (as previously defined in Section 2.3.3) is included in the 2040 MTP and the travel demand model results indicate that the planned capacity will be sufficient for future traffic demand.

Alternative T – This alternative (as previously defined in Section 2.3.3) would provide limited benefit for a project that would be relatively expensive to construct.

Alternative U – It was determined that this connection to the Rio Bosque Park does not meet the overall Purpose and Need of the study. If the proposed Border Highway Extension project moves forward, a connection to the park would be considered at the project level.

Alternative V – Alternative V is not necessary because it was dependent on Alternative 18, which was eliminated.

The Preliminary Alternatives moving forward from the Level 2 screening process are known as the Reasonable Alternatives. This set of alternatives includes 11 roadway alternatives parallel to I-10, 13 roadway alternatives connecting to I-10, and seven non-roadway alternatives. **Exhibit 5** in **Attachment B** presents the reasonable roadway and non-roadway alternatives.

5.0 LEVEL 3 ALTERNATIVE SCREENING

The Level 3 alternative screening involved a detailed evaluation of the Reasonable Alternatives identified from the Level 2 alternative screening. Alternatives were developed to a higher level of detail and evaluated using more detailed quantitative measures. The evaluation criteria for the Level 3 screening were defined in the *BHE PEL Study Alternative Screening Methodology* (**Attachment A**) and were based on the same range of criteria and measures as the Level 2 screening (engineering, environmental, cost feasibility/effectiveness, and public involvement).

5.1 Level 3 Screening Approach

This level of screening quantitatively assessed land use, parcel boundaries, utility impacts, natural terrain, and other constraints. The alignments were designed to a level of detail to define the alternative's general location and basic right-of-way needs based on the general typical sections.

5.2 Level 3 Screening Criteria and Methodology

As noted above, the evaluation criteria for the Level 3 analysis were developed based on the BHE PEL Study goals. The criteria and measures used to evaluate the alternatives are presented in **Table 8**.

Table 8: Level 3 Alternative Screening Criteria

Engineering	
• Level of Service • Travel Times – Vehicle Hours Traveled • Travel Efficiency – Vehicle Miles Traveled	• Regional Access • Incident Management • Construction Impacts • Border Security Compatibility
Cost Feasibility/Effectiveness	
• Estimated Construction Cost • Construction Cost per Lane Mile • Acreage of Necessary ROW • Parcel Impact Rating (number of parcels)	• Impacts to Major Utilities • Financing Opportunities • Economic Development Opportunities
Environmental	
• Neighborhood Character • Context Sensitive Solutions • Environmental Justice • Archaeological Resources • Non- Archaeological Historic Resources • Potential Section 4(f)* • Tigua Land* • Park Land	• Surface Water/Wetlands • Drainage Features • Floodplains * • Biological Resources • Agricultural Resources • Hazardous Materials • Air Quality • Traffic Noise
Public Involvement	
• Public Opinion	• Compatibility with Programmed Improvements

Source: *BHE PEL Study Alternative Screening Methodology* (TxDOT 2014) (**Attachment A**)
Note: * New evaluation criteria added after approval of the *BHE PEL Study Alternative Screening Methodology.*

The following sections describe the quantification methodology and the rating assignment methodology applied for the Level 3 alternative screening criteria that were evaluated in more detail than Level 2. For the criteria in the list below, the methodology did not change between Level 2 and Level 3 alternative screening:

- Regional access,
- Provide pedestrian and bicycle friendly facilities,
- Incident management,
- Construction impacts,
- Border security compatibility,
- Financing opportunities,
- Economic development opportunities,
- Neighborhood character,
- Context Sensitive Solutions (CSS), and
- Compatibility with programmed improvements.

The remaining criteria did include some additional level of quantification during the Level 3 screening and those quantification refinements are defined in the subsequent paragraphs.

Travel Performance

The 2040 Horizon Travel Demand Model from the El Paso MPO and the 2010 Highway Capacity Software (HCS) were used to evaluate and score the Reasonable Alternatives, based on LOS, travel time and travel efficiency. Using the travel demand model, the model's roadway network was modified for ten alternative modeling scenarios: four alternative modeling scenarios parallel to I-10 and six alternative modeling scenarios cross-connecting between I-10 and a proposed Border Highway Extension. The four alternatives parallel to I-10 included:

- Constructing a new location Border Highway Extension between Loop 375 and the Manuel F. Aguilera Highway, near the Fabens International POE (future Tornillo-Guadalupe International POE), with four lanes between Loop 375 and FM 1110 and two lanes between FM 1110 and the Manuel F. Aguilera (Alternatives 8/9, 17, 12 and 13 Mod-Rev);
- Widening Alameda Avenue between Loop 375 and FM 1110, resulting in a six-lane divided roadway (Alternative 3);
- Widening North Loop Drive between Horizon Boulevard and FM 1110, resulting in a four-lane undivided roadway (Alternative 5 Mod); and
- Widening I-10 between Loop 375 and O.T. Smith Road, resulting in a freeway facility with three lanes in each direction (Alternative 22).

The six alternative modeling scenarios cross-connecting to I-10 included:

- Improving and widening Old Hueco Tanks Road between North Loop Drive and Socorro Road, resulting in a four-lane roadway (Alternative I Mod) and improving and widening Old Hueco Tanks Road between North Loop Drive and the proposed Border Highway Extension (Alternative I Mod-Rev);
- Widening Buford Road between Alameda Avenue and Socorro Road, resulting in a four-lane roadway (Alternative D) and widening Buford Road between Alameda Avenue and the proposed Border Highway Extension (Alternative D Mod);
- Constructing a new four-lane roadway along the south side of the City of Socorro between the proposed Border Highway Extension and I-10 (Alternative L);
- Widening and realigning FM 1110 between the proposed Border Highway Extension and I-10, resulting in a four-lane roadway (Alternatives N and F);
- Constructing a new four-lane roadway between the proposed Border Highway Extension and I-10, midway between the communities of Clint and Fabens (Alternative P); and
- Constructing a new four-lane roadway around Fabens between I-10 and the proposed Border Highway Extension (representative of Alternative R Mod or Alternative Q).

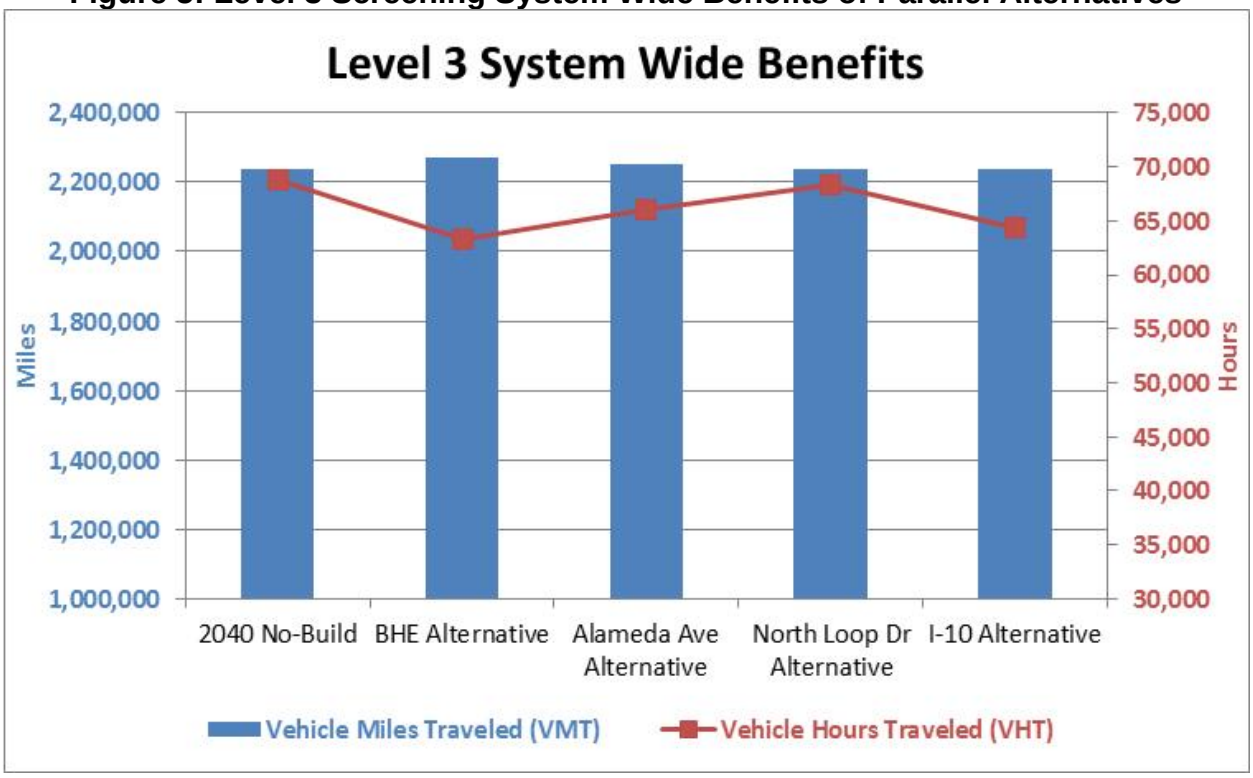
Forecasted traffic volumes were taken from the travel demand model and input into HCS to obtain more detailed block by block volume to capacity ratios and future LOS.

The alternative scenarios were compared to the 2040 base model (No-Build Alternative) to evaluate the change in the LOS along the improved/widened segments.

To evaluate travel time impacts and changes in total miles traveled for the refined list of alternative scenarios described above, the VHT and VMT were calculated using the travel demand model for the study area. These two measures of effectiveness provide an indication of the driving conditions delays and circuitousness experienced by drivers in the study area. Significant decreases in VMT and VHT indicate an overall improvement in traffic flows in the study corridor. A decrease in VHT with an increase in VMT indicates that drivers are going out of their way to get somewhere faster. The alternative scenarios were then scored in the Level 3 screening matrix based on the relative improvements compared to the base (2040 No-Build Alternative) model and the other alternatives.

Figure 5 shows a comparison of VHT and VMT for the parallel alternative scenarios compared to the No-Build Alternative. All of the alternatives show very little change in VMT (travel distance), but the proposed Border Highway Extension alternative scenario and the widen I-10 alternative scenario have the largest decrease (improvement) in VHT (travel time), while the Alameda Avenue alternative scenario has a smaller decrease in VHT. The North Loop Drive alternative scenario shows almost no improvement in VHT.

Figure 5: Level 3 Screening System Wide Benefits of Parallel Alternatives



An operational review and LOS analysis was also conducted for railroad crossings at primary cross-connecting roadways within the study area. The detailed review is included in **Attachment D**. Data on frequency of trains, length of trains, and speed of trains within the study area was obtained from the UPRR. The review evaluated the Horizon Boulevard, FM 1110 and Fabens Drive railroad crossings. The analysis concluded that each at-grade railroad crossing continues to operate at LOS A. However, these delays will continue to have an adverse impact on emergency vehicle access to and from the areas impacted by the at-grade crossings.

Construction Cost - The same cost estimating assumptions were utilized as in the Level 2 alternative screening. However, during the Level 3 alternative screening both the total estimated construction cost and the estimated construction cost per mile were determined for each alternative. For the alternative's total construction cost, if total cost exceeded $100 million, it was rated as having a substantial relative cost (- -); if the alternative's cost was between $10 million and $100 million, it was rated as having a moderate relative cost (-); and if the alternative had a cost of less than $10 million, it was rated as having a minimal relative cost (0).

ROW Acquisition - Two quantities were calculated for each alternative to quantify the ROW requirements: acreage of proposed ROW and number of impacted parcels. The same rating methodology used in the Level 2 alternative screening for ROW acreage impacts was applied during Level 3. For the number of impacted parcels the following ratings were assigned: if the impacts exceeded 100 parcels, then the alternative was rated as having substantial negative effect (- -); if the number of impacted parcels would

be between 25 and 100, then the alternative was rated as having some negative effect (-); and if less than 25 parcels would be impacted, the alternative was rated neutral (0).

Utilities and Infrastructure - Alternatives were evaluated for this criterion by quantifying the number of utility crossings each corridor would have. Utility data evaluated included water mains, major gas lines, major sewer lines, primary overhead electrical lines, and communication lines. Weights were assigned for type utility crossings and if the corridor would be parallel to utility lines. An overall composite utility impact factor was calculated based on the number of crossings, the number of parallel utility lines that were impacted by an alternative, and the weighting factors. If the composite utility impact factor was 5 or greater, the alternative was rated as having substantial negative effect (- -); if the composite utility impact factor was between 2 and 5, the alternative was rated as having some negative effect (-); if the composite utility impact factor was less than 2, the alternative was rated as neutral (0).

Environmental Justice - Alternatives were evaluated for this criterion by reviewing 2010 census data specific to each alternative. Within the study area, the average percent of limited English proficiency (LEP) and minority populations is 40.9 percent and 84.2 percent, respectively. Alternatives that would traverse areas with environmental justice populations present were rated as having substantial negative effect (- -). Alternatives that would traverse areas with populations having income below the poverty level, with racial composition mostly minority populations, or with LEP populations greater than the study area median were rated as having some negative effect (-). Alternatives that would have no LEP or environmental justice population impacts were rated as neutral (0).

Archaeological Resources - Alternatives were evaluated for this criterion by counting the number of cemeteries and archaeological sites that were Listed, Eligible, or Potentially Eligible for the NRHP which would be impacted. Impacted cemeteries were assigned a score of 10; NRHP listed archaeological sites were assigned a score of 20; sites eligible for the NRHP were assigned a score of 10; and sites potentially eligible for the NRHP were assigned a score of 5. If the total impact score was 25 or greater, the alternative was rated as having substantial negative effects (- -); if the score was between 1 and 24 the alternative was rated as having some negative effect (-); and if the alternative impacted no sites the alternative was rated as neutral (0).

Non-Archeological Historic Resources - Alternatives were evaluated for this criterion by reviewing resources located on properties listed in the NRHP or within historic districts as well as those resources identified in previous studies as eligible for listing in the NRHP, potentially eligible for listing in the NRHP, cemeteries, Native American lands, and National Historic Trails. Alternatives proposed to traverse through the non-archeological resources described in the previous sentence were rated as having substantial negative effect (- -). Alternatives that were located adjacent to non-archeological resources identified for the PEL or alternatives that would traverse a NRHP-listed irrigation system without affecting the function of the irrigation system were rated as having some negative effect (-). Alternatives not in the vicinity of non-

archeological resources identified for the PEL were rated as neutral (0). Non-archeological historic resources rating was based on level of importance scoring and the alternative's potential to impact NRHP-listed and potential historic resources.

Potential Section 4(f) - Alternatives were assessed for potential Section 4(f) issues based on the potential of each proposed alternative to have adverse impacts to non-archeological historic resources identified as having a high level of importance. For this criteria, alternatives were given a "yes" or "no" based on the alternative's potential to impact Section 4(f) resources.

Tigua Land - Alternatives were evaluated based on number of Tigua property, trust lands, and ceremonial land parcels crossed. If the alternative crossed between 100 and 200 Tigua parcels, it was rated as having substantial negative effect (- -); if the alternative crossed between 1 to 199 parcels the alternative was rated has having some negative effect (-); and if it crossed no Tigua lands the alternative was rated as neutral (0).

Park Land - Alternatives were evaluated for this criterion by reviewing mapped parks. Alternatives that would require additional ROW that would impact a park were rated as having some negative effect (-). Alternatives that would have no property impacts to parks were rated as neutral (0).

Water Resources - Alternatives were evaluated for this criterion by assessing each alternatives' potential to impact mapped NWI water and wetland features. Alternatives that would potentially impact 0.50 acre or more of waters or wetlands were rated as having a substantial negative impact (- -). Alternatives that would potentially impact 0.10 acre to 0.50 acre were rated as having some negative effect (-). Additionally, alternatives in close proximity to Rio Bosque Park were rated as having some negative effect (-). Alternatives not in the vicinity of wetlands were rated as neutral (0).

Drainage Features - Alternatives were evaluated for this criterion by assessing the type and number of irrigation channels, canals, laterals, viaducts, etc. crossings each alternative would traverse. Alternatives that would be parallel to a drainage feature and impact at least 1,000 linear feet were rated as having substantial negative effect (- -). Alternatives that would perpendicularly cross or would be parallel to at least five drainage features with no impacts to any drainage feature greater than 1,000 linear feet were rated as having some negative effect (-). Alternatives with only perpendicular crossings of a drainage feature were rated as neutral (0).

Floodplains - Alternatives were evaluated for this criterion by assessing the percentage of the corridor that would traverse through the 100-year floodplain. Alternatives that would have more than 20 percent of the corridor in the floodplain were rated as having substantial negative effect (- -). Alternatives that would have less than 20 percent of the corridor in the floodplain were rated as having some negative effect (-). Alternatives that would have no floodplain crossings were rated as neutral (0).

Biological Resources - Biological resources criteria considered a combination of GIS mapped TPWD habitat, Texas Natural Diversity Database (TXNDD) data, and threatened and endangered species information. The acreage amount of habitat (as mapped per the EMST) was calculated to determine if the thresholds would be exceeded. However, the mapped habitat included developed areas (roads, neighborhoods, etc.) and areas of bare ground associated with agriculture; therefore, the rating was adjusted based on existing conditions. The TXNDD data was used to determine if known species/habitat were identified for the corridor. In summary, the rating was based on species and/or habitat present and potential impacts to that species and/or habitat in the corridor.

Agricultural Resources - Alternatives were evaluated for this criterion by assessing the percentage of the corridor that would traverse land zoned for agriculture use. Alternatives that would have more than 50 percent of the corridor as agriculture land were rated as having substantial negative effect (- -). Alternatives that would have more than 10 percent and less than 50 percent of the corridor as agriculture land were rated as having some negative effect (-). Alternatives that would have less than 10 percent of agriculture land were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Hazardous Materials - Alternatives were evaluated for this criterion by reviewing sites that may negatively affect the construction of an alternative. Potential sites were identified during field surveys, from aerial maps, and from the hazardous materials database search. Ratings were based on the number and type of potential hazardous material sites present. Alternatives that would contain potential sites within or adjacent to their corridors sites were rated as having some negative effect (-); otherwise, alternatives were rated as neutral (0).

Air Quality - Alternatives were evaluated for this criterion by reviewing the alternatives' carbon monoxide (CO) potential impact to air quality based on LOS, for the potential to improve air quality through congestion relief; potential to increase number of diesel vehicles; connections to major freight, bus or intermodal facilities; and location within the PM_{10} non-attainment area. Concerning CO, if the estimated LOS for the alternative was A or B it was assumed that there would be a substantial positive effect (++); for LOS of C, the alternative was assumed to have some positive effect (+); for LOS D, the alternative would result in some negative effect (-); and for LOS E or F, it was assumed the alternatives would result in a substantial negative effects on air quality (- -). Minimal or no effect to air quality received a neutral rating (0).

With respect to particulate matter (PM_{10}), if the alternative is for new location or widening with potential to increase the number of diesel vehicles, there would be substantial negative effect (- -). New location and widening alternatives with no significant number of diesel vehicles were rated based on their potential to have some negative effect (-); those alternatives connecting to major freight or intermodal facilities that have the potential to increase truck traffic, or are near a multi-modal freight, bus or intermodal facility were rated as having some negative effect (-). Alternatives within the

PM_{10} non-attainment area were rated to have some negative effect (-). Alternatives outside this area were considered to have neutral effect (0) on air quality. Alternatives that have the potential to provide congestion relief or institute a new transit route were rated as having some positive effect (+). Proposed bicycle and pedestrian connections were rated as having substantial positive effect (++). Overall, alternatives that have both positive and negative qualities were rated as neutral (0).

Traffic Noise - Alternatives were evaluated for this criterion by reviewing types of receivers adjacent to proposed corridors. The rating for traffic noise was based on number of adjacent receivers (residential parcels, schools, churches, daycares and parks). Alternatives that would be adjacent to 200 and 500 sensitive receivers were rated as having substantially negative effect (- -); alternatives that would be adjacent to between 1 and 199 sensitive receivers were rated as having some negative effect (-); and alternatives that would be adjacent to no sensitive receivers were rated as neutral (0). All transit and bike/pedestrian alternatives were rated as neutral (0).

Assessment of public meeting comments – In addition to the public meeting comments considered in Level 2, Level 3 included a review and consideration of all comments received from the public, stakeholders, and agencies. As in Level 2, if all comments received pertaining to the alternative were positive the alternative was rated as having substantial positive effects (++). If most of the comments were positive, or the public favored a particular aspect of the alternative the alternative was rated as having some positive effects (+). If most of the comments were negative, or the public opposed a particular aspect of the alternative the alternative was rated as having some negative effects (-). If all comments received pertaining to the alternative were in opposition of the alternative, the alternative was rated as having substantial negative effects (- -). If no comments were received regarding the alternative, the alternative was rated as neutral (0).

5.3 Level 3 Screening Results and Recommended Alternatives

This section presents the results from the Level 3 alternative screening process and provides rationale as to why alternatives were either eliminated or were designated as Recommended Alternatives.

During the Level 3 alternative screening, alternatives were grouped together to create functional corridors that would work together to achieve the purpose and need of the BHE PEL Study. These functional corridors were compared to ratings and travel performance to determine the Recommended Alternatives. A summary of the Level 3 alternative screening results are presented in **Table 9**. **Attachment C** includes the detailed Level 3 screening matrices. The Recommended Alternatives are presented on **Exhibit 6** in **Attachment B**. Additionally, detailed data collection on the potential environmental impacts associated with the Recommended Alternatives is included in the *BHE PEL Affected Environment Technical Report* (**Appendix G**).

Although the non-roadway alternatives have been recommended for future implementation, it should be noted that these alternatives should be implemented in conjunction with roadway alternatives, as they have limitations in providing capacity to meet future traffic demand on the roadway network. The remainder of this section provides the rationale utilized during the Level 3 alternative screening.

Table 9: Level 3 Alternative Screening Overall Ratings

Corridor (Alternative)	Overall Category Ratings				Recommended Alternative[1]
	Engineering	Cost	Environmental	Public Involvement	
No Build	- -	-	0	- -	✓
Roadway Alternatives					
Socorro Rd. Improvements (Alt 1 Mod)	0	- -	- -	0	X
Alameda Ave. Widening (Alt 3)	+	- -	- -	+	✓
North Loop Dr. Widening (Alt 5 Mod)	+	- -	-	+	✓
I-10 Mainlanes Widening (Alt 22)	+	-	+	0	✓
I-10 Frontage Roads (Alt 15 +16)	+	-	0	-	✓
Border Highway Extension (North) (Alt 8, 12, 17)	++	- -	- -	0	X
Border Highway Extension (North) (Alt 9, 12, 17)	++	-	- -	0	✓
Border Highway Extension (South) (Alt 12 + 13 Mod-Rev)	+	- -	- -	-	X
Entire Border Highway Extension (Alt 9, 12, 17, 13 Mod-Rev)	++	- -	- -	0	✓
Buford Rd. Widening to Socorro Rd. (Alt D)	0	-	-	-	X
Buford Rd. Widening and Extension to Border Highway Extension (Alt D Mod)	0	-	- -	+ +	X
Old Hueco Tanks Rd. Extension to Socorro Rd. (Alt I Mod)	+	- -	- -	-	X
Old Hueco Tanks Rd. Extension to Border Highway Extension (Alt I Mod-Rev)	+ +	- -	- -	+ +	✓
New Socorro Connection (Alt L)	+ +	-	- -	+ +	✓
Existing FM 1110 Improvements (Alt N + E)	+	- -	- -	+	X
New FM 1110 (Alt N + F)	+ +	- -	- -	+ +	✓
New I-10 Connection (Alt P)	+	-	-	0	✓

Corridor (Alternative)	Overall Category Ratings				Recommended Alternative[1]
	Engineering	Cost	Environmental	Public Involvement	
Fabens North Connection (Alt Q)	+	- -	-	-	X
Fabens South Connection (Alt R Mod)	+	-	-	-	✓
Multimodal (Non-Roadway) Alternatives[2]					
BRT and Route 40 Enhancements (Alt TR 1)	+ +	+	+	+	✓
Tornillo Route (Alt TR 2)	+ +	+	+	-	✓
Socorro Path (Alt BP 1)	+ +	-	+	-	✓
Rio Bosque Path (Alt BP 2)	+ +	-	0	+ +	✓
Tigua Path (Alt BP 3)	+ +	- -	0	-	✓
San Elizario Path (Alt BP 4)	+ +	-	+	-	✓
Tornillo Path (Alt BP 5)	+ +	-	0	-	✓

Notes: 1. ✓ = Alternative recommended for future implementation; X = Alternative eliminated.
2. Non-roadway alternatives should be implemented in conjunction with roadway alternatives, as they have limitations in providing capacity to meet future traffic demand.

Recommended Alternatives

The recommended alternatives described below are shown graphically on **Exhibit 6** in **Attachment B**. Although the **No-Build Alternative** would not provide any additional roadway improvements outside of the programmed and funded projects already identified in the study area, this alternative will be used as a baseline for the impact analysis conducted during NEPA. It was determined during the BHE PEL Study that the identified, programmed projects would not sufficiently address the future traffic demand in the study area.

Widening Alameda Avenue

Alternative 3, widening Alameda Avenue from Loop 375 to Herring Road, would provide additional capacity to an existing primary arterial and reduce travel times in the study area.

Widening North Loop Drive

Alternative 5 Mod, widening North Loop Drive from Horizon Boulevard to FM 1110, would provide additional capacity to an existing primary arterial and improve traffic operations. This alternative would complement a current construction project consisting of widening North Loop Drive to four-lanes from Loop 375 and Horizon Boulevard.

Border Highway Extension

The northern portion of the Border Highway Extension utilizing **Alternative 9** was considered a Recommended Alternative because the alternative utilizes Pan American Drive, which provides access to Loop 375. Alternative 9 was preferred because it would require less right-of-way acreage and would require less number of parcels compared to Alternative 8.

Continuing south of Pan American Drive, along the Border Highway Extension, it would include the implementation of **Alternative 17** and a portion of **Alternative 12**, to Herring Road. This combination of alternative corridors was recommended because the corridor would effectively attract traffic from existing and future congested roadways as determined in the 2040 travel demand model. The northern segment of the proposed Border Highway Extension, Loop 375 to Herring Road, would address congestion within the city limits of El Paso, Socorro and San Elizario, which were the areas with the greatest population growth, between 2000 and 2010, and these areas are projected to have the greatest future traffic demand. These alternatives would have potential to cause environmental impacts.

The northern portion could be constructed first, with the southern portion being constructed as future traffic demand warrants. The southern portion would include **Alternative 12**, south of Herring Road, and **Alternative 13 Mod-Rev**. The southern portion is recommended for implementation only in conjunction with the northern portion, as described above. The southern portion would also have potential environmental impacts. Additionally, concern from land owners in this region was expressed during public meetings and individual stakeholder meetings held throughout the BHE PEL Study. If the alternative progresses to the project-level development phase, these concerns will need to be further explored during the route study.

I-10 Improvements

Improvements to I-10 are recommended and include **Alternative 22**, mainlane widening from Loop 375 to O.T. Smith Road, and **Alternatives 15 and 16**, extension of frontage roads from FM 1110 to O.T. Smith Road. While these alternatives do have relatively high construction costs in comparison to other alternatives, these improvements would benefit the roadway network in the study area while minimizing potential environmental impacts. Additionally, I-10 mainlane improvements would be constructed within the existing right-of-way.

City of Socorro Connections

Alternative I Mod-Rev is recommended to improve connectivity between I-10 and the City of Socorro. Alternative I Mod-Rev would connect North Loop Drive to the proposed Border Highway Extension via an extension of Old Hueco Tanks Road, and it was recommended because it would be a new location roadway that would reduce traffic on the existing, surrounding network. This alternative also had a greater impact than Alternative D Mod in reducing travel times in the study area. Additionally, this alternative would include a grade-separated railroad crossing which would improve

safety and efficiency of connections to I-10. This project is included in the *City of Socorro Comprehensive Master Plan* (City of Socorro 2014).

Another improvement, located near the southern limit of Socorro, is a new connection to I-10 and the proposed Border Highway Extension. **Alternative L** is a proposed new location roadway originating at I-10 approximately 2 miles north of FM 1110. This new location roadway would create new roadway links to I-10, North Loop Drive, Alameda Avenue, Socorro Road and the proposed Border Highway Extension and include a grade-separated railroad crossing. This proposed alternative is included in the *2040 Horizon MTP* as a series of projects known as Tiwa Boulevard that would include a new interchange with I-10 and extend west to the proposed Border Highway Extension.

FM 1110 Improvements

The combination of **Alternatives N and F** is recommended for further study as a new location FM 1110. The corridor would improve FM 1110, between I-10 and North Loop Drive, and realign FM 1110, southwest of the North Loop Drive intersection. The improvements would create a continuous roadway from I-10 to the proposed Border Highway Extension, improving access and connectivity to Clint and San Elizario. The current FM 1110 is disjointed at North Loop Drive. These alternatives scored better than Alternatives N and E in the engineering and public involvement categories. It should be noted, that at the time of this study, a portion of this corridor (FM 1110 between I-10 and Alameda Avenue) received funding and therefore, has advanced to the schematic and environmental phase (NEPA) of project development.

Clint/Fabens Connections

Alternative P is a proposed new location, four-lane roadway beginning at I-10 and terminating at the proposed Border Highway Extension. This alternative would provide new access to I-10, North Loop Drive, Alameda Avenue, and Socorro Road and includes a grade-separated railroad crossing, while enhancing access to farming communities between San Elizario and Fabens.

Alternative R Mod is recommended for further study as a possible Fabens by-pass or relief route from I-10 to the proposed Border Highway Extension at Middle Island Road. This alternative would provide enhanced access to I-10 and Alameda Avenue, and include a grade-separated railroad crossing.

Eliminated Reasonable Alternatives

Socorro Road Improvements

Alternative 1 Mod would provide minimal improvement to the overall roadway network through the implementation of CSM/TDM operational improvements along Socorro Road, limiting its effectiveness as a solution to address future traffic demand. Operational improvements to Socorro Road, while not a recommended alternative for this BHE PEL Study, should be considered by the City of Socorro as a community level project.

Border Highway Extension

The northern portion of Border Highway Extension corridor utilizing **Alternative 8** was eliminated. Alternative 8 would utilize the existing Southside Road which does not have a feasible connection to Loop 375. Additionally, constructing this portion of corridor would require purchasing more right-of-way and would have more parcel impacts than Alternative 9.

City of Socorro Connections

Alternatives I Mod, D and D Mod were eliminated due to the recommendation of Alternative I Mod-Rev as the highest rated cross connection alternative within the City of Socorro. Although portion of these alternatives are identified as future roadways in the *City of Socorro Comprehensive Master Plan* (City of Socorro 2014), Alternative I Mod-Rev was selected because of overall improvement on the roadway network and the grade-separated railroad crossing.

FM 1110 Improvements

The combination of **Alternatives N and E** was eliminated as possible improvements to FM 1110. Alternative E would utilize existing FM 1110 between Alameda Avenue and Socorro Road, and create a new location FM 1110 between North Loop Drive and Alameda Avenue. This corridor has significant constraints due to the path of the corridor through Clint. Alternative N and F scored higher in the engineering and public involvement categories.

Fabens Connections

Alternative Q was eliminated because it scored lower than Alternative R Mod in the cost category. While Alternative Q has a lower estimated construction cost than Alternative R Mod, it would impact more utility lines and would have a greater number of parcel impacts.

6.0 CONCLUSION

The Recommended Alternatives should be considered as a long-term set of transportation improvements for the study area. The alternatives were developed to a general corridor-level and evaluated using the horizon year 2040 population and traffic volume projections; therefore, the Recommended Alternatives should be considered in the long-term transportation plan for the study area through 2040. The BHE PEL Study did not consider an order of implementation for the recommended alternatives, but used the areas of highest growth and demand to identify (based on need) the sections of the Border Highway Extension to be constructed first.

The Recommended Alternatives were only developed to be conceptual and do not include a defined alignment of an alternative. Specific alignment determination of the proposed action was not part of the PEL scope; therefore, public comment on specific project design features, including potential environmental impacts and the need for additional ROW, is still an outstanding issue and would be addressed during the NEPA process. Environmental issues and mitigation strategies regarding impacts to water

quality, floodplains, wildlife habitat, agricultural land, the El Paso County Water Improvement District No. 1 (EPCWID1) (that includes the Franklin Canal), environmental justice, and threatened and endangered species generally emphasize avoidance through project alignment and design. The specific issues identified during the BHE PEL Study that would be further explored during NEPA can be found in the *BHE PEL Study NEPA Transition Report* (**Appendix H**).

7.0 REFERENCES

City of Socorro. *City of Socorro Comprehensive Master Plan*. (June 2014). Web. http://ci.socorro.tx.us/wp-content/uploads/2014/07/City-of-Socorro-Comprehensive-Master-Plan-June-2014.pdf

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Attachment A

BHE PEL Alternative Screening Methodology

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1.0 INTRODUCTION AND PLANNING CONTEXT

The purpose of the Border Highway East (BHE) Alternative Screening Methodology (ASM) is to provide a decision-making framework to determine how well each set of alternatives meets the Purpose and Need of the Planning and Environmental Linkages (PEL) Study as well as the BHE study area goals. The PEL Study will be used to develop and evaluate transportation alternatives that will be evaluated further in subsequent stages of project development in accordance with planning guidelines established in Moving Ahead for Progress in the 21st Century (MAP-21) and in the El Paso MPO's Horizon 2040 Metropolitan Transportation Plan (MTP).

Transportation alternatives will be developed and evaluated for the study in a sequential process including the following screening levels: 1) Universe of Alternatives; 2) Preliminary Alternatives; and 3) Reasonable Alternatives. The ASM will be utilized to compare the advantages and disadvantages of each alternative for advancement into the succeeding set of refined alternatives and, ultimately, the recommended alternative PEL strategies for continued project development. The alternative development and screening evaluation is based upon the BHE Purpose and Need (**Table 1**) and Study Goals (**Table 2**) as referenced from the BHE Purpose and Need document:

Table 1: Purpose and Need

Purpose	Need
Develop conceptual transportation alternatives that would address the system capacity, system linkage, and modal connectivity issues mentioned above by: • Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel; • Improving the level of service (LOS) along the primary east-west transportation arterials; • Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements; • Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and • Integrating existing transportation facilities to complement other modes of transportation.	• Lack of direct access/connectivity to I-10 and Loop 375; • Congestion along east-west arterials; • High volumes of truck traffic along the existing east-west arterials; • At-grade train crossings within the study area that cause delay and impede traffic movement; and • Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.

Table 2: Study Goals

- Enhancing east-west mobility;
- Improving local and regional access;
- Providing pedestrian and bicycle friendly facilities;
- Ensuring compliance with the MTP*;*
- Providing transportation solutions that help reduce delay and congestion caused by incidents on I-10 and parallel arterials;
- Ensuring an open public participation process;
- Minimizing disruption to traffic during construction;
- Maximizing cost efficiency;
- Developing a design that coexists with border security;
- Avoiding and/or minimizing impacts to the human and natural environment;
- Developing the facility utilizing context sensitive solutions;
- Optimizing opportunities for economic development, including creating Transportation Reinvestment Zones; and
- Accelerating delivery through innovative financing options.

The BHE ASM is established before any detailed alternatives are developed to ensure that each alternative is examined consistently and evaluations are unbiased. Each of the alternatives, including the "no-build" alternative, will be evaluated using this methodology. The "no-build" alternative represents the baseline condition in the BHE study area as if no additional improvements are implemented other than those already programmed (fiscally constrained Horizon 2040 MTP). The three screening levels that comprise the ASM include: (1) the Purpose and Need for the first level (fatal flaw) screening of the Universe of Alternatives, (2) the study goals at a qualitative level for the second level screening of the Preliminary Alternatives, and (3) the study goals at a quantitative level for the third level screening of the Reasonable Alternatives.

The effectiveness of each alternative (universe, preliminary, reasonable) in terms of meeting the needs of the study area will be measured by a wide range of criteria, defined by the Purpose and Need and study goals, as discussed in the subsequent sections. The potential impacts of each alternative will be quantified and documented by the evaluation criteria (e.g. irrigation canals crossed, order of magnitude cost estimates, displacements, etc.) To compare the advantages and disadvantages of each of the alternatives in the public involvement process, both the qualitative and quantitative analysis of each alternative will be summarized in a five-level rating system defined in **Table 3**.

Table 3: Qualitative Rating System

Rating	Meaning
+ +	Substantial positive effects
+	Some positive effects
O	Neutral
–	Some negative effects

– –	Substantial negative effects

The qualitative rating system will allow the advantages and disadvantages of each alternative (universe, preliminary) to be compared using the evaluation criteria described in the following sections. This system will be utilized as a tool to assist in determining the refined sets of preliminary alternatives and ultimately a set of reasonable alternatives or projects for future development during the National Environmental Policy Act (NEPA) process. As the preliminary alternatives are refined to a greater level of detail as reasonable alternatives, the rating system will be supplemented with quantifiable data to validate the ratings for each reasonable alternative against each evaluation criteria and measure.

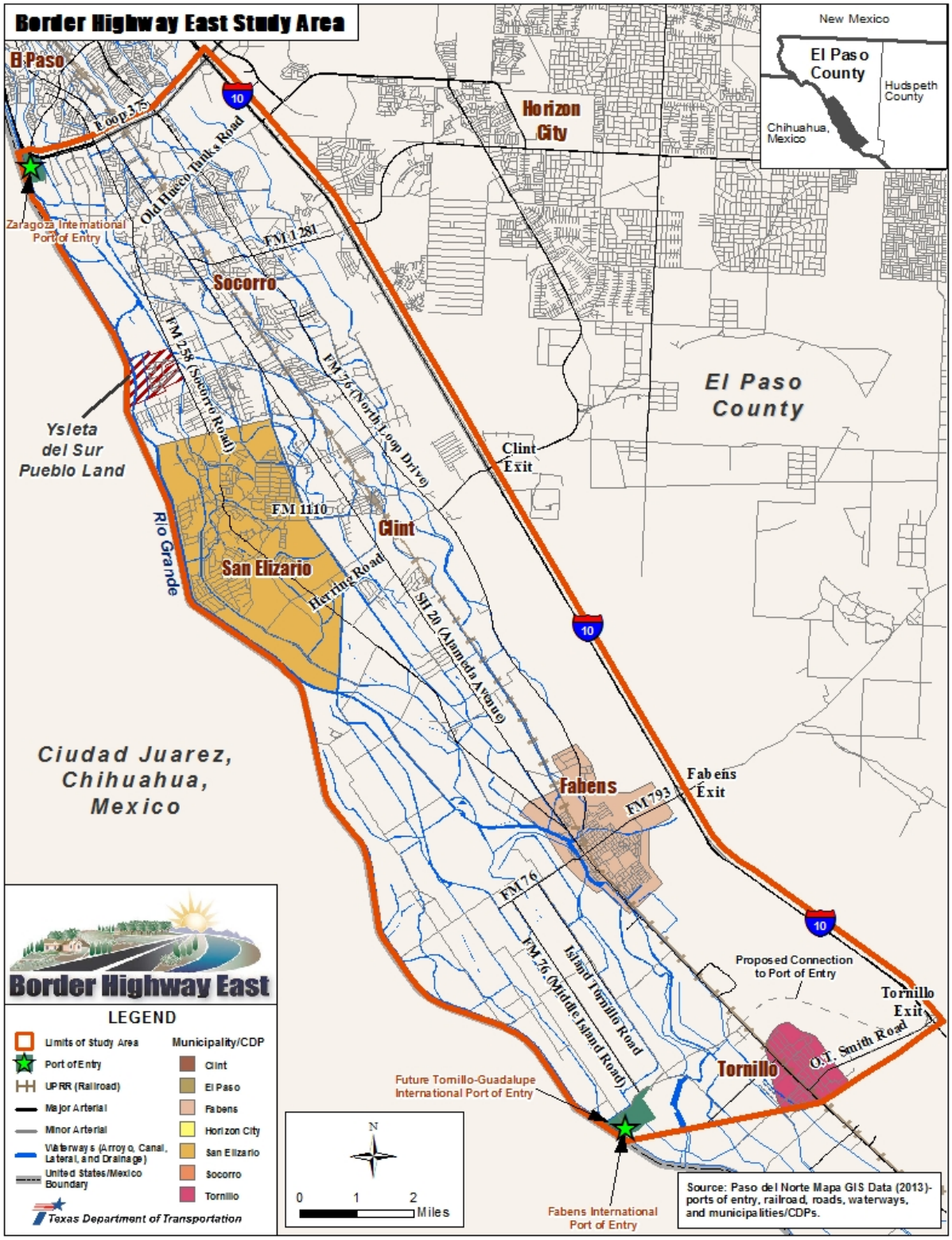


Figure 1: Border Highway East Study Area

2.0 ALTERNATIVE SCREENING FRAMEWORK

The alternative screening process is similar to a funnel with multiple levels of screening blending a varied group of strategies, corridor needs and goals, into a set of refined transportation alternatives through an elaborate “filtering”, or evaluation, process. Definitions of the various screening stages follow below and are shown graphically in **Figure 2** (page 6).

- Level 1, the Concept or Fatal Flaw Screening, involves the development and evaluation of the universe of alternatives across a spectrum of modes and strategies. Of the potential roadway alternatives, a future BHE alignment (as identified in the previous 1997 Border Highway Extension Feasibility Study and as shown in the Horizon 2040 MTP) will be evaluated along with potential connections from the new alignment to potential I-10 and Loop 375 connections. In addition to the potential roadway connections and alternatives, the universe of alternatives shall consist of alternatives from a variety of modes and strategies including the preferred alignment from the 1997 Feasibility Study, as well as those identified by stakeholders at the Technical Work Group (TWG), from input received at Early Coordination Meetings and others developed by the project team. Fatal flaw criteria will be utilized to evaluate and screen the universe of alternatives against the Purpose and Need as depicted in **Figure 3** (page 18). Based on the fatal flaw criteria analysis, alternatives which meet the purpose and need shall be carried through to the next development phase of the project for preliminary alternatives development and evaluation.

- Level 2, the Refinement Process, will include input received from the TWG and Early Coordination Meetings, fatal flaw screening, previous engineering studies, developed methodologies, and screening criteria to identify preliminary alternatives for BHE and connections to I-10 and Loop 375 that are suitable for further evaluation. Each preliminary alternative shall be developed to a level of detail to define the corridor's general location and basic right-of-way (ROW) requirements. The level of alternative development needs to be sufficient to allow for a qualitative evaluation of a range of evaluation criteria and measures including engineering, environmental, cost and public input, which correlate to the study goals as shown in **Figure 4** (page 19). This level of screening may qualitatively assess land use, parcel boundaries, major structures, utility impacts, natural terrain and other constraints. Based on the Refinement Process analysis, alternatives shall be carried through to the next development phase of the project for reasonable alternatives development and evaluation.

- Finally, in Level 3, a Detailed Evaluation, or short list of reasonable alternatives or projects resulting from the Refinement Process screening will be developed to a higher level of detail and evaluated using more detailed quantitative measures as shown in **Figure 5** (page 20), based on the same range of criteria and measures as the Level 2 Refinement Process (Engineering, Environmental, Cost Effectiveness, and Public Input). This level of screening may quantitatively

assess land use, parcel boundaries, major structures, utility impacts, natural terrain and other constraints. The alignments shall be designed to a level of detail to define the alternative's general location and basic ROW needs. The result of this final phase of the process will be the identification of alternatives or projects to be carried forward to the next phase of project development.

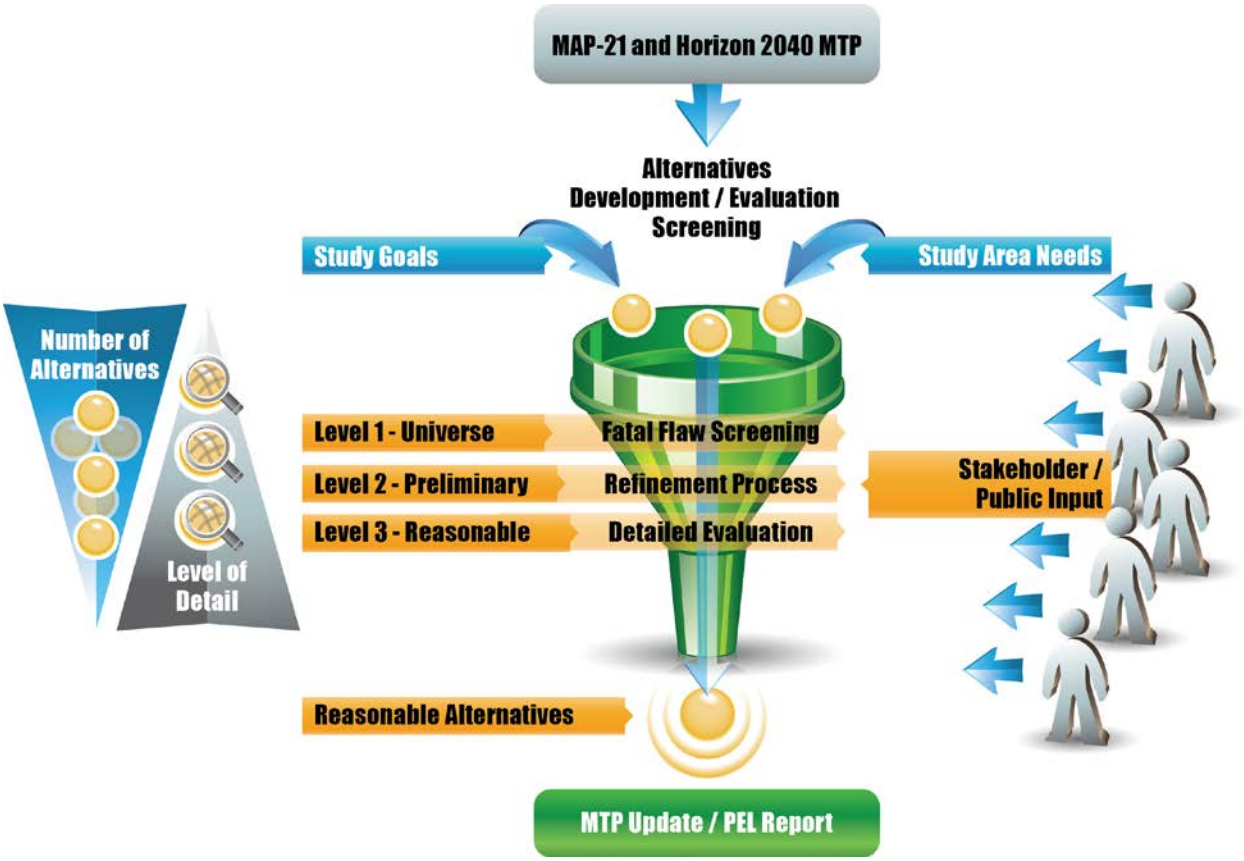


Figure 2: Alternative Screening Process

3.0 ALTERNATIVE EVALUATION CRITERIA AND MEASURES

Alternative Evaluation Criteria and Measures for the BHE study are based upon both the Purpose and Need (Sections 3.1, 3.2, 3.3) and the established study goals (Section 3.4). The following sections provide detailed definitions for each of the evaluation criterion and measures as well as the evaluation matrix process to be utilized during the screening process.

The primary Alternative Evaluation Criteria and Measures are derived from both the Purpose and Need and Study Goals and are summarized below.

3.1 SYSTEM CAPACITY (ENHANCED MOBILITY)

Enhanced mobility through additional system capacity and improved traffic operations is a key purpose of this study. The major roadways within and encompassing the study area (I-10, FM 76, SH 20, and FM 258) primarily serve east-west mobility and are currently heavily utilized with truck traffic exceeding 10 percent of the total traffic in several segments of these corridors. Study alternatives must address improvements to east-west capacity and operational efficiency.

The key BHE system capacity needs include improving the level of service (LOS) along the primary east-west transportation arterials. LOS is an overall measure of congestion and travel performance within a corridor or roadway facility and it provides a way of quantifying less tangible attributes of congestion such as freedom to maneuver in the travel stream, traffic interruptions, comfort and convenience. Generally, alternatives which provide the largest improvement to the LOS along the primary east-west regional roadways (I-10, SH 20, FM 76, FM 258) will have the highest ratings.

Bus transit (through Sun Metro and El Paso County Rural Transit), bicycle and pedestrian pathways and trails currently supplement the existing roadway infrastructure capacity in providing a transportation mobility alternative to roadways for those populations without access to a vehicle. The El Paso MPO does show a future Bus Rapid Transit (BRT) corridor running along Alameda Avenue, which extends from El Paso into the north end of the study area to Horizon Blvd. The MPO also shows several Bicycle and Pedestrian trail linkages throughout the study area. For this study, improvements to these alternative transportation strategies will be evaluated for Modal Connectivity (Section 3.3) on their ability to connect customers from the proposed transportation Horizon 2040 MTP network to major facilities and activity centers within the study area.

While they may not be able to solve the entirety of the future transportation system demand, lower cost strategies which can improve the efficiency of the transportation system outside of capacity investments (e.g. TSM, TDM, ITS) should also be considered as a baseline strategy as part of the overall transportation set of solutions.

3.2 SYSTEM LINKAGE

As noted in the BHE Purpose and Need document, system linkage within the study area is limited by the following:

- The lack of direct access/connectivity to I-10 and Loop 375; and
- The prevalence of at-grade train crossings within the study area that cause delay and impede traffic movement.

The need for improved system linkage includes improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel. Future BHE alternative(s) including alternate connections to I-10 for travel through the study area, paralleling FM 258, SH 20, and FM 76 would help manage congestion on these parallel facilities and provide a more direct route for vehicles traveling southeast from Loop 375 and northwest from the future Tornillo-Guadalupe International Port of Entry (POE). In addition to these roadway oriented links, alternatives need to consider closing the gaps between connections to major activity centers and potential modal connections.

3.2.1 Accessibility - Increased Connectivity

The alternatives for the future BHE project(s) and connections to I-10 and Loop 375 must be compatible with both existing and proposed transportation networks in the study area to be efficiently utilized. Potential interchange/intersection locations for each alternative will be identified. In addition, the alternatives must accommodate emergency vehicle access. Alternatives that integrate with the existing and proposed transportation network and accommodate access to emergency facilities will be ranked higher than those that are not compatible with the existing and proposed transportation network.

Alternatives will be evaluated that:

- Accommodate the establishment of a transportation link between the Tornillo-Guadalupe International POE, the existing regional transportation system, and future BHE projects by improving the trans-continental trade network by providing an alternate route to I-10.
- Accommodate a potential direct connection (interchange) with Loop 375 near the Zaragoza International POE in the City of El Paso.
- Complement and accommodate local city initiatives such as the City of Socorro's plan to improve connections to I-10, through the widening of FM 1281 (Horizon Boulevard), Eastlake Boulevard, and Tiwa Boulevard.

Generally alternatives which provide or accommodate uninterrupted direct connections between major transportation facilities and activity centers will be rated higher than those with more circuitous connections.

3.2.2 Effects on Parallel Roadways

The study would consider an alternative alignment to several parallel roadways in the study area, such as FM 258 (Socorro Road), State Highway 20 (Alameda Avenue), FM 76 (North Loop Road), and I-10. Therefore, alternatives should improve LOS on these parallel facilities by providing an additional route for southeast-northwest trips. The effect that each alternative has on these parallel roadways will be compared and evaluated. Those alternatives which most positively impact the traffic operations on these parallel facilities will be ranked higher than alternatives with less positive impacts.

3.3 MODAL CONNECTIVITY

The El Paso metropolitan area faces unique challenges as a border city with six POE's within the metropolitan planning boundaries. Within the BHE study area, are the Ysleta-Zaragoza POE and the Fabens International POE which attract a significant amount of multimodal traffic including: vehicular, truck, and pedestrian traffic. As noted in the BHE Purpose and Need there is currently a limited integration of the existing transportation network with other existing and planned transportation modes. Consequently there is a need to address increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.

The study must address modal interrelationship improvements which include the following:

- Consideration of the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and
- Integration of the existing transportation facilities to complement other modes of transportation.

Alternatives that contribute to seamless accommodation of the transport of people (vehicular travel, transit via bus service, walking, and bicycling) and goods (through trucking and freight rail) through improved modal connections will receive higher ratings. Those alternatives that do not incorporate multiple transportation modal connections will be given a lower rating. Measures of seamless modal accommodation include:

- Alternatives which provide or accommodate improved transit linkages from El Paso County Rural Transit Bus Routes, pedestrian traffic from the POE's, and identified major activity centers with the study area will rate higher than those that do not;
- Alternatives which provide or accommodate improved modal connections for truck and rail freight traffic to/from distribution facilities will rate higher than those that do not; and
- Alternatives that provide for or accommodate alternative transportation modes such as bicycles and pedestrians will rate higher than those that do not.

3.4 STUDY GOALS AND CRITERIA

Additional or secondary Alternative Evaluation Criteria and Measures are derived from the study goals and are summarized below. The study goals and associated criteria have been categorized by engineering, environmental, cost and public input.

3.4.1 ENGINEERING

Engineering criteria include traffic operational and design measures such as mobility, accessibility, safety, design standards, and constructability.

3.4.1.1 Travel Performance

(Goal: Enhancing east-west mobility; providing transportation solutions that help reduce delay and congestion caused by incidents on I-10 and parallel arterials)

Capacity and LOS

Capacity reflects the ability of a roadway to accommodate traffic volume and is a measure of the roadway's ability to handle traffic loads at a given point in time (travel demand) under specific traffic control and geometric conditions. Capacity is typically determined for the peak hour (or rush hour) and is measured in passenger cars per hour; this metric is also known as average peak hourly volume. Alternatives with greater roadway capacity are able to manage a higher peak hourly volume and will be rated higher.

LOS is an overall measure of congestion and travel performance within a corridor or roadway facility and it provides a way of quantifying less tangible attributes of congestion such as freedom to maneuver in the travel stream, traffic interruptions, comfort and convenience. Generally, alternatives which provide the largest improvement to the LOS along the primary east-west regional roadways (I-10, SH 20, FM 76, FM 528) will have the highest ratings.

Transportation Efficiency (Travel Times and Average Speed)

Transportation Efficiency is measured by an assessment of changes in travel times and average speeds through the study area transportation network resulting from the implementation of an alternative. Those alternatives which result in the largest improvement in reduced travel times and in increased average corridor speeds in comparison to the no-build alternative along the primary east-west regional roadways (I-10, SH 20, FM 76, FM 528) will have the highest ratings.

3.4.1.2 Accessibility

(Goal: Improve local and regional access)

Local Access

Alternatives which provide more direct connections to major regional transportation arteries such as I-10 (from the border) and Loop 375, as well as more direct access to heavy traffic areas (such as the Tornillo-Guadalupe International POE and Zaragoza International POE) as an alternative to I-10 for longer regional east west trips will be evaluated more favorably than those alternatives which do not. Additionally alternatives which provide improved access to alternative modes such as transit, bicycle, and pedestrian will rated higher than those that do not provide accessibility to different modes.

Regional Access

Alternatives which provide an alternate to I-10 for longer regional east-west trips will be evaluated more favorably than those alternatives which do not.

3.4.1.3 Bicycle and pedestrian accommodation

(Goal: Provide pedestrian and bicycle friendly facilities)

Bicycle and pedestrian accommodation is measured by how well an alternative accommodates bicycle and pedestrian users through provision of shared use or dedicated bicycle lanes/sidewalks. Alternatives that accommodate bicycle and pedestrian users will be ranked higher than those that do not.

3.4.1.4 Incident Management

(Goal: Providing transportation solutions that help reduce delay and congestion caused by incidents on I-10 and parallel arterials)

This criterion addresses the impacts of alternatives on the occurrence of incidents in study area. A higher rating will be given to an alternative that potentially reduces the occurrence of accidents within the study area. The lowest rating will be given to an alternative that does not address safety or that may contribute to the occurrence of accidents within the study area. A neutral rating will be given to an alternative that has little or no effect on safety on existing facilities within the study area.

3.4.1.5 Construction Impacts

(Goal: Minimizing disruption to traffic during construction)

Construction generally requires temporary lane closures and detours, which may affect nearby residences and businesses and the transportation users. It is important that the alternatives minimize disruption to neighborhood businesses and residential neighborhoods during construction. An alternative that has little or no effect during construction will generally have a neutral rating. An alternative that is likely to cause greater inconvenience to the public during construction, because of its proximity to more intense development, or in areas where ROW is limited, will be given a more negative rating. Measures of inconvenience will be number of potential street crossings, or

driveway crossings caused by the construction of an alternative impacting existing mobility and access.

3.4.1.6 Border security compatibility

(Goal: Developing a design that coexists with border security)

The key border security focus for the alternatives evaluation centers around alternative compatibility with border security infrastructure while simultaneously facilitating improved access to and from the POEs within or adjacent to the study area (Ysleta-Zaragoza POE, and Fabens International POE, and the future Tornillo-Guadalupe International POE). While the Horizon MTP examines issues of concern for all crossing modes (pedestrian, passenger vehicle, commercial trucks, and bus crossings), recent historical trends show that there are more pedestrian mode crossings and less privately owned vehicular crossings at these POEs. This criterion will focus on alternatives which are compatible with existing and planned border security infrastructure while providing improved POE access for all crossing modes consistent with the Horizon MTP's Border Delay Reduction Strategies.

3.4.2 COST FEASIBILITY

There is limited transportation funding available for transportation studies and improvements; therefore, the alternatives must be viable, cost-effective and maintained to ensure that they remain a valuable resource to the community. The following criteria have been identified to ensure alternatives are cost effective.

3.4.2.1 Construction Cost

(Goal: Maximizing cost efficiency)

Conceptual-level cost estimates will be developed for the alternatives using estimated quantities and unit costs of major construction items, including pavement, structures and ROW. A contingency will be added to the conceptual assessment to account for items not listed in the conceptual assessment. Alternatives with lower construction costs will be ranked higher than alternatives with high construction costs.

3.4.2.2 Right-of-Way Acquisition

(Goal: Maximizing cost efficiency)

ROW acquisition will be a major component of the study because future projects may be new-location roadways. ROW acquisition costs consist of acquiring land (parcels) and the cost of displacements. The ROW footprint of each alternative will be determined and compared. In addition, potential displacements that could result from ROW requirements can be classified as community, residential, commercial, or industrial. Those alternatives that have substantial ROW requirements and potential displacements, in terms of amount or severity, will be ranked lower than alternatives with less substantial ROW requirements and potential displacements.

3.4.2.3 Utilities and Infrastructure

(Goal: Maximizing cost efficiency)

Because future projects in the study area may be on new location, there are anticipated utility and infrastructure impacts. These include, but are not limited to, electric, sewer, water, telephone, gas, fiber optic, and cable TV lines in addition to drainage easements for existing surface roads and streets. The existing utilities and infrastructure information will be obtained by contacting utility companies and conducting field investigations. Each alternative's impact to major utilities and infrastructure will be documented and compared. Alternatives with substantial impacts to major utilities and infrastructure will be ranked lower than alternatives with minor impacts to major utilities and infrastructure.

3.4.2.4 Financing Opportunities

(Goal: Accelerating delivery through innovative financing options)

This criterion addresses how well an alternative accommodates innovative financing and accelerated project delivery. Alternatives which promote and accommodate innovative financing opportunities such as partnerships with local governments and private entities will be rated more favorably. Measures include a qualitative assessment of how well an alternative accommodates alternative financing mechanisms such as toll revenue and demonstrations of local government support (Y=+; N =-).

3.4.2.5 Economic Development Opportunities

(Goal: Optimizing opportunities for economic development)

This criterion addresses how well an alternative provides a supportive climate for economic development and how well an alternative accommodates economic development through the following strategies: provision of direct roadway links to the POEs within the study area (Yslete-Zaragosa POE and proposed Tornillo POE) to maintain unimpeded truck freight movement, provision of alternatives which connect to but do not adversely impact historic resources (thereby supporting economic growth through increased tourism), as well as through the accommodation of Transportation Reinvestment Zones.

3.4.3 MINIMAL ENVIRONMENTAL IMPACTS

Environmental impacts are evaluated to ensure that the alternatives blend with and complement the resources of the communities within the study area. The environmental impacts are subdivided into the following classifications:

- Community Impacts;
- Cultural Resources Impacts;
- Natural Resources Impacts; and
- Other Impacts.

3.4.3.1 Community Impacts

(Goals: Avoiding and/or minimizing impacts to the human and natural environment; developing the facility utilizing context sensitive solutions)

Community impacts are evaluated to ensure that the alternatives complement the study area community and enhance community qualities. The community impacts that will be evaluated in this category include neighborhood character, context sensitive solutions (CSS), and socio-economic environment.

Neighborhood Character

The alternatives should avoid impacts to existing and proposed neighborhoods, have minimal effect on community cohesion, and should enhance the neighborhoods' qualities. Alternatives with substantial impacts to neighborhoods, school districts and other community features will be ranked lower than other alternatives.

Context Sensitive Solutions

The alternatives should incorporate the principles of CSS, address the needs of the community, recognize the character of the region, balance the planning considerations of the study area, and utilize a team based approach to environmental, public involvement and engineering. Alternatives that result in a mutually agreed upon project visions/goals and that also have greater maximizes public/agency support shall be ranked higher than other alternatives.

Socio-Economic Environment

Potential impacts to the social and economic environment of the study area will be identified. Environmental justice issues will be analyzed in order to prevent the potential for discrimination and disproportionately high and adverse effects to minority and low-income populations. Demographics regarding environmental justice populations will be documented and compared. Alternatives which traverse environmental justice populations will be ranked lower than alternatives which do not potentially impact environmental justice populations.

3.4.3.2 Cultural Resources Impacts

(Goal: Avoiding and/or minimizing impacts to the human and natural environment)

The study should avoid impacts to existing cultural resources because they preserve the rich history of the Lower Valley community. The cultural resource properties evaluated include archaeological sites and historic resources.

Archaeological Sites

Alternatives should avoid or minimize impacts to archaeological sites. Recorded archaeological sites will be determined through record searches. High probability areas will also be identified. The number of recorded archaeological sites and high probability areas impacted by each alternative will be documented. Alternatives with impacts to recorded archeological sites and high probability areas will be ranked lower than alternatives that do not impact recorded archeological sites or high probability areas.

Historic Resources

Alternatives should avoid or minimize impacts to historic resources. For screening purposes, historic resources are considered to be historic-age properties (45 years or older) and those listed on or eligible for the National Register of Historic Places (NRHP) as determined through record searches. The number of historic resources located within the area of potential effect of each alternative will be documented. Alternatives with impacts to historic-age or NRHP listed or eligible properties (as determined through other studies) will be ranked lower than alternatives that do not potentially impact these resources.

3.4.3.3 Natural Resources Impacts

(Goal: Avoiding and/or minimizing impacts to the human and natural environment)

The alternatives should have minimal effects on the study area's natural resources, including parkland, water resources (wetlands, drainage, and floodplains), irrigation canals, biological resources, and agricultural resources.

Parkland

The alternatives should avoid or minimize impacts to parkland. Parkland will be identified through field reconnaissance and coordination with the cities/county on proposed parks. The potential impact of each alternative will be documented and compared. Alternatives that potentially impact parkland will receive a negative rating, while the alternatives that do not potentially impact parkland will receive a neutral rating.

Water Resources

Alternatives should avoid or minimize impacts to jurisdictional waters of the U.S., including wetlands, drainage, and floodplains. The number of surface water crossings and acres of jurisdictional features potentially affected by each of the alternatives should be identified and compared. Alternatives that potentially have substantial potential impacts to water resources will be ranked lower than alternatives with minor potential impacts to water resources.

Drainage/Irrigation Features

Irrigation canals are a vital component for the success of the agricultural properties in the Lower Valley. The alternatives should avoid or minimize negative impacts to existing drainage and irrigation features. These features will be identified through coordination with the El Paso County Water Improvement District No. 1 and research. The potential impact of each alternative to drainage and irrigation features will be documented and compared. Alternatives which do not potentially impact the functionality of drainage/irrigation features will be ranked higher than alternatives that potentially negatively impact these features.

Biological Resources

Biologically sensitive areas will be identified such as state and federally listed threatened and endangered species and their habitat, as well as locally important species and rare vegetation series. The potential for occurrence of impacts to

threatened, endangered and rare species and their habitat, as well as, other wildlife habitat areas will be evaluated and compared for each alternative. The alternatives that do not impact biological resources will be ranked higher than alternatives that may potentially impact biological resources.

Agricultural Resources

The acreage of prime farmland converted to transportation use will be evaluated for each alternative. Alternatives with minimal potential impacts to agricultural resources will be ranked higher than alternatives with potential substantial negative impacts to these resources.

3.4.3.4 Other Impacts

(Goal: Avoiding and/or minimizing impacts to the human and natural environment)

The alternatives will be assessed to determine the impacts to the existing environment and constraints such as hazardous materials, air quality and traffic noise.

Hazardous Materials

A list of existing known hazardous materials sites, including petroleum storage tanks and closed municipal landfills, will be obtained from database searches. The number of hazardous material sites located adjacent to each alternative will be compiled and compared. Alternatives which avoid any known hazardous materials sites will be ranked higher than alternatives that impact hazardous material sites.

Air Quality

The study area is partially located in the part of El Paso County (City of El Paso) that is in moderate non-attainment for Particulate Matter 10 (PM_{10}) but outside of the maintenance area for the carbon monoxide standard. Alternatives should reduce emissions of volatile organic compounds, nitrogen oxides, carbon monoxide, and PM_{10} levels by increasing travel speeds and reducing idle times. Air quality impacts are related to traffic volumes, capacity, and speeds. Alternatives with acceptable LOS would increase speeds, reduce idle times, and lower mobile source air emissions, which would result in less traffic congestion. Therefore, alternatives that provide acceptable LOS compared to other roadways in the study area will be ranked higher than alternatives with unacceptable LOS, which will result in reduced air quality.

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics emitted from highway vehicles and non-road equipment. For each alternative, the amount of MSATs emitted will be assumed to be proportional to the amount of vehicle miles traveled (VMT), assuming that other variables are the same for each alternative. Therefore, an alternative with lower VMT will be ranked higher than an alternative with higher VMT. Another factor that will be considered is the location of sensitive receptors near each alternative. Sensitive receptors include day care facilities, elder care facilities, churches (with associated day cares), schools, and hospitals. An alternative in proximity to a

higher number of sensitive receptors will be ranked lower than alternatives in proximity to a lower number of sensitive receptors.

Traffic Noise Receivers

The number of traffic noise receivers (schools, hospitals, parks, residences, daycares, etc.) directly adjacent to each alternative will be determined. Alternatives which are adjacent to a higher number of traffic noise receivers will be ranked lower than alternatives which are not located adjacent to sensitive traffic noise receivers.

3.4.4 PUBLIC INPUT

Public input addresses the public perception of an alternative's overall benefit. Methods to gauge public input include written or verbal comments received at public meetings, resolutions of local agency support, and the compatibility of an alternative with regional transportation plans.

3.4.4.1 Comments from public meetings / Resolutions of support

(Goal: Ensuring an open public participation process)

All verbal and written comments received through the public involvement process, including stakeholder meetings and TWG meetings, will be reviewed during the alternatives evaluation process. Alternatives that are not generally supported by the TWG and the public in a consensus manner will be ranked lower than those alternatives that are supported.

3.4.4.2 Compatibility with Other Studies

(Goal: Ensuring compliance with the MTP)

This criterion addresses how an alternative relates to adjacent studies, as well as with local and regional plans. Items considered in this criterion are local land use, community, and thoroughfare plans and the MTP. A higher rating will be given to an alternative that is consistent with these plans. Conversely, an alternative that is not mentioned in local or regional plans or for which there is a record of or current demonstration of community non-support would receive a lower rating.

4.0 EVALUATION SCREENING MATRIX

The methodology described in this document will be followed to evaluate the various alternatives, including connections to I-10 and Loop 375, to determine their comparative advantages and disadvantages. The alternative screening process depicted in **Figures 3, 4, and 5** contains the primary evaluation categories as well as the individual criteria within those categories. Units of measure for the criteria are also provided, where applicable. Utilizing this screening process and decision making framework will ultimately lead to the selection of reasonable PEL alternatives or projects for continued development during the NEPA process.

Figure 3: Concept Screening Process (Level 1)

First Level Screening for Purpose and Need
Universe of Alternatives (qualitative - fatal flaw analysis)

Need	Purpose	Measure		Alternatives						
				No-Build	Alt 1	Alt 2	Alt 3	Alt X	Alt Y	Alt Z
System Capacity			Use Measure Key (- -, -, 0, +, + +)							
Congestion along east-west arterials; and high volumes of truck traffic along the existing east-west arterials;	Improving the level of service (LOS) along the primary east-west transportation arterials;	LOS								
	Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Does alternative include or accommodate congestion management strategies such as TDM, TSM, ITS (Y/N)?								
System Linkage										
Lack of direct access/connectivity to I-10 and Loop 375;	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Does alternative improve access / connectivity (Y/N)?								
At-grade train crossings along the study area that cause delay and impede traffic movement;		Does an alternative include or accommodate connections from the border communities and future POE to I-10 through the addition ofRR grade separations (Y/N) ?								
Modal Connectivity										
Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.	Considering the of expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and	Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system (Y/N)?								
	Integrating existing transportation facilities to complement other modes of transportation.	Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation (Y/N)?								
Meets Project Purpose		**Y or N**								
Decision		**Carried Forward or Dropped from Consideration**								
Reasons		**(For comparison purposes)**								

Measure Key	
Substantial Negative Effect	**- -**
Some Negative Effect	**-**
No Effect, Neutral	**O**
Some Positive Effect	**+**
Substantial Positive Effect	**++**

Second Level Screening Preliminary Alternatives

Figure 4: Refinement Screening Process (Level 2)

Second Level Screening for Benefits and Impacts - Preliminary Alternatives (qualitative)

Study Goals	Criteria		Measure	Use Measure Key (- -, -, 0, +, + +)	Alternatives: No-Build	Alt 1	Alt 2	Alt 3	Alt X	Alt Y	Alt Z
Engineering											
Enhancing east-west mobility;	Travel Performance	Level of Service	LOS along East -West Roadways								
		Travel Times / Avg. Spd.	Average Speeds along Major Roadways								
Improve local and regional access	Access within/through the study area		Assessment of connections between I-10 and other E/W roadways and to heavy traffic locations in the study area.								
Provide pedestrian and bicycle friendly facilities	Bicycle and pedestrian accommodation		Qualitative assessment of Bike/Ped accom.users through shared use or dedicated lanes/ sidewalks								
Reduce incidents delay / congestion on I-10 / parallel rdwys.	Incident management		Reduces occurrence of incidents in study area								
Minimizing disruption to traffic during construction	Construction Impacts		Impacts to motorists - amount of lane closures / detours								
Developing a design that coexists with border security	Border security compatibility		Compliments and supports border security initiatives								
Cost Feasibility											
Maximizing cost efficiency	Construction Cost		Conceptual Estimate ($)								
	ROW Acquisition		Number/severity of ROW Acquisition and Displacements								
	Utilities and Infrastructure		Impact to major utilities and infrastructure								
Accelerating delivery through innovative financing options	Financing Opportunities		Accommodates innovative financing and accelerated project delivery								
Optimizing opportunities for economic development	Economic Development Opportunities		Accommodates / supports development of TRZ								
Environmental											
Developing the facility utilizing context sensitive solutions	Community Impacts	Neighborhood Char.	Impact to existing and proposed neighborhoods								
Avoiding and/or minimizing impacts to the human and natural environment		Context Sensitive Solutions (CSS)	Design incorporates CSS principles (community needs and regional character), while also balancing system goals								
		SEE	Impact to environmental justice populations								
	Cultural Resource Impacts	Archaeological Sites	Number of recorded archaeological sites and high probability areas potentially impacted								
		Historic Resources	Number of NRHP, NRHP-eligible, historic-age properties								
	Natural Resource Impacts	Park Land	Acreage of park impacts								
		Water Resources	LF/# of surface water crossings, acreage of wetlands								
		Drainage Features	Functionality impacts of irrigation channels								
		Biological Resources	Potential to impact threated/endangered, rare locally important species. Agreage of habitat								
		Agricultural Resources	Acres of prime farmland converted to transportation use.								
	Other Impacts	Hazardous Materials	Number of hazardous material sites impacted								
		Air Quality	LOS, VMT, and number of sensitive receptors								
		Traffic Noise Receivers	Number of noise receivers directly adjacent								
Public Involvement											
Ensuring an open public participation process	Public Input		Meeting comments and local resolutions of support								
Ensuring compliance with the MTP			Compatibility with programmed improvements								
Decision			**Carried Forward** / **Dropped from Consideration**								
Reasons			**(For comparison purposes)**								

Measure Key	
Substantial Negative Effect	- -
Some Negative Effect	-
No Effect, Neutral	O
Some Positive Effect	+
Substantial Positive Effect	++

Third Level Screening Reasonable Alternatives

Figure 5: Detailed Evaluation Screening Process (Level 3)

Third Level Screening for Benefits and Impacts - Reasonable Alternatives (quantitative)

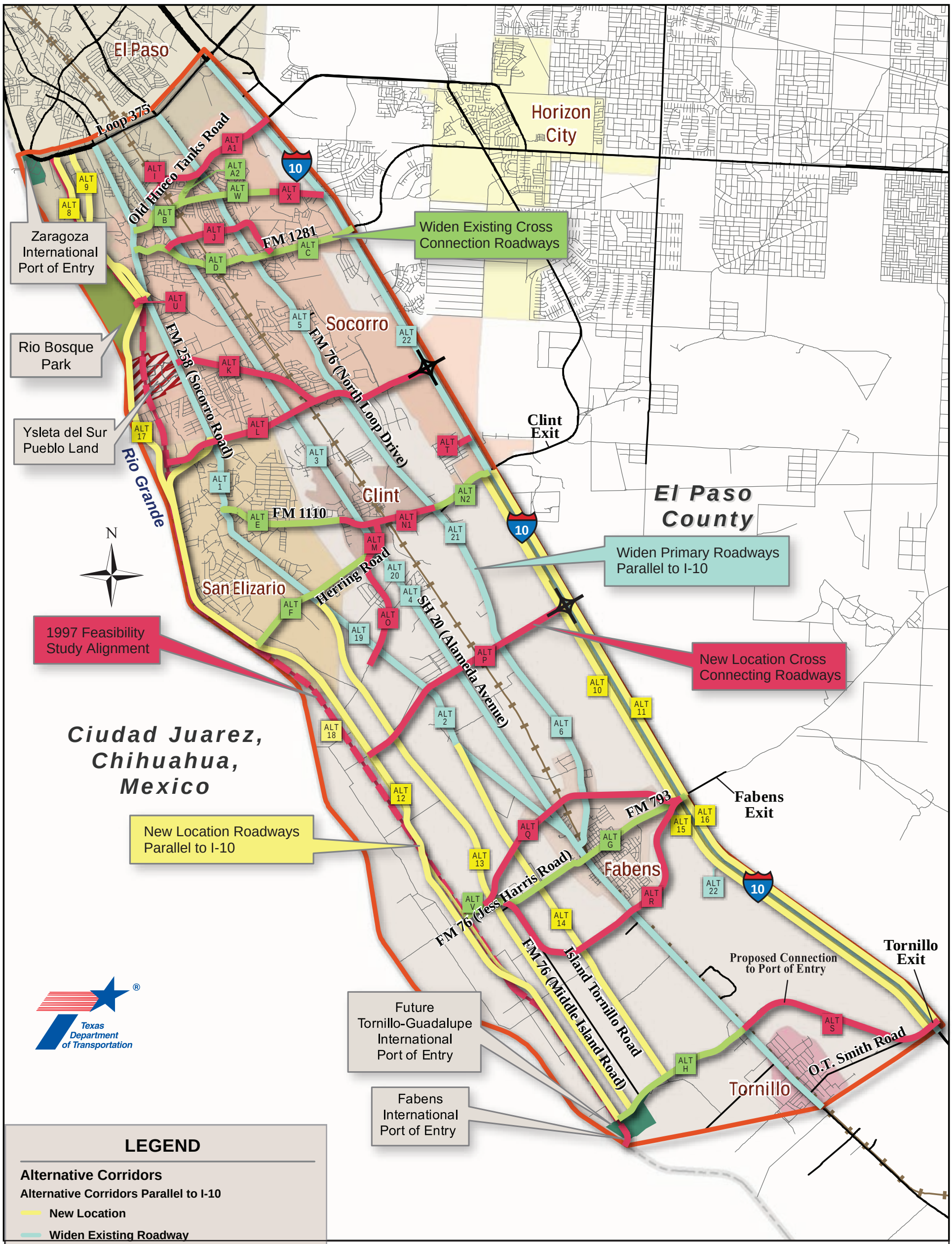
Study Goals	Criteria		Measure	Alternatives						
				No-Build	Alt 1	Alt 2	Alt 3	Alt X	Alt Y	Alt Z
Engineering										
Enhancing east-west mobility;	Travel Performance	Level of Service	LOS along East -West Roadways							
		Travel Times / Avg. Spd.	Average Speeds along Major Roadways							
Improve local and regional access	Access within/through the study area		Assessment of connections between I-10 and other E/W roadways and to heavy traffic locations in the study area.							
Provide pedestrian and bicycle friendly facilities	Bicycle and pedestrian accommodation		Qualitative assessment of Bike/Ped accom.users through shared use or dedicated lanes/ sidewalks							
Reduce incidents delay / congestion on I-10 / parallel rdwys.	Incident management		Reduces occurrence of incidents in study area							
Minimizing disruption to traffic during construction	Construction Impacts		Impacts to motorists - amount of lane closures / detours							
Developing a design that coexists with border security	Border security compatibility		Compliments and supports border security initiatives							
Cost Feasibility										
Maximizing cost efficiency	Construction Cost		Conceptual Estimate ($)							
	ROW Acquisition		Number/severity of ROW Acquisition and Displacements							
	Utilities and Infrastructure		Impact to major utilities and infrastructure							
Accelerating delivery through innovative financing options	Financing Opportunities		Accommodates innovative financing and accelerated project delivery							
Optimizing opportunities for economic development	Economic Development Opportunities		Accommodates / supports development of TRZ							
Environmental										
Developing the facility utilizing context sensitive solutions	Community Impacts	Neighborhood Char.	Impact to existing and proposed neighborhoods							
Avoiding and/or minimizing impacts to the human and natural environment		Context Sensitive Solutions (CSS)	Design incorporates CSS principles (community needs and regional character), while also balancing system goals							
		SEE	Impact to environmental justice populations							
	Cultural Resource Impacts	Archaeological Sites	Number of recorded archaeological sites and high probability areas potentially impacted							
		Historic Resources	Number of NRHP, NRHP-eligible, historic-age properties							
	Natural Resource Impacts	Park Land	Acreage of park impacts							
		Water Resources	LF/# of surface water crossings, acreage of wetlands							
		Drainage Features	Functionality impacts of irrigation channels							
		Biological Resources	Potential to impact threated/endangered, rare locally important species. Agreage of habitat							
		Agricultural Resources	Acres of prime farmland converted to transportation use.							
	Other Impacts	Hazardous Materials	Number of hazardous material sites impacted							
		Air Quality	LOS, VMT, and number of sensitive receptors							
		Traffic Noise Receivers	Number of noise receivers directly adjacent							
Public Involvement										
Ensuring an open public participation process	Public Input		Meeting comments and local resolutions of support							
Ensuring compliance with the MTP			Compatibility with programmed improvements							
Decision			**Carried Forward or Dropped from Consideration**							
Reasons			**(For comparison purposes)**							

Measure Key	
Substantial Negative Effect	**- -**
Some Negative Effect	**-**
No Effect, Neutral	**O**
Some Positive Effect	**+**
Substantial Positive Effect	**++**

Recommended PEL Alternative(s) for continued project development

Attachment B

Alternative Exhibits and Typical Sections



LEGEND

Alternative Corridors

Alternative Corridors Parallel to I-10

- New Location
- Widen Existing Roadway

Alternative Cross-Connecting Corridors

- New Location
- Widen Existing Roadway

Interchanges

- Proposed Interchanges

- Limits of Study Area
- UPRR Railroad
- Major Arterial
- Minor Arterial
- Port of Entry
- United States/ Mexico Boundary

0 1 2 Miles

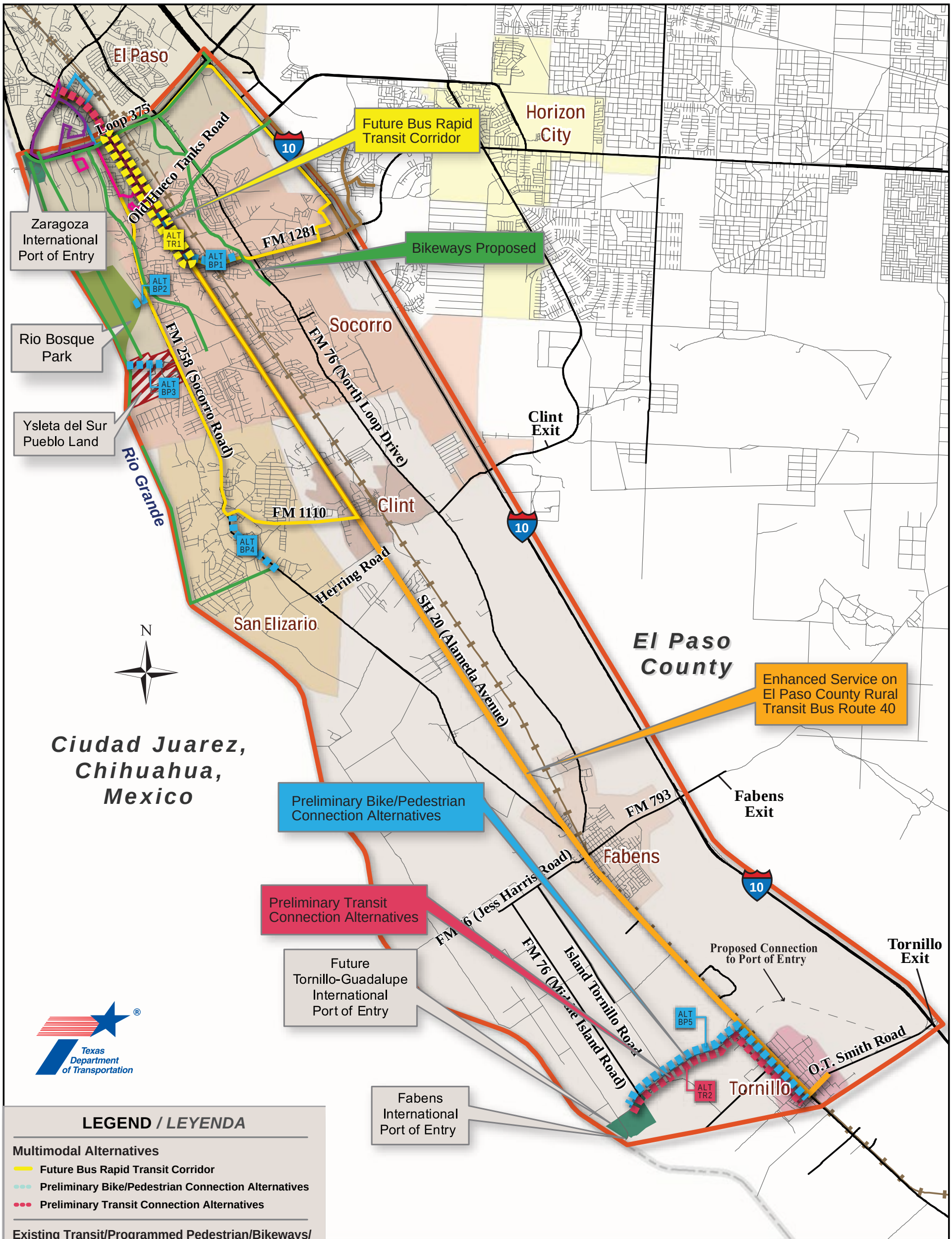
July 17, 2014

Exhibit 1

Border Highway East

Universe of Alternatives

Initial Roadway Alternatives



Texas Department of Transportation

LEGEND / *LEYENDA*

Multimodal Alternatives

- Future Bus Rapid Transit Corridor
- Preliminary Bike/Pedestrian Connection Alternatives
- Preliminary Transit Connection Alternatives

Existing Transit/Programmed Pedestrian/Bikeways/

El Paso County Rural Transit Bus Routes /
- Route 30
- Route 40
- Route 84

Sun Metro Transit Bus Routes /
- Route 60
- Route 63
- Route 69

Pedestrian/Bikeways
- Proposed

(Souce: El Paso MPO 2013)

- Limits of Study Area
- UPRR Railroad
- Major Arterial
- Minor Arterial
- Port of Entry
- United States/ Mexico Boundary

0 1 2 Miles

June 25, 2014

Exhibit 2

Border Highway East

Universe of Alternatives

Initial Multi-modal Connection Alternatives

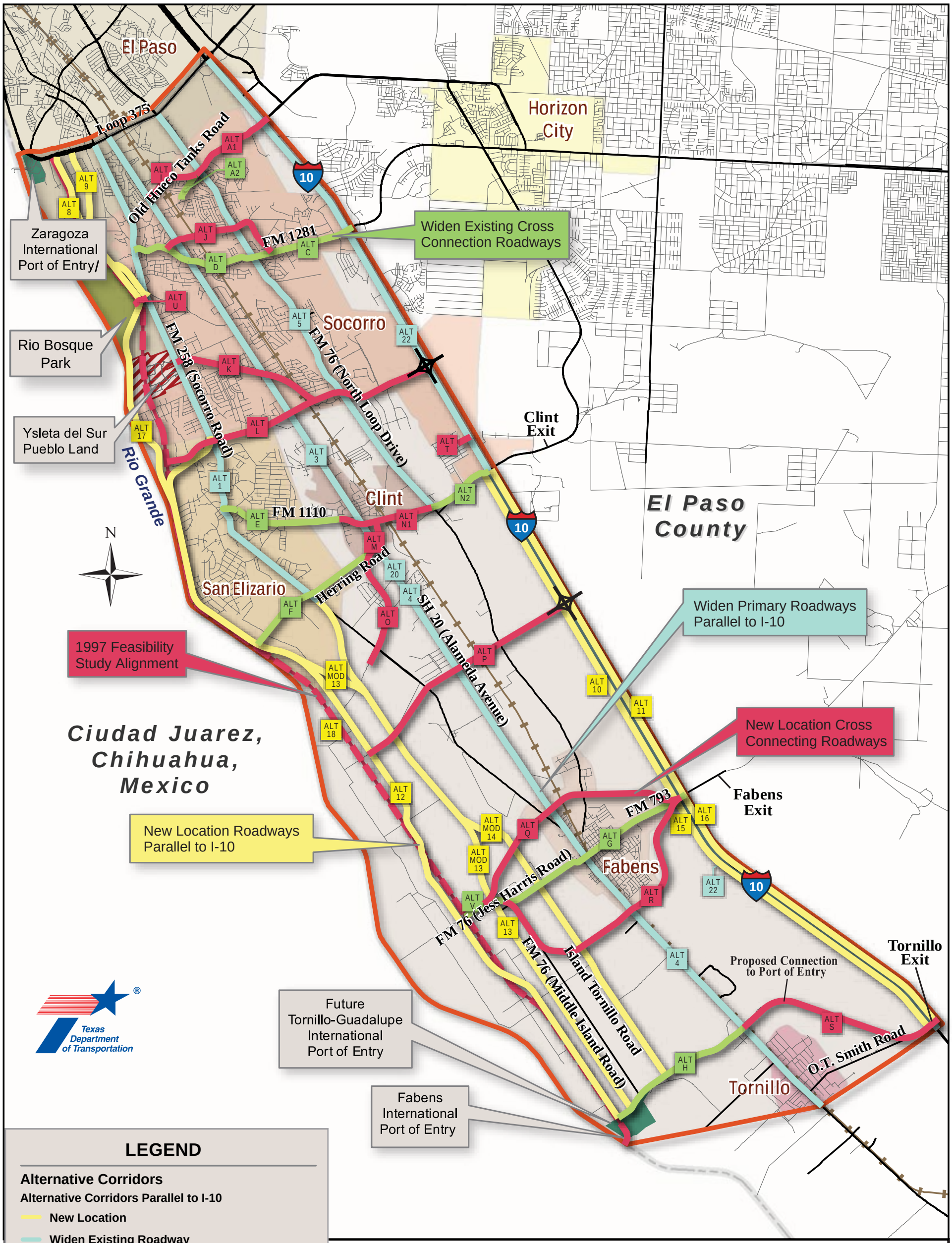
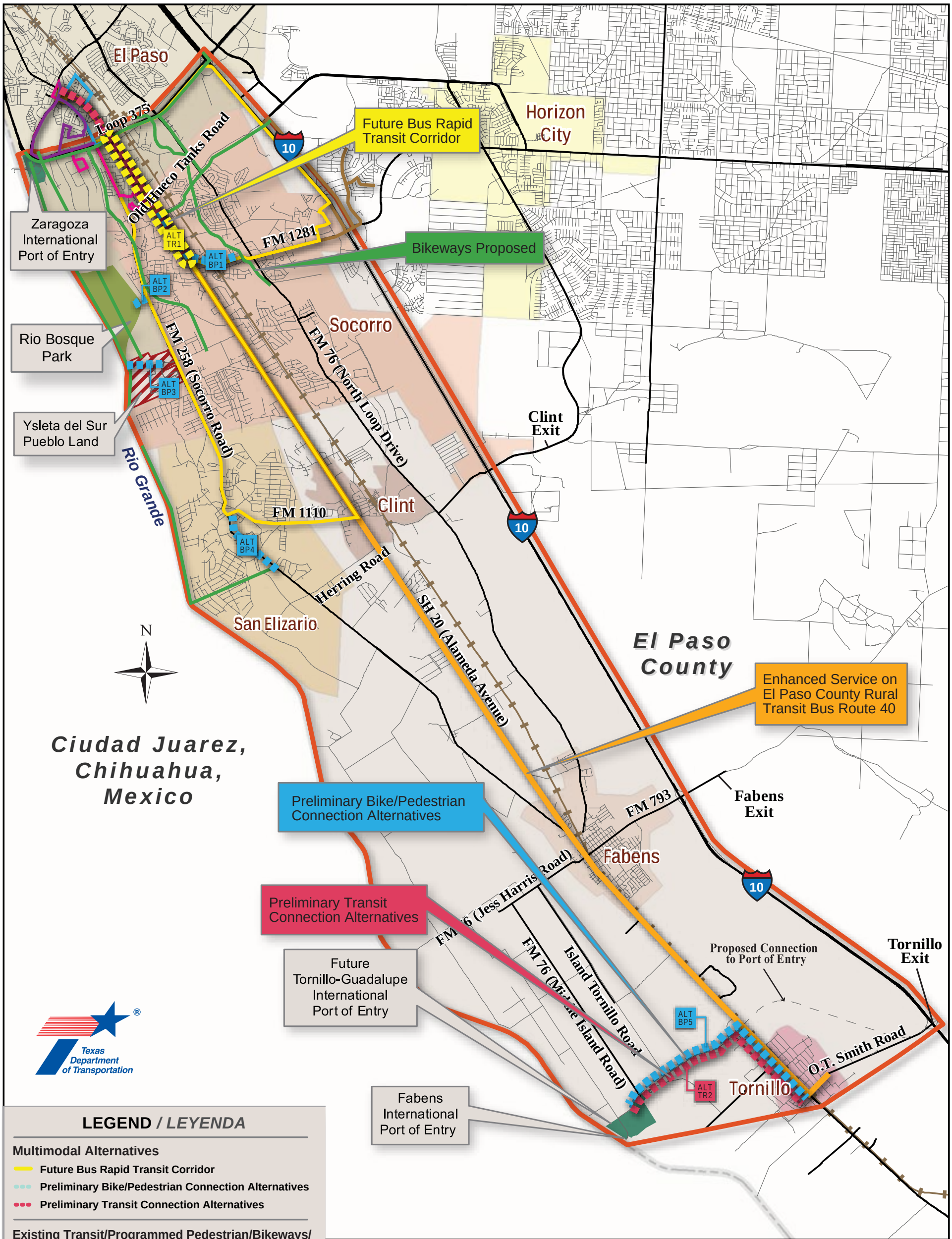


Exhibit 3

Border Highway East

Preliminary Alternative Recommendations

Roadway Alternatives



Texas Department of Transportation

LEGEND / *LEYENDA*

Multimodal Alternatives

- Future Bus Rapid Transit Corridor
- Preliminary Bike/Pedestrian Connection Alternatives
- Preliminary Transit Connection Alternatives

Existing Transit/Programmed Pedestrian/Bikeways/

El Paso County Rural Transit Bus Routes /
- Route 30
- Route 40
- Route 84

Sun Metro Transit Bus Routes /
- Route 60
- Route 63
- Route 69

Pedestrian/Bikeways
- Proposed

(Souce: El Paso MPO 2013)

- Limits of Study Area
- UPRR Railroad
- Major Arterial
- Minor Arterial
- Port of Entry
- United States/ Mexico Boundary

0 1 2 Miles

June 25, 2014

Exhibit 4

Border Highway East

Preliminary Alternative Recommendations

Multi-modal Connection Alternatives

El Paso
Horizon City
Loop 375
Old Hueco Tanks Road
FM 1281
Socorro
FM 258 (Socorro Road)
FM 76 (North Loop Drive)
Clint
FM 1110
San Elizario
Herring Road
SH 20 (Alameda Avenue)
Clint Exit
El Paso County
Ciudad Juarez, Chihuahua, Mexico
Fabens Exit
FM 793
Fabens
FM 76 (Jess Harris Road)
FM 76 (Middle Island Road)
Island Tornillo Road
Proposed Connection to Port of Entry
Tornillo Exit
Tornillo
O.T. Smith Road
Zaragoza International Port of Entry
Rio Bosque Park
Ysleta del Sur Pueblo Land
Rio Grande
Future Tornillo-Guadalupe International Port of Entry
Fabens International Port of Entry
ALT TR1
ALT 8
ALT 9
ALT I MOD
ALT I MOD-REV
ALT BP1
ALT D
ALT D MOD
ALT BP2
ALT BP3
ALT 5 MOD
ALT 22
ALT L
ALT 17
ALT 1 MOD
ALT 3
ALT N
ALT E
ALT BP4
ALT 12
ALT F
ALT P
ALT Q
ALT 16
ALT 15
ALT 13 MOD-REV
ALT R MOD
ALT BP5
ALT TR2
10

N

Texas Department of Transportation

LEGEND

Alternative Corridors

Alternative Corridors Parallel to I-10

- New Location
- Widen Existing Roadway

Alternative Cross-Connecting Corridors

- New Location
- Widen Existing Roadway

Interchanges

- Proposed Interchanges

Multimodal Alternatives

- Future Bus Rapid Transit Corridor
- Preliminary Bike/Pedestrian Connection Alternatives
- Preliminary Transit Connection Alternatives
- Enhanced Service on El Paso County Rural Transit Bus Route 40

Programmed Pedestrian/Bikeways

- Proposed Pedestrian/Bikeways

- Limits of Study Area
- UPRR Railroad
- Major Arterial
- Minor Arterial
- Port of Entry
- United States/ Mexico Boundary

0 1 2 Miles

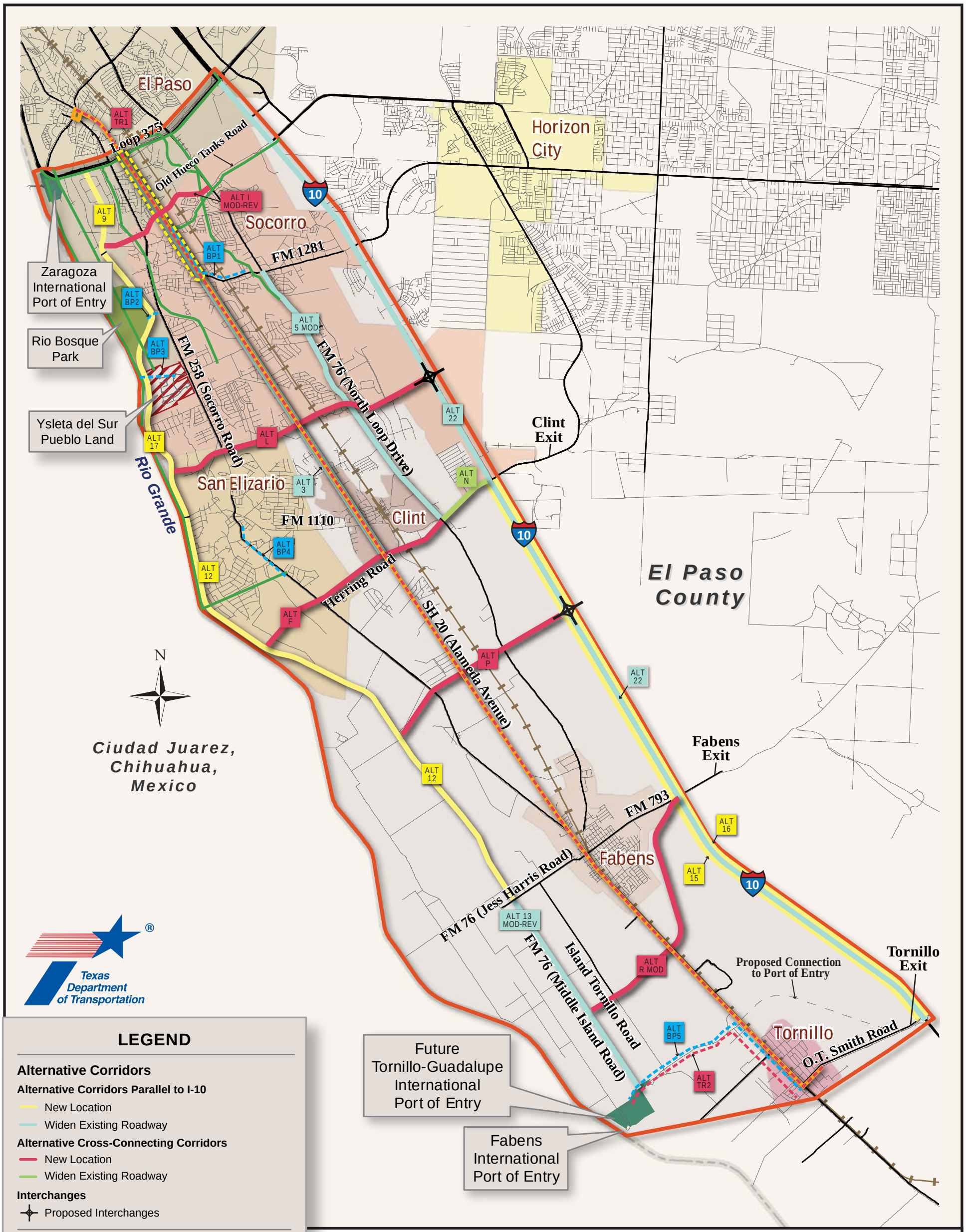
(Souce: El Paso MPO 2013)

July 17, 2014

Exhibit 5

Border Highway East

Reasonable Alternatives



Texas Department of Transportation

LEGEND

Alternative Corridors

Alternative Corridors Parallel to I-10

- New Location
- Widen Existing Roadway

Alternative Cross-Connecting Corridors

- New Location
- Widen Existing Roadway

Interchanges

- Proposed Interchanges

Multimodal Alternatives

- Future Bus Rapid Transit Corridor
- Preliminary Bike/Pedestrian Connection Alternatives
- Preliminary Transit Connection Alternatives
- Enhanced Service on El Paso County Rural Transit Bus Route 40

Programmed Pedestrian/Bikeways

- Proposed Pedestrian/Bikeways

- Limits of Study Area
- UPRR Railroad
- Major Arterial
- Minor Arterial
- Port of Entry
- United States/ Mexico Bound

0 1 2 Miles

(Souce: El Paso MPO 2013)

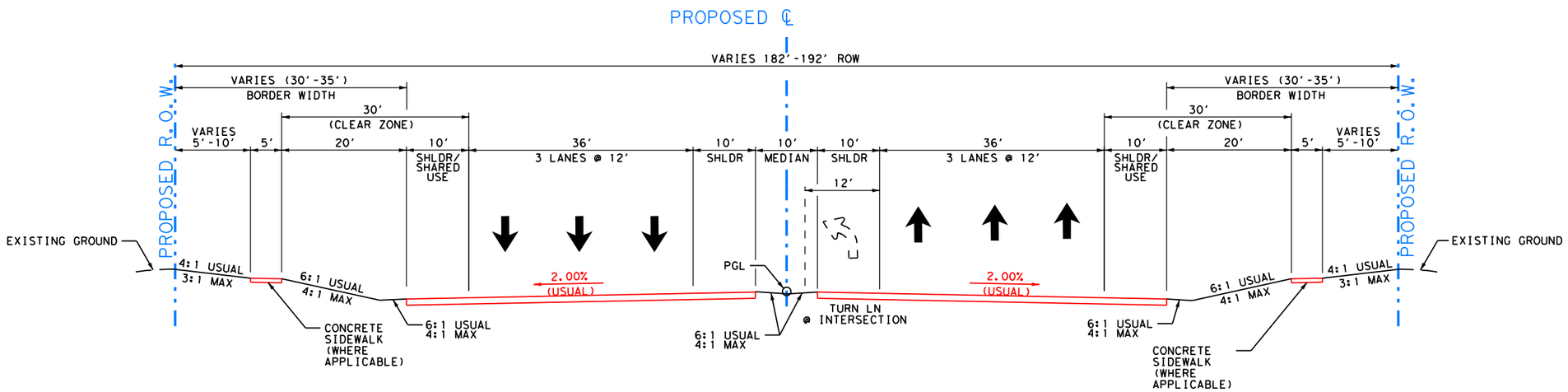
July 8, 2014

Exhibit 6

Border Highway East

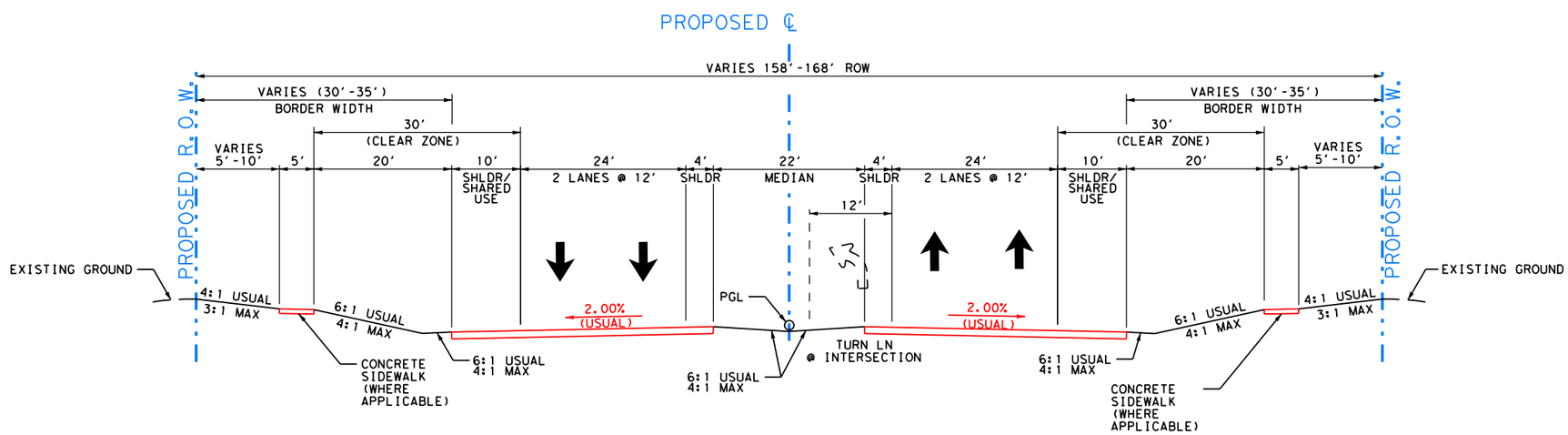
2040 Recommended Alternatives

URBAN ARTERIAL - UNCURBED
(NATURAL GROUND MEDIAN)



TYPICAL SECTION

(6-LANE URBAN ARTERIAL)



TYPICAL SECTION

(4-LANE URBAN ARTERIAL)

HNTB CORPORATION
REGISTRATION NUMBER 420
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OR CONSTRUCTION.
PREPARED BY OR UNDER THE
DIRECT SUPERVISION OF:
Russell K. Ozmer 91108
NAME P.E. #
JULY 30, 2013

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BORDER HIGHWAY EAST
CSJ 0924-06-090

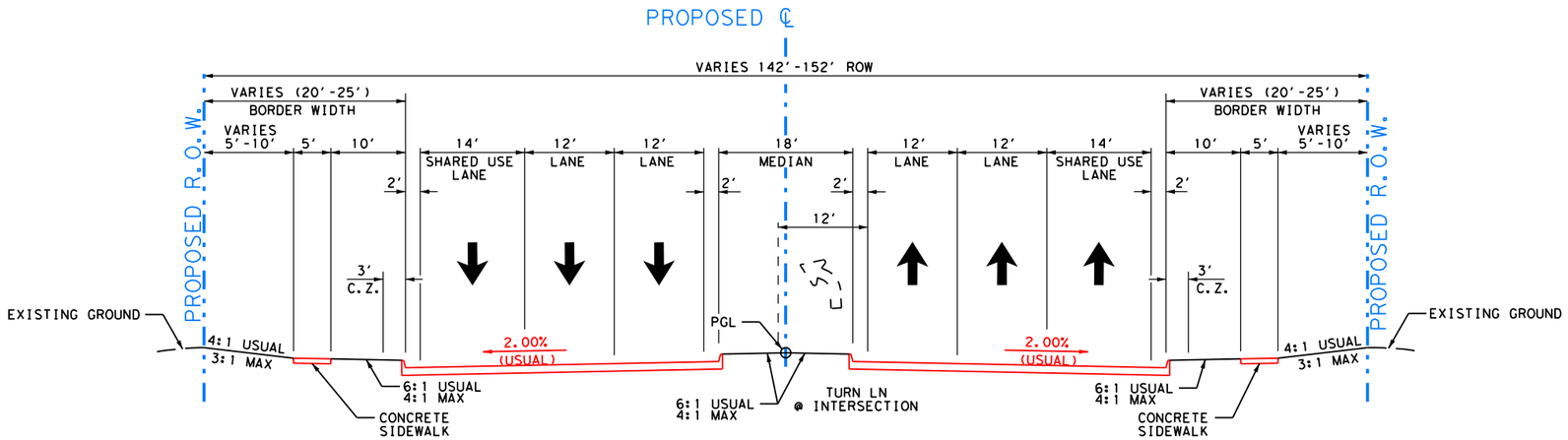
TYPICAL SECTIONS

SHEET 1 OF 4

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners

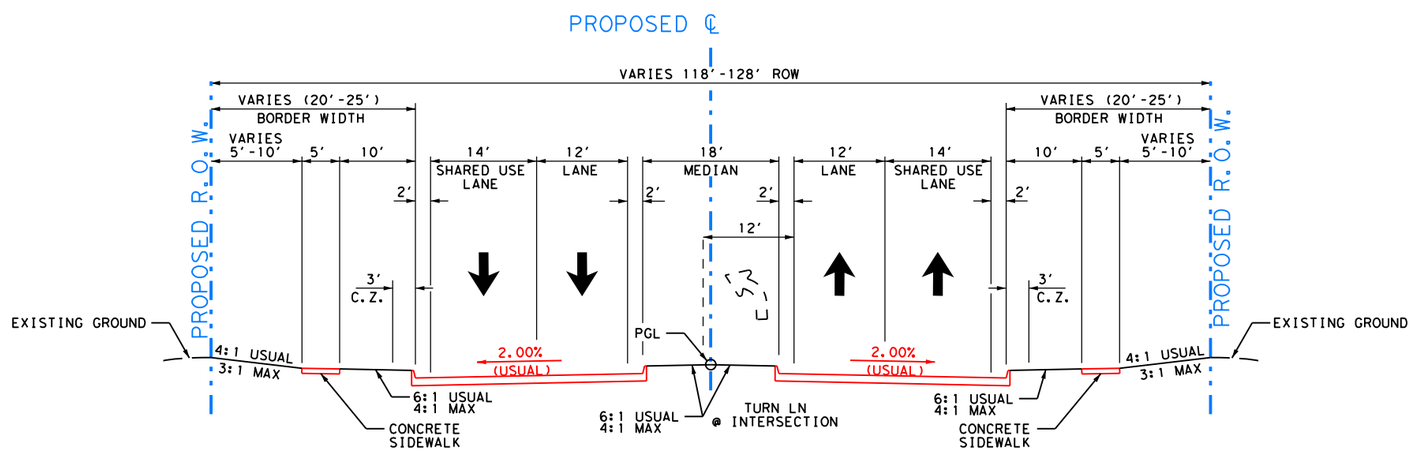
Border Highway East

URBAN ARTERIAL - CURBED
(NATURAL GROUND MEDIAN)



TYPICAL SECTION

(6-LANE URBAN ARTERIAL)



TYPICAL SECTION

(4-LANE URBAN ARTERIAL)

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Russell K. Ozmer	91108

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TYPICAL SECTIONS

SHEET 2 OF 4

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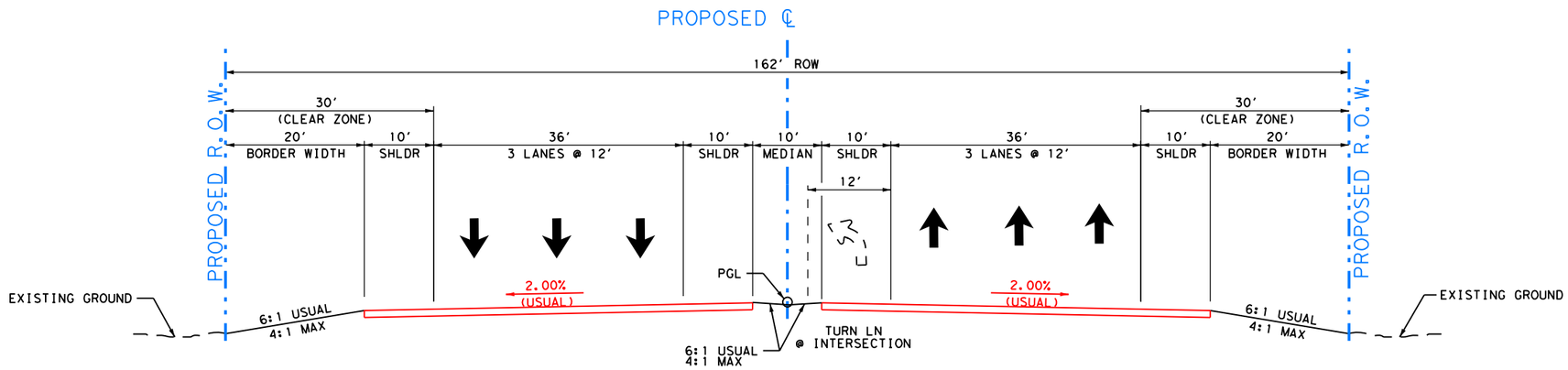
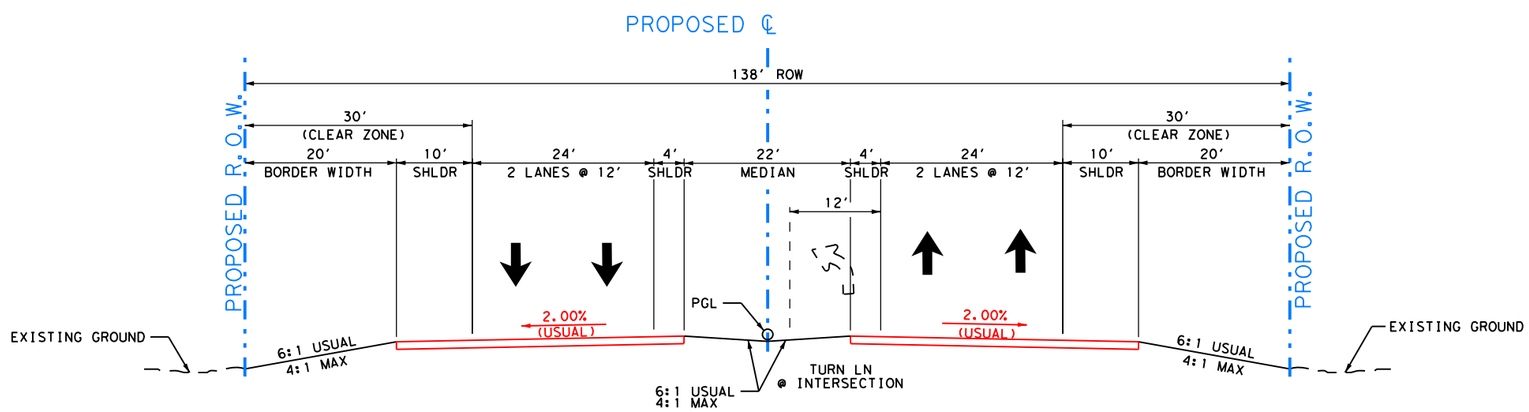
Border Highway East

RURAL ARTERIAL
(NATURAL GROUND MEDIAN)



TYPICAL SECTION

(6-LANE RURAL ARTERIAL)



TYPICAL SECTION

(4-LANE RURAL ARTERIAL)

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TYPICAL SECTIONS

SHEET 3 OF 4

HNTB

HNTB Corporation
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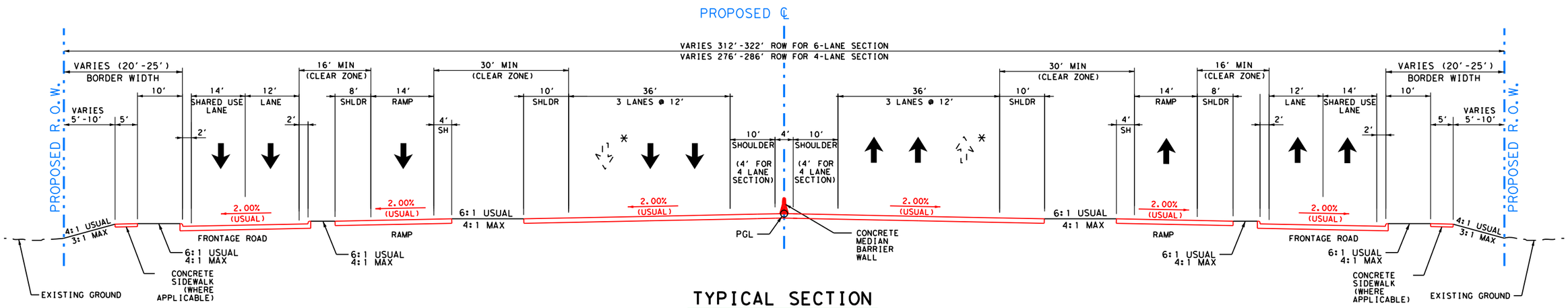
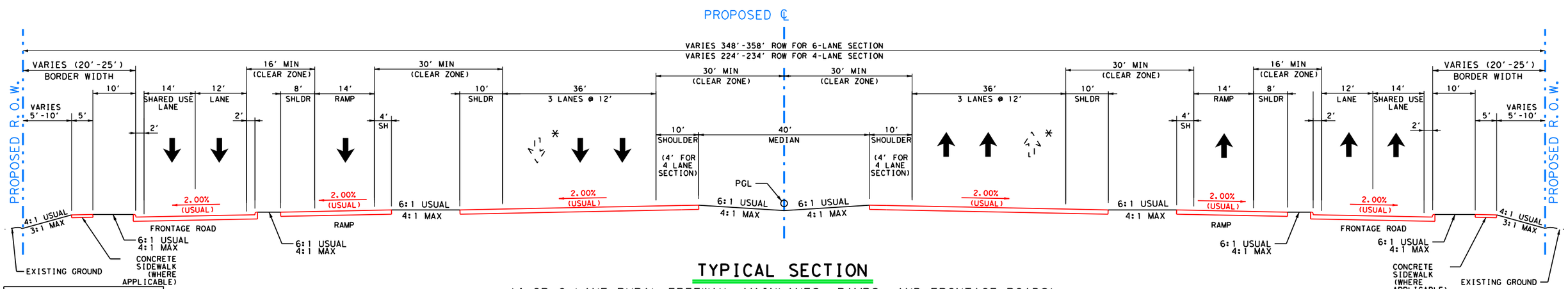
Engineers Architects Planners

URBAN AND RURAL FREEWAYS WITH RAMPS AND FRONTAGE ROADS



TYPICAL SECTION

(4 OR 6-LANE URBAN FREEWAY: MAINLANES, RAMPS, AND FRONTAGE ROADS)



TYPICAL SECTION

(4 OR 6-LANE RURAL FREEWAY: MAINLANES, RAMPS, AND FRONTAGE ROADS)

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REGISTRATION NUMBER 420

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CSJ 0924-06-090

TYPICAL SECTIONS

SHEET 4 OF 4

HNTB

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Attachment C

Alternative Evaluation Matrices

Universe of Alternatives Summary Matrix
First Level Screening for Purpose and Need
(Qualitative - Fatal Flaw Analysis)

	System Capacity		System Linkage		Modal Connectivity		
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10.		Lack of direct access/connectivity to I-10 and Loop 375. At-grade train crossings along the study area that cause delay and impede traffic movement.		Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.		**Meets Project Purpose (Y/N)**
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10. Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements.		Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel.		Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system. Integrating existing transportation facilities to complement other modes of transportation.		
Alt No.	**Measure**		**Measure**		**Measure**		
	LOS of primary arterials	Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?	Does alternative improve access/connectivity?	Does an alternative include or accommodate connections from the border communities and future POE to I-10/Loop 375 and provide the addition of RR grade separations?	Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?	Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?	
	Rating (++,+,0,-,--)	Y/N	Y/N	Y/N	Y/N	Y/N	
Roadway Alternatives Parallel to I-10							
Widen Existing Roadways							
Alt 1	+	Y	Y	Y	Y	Y	**Y**
Alt 2	0	Y	N	N	Y	Y	**N**
Alt 3	+	Y	Y	Y	Y	Y	**Y**
Alt 4	+	Y	Y	Y	Y	Y	**Y**
Alt 5	+	Y	Y	Y	Y	Y	**Y**
Alt 6	0	Y	N	N	Y	Y	**N**
Alt 7	+	Y	Y	Y	N	N	**Y**
Alt 19	0	Y	N	Y	Y	Y	**N**
Alt 20	+	Y	Y	Y	Y	Y	**Y**
Alt 21	0	Y	N	Y	Y	Y	**N**
Alt 22	+	Y	Y	Y	N	N	**Y**
New Location Roadways							
Alt 8	++	Y	Y	Y	Y	Y	**Y**
Alt 9	++	Y	Y	Y	Y	Y	**Y**
Alt 10	++	Y	Y	N	Y	Y	**Y**
Alt 11	++	Y	Y	N	Y	Y	**Y**
Alt 12	++	Y	Y	Y	Y	Y	**Y**
Alt 13	+	Y	Y	Y	Y	Y	**Y**
Alt 14	0	Y	Y	N	Y	Y	**N**
Alt 15	++	Y	Y	N	Y	Y	**Y**
Alt 16	++	Y	Y	N	Y	Y	**Y**
Alt 17	+	Y	Y	N	Y	Y	**Y**
Alt 18	++	Y	Y	Y	Y	Y	**Y**
Cross-Connecting Roadway Alternatives							
Widen Existing Roadways							
Alt A2	+	Y	Y	N	Y	Y	**Y**
Alt B	0	Y	N	N	Y	Y	**N**
Alt C	+	Y	Y	Y	Y	Y	**Y**
Alt D	0	Y	Y	N	Y	Y	**Y**
Alt E	0	Y	Y	N	Y	Y	**Y**
Alt F	0	Y	Y	N	Y	Y	**Y**
Alt G	0	Y	Y	N	Y	Y	**Y**
Alt H	+	Y	N	Y	Y	Y	**Y**
Alt N2 (FM 1110 from North Loop Dr. to I-10)	0	Y	Y	Y	Y	Y	**Y**
Alt V	+	Y	Y	Y	Y	Y	**Y**
Alt W	0	Y	N	N	Y	Y	**N**
New Location Roadways							
Alt A1	0	Y	Y	Y	Y	Y	**Y**
Alt I	0	Y	Y	Y	Y	Y	**Y**
Alt J	0	Y	Y	Y	Y	Y	**Y**
Alt K	0	Y	Y	Y	Y	Y	**Y**
Alt L	+	Y	Y	Y	Y	Y	**Y**
Alt M	**0**	Y	Y	Y	Y	Y	**Y**
Alt N1 (FM 1110 from west of Alameda Ave. to	0	Y	Y	Y	Y	Y	**Y**
Alt O	0	Y	Y	N	Y	Y	**Y**
Alt P	0	Y	Y	Y	Y	Y	**Y**
Alt Q	0	Y	Y	N	Y	Y	**Y**
Alt R	0	Y	Y	N	Y	Y	**Y**
Alt S	0	Y	Y	Y	Y	Y	**Y**
Alt T	0	Y	Y	N	Y	Y	**Y**
Alt U	0	Y	Y	N	Y	Y	**Y**
Alt X	0	Y	N	N	Y	Y	**N**
Multimodal (Non-Roadway) Alternatives							
Transit Alternatives							
Alt TR 1	0	Y	Y	N	Y	Y	**Y**
Alt TR 2	0	Y	Y	Y	Y	Y	**Y**
Bicycle and Pedestrian Alternatives							
Alt BP 1	0	Y	Y	N	Y	Y	**Y**
Alt BP 2	0	Y	Y	N	Y	Y	**Y**
Alt BP 3	0	Y	Y	N	Y	Y	**Y**
Alt BP 4	0	Y	Y	N	Y	Y	**Y**
Alt BP 5	0	Y	Y	N	Y	Y	**Y**

Key Measures

Key Measures

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

	System Capacity	System Linkage	Modal Connectivity
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	Alternative Description	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
		Rating (++,+,0,-,--)	Evaluation	Y/N	Evaluation	Y/N	Evaluation	Y/N	Evaluation	Y/N	Evaluation	Y/N	Evaluation	
Roadway Alternatives parallel to I-10:														
Widen Existing Roadways														
Alt 1	Socorro Rd. (FM 25) from Loop 375 to Herring Rd.	+	Existing facility is anticipated to operate at LOS E and D in 2014 for the segments located in the Alternative 1 corridor.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 1 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity in the northwestern portion of the study area.	Y	Alternative 1 would enhance the connection of Socorro Rd. with Loop 375. The corridor would run adjacent to the Tigua Property and would pass through San Elizario, terminating at Herring Rd.	Y	Alt 1 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make Socorro Rd. a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 2	Socorro Rd. from Herring Rd. to Fabens/Alameda	0	Existing facility is anticipated to operate at LOS A in 2040 for the segments located in the Alternative 2 corridor.	Y	Existing facility is anticipated to have little congestion in 2040.	N	Existing facility is anticipated to operate at LOS A in 2040 for the segments located in the Alternative 2 corridor; therefore, this alternative is not viewed as a critical improvement to roadway network.	N	While Alternative 2 would widen the connection of Socorro Rd. between San Elizario and Fabens, the additional capacity is not warranted.	Y	Alt 2 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make Socorro Rd. a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**
Alt 3	Alameda Ave. (SH 20) from Loop 375 to Herring Rd.	+	Existing facility is anticipated to operate at LOS C and F in 2040 for the segments located in the Alternative 3 corridor.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 3 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity in the northwestern portion of the study area.	Y	Alternative 3 would enhance the connection of Alameda Ave. with Loop 375. The corridor would pass through Socorro and Clint.	Y	Alt 3 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would improve access to existing bus routes along Alameda Ave.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 4	Alameda Ave. from Herring Rd. to Tornillo	+	Existing facility is anticipated to operate between LOS C and D in 2040 for the segments located in the Alternative 4 corridor.	Y	Existing facility is anticipated to have little congestion in 2040.	Y	Existing facility is anticipated to operate at LOS D in 2040 for the segments located in the Alternative 4 corridor; therefore, this alternative is should be considered a critical improvement to roadway network.	Y	Alternative 4 would widen the connection of Alameda Ave. between Clint, Fabens, and Tornillo while providing the necessary additional capacity.	Y	Alt 4 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would improve access to existing bus routes along Alameda Ave.	Y	The provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 5	North Loop Dr. (FM 76) from Loop 375 to Clint Cutoff Rd. (FM 1110)	+	Existing facility is anticipated to operate at LOS D and E in 2040 for the segments located in the Alternative 5 corridor.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 5 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity in the central portion of the study area.	Y	Alternative 5 would enhance the connection of North Loop Dr. with Loop 375. The corridor would pass through El Paso, Socorro, and Clint.	Y	Alt 5 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make North Loop Dr. a more attractive option for bus routes.	Y	The provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 6	North Loop Dr. from Clint Cutoff Rd. to Alameda Ave. in Fabens	0	Existing facility is anticipated to operate at LOS B in 2040 for the segments located in the Alternative 6 corridor.	Y	Existing facility is anticipated to have little congestion in 2040.	N	Existing facility is anticipated to operate at LOS A in 2040 for the segments located in the Alternative 6 corridor; therefore this alternative is not viewed as a critical improvement to roadway network.	N	While Alternative 6 would widen the connection of North Loop Dr. between Clint and Fabens the additional capacity is not warranted.	Y	Alt 6 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make North Loop Dr. a more attractive option for bus routes.	Y	The provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**N**
Alt 7	I-10 Mainlanes from Loop 375 to Fabens Dr. (FM 793)	+	Existing facility is anticipated to operate at LOS C, B and F in 2040 for the segments located in the Alternative 7 corridor.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 7 would enhance capacity of I-10, which is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity along the eastern limit of the study area.	Y	Alternative 7 would enhance the connection of I-10 with Loop 375. The corridor would improve access to Socorro, Clint and Fabens.	N	No, Alt 7 does not address bicycle and pedestrian access or transit directly	N	Alt 7 does not address improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 19	Socorro Rd. from Loop 375 to Fabens/Alameda. Alternative 19 is the combination of Alternatives 1 and 2.	0	The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in the Alternative 1 corridor. The Alternative 2 corridor was not determined to be warranted based on future traffic volumes.	Y	Capacity improvements are only necessary for a portion of the Alternative 19 corridor; while certain portions of the existing facility are anticipated to have little congestion in 2040.	N	The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in the Alternative 1 corridor. The Alternative 2 corridor was not determined to be warranted based on future traffic volumes. Improving access and capacity for the entire Socorro Rd. corridor is not a critical improvement.	Y	Alternative 19 would span between Loop 375 and Fabens, enhancing access between El Paso, Socorro, the Tigua Property, San Elizario and Fabens.	Y	Alt 19 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make Socorro Rd. a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**
Alt 20	Alameda Ave. (SH 20) from Loop 375 to Tornillo. Alternative 20 is the combination of Alternatives 3 and 4.	+	The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in both the Alternative 3 and 4 corridors.	Y	Capacity improvements are necessary for segments throughout the entire length of the Alameda Ave. corridor, as these segments for the existing facility are anticipated to have significant congestion in 2040.	Y	Alternative 20 is the combination of Alternatives 3 and 4. The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in both alternative corridors. Improving access and capacity for entire Alameda Ave. corridor would provide enhanced connectivity and access for the entire length of the study area.	Y	Alternative 20 would span the entire length of the study area, between Loop 375 and Tornillo, enhancing access between El Paso, Socorro, Clint, Fabens, and Tornillo.	Y	Alt 20 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make Alameda Ave. a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

	System Capacity	System Linkage	Modal Connectivity	
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.	
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.	

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	**Alternative Description**	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Alt 21	North Loop Dr. from Loop 375 to Alameda Ave. in Fabens Alternative 21 is the combination of Alternatives 5 and 6.	0	The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in the Alternative 5 corridor. The Alternative 6 corridor was not determined to be warranted based on future traffic volumes.	Y	Capacity improvements are only necessary for a portion of the Alternative 21 corridor; portions of the existing facility are anticipated to have little congestion in 2040.	N	Alternative 21 is the combination of Alternatives 5 and 6. The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in the Alternative 5 corridor. The Alternative 6 corridor was not determined to be warranted based on future traffic volumes. Improving access and capacity for the entire North Loop Dr. corridor is not a critical improvement.	Y	Alternative 21 would span between Loop 375 and Fabens, enhancing access between El Paso, Socorro, Clint, and Fabens.	Y	Alt 21 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make North Loop Dr. a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Rd. (FM 3380) Alternative 22 includes a portion of Alternative 7.	+	Existing facility is anticipated to operate at LOS C, E and F in 2040 for the segments located in the Alternative 22 corridor.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 22, includes Alternative 7, would enhance capacity of I-10, which is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity along the eastern limit of the study area.	Y	Alternative 22 would enhance the connection of I-10 with Loop 375. The corridor would improve access to Socorro, Clint, Fabens, and Tornillo.	N	Alt 22 does not address bicycle and pedestrian access or transit directly	N	Alt 22 does not address improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
New Location Roadways														
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Modified 1997 Alignment) Alternative 8 would provide a new, four-lane facility in the northwest portion of the study area.	++	Alternative 8 would provide significant relief to Socorro Rd. between Loop 375 and Herring Rd.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 8 would provide a new roadway west of Socorro Rd., at Southside Rd., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alternative 8 would provide an alternative route in northwest portion of the study area.	Y	Alternative 8, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alternative 17, Alternative 8 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	Y	Alt 8 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd. (Modified 1997 Alignment) Alternative 9 would provide a new, four-lane facility in the northwest portion of the study area.	++	Alternative 9 would provide significant relief to Socorro Rd. between Loop 375 and Herring Road.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 9 would provide a new roadway west of Socorro Rd., at Pan American Dr., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alternative 9 would provide an alternative route in northwest portion of the study area.	Y	Alternative 9, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alternative 17, Alternative 9 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	Y	Alt 9 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 10	I-10 Eastbound Frontage Road (EB FR) from Clint Cutoff Rd. to Fabens Dr. Alternative 10 would provide a new, two-lane EB FR extending the current EB FR terminus at Clint Cutoff Rd..	++	This new parallel arterial to the I-10 mainlanes would provide significant relief to the mainlanes which are projected to be congested (LOS F) in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 10 would add an eastbound frontage road along I-10, connecting to the current frontage road terminus at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 10 would provide an alternative roadway parallel to I-10.	N	Although the frontage roads would provide direct connectivity between Clint and Fabens, it does not enhance the linkages since the existing I-10 offers the same connectivity.	Y	Alt 10 would improve bicycle and pedestrian access by including a wide outside shared-use lanes for bicyclists and right of way (ROW) accommodation for a sidewalk, which in turn would make it a more attractive option for bus routes.	Y	Yes the accommodation of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 11	I-10 Westbound (WB) FR from Clint Cutoff Rd. to Fabens Dr. Alternative 11 would provide a new, two-lane WB FR extending the current WB FR terminus at Clint Cutoff Rd.	++	This new parallel arterial to the I-10 mainlanes would provide significant relief to the mainlanes which are projected to be congested (LOS F) in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 11 would add an westbound frontage road along I-10, connecting to the current frontage road terminus at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 11 would provide an alternative roadway parallel to I-10.	N	Although the frontage roads would provide direct connectivity between Clint and Fabens, it does not enhance the linkages since the existing I-10 offers the same connectivity.	Y	Alt 11 would improve bicycle and pedestrian access by including a wide outside shared-use lanes for bicyclists and ROW accommodation for a sidewalk, which in turn would make it a more attractive option for bus routes.	Y	Yes the accommodation of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 12	BHE-South Connection - from Socorro Rd. transition to border / Island Main Lateral / Robinson Rd - terminating at FM 1109	++	Alternative 12 would provide a new, four-lane roadway from San Elizario east to Tornillo, at the Fabens POE. This proposed corridor would have connectivity to Loop 375 via Socorro Rd. and also have the option of connecting to Alternative 17, along with either Alternative 8 or 9, for continuous connectivity between Loop 375 and Tornillo.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 12 would provide improved access as a new roadway near the western limit of the study area as a border alternative to Socorro Rd.	Y	Alternative 12 would provide improved network connectivity near the western limit of the study area, connecting Socorro Rd. to FM 1109 at the Fabens POE. This would create a direct connection between the southwestern limit of Socorro, San Elizario and the Fabens POE, while still having connectivity Loop 375 via Socorro Rd. Additional connectivity to Loop 375 would be provided through a connection to Alternatives 17, 8 and 9.	Y	Alt 12 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

	System Capacity	System Linkage	Modal Connectivity	
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.	
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.	

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	Alternative Description	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Alt 13	BHE-Mid Connection - from Socorro Rd. transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109	+	Alternative 13 would provide a new, four-lane roadway from the southern end of San Elizario south to Tornillo, at the Fabens POE. This proposed corridor would have connectivity to Loop 375 via Socorro Rd.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 13 would provide improved access as a new roadway near the western limit of the study area as a border alternative to Socorro Rd. from the eastern end of San Elizario connecting Socorro Rd. to FM 1109 at the Fabens POE.	Y	Alternative 13 would provide improved network connectivity near the western limit of the study area, connecting Socorro Rd. north of Herring Rd. to FM 1109 at the Fabens POE. This would create a direct connection between San Elizario and the Fabens POE, while still having connectivity to Loop 375 via Socorro Rd. As a stand-alone improvement, Alternative 13 would have limited connectivity to existing routes that connect to I-10.	Y	Alt 13 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 14	BHE-North Connection - from Socorro Rd. transitioning to Island Tornillo Rd - terminating at FM 1109	0	Alternative 14 would provide a new, four-lane roadway, connecting at Socorro Rd and would have connectivity to Loop 375 via Socorro Rd. A portion of the Alternative 14 corridor would be along the existing Island Tornillo Road. The effectiveness of Alt 14 is limited by its connection to the section Socorro Rd south of Herring Rd, which is not expected warrant mprovement. A modified version of Alt 14 which links to Alt 13 would be more effective in providing capacity relief.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 14 would provide a new roadway from Socorro Rd., just northwest of Fabens, to FM 1109 at the Fabens POE. Alternative 14 would utilize the existing Island Tornillo Rd. alignment. This alternative would only improve access in the southern portion of the study area, although it would be located mid-way between the Rio Grande and I-10. Existing parallel roadways are not anticipated to exceed capacity in 2040. Connectivity to Loop 375 would be provided via Socorro Rd.	N	Alternative 14 would provide an alternative connection between Fabens to the Fabens POE and Tornillo via FM 1109. However, connectivity to Loop 375 would be via Socorro Rd. south of Herring Rd., which may not be an effective connection if Alternative 2 is not implemented.	Y	Alt 14 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**
Alt 15	I-10 EB FR from Clint Cutoff Rd. to O.T. Smith Rd.	++	Alternative 15 would provide a new, two-lane eastbound frontage road extending Alternative 10, from Fabens Dr. to O.T. Smith Rd.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 15 would add an eastbound frontage along I-10, connecting to Alternative 10 at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 15 would provide an alternative roadway parallel to I-10.	N	Although the frontage roads would provide direct connectivity between Fabens and Tornillo, it does not enhance the linkages since the existing I-10 offers the same connectivity.	Y	Alt 15 would improve bicycle and pedestrian access by including a wide outside shared-use lanes for bicyclists and ROW accommodation for a sidewalk, which in turn would make it a more attractive option for bus routes.	Y	Yes the accommodation of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 16	I-10 WB FR from Clint Cutoff Rd. to O.T. Smith Rd.	++	Alternative 16 would provide a new, two-lane westbound frontage road extending Alternative 11, from Fabens Dr. to O.T. Smith Rd.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 16 would add an westbound frontage along I-10, connecting to Alternative 11 at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 16 would provide an alternative roadway parallel to I-10.	N	Although the frontage roads would provide direct connectivity between Fabens and Tornillo, it does not enhance the linkages since the existing I-10 offers the same connectivity.	Y	Alt 16 would improve bicycle and pedestrian access by including a wide outside shared-use lanes for bicyclists and ROW accommodation for a sidewalk, which in turn would make it a more attractive option for bus routes.	Y	Yes the accommodation of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles, with pedestrians, bicyclists, and transit.	**Y**
Alt 17	BHE river running alignment through Socorro	+	Alternative 17 would provide a new, four-lane roadway, connecting various new location alternatives in the western portion of the study area. Connectivity to Loop 375 and Tornillo would be dependent on other new location alternatives. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 17 would provide a new, four-lane roadway, connecting various new location alternatives in the northwestern portion of the study area. Alternative 17, in conjunction with other proposed alternatives, would provide a new location roadway that parallels existing alignments that are anticipated to exceed capacity in 2014. Overall system connectivity is dependent on other proposed alternatives.	N	Alternative 17 does not provide continuity as a stand-alone improvement, other proposed alternatives that parallel I-10, such as Alternatives 8, 9, or 12 would need to be implemented. Additionally, connectivity to I-10 is dependent on other proposed alternatives, such as Alternatives U or L.	Y	Alt 17 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt 18	1997 Feasibility Study Alignment	++	Alternative 18, the corridor identified in the 1997 BHE Feasibility Study, would provide a new location, four-lane roadway from Loop 375 to the Fabens POE in Tornillo. The corridor would span the entire length of the study area.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative 18 would provide a new location roadway from Loop 375 to the Fabens POE and FM 1109. Alternative 18 is a continuous corridor that would be dependent on connectivity to I-10 via other proposed alternatives.	Y	Alternative 18 would be a continuous, direct corridor connecting Loop 375 to the Fabens POE and FM 1109. This alternative would connect the City of El Paso, the Tigua Property, San Elizario and the Fabens POE. Connectivity to I-10 is dependent on other proposed alternatives, such as Alternatives U, F, O , P, and V.	Y	Alt 18 would improve bicycle and pedestrian access by including a mixture of sidewalks and wide shared-use lanes (dependent on the facility functional classification as freeway/arterial), which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

Need	System Capacity	System Linkage	Modal Connectivity
	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.

Alternative Definition		Measure				Measure						Meets Project Purpose (Y/N)
Alt #	Alternative Description	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?	Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?	
Cross Connection Alternatives												
Widen Existing Roadways												
Alt A2	Widen Old Hueco Tanks Rd from North Loop drive to N. Moon Rd.	+	The widened roadway (4 lanes divided) would increase capacity on the roadway network and provide marginal congestion relief to North Loop Dr., by improving the connection between North Loop Dr. and I-10.	Y	Proposed improvements would include TSM and/or ITS strategies, although because of limited connectivity, this corridor may not provide benefits to primary corridors parallel to I-10.	Y	Alternative A2 would enhance the access between I-10 to N. Moon Rd. via the new location Old Hueco Tanks Rd. alignment (Alt A2). Old Hueco Tanks Rd. is anticipated to exceed capacity in 2040.	N	Alternative A2 would improve Hueco Tanks Rd. located in the northeastern potion of the study area by improving access to I-10 via Alternative A1. Alternative A2 does not cross the Union Pacific Railroad (UPRR), so it would be dependent upon other alternatives for improved access across the UPRR.	Y	Alt A2 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt B	Widen N/S Moon Rd. from Old Hueco Tanks Rd. to Socorro Alameda Ave.	0	The widened roadway would increase capacity on the roadway network, but because Alternative B has limited connectivity to the existing primary arterials, no significant change in LOS for these facilities are anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies, although because of limited system connectivity, this corridor may not provide benefits to primary corridors parallel to I-10.	N	Alternative B would only improve N. Moon Rd. located in the northeastern portion of the study area. The segment would only improve access between Alameda Ave and Socorro Rd. To fully support the proposed alternative, Alternative A and/or W would need to be implemented.	N	Alternative B would cross the UPRR with a grade-separated crossing. However, implementing a grade separation at this location would likely have significant existing property and access impacts.	Y	Alt B would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**
Alt C	Widen Horizon Blvd (FM 1281) from I-10 to Alameda Ave. (with grade-separate UPRR crossing)	+	The widened roadway (4 lanes divided) south of North Loop Dr. would increase capacity on the roadway network and provide marginal congestion relief to North Loop Dr., by improving the connection between Alameda Ave., North Loop Dr. and I-10. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative C would enhance the access between I-10 and Alameda Ave via the existing Horizon Blvd. alignment. Horizon Blvd. between I-10 North Loop Dr. is anticipated to exceed capacity in 2040. The existing facilities Alternative C would intersect (I-10, North Loop Dr., and Alameda Ave.) are anticipated to be congested in 2040.	Y	Alternative C would enhance connectivity to I-10, improve access in Socorro, improve the existing at-grade UPRR crossing to be grade-separated, and continue to provide connectivity to the existing roadway network without being dependent on other proposed alternatives.	Y	Alt C would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt D	Widen Buford Rd. from Alameda Ave. to Socorro Rd.	0	The widened roadway would increase capacity on the roadway network, but because Alternative D has limited connectivity to the existing primary arterials, no significant change in LOS for these facilities are anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative D would widen Buford Rd. between Alameda Ave. and Socorro Rd., providing an improved connection to those two major roadways which are anticipated to exceed capacity in 2040.	N	Alternative D is limited in providing improved access to the roadway network, while also being dependent on other proposed alternatives including Alternatives J and C to provide improved connectivity to I-10. The improvement would primarily serve the area of northwestern Socorro.	Y	Alt D would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt E	Widen San Elizario Rd (FM 1110) from new FM 1110 connection to Socorro Rd.	0	This alternative would increase the N/S capacity in San Elizario, but is dependent on other proposed alternatives for optimal connectivity and congestion relief. This proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative E would enhance access between Clint and San Elizario via a widened S. San Elizario Rd., generally between Alameda Ave to Socorro Rd. Alternative E is proposed to connect the realignment of FM 1110 in Clint (Alternative N). The major roadways intersected by Alternative E have a need for additional capacity in 2040.	N	Alternative E improves local connectivity between Alameda and Socorro Rd. However, optimal connectivity to I-10 is dependent on the proposed implementation of Alternative N.	Y	Alt E would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt F	Widen Herring Rd. from new FM 1110 connection at Alameda Ave.	0	This alternative would increase the cross-connecting roadway capacity in San Elizario, but is dependent on other proposed alternatives for optimal connectivity to the roadway network and congestion relief. This proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative F would include widening the existing Herring Rd. along with segments on new location. Alternative F would intersect with two primary arterials, Socorro Rd. and Alameda Rd. in an area where these facilities are anticipated to exceed capacity in 2040. Alternative F would enhance connectivity between Clint and San Elizario, but it is dependent on additional alternatives (Alternative M and N) to provide direct access to I-10.	N	Alternative F would span west from Alameda Ave. west to the western limit of the study area where it is proposed to intersect with Alternatives 12 and/or 18. This connectivity would enhance the linkages between Clint and San Elizario, while potentially providing connectivity to an alternate route parallel to I-10 through implementation of Alternative M and Alternative N.	Y	Alt F would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt G	Widen Fabens Dr. from I-10 to Middle Island Rd. Alternative G would widen Fabens Dr. (FM 793) from I-10 to Middle Island Rd. Alternative G would intersect several E/W roadways, including I-10, Alameda Ave., and Island Tornillo Rd.	0	The improved connectivity between the major arterials (I-10, Alameda Ave., and Island Tornillo Rd.) could increase the traffic volume utilizing them, therefore potentially degrading the LOS. Although, based on future traffic volumes, this portion of the study area is not anticipated to exceed the existing capacity of the these arterials.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative G would enhance the access between I-10, Alameda Ave, and Island Tornillo Dr. via the existing Fabens Dr. alignment. Fabens Dr. between I-10 North Loop Dr. is anticipated to exceed capacity in 2040.	N	Although, Alternative G would enhance the connectivity from I-10 to Fabens through improved capacity, implementing a grade separation at this location would likely not be feasible due to the significant existing property and access impacts. Without a grade separation over UPRR, Alternative G would have limited connectivity to the roadway network based on the existing corridor location.	Y	Alt G would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

	System Capacity	System Linkage	Modal Connectivity
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	**Alternative Description**	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Alt H	Widening of FM 1109 (Manuel Aguilera Freeway) from Alameda Ave. to Tornillo POE / BHE	+	The added capacity provided by this alternative would be beneficial as the major arterial connection between the future Tornillo POE and I-10 and the potential future BHE connection. This proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	N	Alternative H would realign and widen the existing Manuel Aguilera Freeway, improving connectivity from Alameda Ave. to the Fabens POE. Alameda Ave. is anticipated to exceed capacity in 2040; although FM 1109 is anticipated to have adequate capacity in 2040.	Y	Alternative H would enhance the connectivity to Fabens and Tornillo to the Fabens POE via the future FM 1109 (Alternative S). With the implementation of Alternative S, the Manuel Aguilera Freeway extension to I-10, the FM 1109 corridor would provide new linkages.	Y	Alt H would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y
Alt N2	FM 1110 widening from I-10 to North Loop Dr. (Alt N2 reflects the widening of the existing roadway section of FM 1110 from North Loop to I-10. In combination with Alt N1, it forms Alternative N - a continous widened and realigned section of FM 1110 between Alameda Ave. and I-10)	0	The major roadways parallel to I-10 in this vicinity are anticipated to exceed capacity in 2040. No significant change in LOS for the E/W facilities is anticipated. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative N2 would improve the access from I-10 to Clint and San Elizario via a widening and realigned FM 1110 (in combination with Alt N1). The project would provide direct access to I-10, North Loop Dr. and S. San Elizario Rd. FM 1110 between I-10 and North Loop Dr. is anticipated to exceed capacity in 2040.	Y	Alternative N2 would link to the Alternative N1 section (that includes a grade-separated rail crossing at the UPRR) and would enhance connectivity between I-10 and Clint. With the implementation of Alternative E, the FM 1110 corridor would connect to the City of San Elizario and Socorro Rd.	Y	Alt N2 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y
Alt V	Widen/realign Jess Harris Rd. from Island Rd/Middle Island Rd to future BHE alignment (Alternative 12 or 18)	+	This alternative would only intersect one existing primary arterial, while relying on another proposed alternative for connectivity to southern portions of the study area.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative V would widen Jess Harris Rd., west of Fabens, to provide improved connectivity and access to potential BHE alternative corridors and cross-connecting roadways (Alternatives 12, 18, 13, G, Q and R).	Y	Alternative V has limited connectivity to communities as a standalone, but is important as a link to a future BHE connectionto I-10. The rationale behind this alternative is to connect directly to I-10 with Alt Q, R, or G.	Y	Alt V would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y
Alt W	Widen N. Moon Rd. from Old Hueco Tanks Rd. to Mesa Spur Drain	0	The widened roadway would increase capacity of the roadway network, but because Alternative X has limited connectivity to the existing primary arterials, no significant change in LOS for these facilities are anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies.	N	Alternative W would only marginally improve local access between North Loop Dr. and Alameda Ave. Since it currently dead ends at Mesa Spur, additional capacity would not provide measureable benefit.	N	The corridor is isolated because there is currently no eastward connection to I-10. The segment by itself would only improve access between North Loop Drive and Alameda Ave. To fully support the proposed alternative, Alternative X and/or B would need to be implemented.	Y	Alt W would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	N
New Location Roadways														
Alt A1	Construct new location Old Hueco Tanks Rd from Gateway Blvd. E (I-10) to North Loop Drive.	+	The widened roadway (4 lanes divided) would increase capacity on the roadway network and provide marginal congestion relief to North Loop Dr., by improving the connection between North Loop Dr. and I-10.	Y	Proposed improvements would include TSM and/or ITS strategies, although because of limited connectivity, this corridor may not provide benefits to primary corridors parallel to I-10.	Y	Alternative A would enhance the access between I-10 to N. Moon Rd. via the existing Hueco Tanks Rd. alignment. Old Hueco Tanks Rd. is anticipated to exceed capacity in 2040. The existing facilities Alternative A would intersect (I-10 and North Loop Dr.) are anticipated to be congested in 2040.	N	Alternative A1 would improve crossing connectivity between North Loop and I-10. Alternative A1 does not cross the Union Pacific Railroad (UPRR), so it would be dependent upon other alternatives for improved access across the UPRR.	Y	Alt A1 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y
Alt I	New connection from Old Hueco Tanks Rd. at North Loop Dr. to Alameda Ave. (with grade-separated RR crossing)	0	The proposed corridor begins at an existing cross-connecting alignment. The widened roadway would increase capacity on the roadway network, but because Alternative I has limited connectivity to the existing primary arterials, no significant change in LOS for these facilities are anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative I is a new roadway that generally runs parallel to N. Moon Rd. and spans between Alameda Ave. and North Loop Dr. Roadways in this area are anticipated to exceed capacity in 2040. Alternative I would have connectivity to I-10 via Old Hueco Tanks Rd.	Y	Alternative I would provide a new connection to I-10 from Alameda Ave. in the northeastern portion of the study area. It would include a grade-separated RR crossing which makes this alternative more viable than Alternative J. Alternative I has no westward connections after intersecting with Alameda Ave., which limits its effectiveness to the west. To fully support the proposed alternative, Alternative A would need to be implemented.	Y	Alt I would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y
Alt J	New connection from Horizon Blvd at the Mesa Drain to Buford Rd. (with grade-separated RR crossing)	0	The corridor begins at another existing connecting roadway, Horizon Blvd. The new location and widened existing roadway may increase capacity on the roadway network, but because Alternative J has limited connectivity to the existing major facilities paralleling I-10, no significant change in LOS for these facilities is anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative J is a proposed combination of a four-lane, new location roadway and widening the existing N. Rio Vista Rd. corridor originating at the Mesa Drain at Horizon Boulevard (Alternative C) and ending at Buford Road. Alternative J intersects the following major roadways: North Loop Dr. and Alameda Ave. Existing roadways in this portion of the study area are anticipated to exceed capacity in 2040.	Y	Alternative J would provide enhanced , indirect connectivity to I-10 via Horizon Blvd, along with direct connectivity to North Loop Dr. and Alameda Ave. With the implementation of Alternative D, the existing N. Rio Vista Rd. would have improved connectivity to Socorro Rd. Alternative J does include a grade-separated RR crossing.	Y	Alt J would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	Y

Key Measures

Universe of Alternatives Matrix

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	System Capacity	System Linkage	Modal Connectivity	
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.	
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.	

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	**Alternative Description**	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Alt K	Extend Tiwa Blvd. along Ysleta Lateral from Socorro to Trent Rd.	0	The proposed roadway would enhance capacity on the existing roadway network. However, since Alternative K has limited connectivity to existing primary arterials, no significant change in LOS for these facilities are anticipated. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative K is a proposed four-lane, new location roadway originating at the Ysleta Lateral and extending northwest to Tiwa Blvd. The beginning of Alternative K connects to another proposed corridor, Alternative L, and intersects Alameda Ave. and Socorro Rd. The corridor would enhance connectivity between southern Socorro and the Tigua Properties, by providing a direct connection. Current connections do exist. Major facilities parallel to I-10 are anticipated to exceed capacity in 2040.	Y	Alternative K's connectivity to I-10 and other proposed parallel corridors is dependent on the implementation of Alternative L. Alternative K includes a grade-separated rail crossing at the UPRR.	Y	Alt K would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt L	New location arterial from I-10 to future BHE Connection near Socorro city limit southern boundary	+	Alternative L would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. Alternative L would span almost the entire width of the study area, providing enhanced capacity in the areas south of Socorro and north of San Elizario. This proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative L is a proposed four-lane, new location roadway originating at I-10 and traversing west to connect to proposed Alternative 18, south of the Tigua Property. Alternative L would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. Alternative L would span almost the entire width of the study area, providing increased connectivity to the areas south of Socorro and north of San Elizario. Alternative L would provide a new cross connection in an area currently lacking that connectivity.	Y	Alternative L would connect I-10 to another proposed parallel corridor along the western limit of the study area. Connectivity to the following communities would be enhanced: Socorro, Clint, San Elizario, and the Tigua Property. Alternative L includes a grade-separated rail crossing at the UPRR.	Y	Alt L would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt M	FM 1110 realignment and widening from I-10 to Herring Rd. widened sections	0	Alternative M, in conjunction with other proposed alternatives (Alternatives N, O, and F), would provide enhanced capacity and access to I-10, North Loop Dr., Alameda Ave., and Socorro Rd. Roadways in this area are anticipated to exceed capacity in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative M would connect to Herring Rd. which is proposed for widening (Alternative F) to the proposed FM 1110 widening realignment (Alternative N). The connection would improve access from FM 1110 to Alameda Ave. Additionally, Alternative M could connect to the proposed extension of Hole in the Wall Rd., which would provide more connectivity to proposed corridors running parallel to I-10 along the western limit of the study area.	Y	Alternative M would provide improved connectivity to Clint and San Elizario, with the implementation of Alternatives N, O, and F would provide connectivity across the study area.	Y	Alt M would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt N1	FM 1110 realignment / widening from San Elizario Rd(west of I-10) to North Loop Dr. (Alt N1 reflects the new location segment of FM 1110 that begins west of Alameda Ave and continues east to North Loop Dr. In combination with Alt N2, it forms Alternative N - a continous widened and realigned section of FM 1110 between Alameda Ave. and I-10)	0	The major roadways parallel to I-10 in this vicinity are anticipated to exceed capacity in 2040. No significant change in LOS for the E/W facilities is anticipated. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative N1 would improve the access from I-10 to Clint and San Elizario via a realigned FM 1110. The project would provide direct access to I-10, North Loop Dr. and S. San Elizario Rd.	Y	Alternative N1 includes a grade-separated rail crossing at the UPRR and would enhance connectivity between I-10 and Clint in combination with Alt N2. With the implementation of Alternative E, the FM 1110 corridor would connect to the City of San Elizario and Socorro Rd.	Y	Alt N1 would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt O	Extend Hole-in-the-Wall Rd from Socorro Rd. northwest to connect to Herring Rd.	0	The extension would provide connections to Socorro Rd. and Alameda Ave. It would connect with other proposed alternatives at Alameda Ave. The widened roadway would increase capacity on the roadway network, but because Alternative O has limited connectivity to existing primary arterials, no significant change in LOS for these facilities are anticipated.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative O is a four-lane, new location extension of Hole in the Wall Road to Alameda Ave, south of Clint. The extension would provide direct connections to Socorro Rd and Alameda Ave. from Clint. Major facilities parallel to I-10 are anticipated to exceed capacity in the vicinity of the alternative. In combination with other proposed alternatives, Alternative O may provide a route for traffic to flow to alternate routes.	N	Alternative O would provide connectivity from Clint to Alameda Ave. and Socorro Rd. The connectivity of this alternative is dependent on other proposed alternatives, including Alternative M, N and F. To provide relief to congested facilities parallel to I-10, proposed Alternatives 12, 13 or 18 would need to be implemented. Alternative O has limited connectivity to existing major facilities.	Y	Alt O would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between Clint Cutoff Rd. and Fabens Dr.	0	Alternative P would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. Alternative P would span almost the entire width of the study area. I-10 and Alameda Ave. are anticipated to exceed capacity in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative P is a proposed four-lane, new location roadway originating at I-10 and traversing west to connect to proposed Alternative 12. Alternative P would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. I-10 and Alameda Ave. are anticipated to exceed capacity in 2040.	Y	Alternative P would increase connectivity to I-10 midway between FM 1109 and Fabens Dr. Alternative P would terminate at a proposed parallel corridor along the west limit of the study area (Alternatives 12 and 18). Due to its location, direct connectivity to border communities would be limited. Additionally, the corridor would include a grade-separated RR crossing.	Y	Alt P would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**

Key Measures

Universe of Alternatives Matrix

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	System Capacity	System Linkage	Modal Connectivity	
Need	Congestion and high volumes of truck traffic along primary arterials parallel to I-10;	Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;	Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.	
Purpose	Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements	Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;	Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.	

Alternative Definition		Measure				Measure				Measure				Meets Project Purpose (Y/N)
Alt #	**Alternative Description**	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Alt Q	New location arterial from I-10 at Fabens Dr. to future BHE Connection - northern bypass of Fabens	0	Alternative Q would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd, while providing a northern bypass of Fabens. Alternative Q would span almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative Q is a proposed four-lane, new location roadway originating at I-10 and traversing northwest to connect to Jess Harris Rd. Alternative Q would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd, while providing a northern bypass of Fabens. Alternative Q would span almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040.	N	Alternative Q would provide a northern bypass of Fabens. Since Fabens Dr. currently intersects I-10, Alternative Q would not enhance connectivity to I-10. The corridor would connect to other proposed parallel corridors along the western limit of the study area (Alternative 12 and 18). Additionally, the corridor would include a grade-separated RR crossing.	Y	Alt Q would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt R	New location arterial from I-10 at Fabens Dr. to future BHE Connection - southern bypass of Fabens	0	Alternative R would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd, while providing a southern bypass of Fabens. Alternative R would span almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative R is a proposed four-lane, new location roadway originating at I-10 and traversing southwest to connect to Jess Harris Rd. Alternative R would connect with the following existing major corridors: I-10, North Loop Dr., and Alameda Ave., while providing a southern bypass of Fabens. Alternative R would span almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040.	N	Alternative R would provide a southern bypass of Fabens. Since Fabens Dr. currently intersects I-10, Alternative R would not enhance connectivity to I-10. The corridor would connect to other proposed parallel corridors along the western limit of the study area (Alternative 12 and 18). Additionally, the corridor would include a grade-separated RR crossing.	Y	Alt R would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt S	Extension of FM 1109 from I-10 at FM 3380 to Alameda Ave. - western bypass of Tornillo (Manuel Aguilera Freeway).	0	The corridor would connect I-10 to Alameda Ave. This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP. With the newly constructed FM 1109 this corridor provides direct access to the Fabens POE.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative S would connect with I-10 at the existing interchange with O.T. Smith Rd. Alternative S would provide a northern bypass of Tornillo connecting to the existing FM 1109. Alameda Ave. is anticipated to exceed capacity in 2040; although O.T. Smith Rd. is anticipated to have adequate capacity in 2040.	Y	Alternative S would enhance the connectivity to Fabens and Tornillo to the Fabens POE via a new location extension of FM 1109 to I-10. With the implementation of Alternative H, the Manuel Aguilera Freeway extension to I-10, the FM 1109 corridor would provide new linkages to the Fabens POE. Additionally, the corridor would include a grade-separated RR crossing.	Y	Alt S would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt T	New arterial connection from Gateway Blvd. E (I-10 EB FR) to Angel Park development	0	Connection would have little effect on overall system LOS.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative T would improve access from the Angel Park Development to I-10. Would have limited impact on the overall roadway network.	N	Alternative T is a localized improvement, only improving connectivity to I-10 from the Angel Park Development.	Y	Alt T would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt U	Rio Bosque Park Connection	0	Connection would have little effect on overall system LOS.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alternative U would improve access from Socorro Rd. to the Rio Bosque Wetlands Park serving to provide an important community connection to a valuable resource.	N	Alternative U would have limited impact on the overall roadway network.	Y	Alt U would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**Y**
Alt X	New alignment /extension of N. Moon Rd from Mesa Spur Drain to I-10	0	It would only be functional with the implementation of other proposed alternatives, including Alternative W.	Y	Proposed improvements would include TSM and/or ITS strategies.	N	Alternative X would enhance the access between I-10, North Loop Dr. and Alameda Ave. via a new location roadway and the existing N. Moon Rd. alignment. Alternative X would provide new, direct access to (Alameda Ave. and North Loop Dr.) are anticipated to be congested in 2040.	N	Alternative X would provide an additional connection to the I-10 frontage roads, between the existing connections at Old Hueco Tanks Rd. and Horizon Blvd. However, Alternatives A and C are existing corridors that be more suitable in providing more effective connectivity to I-10 with interchanges already in place. Alt X is also dependent upon improvements to North Moon Rd to be able to utilize its capacity.	Y	Alt X would improve bicycle and pedestrian access by including sidewalks for pedestrians and wide outside shared-use lanes for bicyclists, which in turn would make it a more attractive option for bus routes.	Y	Yes, the provision of sidewalks and wide outside lanes for shared bicycle usage would allow for improved integration of vehicles with pedestrians, bicyclists, and transit.	**N**

Key Measures

Universe of Alternatives Matrix

First Level Screening for Purpose and Need - Universe of Alternatives (Qualitative - Fatal Flaw Analysis)

		System Capacity				System Linkage				Modal Connectivity				
Need		Congestion and high volumes of truck traffic along primary arterials parallel to I-10;				Lack of direct access/connectivity to I-10 and Loop 375; At-grade train crossings along the study area that cause delay and impede traffic movement;				Increasing demand on area transportation infrastructure (roadways, railroads and ports of entry) associated with the increasing international and interregional trade and freight rail movements.				
Purpose		Improving the level of service (LOS) along the primary transportation arterials that are parallel to I-10; Implementing transportation systems management (TSM), transportation demand management (TDM), and/or intelligent transportation systems (ITS) improvements				Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;				Considering the expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system; and Integrating existing transportation facilities to complement other modes of transportation.				
Alternative Definition		**Measure**				**Measure**				**Measure**				**Meets Project Purpose (Y/N)**
Alt #	**Alternative Description**	LOS of primary arterials		Does alternative include or accommodate congestion management strategies (CMS) such as TDM, TSM, ITS?		Does alternative improve access / connectivity?		Does an alternative include or accommodate connections from the border communities and future port of entry (POE) to I-10/Loop 375 and provide the addition of railroad (RR) grade separations?		Does alternative improve or accommodate expansion of transit, bus, and pedestrian options that are better integrated with the overall transportation system?		Does alternative improve or accommodate integration with existing transportation facilities that complement other modes of transportation?		
Multimodal (Non-Roadway) Alternatives														
Transit (TR) Alternatives														
Alt TR 1	Bus Rapid Transit (BRT) along Alameda from Loop 375 to Horizon Blvd	0	Transit is expected to handle 3% of trips within the study area. Alt TR 1 would have a marginal beneficial impact to LOS by providing an alternative for travel along Alameda Ave. within the northern reaches of the study area. However, its potential impact would be limited due to the short length of the proposed segment.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alt TR 1 would improve access and connectivity in the north end of the study area by providing an alternative link to Loop 375.	N	Alt TR 1 does not directly link to the Zaragoza POE from Socorro, but would provide an improved Socorro link to Loop 375.	Y	Alt TR 1 improves expansion of bus transit in the northern part study area through the addition of BRT along Alameda Ave. between Loop 375 and Horizon Blvd.	Y	Alt TR 1 would improve integration with existing Sun Metro and El Paso County Rural Transit bus routes in the study area by providing an transit alternative to the existing network. It would also connect to proposed pedestrian and bicycle facilities in the area.	**Y**
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 1109 / Manual Aguilera Freeway and Tornillo POE	0	Alt TR 2 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the POE and existing bus routes.	Y	Proposed improvements would include TSM and/or ITS strategies.	Y	Alt TR 2 would improve access and connectivity in the south end of the study area by providing an alternative link between the future Tornillo POE and existing El Paso County Rural bus transit to Loop 375.	Y	Alt TR 2 does directly link the Tornillo POE to border communities and Loop 375 via El Paso County Rural Transit.	Y	Alt TR 2 improves expansion of Bus transit in the southern part study area through the proposed extension of El Paso County Rural Transit Route 40 to the future Tornillo POE.	Y	Alt TR 2 would improve integration with between transit, bicycle, and pedestrian facilities, and the future POE by providing an important transit link to integrate these alternative transportation modes in the southern portion of the study area.	**Y**
Bicycle and Pedestrian (BP) Alternatives														
Alt BP 1	Provide Bike/Ped connection from Proposed Border Trails along Old Hueco Tanks Rd. and Horizon Blvd. to Sun El Paso Rural County Transit stop for Routes 30, 40, and 84.	0	Alt BP 1 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the existing bus routes and proposed bicycle/pedestrian trails.	Y	Proposed improvements would accommodate TSM and/or ITS strategies.	Y	Alt BP 1 would improve access and connectivity in the northern section of the study area including Socorro by providing additional bicycle and pedestrian connections.	N	Alt BP 1 provides local access between transit and pedestrian networks in the northern section of the study area, but does not provide direct access to I-10.	Y	Alt BP 1 would improve bicycle and pedestrian options within the northern section of the study area in Socorro by providing additional bicycle and pedestrian paths linking to the proposed transit and roadway network to congested corridors including Horizon Blvd. and Alameda Ave.	Y	Alt BP 1 would improve integration between transit, bicycle, and pedestrian facilities by providing enhanced bicycle and pedestrian links to existing El Paso County Rural Transit bus routes along Alameda Ave. and Horizon Blvd.	**Y**
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot.	0	Alt BP 2 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the existing bus routes and proposed bicycle/pedestrian trails.	Y	Proposed improvements would accommodate TSM and/or ITS strategies.	Y	Alt BP 2 would improve access and connectivity to Rio Bosque Park from transportation modal options along Socorro Rd. including El Paso County Rural transit bus routes.	N	Alt BP 2 does not address linkages to I-10 or Loop 375.	Y	Alt BP 2 would improve bicycle and pedestrian options within the northern section of the study area near Rio Bosque Park by providing a direct bicycle and pedestrian connection from the park to Socorro Rd.	Y	Alt BP 2 would improve integration between transit, bicycle, and pedestrian facilities by providing a direct pedestrian and bicycle link between Rio Bosque park, existing El Paso Rural Transit bus routes, and proposed pedestrian trails running parallel to Socorro Rd.	**Y**
Alt BP 3	Provide Bike/Ped connection from proposed border trails to Socorro Rd for improved access to Socorro Entertainment Center.	0	Alt BP 3 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the existing bus routes and proposed bicycle/pedestrian trails.	Y	Proposed improvements would accommodate TSM and/or ITS strategies.	Y	Alt BP 3 would improve access and connectivity to Tigua properties including the Socorro Entertainment Center from future bicycle and pedestrian facilities along the border.	N	Alt BP 3 does not address linkages to I-10 or Loop 375.	Y	Alt BP 3 would improve Bicycle and Pedestrian options within the northern section of the study area near Tigua properties by providing a direct bicycle and pedestrian connection to proposed pedestrian trails running along the border.	Y	Alt BP 3 would improve integration between transit, bicycle, and pedestrian facilities, by providing a direct pedestrian and bicycle link between Tigua properties, the Socorro Entertainment Center, existing El Paso Rural Transit bus routes, and proposed pedestrian trails running along the border.	**Y**
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to Route 84 Bus Stop 5.	0	Alt BP 4 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the existing bus routes and proposed bicycle/pedestrian trails.	Y	Proposed improvements would accommodate TSM and/or ITS strategies.	Y	Alt BP 4 would improve access and connectivity to San Elizario and El Paso County Rural Transit bus routes from future bicycle and pedestrian facilities along the border.	N	Alt BP 4 does not address linkages to I-10 or Loop 375.	Y	Alt BP 4 would improve Bicycle and Pedestrian options within San Elizario by providing a direct bicycle and pedestrian connection to El Paso Rural Transit Bus Route 40.	Y	Alt BP 4 would improve integration between transit, nicycle, and pedestrian facilities, by providing a direct bicycle and pedestrian connection to El Paso Rural Transit Bus Route 40.	**Y**
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5	0	Alt BP 5 is expected to have a negligible impact to overall primary arterial LOS as its primary function is as a connection between the existing bus routes and proposed bicycle/pedestrian trails.	Y	Proposed improvements would accommodate TSM and/or ITS strategies.	Y	Alt BP 5 would improve access and connectivity to Tornillo and El Paso County Rural Transit bus routes from the future Tornillo POE.	N	Alt BP 5 does not address linkages to I-10, but would link indirectly to Loop 375 via El Paso County Rural Transit bus routes.	Y	Alt BP 5 would improve bicycle and pedestrian options in the southern part of the study area through the proposed bicycle and pedestrian connection along FM 1109 from El Paso County Rural Transit Route 40 to the future Tornillo POE.	Y	Alt BP 5 would improve integration between transit, bicycle, and pedestrian facilities, and the future POE by providing an important link to integrate these alternative transportation modes in the southern portion of the study area.	**Y**

Key Measures

Border Highway East PEL Study
Level 2 Screening Summary Evaluation Matrix
August 2014

Level 2 Screening Summary Matrix

Criteria	Travel Performance		Study Area Access	Bike/Ped Accommod-ation	Incident Mgmt	Construction Impacts	Border Security Compatibility	Construction Cost	ROW Acquisition	Utilities & Infrastruc-ture	Financing Opportunity	Economic Dvlpmnt Opportunity	Community Impacts			Cultural Resource Impacts			Natural Resource Impacts						Other Impacts			Public Input		Overall Category Ratings			
	Level of Service	Travel Times/Avg Speed											Neighbor-hood Character	CSS	EJ	Arch. Resources	Historic Resources	Tigua Land	Park Land	Water Resources	Drainage Features	Floodplains	Biological Resources	Agricultural Resources	Hazmat	Air Quality	Traffic Noise	Public Opinion	MTP Compliance	Engineering	Cost	Environmental	Public Involvement
No Build Alt	- -	- -	- -	- -	0	0	0	-	0	0	0	- -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	- -	0	- -	-	+	- -
Roadway Alternatives Parallel to I-10																																	
Socorro Road Widening																																	
Alt 1	+	+	+	++	0	- -	0	- -	-	- -	+	-	- -	0	- -	- -	--	- -	-	0	- -	-	0	-	-	- -	- -	-	0	0	- -	- -	- -
Alt 1 Mod	To be evaluated in Level 3.																																
Alameda Avenue Widening																																	
Alt 3	++	+	+	++	0	-	0	- -	-	- -	+	-	-	0	-	-	-	0	0	0	- -	- -	0	-	-	- -	-	++	0	+ +	- -	- -	+
Alt 4	+	+	+	+	0	-	0	- -	-	-	+	-	- -	0	-	-	0	0	-	0	- -	- -	0	- -	-	+	- -	++	0	0	- -	- -	+
Alt 20	+	+	+	+	0	- -	0	- -	-	- -	+	-	- -	0	- -	-	-	- -	-	0	- -	- -	0	-	0	0	- -	++	0	0	- -	- -	+
North Loop Drive Widening																																	
Alt 5	++	+	+	+	0	- -	0	- -	-	- -	+	+	- -	0	- -	0	0	0	-	0	- -	- -	0	-	-	0	- -	+	0	0	-	- -	0
Alt 5 Mod	To be evaluated in Level 3.																																
I-10 Widening and Frontage Roads																																	
Alt 7	+	++	+	0	0	-	0	- -	0	0	+	- -	0	0	0	0	0	0	0	0	0	- -	0	0	0	-	-	0	+	0	-	0	0
Alt 10	++	+	+	0	++	0	0	- -	-	0	+	-	0	0	0	0	0	0	0	0	0	- -	0	0	0	+	0	0	0	+ +	-	0	-
Alt 11	++	+	+	0	++	0	0	- -	-	0	+	-	0	0	0	0	0	0	0	0	0	- -	0	0	0	+	0	0	0	+ +	-	0	-
Alt 15	+	+	+	0	++	0	0	- -	-	+	+	-	0	0	0	0	0	0	0	0	0	- -	0	0	0	+	0	0	0	+ +	-	0	-
Alt 16	+	+	+	0	++	0	0	- -	-	+	+	-	0	0	0	0	0	0	0	0	0	- -	0	0	0	+	0	0	0	+ +	-	0	-
Alt 22	+	++	+	0	0	-	0	- -	0	0	++	- -	0	0	0	0	0	0	0	0	0	- -	0	0	0	-	-	0	+	0	-	0	0
Border Highway Alignments																																	
Alt 8	++	++	+	+	++	-	0	-	-	0	++	0	0	0	-	0	-	- -	-	0	- -	- -	-	0	0	0	-	0	+	+ +	0	- -	0
Alt 9	++	++	+	+	++	-	0	-	-	-	++	0	0	0	-	0	-	- -	-	0	-	- -	0	0	-	0	-	0	+	+ +	0	-	0
Alt 12	+	++	+	+	0	-	0	-	- -	0	++	0	-	0	- -	0	-	- -	0	0	- -	0	0	- -	0	+	-	+	+	+	0	-	+
Alt 13	+	++	0	+	0	0	0	-	- -	0	+	0	0	0	-	0	-	- -	0	0	- -	- -	0	- -	0	+	0	0	+	+	-	-	0
Alt 13 MOD	+	++	+	0	0	0	0	-	- -	0	+	0	0	0	-	0	-	- -	0	0	- -	- -	0	- -	0	+	0	++	+	+	-	-	+ +
Alt 14 MOD	+	++	+	0	0	-	0	-	-	0	+	0	0	0	-	0	-	0	0	0	- -	-	0	- -	0	+	-	0	+	0	0	-	0
13 Mod-Rev	To be evaluated in Level 3.																																
Alt 17	++	++	+	0	++	0	0	-	-	0	++	+	-	0	-	0	-	- -	-	-	- -	-	-	-	0	+	-	0	+	+ +	+	- -	0
Alt 18	++	++	+	+	++	-	0	-	- -	0	++	+	-	0	- -	- -	--	- -	-	-	- -	-	-	- -	0	0	-	-	+	+ +	0	- -	-
Alt U	0	0	0	+	0	-	0	- -	0	0	+	+	0	0	-	0	-	- -	- -	0	-	0	-	0	0	+	0	+	+	0	0	-	+
Cross-Connecting Roadway Alternatives																																	
Socorro Improvements																																	
Alt A1	0	0	0	+	+	-	0	-	-	-	+	+	-	0	-	- -	-	0	0	0	-	-	0	- -	0	+	-	0	++	0	0	-	+
Alt A2	++	++	0	+	0	- -	0	- -	0	-	+	-	-	0	-	0	-	0	0	0	-	0	0	0	0	+	- -	0	0	0	-	-	-
Alt C	+	++	++	++	0	- -	0	- -	-	- -	+	-	-	0	- -	-	-	0	0	0	-	- -	0	0	-	+	-	0	++	+ +	- -	-	+
Alt D	+	++	++	++	0	- -	0	- -	0	-	+	-	- -	0	0	-	--	0	-	0	-	0	0	0	0	+	- -	-	+	+ +	-	-	-
Alt I	++	++	++	+	+	-	0	- -	-	-	+	0	-	0	-	- -	-	0	0	0	- -	0	-	- -	-	+	-	0	0	+ +	-	- -	-
Alt D Mod	To be evaluated in Level 3.																																
Alt I Mod-Rev	To be evaluated in Level 3.																																
Alt I Mod	To be evaluated in Level 3.																																
Alt J	+	++	0	+	+	- -	0	- -	-	-	+	0	-	0	-	0	-	0	-	0	-	0	-	- -	0	+	-	0	0	0	-	-	-
Alt K	+	+	+	+	+	-	0	- -	-	-	+	++	-	0	-	0	-	- -	0	0	- -	0	-	- -	0	0	- -	++	0	+	0	- -	+
Alt L	++	+	++	+	++	-	0	- -	-	0	+	++	-	0	- -	-	-	- -	0	-	- -	-	-	- -	0	-	-	++	++	+ +	0	- -	+ +
Alt T	0	0	0	0	0	-	0	- -	0	0	+	-	-	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0	0	- -	-	0	-
San Elizario/Clint Improvements																																	
Alt E	+	++	++	++	0	- -	0	- -	-	-	+	0	-	0	-	0	-	0	0	0	- -	0	0	-	0	+	-	+	0	+ +	-	-	0
Alt F	++	++	++	+	+	- -	0	- -	-	-	+	-	-	0	-	0	-	- -	0	0	- -	0	0	-	0	+	0	++	+	+ +	- -	-	+ +
Alt N2	+	++	++	0	0	- -	0	- -	0	-	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0	+	0	0	+	0	0	+	0
Alt N1	+	++	++	+	+	-	0	- -	-	0	+	++	0	0	-	-	-	0	0	0	-	-	0	- -	0	+	0	++	+	+ +	0	-	+ +
Alt V	+	++	0	0	0	-	0	- -	0	0	+	-	0	0	-	0	-	0	0	0	-	0	0	-	0	0	0	0	0	0	-	0	-
Alt M	+	++	++	+	0	-	0	-	-	0	+	++	0	0	0	0	-	0	0	0	-	0	0	- -	0	+	0	- -	+	+ +	+	0	- -
Alt O	+	+	0	0	0	-	0	-	-	0	+	0	0	0	0	0	-	- -	0	0	-	0	0	- -	0	+	-	+	0	0	0	-	0
Fabens Connections																																	
Alt G	0	++	+	++	0	- -	0	- -	-	- -	+	0	- -	0	-	0	-	0	0	0	-	-	0	-	-	+	- -	0	0	0	- -	-	-
Alt P	++	+	++	0	0	-	0	- -	-	+	+	+	0	0	0	0	-	- -	0	0	- -	- -	0	- -	0	0	0	+	0	+	0	-	0
Alt Q	+	++	+	0	+	-	0	- -	-	0	+	0	0	0	-	0	-	0	0	-	- -	- -	0	- -	0	0	0	0	0	+	-	-	-
Alt R	+	++	+	0	+	-	0	- -	-	0	+	0	0	0	0	-	-	0	0	0	- -	-	0	- -	0	0	0	- -	0	+	-	-	- -
Alt R Mod	To be evaluated in Level 3.																																
Tornillo Connections																																	
Alt S	0	0	++	+	+	0	0	-	-	0	+	+	0	0	- -	-	0	0	0	0	0	-	0	- -	0	0	0	0	++	+	0	-	+
Alt H	0	0	+	+	0	-	0	- -	-	0	+	+	0	0	-	0	-	0	0	0	- -	0	0	-	0	0	-	0	0	0	0	-	-
Multimodal (Non-Roadway) Alternatives																																	
Transit Alternatives																																	
Alt TR 1	+	+	++	++	+	0	0	0	0	+	+	+	0	0	+	0	-	- -	0	0	0	0	0	0	0	+	-	0	++	+ +	+ +	0	+
Alt TR 2	+	+	++	++	0	0	0	0	0	++	+	++	0	0	+	0	0	0	0	0	0	0	0	0	0	+	0	0	0	+ +	+ +	+ +	-
Bicycle and Pedestrian Alternatives																																	
Alt BP 1	+	+	+	++	0	0	0	-	-	+	+	0	0	0	0	0	-	0	0	0	0	0	0	0	0	+	0	0	0	+ +	0	+	-
Alt BP 2	+	+	+	++	0	0	0	-	-	+	+	+	0	0	0	0	-	- -	- -	0	0	0	0	0	0	+	0	++	+	+ +	+	0	+ +
Alt BP 3	+	+	+	++	0	0	0	-	-	+	+	0	0	0	0	- -	-	- -	0	0	0	0	0	0	0	+	0	0	0	+ +	0	0	-
Alt BP 4	+	+	+	++	0	0	0	-	-	+	+	0	0	0	0	-	-	0	0	0	0	0	0	0	0	+	0	0	0	+ +	0	0	-
Alt BP 5	+	+	+	++	0	0	0	- -	- -	+	+	+	0	0	0	0	-	0	0	0	0	0	0	0	0	++	0	0	0	+ +	0	+	-

Border Highway East
PEL Study
Level 2 Screening Detailed Evaluation Matrix
August 2014

Level 2 - Engineering Screening

Study Goals		Enhancing east-west mobility				Improve local and regional access		Provide bike/ped facilities		Reduce incidents delay on I-10/parallel rdwys		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance				Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service		Travel Times/Average Speed											
Measure		LOS along Roadways		Average Speeds along Major Roadways		Assessment of connections between I-10 and other east/west roadways		Assessment of bike/ped accommodations		Reduces occurrence of incidents in study area		Impacts to motorists, amt of lane closures/detours		Compliments and supports border security initiatives	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	- -	Continued reduction in LOS compared to existing conditions	- -	Continued reduction in travel times compared to existing conditions	- -	No Build Alt would not improve local or regional access.	- -	No Build Alt would not enhance pedestrian facilities.	0	No Build Alt would not improve incident management.	0	No Build Alt would have no construction impacts.	0	No Build Alt would have no impact on border security.
Roadway Alternatives Parallel to I-10															
Widen Existing Roadways															
Alt 1	Socorro Rd. from Loop 375 to Herring Rd.	+	About 25% increase in traffic on Socorro Rd. and 5% reduction in traffic on Alameda Ave. and North Loop Dr. The LOS on Socorro Rd. between Loop 375 and Buford Rd. remains at LOS F; between Buford Rd. and Tiwa Blvd. improves from LOS F to LOS D; between Tiwa Blvd. and Herring Dr. improves from LOS F to LOS C. The LOS on Alameda Ave. between Loop 375 and Tiwa Blvd. improves from LOS F to LOS E. There is minimal change to the LOS on other parallel routes. There are access management and safety concerns with widening in this location.	+	A 2.8% reduction in VHT for the study area	+	Alternative 1 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the northwestern portion of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alternative 1 would enhance the connection of Socorro Rd. with Loop 375. The corridor would run adjacent to the Tigua Property and would pass through San Elizario, terminating at Herring Rd., providing additional capacity to these communities.	++	Widening existing Socorro Rd. would include some sort of pedestrian enhancement with a shared use lane/sidewalk. Since the alternative considers improving an existing roadway, traverses through populated areas, and is on the El Paso County Rural Transit Bus Route 84, this alternative was given the highest rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of existing roadway with approximately 0.86 intersections/mile. Additionally, there is no other parallel route in the vicinity, so construction could be very disruptive.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 3	Alameda Ave. from Loop 375 to Herring	++	About 15% increase in traffic on Alameda Ave., 10% reduction in traffic on Socorro Rd., and 5% reduction in traffic on North Loop Dr. The LOS on Alameda Ave. between Loop 375 and Tiwa Blvd. improves from LOS F to LOS D; between Tiwa Blvd. and Herring Dr. improves from LOS C to LOS B. The LOS on North Loop Dr. between Loop 375 and Old Hueco Tanks Rd. improves from LOS E to LOS D. There is minimal change to the LOS on other parallel routes.	+	A 2.8% reduction in VHT for the study area	+	Alternative 3 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the northwestern portion of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alternative 3 would enhance the connection of Alameda Ave. with Loop 375. The corridor would pass through Socorro and Clint, providing additional capacity to these communities.	++	Widening existing Alameda Ave. would include some sort of pedestrian enhancement. Since the alternative considers improving an existing roadway, traverses through populated areas, and is on the El Paso County Rural Transit Bus Route 40, Bus Route 84, and proposed Bus Rapid Transit (BRT) route, this alternative was given the highest rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Alternative would involve reconstruction of existing roadway with approximately 0.91 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 4	Alameda Ave. from Herring to Tornillo	+	About 10% increase in traffic on Alameda Ave., 5% reduction in traffic on Socorro Rd. and 10% reduction in traffic on North Loop Dr. The LOS on Alameda Ave. between Herring Rd. and FM 258 improves from LOS C to LOS A; between FM 258 and FM 3380 improves from LOS D to LOS B. There is minimal change to the LOS on other parallel routes.	+	A 2.8% reduction in VHT for the study area	+	Existing facility is anticipated to operate at LOS D in 2040 for the segments located in the Alternative 4 corridor; therefore, this alternative is should be considered a critical improvement to roadway network. While not directly affecting connection between I-10 and other parallel roadways, Alternative 4 would widen the connection of Alameda Ave. between Clint, Fabens, and Tornillo, providing the necessary additional capacity to these communities.	+	Widening existing Alameda Ave. would include some sort of pedestrian enhancement. Since the alternative considers improving an existing roadway, traverses through mostly rural areas (although does pass through population centers in Fabens and Tornillo), and is on the El Paso County Rural Transit Bus Route 40, this alternative was given a positive rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Alternative would involve reconstruction of existing roadway with approximately 0.71 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 5	North Loop from Loop 375 to Clint Cutoff Rd.	++	About 10% increase in traffic on North Loop Dr. northwest of Horizon Blvd. There is no change to the LOS northwest of Horizon Blvd. 45% increase in traffic southeast of Horizon Blvd. The LOS on North Loop Dr. between FM 1281 and FM 1110 improves from LOS D to LOS C. There is minimal change to the LOS on other parallel routes.	+	A 1.1% reduction in VHT for the study area	+	Alternative 5 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the central portion of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alternative 5 would enhance the connection of North Loop Dr. with Loop 375. The corridor would pass through El Paso, Socorro, and Clint, providing additional capacity to these communities.	+	Widening existing North Loop Dr. would include some sort of pedestrian enhancement. Since the alternative considers improving an existing roadway and traverses through mostly residential areas in the northern portion of the corridor and mostly rural areas south of Socorro, this alternative was given a positive rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of existing roadway with approximately 1.25 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 7	I-10 ML from Loop 375 to Fabens	+	About 10% increase in traffic on I-10 and 5% reduction in traffic on Socorro Rd., Alameda Ave., and North Loop Rd. The LOS on I-10 between FM 1110 and FM 793 improves from LOS F to LOS E. The LOS on the rest of I-10 remains the same. The LOS on North Loop Dr. between Loop 375 and Old Hueco Tanks improves from LOS E to LOS D. The LOS on Alameda Ave. between Loop 375 and Tiwa Blvd. improves from LOS F to LOS E; and between Tiwa Blvd. and FM 258 from LOS C to LOS B. There is minimal change to the LOS on other parallel routes.	++	A 6.4% reduction in VHT and a 0.2% reduction in VMT for the study area	+	Alternative 7 would enhance capacity of I-10, which is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief along the eastern limit of the study area. Alternative 7 would enhance the connection of I-10 with Loop 375. The corridor would improve access to Socorro, Clint and Fabens.	0	Alternative 7 does not address bicycle and pedestrian access because of the interstate classification.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Construction on I-10 would be somewhat disruptive.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 20	Alameda Ave. (SH 20) from Loop 375 to Tornillo	+	10% to 15% increase in traffic on Alameda Ave. and 10% reduction in traffic on Socorro Rd. and North Loop Rd. The LOS on Alameda Ave. between Loop 375 and Tiwa Blvd improves from LOS F to LOS D; between Tiwa Blvd and Herring Dr. improves from LOS C to LOS B; between Herring Rd. and FM 258 improves from LOS C to LOS A; between FM 258 and FM 3380 improves from LOS D to LOS B. The LOS on North Loop Dr. between Loop 375 and Old Hueco Tanks Rd. improves from LOS E to LOS D. There is minimal change to the LOS on other parallel routes.	+	A 2.8% reduction in VHT for the study area	+	Alternative 20 is the combination of Alternatives 3 and 4. The segments of the existing facility that are anticipated to operate at unacceptable LOS in 2040 are located in both alternative corridors. Improving access and capacity for the entire Alameda Ave. corridor would provide enhanced connectivity and access for the entire length of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alternative 20 would span the entire length of the study area, between Loop 375 and Tornillo, enhancing access between El Paso, Socorro, Clint, Fabens, and Tornillo.	+	Widening existing Alameda Ave. would include some sort of pedestrian enhancement. Since the alternative considers improving an existing roadway and traverses through urban areas in the northern portion of the study area and mostly rural areas in the southern portion of the study area this alternative was given a positive rating for the bike/ped criteria. The alternative does pass through population centers in Fabens and Tornillo and is on the El Paso County Rural Transit Bus Route 40, Route 84, and the proposed BRT route.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Construction would involve existing roadway with approximately 0.75 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 22	I-10 ML from Loop 375 to OT Smith / FM 3380	+	About 10% increase in traffic on I-10 and 5% reduction in traffic on Socorro Rd., Alameda Ave., and North Loop Rd. The LOS on I-10 between FM 1110 and FM 793 LOS improves from LOS F to LOS E. The LOS on the rest of I-10 remains the same. The LOS on North Loop Dr. between Loop 375 and Old Hueco Tanks improves from LOS E to LOS E. The LOS on Alameda Ave. between Loop 375 and Tiwa Blvd improves from LOS F to LOS E; and between Tiwa Blvd and FM 258 from LOS C to LOS B. There is minimal change to the LOS on other parallel routes.	++	A 6.4% reduction in VHT and a 0.2% reduction in VMT for the study area	+	Alternative 22, includes Alternative 7, would enhance capacity of I-10 which is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity along the eastern limit of the study area. Alternative 22 would enhance the connection of I-10 with Loop 375. The corridor would improve access to Socorro, Clint, Fabens, and Tornillo.	0	Alternative 22 does not address bicycle and pedestrian access because of the interstate classification.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Construction on I-10 would be somewhat disruptive.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
New Location Roadways															
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	++	35% to 40% reduction in traffic on Socorro Rd. and about 5% reduction on Alameda Ave., North Loop Rd., and I-10. The LOS on Socorro Rd would still be a LOS F. The is minimal change to the LOS on parallel routes.	++	A 4 % reduction in VHT for the study area	+	Alternative 8 would provide a new roadway west of Socorro Rd., at Southside Rd., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alternative 8 would provide an alternate route in the northwest portion of the study area. While not directly improving connectivity with I-10, Alternative 8, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alternative 17, Alternative 8 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	+	Alternative 8 is a new location alternative that traverses through an industrial/commercial area, although it is near a MPO proposed bike/ped trail near the Zaragoza POE. Alternative 8 would connect to Sun Metro Route 69 and El Paso County Rural Transit Route 84.	++	Alternative 8 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 1.53 intersections/mile. Construction would have some impact on existing network, since a portion of the alternative is on new alignment.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	++	35% to 40% reduction in traffic on Socorro Rd. and about 5% reduction on Alameda Ave., North Loop Rd., and I-10. The LOS on Socorro Rd would still be a LOS F. The is minimal change to the LOS on parallel routes.	++	A 4 % reduction in VHT for the study area	+	Alternative 9 would provide a new roadway west of Socorro Rd., at Pan American Dr., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alternative 9 would provide an alternative route in northwest portion of the study area. While not directly improving connectivity with I-10, Alternative 9, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alternative 17, Alternative 9 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	+	Alternative 9 is a new location alternative that traverses through an industrial/commercial area, although it is near a MPO proposed bike/ped trail near the Zaragoza POE. Alternative 9 would connect to Sun Metro Route 60 and El Paso County Rural Transit Route 84.	++	Alternative 9 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 1.53 intersections/mile. Construction would have some impact on existing network, since a portion of the alternative is on new alignment.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

Level 2 - Engineering Screening

Study Goals		Enhancing east-west mobility				Improve local and regional access		Provide bike/ped facilities		Reduce incidents delay on I-10/parallel rdwys		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance				Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service		Travel Times/Average Speed											
Measure		LOS along Roadways		Average Speeds along Major Roadways		Assessment of connections between I-10 and other east/west roadways		Assessment of bike/ped accommodations		Reduces occurrence of incidents in study area		Impacts to motorists, amt of lane closures/detours		Compliments and supports border security initiatives	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt 10	I-10 EB FR from FM 1110 to Fabens Dr. / FM 793	++	I-10 forecasted LOS F for this segment without frontage roads. Frontage roads will increase capacity and improve access.	+	Travel time on I-10 will decrease with improved access and reduced congestion.	+	Alternative 10 would add an eastbound frontage road along I-10, connecting to the current frontage road terminus at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 10 would provide an alternate roadway parallel to I-10. Although the frontage roads would provide direct connectivity between Clint and Fabens, it does not enhance the linkages since the existing I-10 offers the same connectivity. In combination with Alternative P, the frontage road would provide improved connectivity to Fabens.	0	The proposed I-10 frontage road would provide a shared use lane. Alternative 10 would be a new roadway and would traverse a generally commercial area. Alternative 10 would have limited connectivity to existing transit routes.	++	Alternative 10 would provide a frontage road parallel to I-10. This alternative would serve as a parallel route if an incident forced closure of I-10. This would provide redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.3 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 11	I-10 WB FR from FM 1110 to Fabens Dr. / FM 793	++	I-10 forecasted LOS F for this segment without frontage roads. Frontage roads will increase capacity and improve access.	+	Travel time on I-10 will decrease with improved access and reduced congestion.	+	Alternative 11 would add an westbound frontage road along I-10, connecting to the current frontage road terminus at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 11 would provide an alternate roadway parallel to I-10. Although the frontage roads would provide direct connectivity between Clint and Fabens, it does not enhance the linkages since the existing I-10 offers the same connectivity. In combination with Alternative P, the frontage road would provide improved connectivity to Fabens.	0	The proposed I-10 frontage road would provide a shared use lane. Alternative 11 would be a new roadway and would traverse a generally commercial area. Alternative 11 would have limited connectivity to existing transit routes.	++	Alternative 11 would provide a frontage road parallel to I-10. This alternative would serve as a parallel route if an incident forced closure of I-10. This would provide redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.3 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 12	BHE-South Connection - from Socorro Rd transition to border / Island Main Lateral / Robinson Rd - terminating at FM 1109.	+	5% reduction in traffic volumes on parallel routes. There is minimal change to the LOS on parallel routes.	++	A 4 % reduction in VHT for the study area	+	Alternative 12 would provide improved access as a new roadway near the western limit of the study area as a border alternative to Socorro Rd. Alternative 12 would provide improved network connectivity near the western limit of the study area, connecting Socorro Rd. to FM 1109 at the Fabens POE. This would create a direct connection between the southwestern limit of Socorro, San Elizario and the Fabens POE, while still having connectivity Loop 375 via Socorro Rd. Additional connectivity to Loop 375 would be provided through a connection to Alternatives 17, 8 and 9.	+	Alternative 12 would be a new roadway that connects to the existing El Paso County Rural Transit Route 84. In San Elizario, Alternative 12 would connect to the proposed MPO ped/bike trail. At its terminus, near the Future Tornillo-Guadalupe POE, Alternative 12 would connect to proposed Alternatives BP5 and TR2. Alternative 12 passes through a very rural area.	0	Alternative 12 would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.33 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 13	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	+	5% reduction in traffic volumes on parallel routes. There is minimal change to the LOS on parallel routes.	++	A 4 % reduction in VHT for the study area	0	Alternative 13 would provide improved access as a new roadway near the western limit of the study area as a border alternative to Socorro Rd. from the eastern end of San Elizario connecting Socorro Rd. to FM 1109 at the Fabens POE. Alternative 13 would provide improved network connectivity near the western limit of the study area, connecting Socorro Rd. north of Herring Rd. to FM 1109 at the Fabens POE. If Socorro Rd was improved, this would create a direct connection between San Elizario and the Fabens POE, while still having connectivity to Loop 375 via Socorro Rd. As a stand-alone improvement, Alternative 13 would have limited connectivity to existing routes that connect to I-10. Alternative is part of Border Highway Extension corridor that has been programmed in the 2040 MTP.	+	Alternative 13 would be a new roadway that connects to the existing El Paso County Rural Transit Route 84. At its terminus, near the Future Tornillo-Guadalupe POE, Alternative 13 would connect to proposed Alternatives BP5 and TR2. Alternative 13 passes through a very rural area.	0	Alternative 13 would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	0	Alternative would be on all new alignment and would have approximately 0.56 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 13 (MOD)	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	+	5% reduction in traffic volumes on parallel routes. There is minimal change to the LOS on parallel routes.	++	A 4% reduction in VHT for the study area	+	Alternative 13 would provide a new roadway from the eastern end of San Elizario connecting Socorro Rd. to FM 1109 at the Fabens POE. Existing parallel roadways are not anticipated to exceed capacity in 2040. Alternative 13 would provide a new roadway near the western limit of the study area, connecting Socorro Rd. to FM 1109 at the Fabens POE. This would create a direct connection between the San Elizario and the Fabens POE, while still having connectivity Loop 375 via Socorro Rd. As a stand-alone improvement, Alternative 13 would have limited connectivity to existing routes that connect to I-10. Alternative is part of Border Highway Extension corridor that has been programmed in the 2040 MTP.	0	Alternative 13 Mod would be a new roadway that does not connect to any existing transit routes. At its terminus, near the Future Tornillo-Guadalupe POE, Alternative 13 Mod would connect to proposed Alternatives BP5 and TR2. Alternative 13 Mod passes through a very rural area.	0	Alternative 13 would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	0	Alternative would be on all new alignment and would have approximately 0.59 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 14 (MOD)	BHE-North Connection - from Socorro Rd transitioning to Island Tornillo Rd - terminating at FM 1109	+	5% reduction in traffic volumes on parallel routes. There is minimal change to the LOS on parallel routes.	++	A 4% reduction in VHT for the study area	+	Alternative 14 would provide a new roadway from Socorro Rd., just northwest of Fabens, to FM 1109 at the Fabens POE. Alternative 14 would utilize the existing Island Tornillo Rd. alignment. This alternative would only improve access in the southern portion of the study area, although it would be located mid-way between the Rio Grande and I-10. Existing parallel roadways are not anticipated to exceed capacity in 2040. Alternative 14 would provide a new roadway just north of Fabens, mid-way between the Rio Grande and I-10. Alternative 14 would connect Fabens to the Fabens POE and Tornillo via FM 1109. Connectivity to Loop 375 would be via Socorro Rd. As a stand-alone improvement, Alternative 14 would have limited connectivity to existing routes that connect to I-10. Alternative is part of Border Highway Extension corridor that has been programmed in the 2040 MTP.	0	Alternative 14 Mod would be a new roadway that does not connect to any existing transit routes. At its terminus, near the Future Tornillo-Guadalupe POE, Alternative 14 Mod would connect to proposed Alternatives BP5 and TR2. Alternative 14 Mod passes through a very rural area.	0	Alternative 14 would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.29 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 15	I-10 EB FR from FM 1110 to OT Smith / FM 3380	+	I-10 forecasted for LOS F and LOS E for I-10 in the study area without frontage roads. Frontage roads will increase capacity and improve access.	+	Travel time on I-10 will decrease with improved access and reduced congestion.	+	Alternative 15 would add an eastbound frontage along I-10, connecting to Alternative 10 at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 15 would provide an alternative roadway parallel to I-10. Frontage roads would provide direct connectivity between Fabens and Tornillo.	0	The proposed I-10 frontage road would provide a shared use lane. Alternative 15 would be a new roadway and would traverse a generally rural/agricultural area. Alternative 15 would have limited connectivity to existing transit routes.	++	Alternative 15 would provide a frontage road parallel to I-10. This alternative would serve as a parallel route if an incident forced closure of I-10. This would provide redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.5 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 16	I-10 WB FR from FM 1110 to OT Smith / FM 3380	+	I-10 forecasted for LOS F and LOS E for I-10 in the study area without frontage roads. Frontage roads will increase capacity and improve access.	+	Travel time on I-10 will decrease with improved access and reduced congestion.	+	Alternative 16 would add an westbound frontage along I-10, connecting to Alternative 11 at Clint Cutoff Rd. I-10 is anticipated to exceed capacity in 2040, Alternative 16 would provide an alternative roadway parallel to I-10. Frontage roads would provide direct connectivity between Fabens and Tornillo.	0	The proposed I-10 frontage road would provide a shared use lane. Alternative 16 would be a new roadway and would traverse a generally rural/agricultural area. Alternative 16 would have limited connectivity to existing transit routes.	++	Alternative 15 would provide a frontage road parallel to I-10. This alternative would serve as a parallel route if an incident forced closure of I-10. This would provide redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.5 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 17	BHE river running alignment through Socorro	++	35% to 40% reduction in traffic on Socorro Rd. and about 5% reduction on other parallel routes. The LOS on Socorro Rd between Buford Rd. and Tiwa Blvd. would improve from LOS F to LOS D. There is minimal change to the LOS on other parallel routes.	++	A 4 % reduction in VHT for the study area	+	Alternative 17 would provide a new, four-lane roadway, connecting various new location alternatives in the northwestern portion of the study area. Alternative 17, in conjunction with other proposed alternatives, would provide a new location roadway that parallels existing alignments that are anticipated to exceed capacity in 2014. Overall system connectivity is dependent on other proposed alternatives. Alternative 17 does not provide continuity as a stand-alone improvement, other proposed alternatives that parallel I-10, such as Alternatives 8, 9, or 12 would need to be implemented. Additionally, connectivity to I-10 is dependent on other proposed alternatives, such as Alternatives U or L. Alternative is part of Border Highway Extension corridor that has been programmed in the 2040 MTP.	0	Alternative 17 would be a new roadway that does not connect to any existing transit routes. Alternative 17 passes through a very rural area.	++	Alternative 17 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS up to San Elizario. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	0	Alternative would be on all new alignment and would have approximately 0 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 18	1997 Feasibility Study Alignment	++	35% to 40% reduction in traffic on Socorro Rd. and about 5% reduction on other parallel routes. The LOS on Socorro Rd between Buford Rd. and Tiwa Blvd. would improve from LOS F to LOS D. There is minimal change to the LOS on other parallel routes.	++	A 4 % reduction in VHT for the study area	+	Alternative 18 would provide a new location roadway from Loop 375 to the Fabens POE and FM 1109. Alternative 18 is a continuous corridor that would be dependent on connectivity to I-10 via other proposed alternatives. Alternative 18 would be a continuous, direct corridor connecting Loop 375 to the Fabens POE and FM 1109. This alternative would connect the City of El Paso, the Tigua Property, San Elizario and the Fabens POE. Connectivity to I-10 is dependent on other proposed alternatives, such as Alternatives U, F, O , P, and V. Alternative is part of Border Highway Extension corridor that has been programmed in the 2040 MTP.	+	Alternative 18 would be a new roadway that would connect to existing Sun Metro Route 69 at Loop 375. At its terminus, near the Future Tornillo-Guadalupe POE, Alternative 18 would connect to proposed Alternatives BP5 and TR2. The new facility would pass through more populated areas in the northern part of the study area and more rural areas in the southern part of the study area.	++	Alternative 18 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS up to San Elizario. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.54 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

Border Highway East
PEL Study
Level 2 Screening Detailed Evaluation Matrix
August 2014

Level 2 - Engineering Screening

Study Goals		Enhancing east-west mobility				Improve local and regional access		Provide bike/ped facilities		Reduce incidents delay on I-10/parallel rdwys		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance				Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service		Travel Times/Average Speed											
Measure		LOS along Roadways		Average Speeds along Major Roadways		Assessment of connections between I-10 and other east/west roadways		Assessment of bike/ped accommodations		Reduces occurrence of incidents in study area		Impacts to motorists, amt of lane closures/detours		Compliments and supports border security initiatives	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Cross-Connecting Roadway Alternatives															
Widen Existing Roadways															
Alt A2	Widen Old Hueco Tanks Rd from North Loop drive to N. Moon Rd.	++	30% increase in traffic. The LOS on Old Hueco Tanks would improve from LOS D to LOS C.	++	A 4% reduction in VHT for the study area	0	Alternative A2 would have limited enhanced access because does not connect to Alameda.	+	Alternative A2 would improve an existing roadway and would parallel a proposed MPO bikeway. The area it traverses includes residential areas. North Loop Drive is a bus corridor within City of E Paso. This area is just outside City of El Paso and is likely to soon have access to the Sun Metro bus routes.	0	This short portion of proposed roadway does not significantly help with incident management	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 2.71 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt C	Widen Horizon Blvd (FM 1281) from I 10 to Alameda w RR Grade Sep.	+	5% increase in traffic. The LOS on Horizon Blvd. would remain the same.	++	A 3.8% reduction in VHT for the study area	++	Alternative C would enhance the access between I-10 and Alameda Ave via the existing Horizon Blvd. alignment. Horizon Blvd. between 10 North Loop Dr. is anticipated to exceed capacity in 2040. The existing facilities Alternative C would intersect (I-10, North Loop Dr., and Alameda Ave.) are anticipated to be congested in 2040. Alternative C would enhance connectivity to I-10, improve access in Socorro, improve the existing at-grade UPRR crossing to be grade-separated, and continue to provide connectivity to the existing roadway network without being dependent on other proposed alternatives. In conjunction with Alternative D, this corridor would greatly enhance connectivity in Socorro from I-10 to Socorro Rd. Alternatives C and D are programmed improvements in the 2040 MTP.	++	Alternative C would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84 and Route 30 and the proposed BRT. The area it traverses is generally populated/residential.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 1.65 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt D	Widen Buford from Alameda to Socorro.	+	50% increase in traffic on Buford Rd. The LOS on Buford Rd. would change from LOS A to LOS B when Alt D is done in conjunction with Alt C.	++	A 3.8% reduction in VHT for the study area	++	Alternative D would widen Buford Rd. between Alameda Ave. and Socorro Rd., providing an improved connection to those two major roadways which are anticipated to exceed capacity in 2040. Alternative D is limited in providing improved access to the roadway network, while also being dependent on other proposed alternatives including Alternatives J and C to provide improved connectivity to I-10. The improvement would primarily serve the area of northwestern Socorro. In conjunction with Alternative C, this corridor would greatly enhance connectivity in Socorro from I-10 to Socorro Rd. Alternatives C and D are programmed improvements in the 2040 MTP.	++	Alternative D would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84 and Route 40 and the proposed BRT. The improvements also align with a MPO proposed ped/bike trail. The area it traverses is generally populated/residential.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 1.9 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt E	Widen San Elizario Rd (FM 1110) from new FM 1110 connection (E of UPRR) to Socorro Rd.	+	Would provide additional capacity on San Elizario Rd. (FM 1110) between Alameda Ave. and Socorro Rd.	++	A 4.2% reduction in VHT for the study area	++	Alternative E would enhance access between Clint and San Elizario via a widened S. San Elizario Rd., generally between Alameda Ave to Socorro Rd. Alternative E is proposed to connect the realignment of FM 1110 in Clint (Alternative N). The major roadways intersected by Alternative E have a need for additional capacity in 2040. Alternative E improves local connectivity between Alameda and Socorro Rd. However, optimal connectivity to I-10 is dependent on the proposed implementation of Alternatives N1 and N2. Improvements to the FM 1110 corridor have been programmed in the 2040 MTP.	++	Alternative E would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84. The improvements also align with a MPO proposed ped/bike trail and Alternative BP4. The area it traverses is generally populated/residential.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 1.42 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt F	Widen Herring Rd from new FM 1110 connection /Alameda UPRR) to future BHE.	++	Would provide additional capacity on Herring Rd. between Alameda Ave. and a connection to BHE. Would reduce traffic on San Elizario Rd. 20%.	++	A 4.2% reduction in VHT for the study area	++	Alternative F would include widening the existing Herring Rd. along with segments on new location. Alternative F would intersect with two primary arterials, Socorro Rd. and Alameda Rd. in an area where these facilities are anticipated to exceed capacity in 2040. Alternative F would enhance connectivity between Clint and San Elizario, but it is dependent on additional alternatives (Alternatives M, N1 and N2) to provide direct access to I-10. Alternative F would span west from Alameda Ave. west to the western limit of the study area where it is proposed to intersect with Alternatives 12 or 18. This connectivity would enhance the linkages between Clint and San Elizario, while potentially providing connectivity to an alternate route parallel to I-10 through implementation of Alternatives M, N1 and N2.	+	Alternative F would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 40. The area is generally rural.	+	Alternative F helps in conjunction with Alternate 18 and the Alternates for FM 1110 by providing a new alternate route and serving as a loop road surrounding Clint and San Elizario.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 1.16 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt G	Widen Fabens Dr. (FM 793) / Island Rd. from I-10/ FM 793 to Middle Island Rd.	0	5% to 8% reduction in traffic with connection to BHE. The LOS on Fabens Dr. between FM 793 and SH 20 improves from LOS B to LOS A; between SH 20 and I-10 improves from LOS E to LOS B. There are access management and safety concerns with widening in this location.	++	A 4.2% reduction in VHT for the study area	+	Alternative G would enhance the access between I-10, Alameda Ave and Island Tornillo Dr. via the existing Fabens Dr. alignment. Fabens Dr. between I-10 North Loop Dr. is anticipated to exceed capacity in 2040. Although, Alternative G would enhance the connectivity from I-10 to Fabens through improved capacity, implementing a grade separation at this location would likely not be feasible due to the significant existing property and access impacts. With the implementation of Alternative 12, 13, or 14 Mod, Fabens Drive would be able to connect from I-10 to the Border Highway East Extension.	++	Alternative G would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 40. The roadway passes through the city center of Fabens.	0	Added lanes through town provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relie routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 3.63 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt H	Widening of FM 1109 (Manuel Aguilera Freeway) from FM 76 to Tornillo POE / BHE.	0	Forecasted LOS is A*	0	No change to travel time.*	+	Alternative H would realign and widen the existing Manuel Aguilera Freeway, improving connectivity from Alameda Ave. to the Fabens POE. Alameda Ave. is anticipated to exceed capacity in 2040; although FM 1109 is anticipated to have adequate capacity in 2040. Alternative H would enhance the connectivity to Fabens and Tornillo to the Fabens POE via the future FM 1109 (Alternative S). With the implementation of Alternative S, the Manuel Aguilera Freeway extension to I-10, the FM 1109 corridor would provide new linkages.	+	Alternative H would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 40. Alternative H is contiguous with proposed Alternatives TR2 and BP5 and would link Tornillo-Guadalupe POE to Tornillo. The area is generally rural.	0	Added lanes provide redundancy for incident management. It also helps to provide an alternate route around Town of Fabens and alternate route to Port of Entry.	-	Alternative would involve reconstruction of an existing roadway and would have approximately 0.72 crossings/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt N2 (FM 1110 from North Loop Dr. to I-10)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	+	4% increase in traffic. The LOS on FM 1110 improves from LOS E to LOS C.	++	A 4.2% reduction in VHT for the study area	++	Alternative N2 would improve the access from I-10 to Clint and San Elizario via a widening and realigned FM 1110 (in combination with Alt N1). The project would provide direct access to I-10, North Loop Dr. and S. San Elizario Rd. FM 1110 between I-10 and North Loop Dr. is anticipated to exceed capacity in 2040. Alternative N2 would link to the Alternative N1 section (that includes a grade-separated rail crossing at the UPRR) and would enhance connectivity between I-10 and Clint. With the implementation of Alternative E, the FM 1110 corridor would connect to the City of San Elizario and Socorro Rd. Improvements to the FM 1110 corridor have been programmed in the 2040 MTP.	0	Alternative N2 would improve and existing roadway, but would not connect to any existing transit routes. The roadway traverses through a generally agricultural and commercial area.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 3.09 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt V	Widen/realign Jess Harris Rd. from Island Rd/Middle Island Rd to future BHE alignment (Alternative 12 or 18)	+	5% to 8% reduction in traffic along FM 793 with connection to BHE (ALT V). The LOS on FM 793 between BHE and SH 20 improves from LOS B to LOS A; between SH 20 and I-10 improves from LOS E to LOS B.	++	A 4.2% reduction in VHT for the study area	0	Alternative V would widen Jess Harris Rd., west of Fabens, to provide improved connectivity and access to potential BHE alternative corridors and cross-connecting roadways (Alternatives 12, 18, 13, G, Q and R). Alternative V has limited connectivity to communities as a standalone, but is important as a link to a future BHE connection to I-10. The rationale behind this alternative is to connect directly to I-10 with Alt Q, R, or G.	0	Alternative V would improve and existing roadway, but would not connect to any existing transit routes. The roadway traverses through a generally agricultural area.	0	This short portion of proposed roadway does not significantly help with incident management	-	Alternative would involve reconstruction of an existing roadway although would have no existing street crossings. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input will be sought during the Level 3 screening process.
New Location Roadways															
Alt A1	Construct new location Old Hueco Tanks Rd from Gateway Blvd. E (I-10) to North Loop Drive.	0	5% increase in traffic. The LOS on Old Hueco Tanks will be LOS C with adjacent project (ALT I).*	0	A 4% reduction in VHT for the study area*	0	Alternative A1 would enhance the access between I-10 to North Loop Drive via the existing Hueco Tanks Rd. alignment. Old Hueco Tanks Rd. is anticipated to exceed capacity in 2040. The existing facilities Alternative A1 would intersect (I-10 and North Loop Dr.) are anticipated to be congested in 2040. Alternative A1 would improve crossing connectivity between North Loop Dr. and I-10. Alternative A1 does not cross the UPRR, so it would be dependent upon other alternatives for improved access across the UPRR. Since Alternative A1 is a programmed improvement in the 2040 MTP, it would not change the no-build network.	+	Alternative A1 is a new roadway that would connect to existing El Paso County Rural Transit Route 84. The roadway traverses a generally rural area. The roadway aligns with a proposed MPO ped/bike trail.	+	This proposed connecting roadway would help with incident management by providing an alternate route to/from 10. Roadway is not long enough to be highly ranked.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 1.94 intersections/mile, although there are few access points to the existing roadway. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

Border Highway East
PEL Study
Level 2 Screening Detailed Evaluation Matrix
August 2014

Level 2 - Engineering Screening

Study Goals		Enhancing east-west mobility				Improve local and regional access		Provide bike/ped facilities		Reduce incidents delay on I-10/parallel rdwys		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance				Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service		Travel Times/Average Speed											
Measure		LOS along Roadways		Average Speeds along Major Roadways		Assessment of connections between I-10 and other east/west roadways		Assessment of bike/ped accommodations		Reduces occurrence of incidents in study area		Impacts to motorists, amt of lane closures/detours		Compliments and supports border security initiatives	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt I	New connection from Old Hueco Tanks/ North Loop to Alameda w RR Grade Sep.	++	30% increase in traffic. The LOS on Old Hueco Tanks would improve from LOS D to LOS C.	++	A 4% reduction in VHT for the study area	++	Alternative I is a new roadway that generally runs parallel to N. Moo Rd. and spans between Alameda Ave. and North Loop Dr. and includes a grade-separated RR crossing. Roadways in this area are anticipated to exceed capacity in 2040. Alternative I would have connectivity to I-10 via Old Hueco Tanks Rd. Alternative I would provide a new connection to I-10 from Alameda Ave. in the northeastern portion of the study area. Alternative I has no westward connections after intersecting with Alameda Ave., which limits its effectiveness to the west. To fully support the proposed alternative, Alternative A1 would need to be implemented, which is a programmed, fiscally constrained project in the TIP and the 2040 MTP.	+	Alternative I is a new roadway that would connect to existing El Paso County Rural Transit Route 84 and Route 40 and the proposed BRT route. The roadway traverses a generally rural area.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Roadway is not long enough to be highly ranked.	-	Alternative would be on all new alignment and would have approximately 1.95 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt J	New connection from Horizon Blvd / Mesa Drain to Buford (s of Alameda) w RR Grade Sep.	+	5% increase in traffic. LOS would remain the same.	++	A 3.8% reduction in VHT for the study area	0	Alternative J is a proposed combination of a four-lane, new location roadway and widening the existing N. Rio Vista Rd. corridor originating at the Mesa Drain at Horizon Boulevard (Alternative C) and ending at Buford Road. Alternative J includes a grade-separated RR crossing and intersects the following major roadways: North Loop Dr. and Alameda Ave. Existing roadways in this portion of the study area are anticipated to exceed capacity in 2040. Alternative J would provide enhanced , indirect connectivity to I-10 via Horizon Blvd, along with direct connectivity to North Loop Dr. and Alameda Ave. With the implementation of Alternative D, the existing N. Rio Vista Rd. would have improved connectivity to Socorro Rd. Direct connectivity to I-10 is dependent on Alternative C which is a programmed, fiscally constrained project included in the TIP and the 2040 MTP. As a programmed project, Alternative C would provide the same level of connectivity as Alternative J.	+	Alternative J is a new roadway that would connect to existing El Paso County Rural Transit Route 84 and the proposed BRT route. The roadway traverses a generally populated area.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Roadway is not long enough to be highly ranked.	- -	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 1.80intersections/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt K	Extend Tiwa Blvd along Ysleta Lateral from Socorro to Trent Rd. and New Location N/S connection.	+	Connection would provide alternate route between Socorro Rd. / Ysleta del Sur Pueblo land and Alt L.	+	Connection would decrease travel time for existing routes	+	Alternative K is a proposed four-lane, new location roadway originating at the Ysleta Lateral and extending northwest to Tiwa Blv The beginning of Alternative K connects to another proposed corrido Alternative L, and intersects Alameda Ave. and Socorro Rd, with a grade-separated RR crossing. The corridor would enhance connectivity between southern Socorro and the Tigua Properties, by providing a direct connection, although current connections do exist. Alternative K's connectivity to I-10 and other proposed parallel corridors is dependent on the implementation of Alternative L. Portions of the Alternative K corridor are programmed in the 2040 MTP.	+	Alternative K is a new roadway that would connect to existing El Paso County Rural Transit Route 40 and Route 84. Alternative K would connect to Alternative BP3. The area is generally populated.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Roadway is not long enough to be highly ranked.	-	Alternative would be on all new alignment and would have approximately 1.04 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	++	Connection between I-10 interchange and BHE would provide additional capacity and improved LOS for existing routes.	+	Connection would decrease travel time for existing routes	++	Alternative L is a proposed four-lane, new location roadway originating at I-10 with interchange and traversing west to connect to proposed Alternative 18, south of the Tigua Property. Alternative L would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. and include a grade-separated RR crossing. Alternative L would span almost the entire width of the study area, providing increased connectivity to the areas south of Socorro and north of San Elizario; providing a new cross connection in an area currently lacking that connectivity. Alternative L would connect I-10 to a proposed Border Highway Extension corridor along the western limit of the study area. Connectivity to the following communities would be enhanced: Socorro, Clint, San Elizario, and the Tigua Property.	+	Alternative L is a new roadway that would connect to existing El Paso County Rural Transit Route 40 and Route 84. The area is generally rural between BHE and Alameda Ave and populated between Alameda Ave and I-10.	++	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Also serves as a loop road surrounding Socorro and San Elizario.	-	Alternative would be on all new alignment and would have approximately 2.00 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt M	FM 1110 realignment and widening from I-10 to Herring widened sections.	+	Connection would increase capacity and improve LOS for existing routes.	++	A 4.2% reduction in VHT for the study area	++	Alternative M would connect to Herring Rd. which is proposed fo widening (Alternative F) to the proposed FM 1110 widening realignment (Alternative N1). The connection would improve access from FM 1110 to Alameda Ave. Additionally, Alternative M could connect to the proposed extension of Hole in the Wall Rd. (Alternativ O), which would provide more connectivity to proposed corridors running parallel to I-10 along the western limit of the study area. Alternative M 's connectivity to the study area is dependent on the implementation other proposed alternatives (Alternatives N1, O, and F).	+	Alternative M is a new roadway that would connect to existing El Paso County Rural Transit Route 40. The area is generally rural.	0	This short portion of proposed roadway does not significantly help with incident management	-	Alternative would be on all new alignment and would have approximately 3.25 intersections/mile (although the alternative is short it only has 2 intersections). Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt N1 (FM 1110 from west of Alameda Ave. to North Loop Dr.)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	+	Connection would increase capacity and improve LOS for existing routes.	++	A 4.2% reduction in VHT for the study area	++	Alternative N1 would improve the access from I-10 to Clint and San Elizario via a realigned FM 1110. In conjunction with Alternative N2, N1 would provide direct access to I-10, North Loop Dr. and S. San Elizario Rd., with a grade-separated railroad crossing. With the implementation of Alternative E, the FM 1110 corridor would connect to the City of San Elizario and Socorro Rd. Improvements to the FM 1110 corridor have been programmed in the 2040 MTP.	+	Alternative N1 is a new roadway that would connect to El Paso County Rural Transit Bus Route 40 and Route 84. It would traverse just south of the population center of Clint.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Roadway is not long enough to be highly ranked.	-	Alternative would be on all new alignment and would have approximately 1.33 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt O	Extend Hole-in-the-wall Rd from Socorro rd. north to tie to Herring Rd/ FM 1110 Connection.	+	Connection would provide alternate route to BHE.	+	Connection would decrease travel time for existing routes	0	Alternative O is a four-lane, new location extension of Hole in the Wa Road to Alameda Ave, south of Clint. The extension would provide direct connections to Socorro Rd and Alameda Ave. from Clint. Major facilities parallel to I-10 are anticipated to exceed capacity in the vicinity of the alternative. In combination with other proposed alternatives, Alternative O may provide a route for traffic to flow to alternate routes, although the connectivity of this alternative is dependent on other proposed alternatives, including Alternatives M, N1, N2, and F. To provide relief to congested facilities parallel to I-10, proposed Alternatives 12, 13 or 18 would need to be implemented. Alternative O has limited connectivity to existing major facilities.	0	Alternative O is a new a roadway that would not connect to any existing or proposed transit routes. The area it traverses if rural.	0	This short portion of proposed roadway does not significantly help with incident management	-	Alternative would be on all new alignment and would have approximately 1.81 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid way between FM 793 and FM 1110.	++	Connection between I-10 interchange and BHE would provide additional capacity and improved LOS for existing routes.	+	Connection would decrease travel time for existing routes	++	Alternative P is a proposed four-lane, new location roadway originating at I-10 with interchange and traversing west to connect to proposed Alternative 12, 13, or 18. Alternative P would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. while including a grade-separated RR crossing. I-10 and Alameda Ave. are anticipated to exceed capacity in 2040. Alternative P would increase connectivity to I-10 midway between FM 1109 and Fabens Dr. Alternative P would terminate at proposed parallel corridor along the west limit of the study area (Alternatives 12, 13, or 18). Due to its location, direct connectivity to border communities would be limited.	0	Alternative P is a new roadway that would connect to El Paso County Rural Transit Bus Route 40. The area it traverses is generally rural.	0	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Rating is neutral because of reasonable LOS on nearby roads and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would be on all new alignment and would have approximately 1.14 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	+	5% to 8% reduction in traffic with connection to BHE (ALT V). Reduction in traffic and improved LOS on FM 793.	++	A 4.2% reduction in VHT for the study area	+	Alternative Q is a proposed four-lane, new location roadway originating at I-10 and traversing northwest to connect to Jess Harris Rd., including a grade-separated RR crossing. Alternative Q would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd, while providing a northern bypass of Fabens and spanning almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040. Since Fabens Dr. currently intersects I-10, Alternative Q would not enhance connectivity to I-10, but could potentially connect to the proposed Border Highway East Extension along the western limit of the study area (Alternative 12, 13, 13 Mod, 14 Mod or 18).	0	Alternative Q is a new roadway that would circumnavigate Fabens, although it would connect to El Paso County Rural Transit Bus Route 40.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad.	-	Alternative would be on all new alignment and would have approximately 1.11 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

Border Highway East
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Level 2 Screening Detailed Evaluation Matrix
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Level 2 - Engineering Screening

Study Goals		Enhancing east-west mobility				Improve local and regional access		Provide bike/ped facilities		Reduce incidents delay on I-10/parallel rdwys		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance				Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service		Travel Times/Average Speed											
Measure		LOS along Roadways		Average Speeds along Major Roadways		Assessment of connections between I-10 and other east/west roadways		Assessment of bike/ped accommodations		Reduces occurrence of incidents in study area		Impacts to motorists, amt of lane closures/detours		Compliments and supports border security initiatives	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt R	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - eastern bypass of Fabens.	+	5% to 8% reduction in traffic with connection to BHE (ALT V). Reduction in traffic and improved LOS on FM 793.	++	A 4.2% reduction in VHT for the study area	+	Alternative R is a proposed four-lane, new location roadway originating at I-10 and traversing southwest to connect to Jess Harris Rd., including a grade-separated RR crossing. Alternative R would connect with the following existing major corridors: I-10, North Loop Dr., and Alameda Ave., while providing a southern bypass of Fabens and spanning almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040. Since Fabens Dr. currently intersects I-10, Alternative R would not enhance connectivity to I-10, but could potentially connect to the proposed Border Highway East Extension along the western limit of the study area (Alternative 12, 13, 13 Mod, 14 Mod or 18).	0	Alternative R is a new roadway that would circumnavigate Fabens, although it would connect to El Paso County Rural Transit Bus Route 40.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. It also helps to provide an alternate route around Town of Fabens and alternate route to Port of Entry	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.94 intersections/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt S	Extension of FM 1109 from I-10/FM 3380 to FM 76 - western bypass of Tornillo (Manuel Aguilera Freeway).	0	Forecasted LOS is B*. No additional capacity is needed for design year.	0	No change to travel time.*	++	Alternative S would connect with I-10 at the existing interchange wit O.T. Smith Rd. Alternative S would provide a northern bypass of Tornillo connecting to the existing FM 1109, with a grade-separated RR crossing. Alameda Ave. is anticipated to exceed capacity in 2040 although O.T. Smith Rd. is anticipated to have adequate capacity in 2040. Alternative S would enhance the connectivity to Fabens and Tornillo to the Fabens POE via a new location extension of FM 1109 to I-10. With the implementation of Alternative H, the Manuel Aguilera Freeway extension to I-10, the FM 1109 corridor would provide new linkages to the Fabens POE. This project has been identified in the TIP and in the 2040 MTP as a fiscally constrained project.	+	Alternative S is a new roadway that would connect to El Paso County Rural Transit Bus Route 40. Alternative S would connect to Alternatives BP5 and TR2. The area is generally rural, although it would link the future Tornillo-Guadalupe POE to I-10.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. It also helps to provide an alternate route around Town of Fabens and alternate route to Port of Entry.	0	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.53 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt T	New arterial connection from Gateway East (I-10 EB FR) to Angel Park development.	0	Minimal impact to transportation system.	0	Minimal impact to transportation system	0	Alternative T would improve access from the Angel Park Development to I-10. Would have limited impact on the overall roadway network. Alternative T is a localized improvement, only improving connectivity to I-10 from the Angel Park Development.	0	Alternative T would not connect to any existing or proposed transit routes. Alternative T links a neighborhood to I-10, which is not conducive for bike/ped activities.	0	This short portion of proposed roadway does not significantly help with incident management	-	Alternative would be on all new alignment, short alternative alignment although may be disruptive to residential development during construction.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt U	Rio Bosque Park Connection.	0	Minimal impact to transportation system	0	Minimal impact to transportation system	0	Alternative U would improve access from Socorro Rd. to the Rio Bosque Wetlands Park serving to provide an important community connection to a valuable resource. Alternative U would have limited impact on the overall roadway network.	+	Alternative U would link to Alternative BP2 and El Paso County Rural Transit Route 84. Alternative U would improve access to the Rio Bosque Park, which is pedestrian friendly.	0	This short portion of proposed roadway does not significantly help with incident management	-	Alternative would be on all new alignment, short alternative alignment although may be disruptive to park access during construction.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Multimodal (Non-Roadway) Alternatives															
Transit Alternatives															
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd	+	Increased regular transit service could decrease traffic volumes up to 3%.	+	With decreased traffic volumes travel times would also decrease	++	Alternative TR 1 would improve access and connectivity in the north end of the study area by providing an alternative link to Loop 375. Alt TR 1 does not directly link to the Zaragoza POE from Socorro, but would provide an improved Socorro link to Loop 375.	++	The proposed BRT would connect to various MPO proposed bike/ped trails and also link to other El Paso County Rural Transit routes.	+	BRT may help commuters reach Loop 375 if incident causes closures.	0	No construction required.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 1109 / Manual Aguillera Freeway and Tornillo POE.	+	Increased regular transit service could decrease traffic volumes up to 3%.	+	With decreased traffic volumes travel times would also decrease	++	Alt TR 2 would improve access and connectivity in the south end of the study area by providing an alternative link between the future Tornillo POE and existing El Paso County Rural bus transit to Loop 375. Alt TR 2 does directly link the Tornillo POE to border communities and Loop 375 via El Paso County Rural Transit.	++	Proposed extension of transit route would provide enhanced access for pedestrians between the future Tornillo-Guadalupe POE and Tornillo. Would connect to existing El Paso County Rural Transit route 40.	0	This short proposed connection does not significantly help with incident management	0	No construction required.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Bicycle and Pedestrian Alternatives															
Alt BP 1	Provide Bike/Ped connection from Proposed Border Trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso Rural County Transit stop for Routes 30, 40, and 84.	+	Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+	With decreased traffic volumes travel times would also decrease	+	Alt BP 1 would improve access and connectivity in the northern section of the study area including Socorro by providing additional bicycle and pedestrian connections. Alt BP 1 provides local access between transit and pedestrian networks in the northern section of the study area, but does not provide direct access to I-10.	++	Alternative BP1 would enhance pedestrian access and links to proposed BRT route and existing El Paso County Rural Transit Route 84 and Route 40.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	+	Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+	With decreased traffic volumes travel times would also decrease	+	Alt BP 2 would improve access and connectivity to Rio Bosque Park from transportation modal options along Socorro Rd. including El Paso County Rural transit bus routes. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance pedestrian access to Rio Bosque Park. Would connect to existing El Paso County Rural transit route 84.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 3	Provide Bike/Ped connection from proposed border trails to Socorro Rd for improved access to Socorro Entertainment Center.	+	Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+	With decreased traffic volumes travel times would also decrease	+	Alt BP 3 would improve access and connectivity to Tigua properties including the Socorro Entertainment Center from future bicycle and pedestrian facilities along the border. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance pedestrian access to the Socorro Entertainment Center. Would connect to existing El Paso County Rural Transit Route 84.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to Route 84 Bus Stop 5.	+	Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+	With decreased traffic volumes travel times would also decrease	+	Alt BP 4 would improve access and connectivity to San Elizario and El Paso County Rural Transit bus routes from future bicycle and pedestrian facilities along the border. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance bike/ped facilities between existing El Paso County Rural Transit Route 84 and the City of San Elizario.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5	+	Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+	With decreased traffic volumes travel times would also decrease	+	Alt BP 5 would improve access and connectivity to Tornillo and El Paso County Rural Transit bus routes from the future Tornillo POE. Alt BP 5 does not address linkages to I-10, but would link indirectly to Loop 375 via El Paso County Rural Transit bus routes.	++	Alternative would enhance bike/ped facilities between the future Tornillo-Guadalupe POE and Tornillo. Alternative is contiguous with Alt TR2.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

*Improvements currently under construction or in TIP will provide adequate capacity for forecasted traffic and no additional improvements are need

Level 2 - Cost Screening

Study Goals		Maximizing cost efficiency						Innovative Financing Options		Opportunities for Econ Development	
Criteria		Construction Cost		ROW Acquisition		Utilities and Infrastructure		Financing Opportunities		Economic Development Opportunities	
Measure		Conceptual Estimate ($)		Sseverity of ROW acquisition/displacements		Major utilities/infrastructure		Accommodates innovative financing		Accommodates development of TRZ	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	-	No Build Alt would have maintenance and life cycle costs associated with existing roadway network.	0	No Build Alt has no ROW requirements.	0	No Build Alt has no impact to utilities or existing infrastructure.	0	No Build Alt has no cost.	- -	No Build Alt would provide no additional opportunities for economic development.
Roadway Alternatives Parallel to I-10											
Widen Existing Roadways											
Alt 1	Socorro Rd. from Loop 375 to Herring Rd.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many local utilities plus electric transmission lines	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	-	Residential is most common land use
Alt 3	Alameda Ave. from Loop 375 to Herring	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many local utilities plus interstate communication lines	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Much of south frontage is blocked by Franklin Canal
Alt 4	Alameda Ave. from Herring to Tornillo	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Interstate communication lines	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Rather far from population centers
Alt 5	North Loop from Loop 375 to Clint Cutoff Rd.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many local utilities plus interstate communication lines	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Moderate amount of commercial development, moderate amount of developable land
Alt 7	I-10 ML from Loop 375 to Fabens	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Some utilities at edges, some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	- -	Mainlanes would not significantly help economic development (compared to frontage roads)
Alt 20	Alameda Ave. (SH 20) from Loop 375 to Tornillo.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many local utilities plus interstate communication lines	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Much of south frontage is blocked by Franklin Canal, and other portion is far from population centers
Alt 22	I-10 ML from Loop 375 to OT Smith / FM 3380	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Some utilities at edges, some crossings	++	Alternative has the ability to pursue revenue through managed lanes if the project has secured funding.	- -	Mainlanes would not significantly help economic development (compared to frontage roads)
New Location Roadways											
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Large water/sewer transmission lines near treatment plants, some high pressure gas	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	0	Better if access to properties is provided. Passes through desirable commercial/ industrial land uses near Loop 375 and Zaragoza POE; also passes near Wildlife Refuge
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Portion is fully developed with all urban utilities	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	0	Better if access to properties is provided. Passes through desirable commercial/industrial land uses near Loop 375 and Zaragoza POE; also passes near Wildlife Refuge
Alt 10	I-10 EB FR from FM 1110 to Fabens Dr. / FM 793	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Some utilities at edges, some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt 11	I-10 WB FR from FM 1110 to Fabens Dr. / FM 793	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Some utilities at edges, some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt 12	BHE-South Connection - from Socorro Rd transition to border / Island Main Lateral / Robinson Rd - terminating at FM 1109.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	- -	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	++	A portion (north of Herring Rd) of this alternative has the ability to pursue revenue through tolls if the project has secured funding.	0	Far from population centers, but close to Tornillo Port
Alt 13	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	- -	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	0	Far from population centers, but close to Tornillo POE
Alt 13 (MOD)	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	- -	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	0	Far from population centers, but close to Tornillo POE
Alt 14 (MOD)	BHE-North Connection - from Socorro Rd transitioning to Island Tornillo Rd - terminating at FM 1109	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	0	Far from population centers, but close to Tornillo Port
Alt 15	I-10 EB FR from FM 1110 to OT Smith / FM 3380	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	+	Few utilities along edges, and few crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers

Level 2 - Cost Screening

Study Goals		Maximizing cost efficiency						Innovative Financing Options		Opportunities for Econ Development	
Criteria		Construction Cost		ROW Acquisition		Utilities and Infrastructure		Financing Opportunities		Economic Development Opportunities	
Measure		Conceptual Estimate ($)		Sseverity of ROW acquisition/displacements		Major utilities/infrastructure		Accommodates innovative financing		Accommodates development of TRZ	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt 16	I-10 WB FR from FM 1110 to OT Smith / FM 3380	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	+	Few utilities along edges, and few crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt 17	BHE river running alignment through Socorro	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	+	Better if access to properties is provided. Passes through desirable commercial/ industrial land uses near Loop 375 and Zaragoza POE; also passes near Wildlife Refuge and existing residential areas.
Alt 18	1997 Feasibility Study Alignment	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	- -	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Utilities near development, but mostly undeveloped	++	A portion (north of Herring Rd) of this alternative has the ability to pursue revenue through tolls if the project has secured funding.	+	Better if access to properties is provided. Passes through desirable commercial/ industrial land uses near Loop 375 and Zaragoza POE; also passes near Wildlife Refuge and existing residential areas.
Cross-Connecting Roadway Alternatives											
Widen Existing Roadways											
Alt A2	Widen Old Hueco Tanks Rd from North Loop drive to N. Moon Rd.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	-	Mostly developed with existing residential and school
Alt C	Widen Horizon Blvd (FM 1281) from I-10 to Alameda w RR Grade Sep.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many utilities along route and many crossing at RR and SH20	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Little developable land available
Alt D	Widen Buford from Alameda to Socorro.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Little developable land available
Alt E	Widen San Elizario Rd (FM 1110) from new FM 1110 connection (E of UPRR) to Socorro Rd.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Some developable land, also some existing residential
Alt F	Widen Herring Rd from new FM 1110 connection /Alameda UPRR) to future BHE.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt G	Widen Fabens Dr. (FM 793)/Island Rd. from I-10/ FM 793 to Middle Island Rd.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	- -	Many utilities along route and many crossing at RR and SH20	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	About half of this area is built out. Some developable land near I-10. Proximity to Fabens airport
Alt H	Widening of FM 1109 (Manuel Aguilera Freeway) from FM 76 to Tornillo POE/BHE.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Proximity to Tornillo POE, and developable land
Alt N2 (FM 1110 from North Loop Dr. to I-10)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Proximity to I-10 and accessible from population centers
Alt V	Widen/realign Jess Harris Rd. from Island Rd/Middle Island Rd to future BHE alignment (Alternative 12 or 18)	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
New Location Roadways											
Alt A1	Construct new location Old Hueco Tanks Rd from Gateway Blvd. E (I-10) to North Loop Drive.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Much land available, proximity to I-10, proximity to population centers
Alt I	New connection from Old Hueco Tanks/ North Loop to Alameda w RR Grade Sep.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	About half of this area is built out. Some developable land.
Alt J	New connection from Horizon Blvd / Mesa Drain to Buford (s of Alameda) w RR Grade Sep.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much of this area is built out. Small amount of developable land.
Alt K	Extend Tiwa Blvd along Ysleta Lateral from Socorro to Trent Rd. and New Location N/S connection.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	-	Some utilities along route and some crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	++	Much land available, proximity to I-10, proximity to population centers, access to Tigua venues
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	++	Much land available, proximity to I-10, proximity to population centers

Level 2 - Cost Screening

Study Goals		Maximizing cost efficiency						Innovative Financing Options		Opportunities for Econ Development	
Criteria		Construction Cost		ROW Acquisition		Utilities and Infrastructure		Financing Opportunities		Economic Development Opportunities	
Measure		Conceptual Estimate ($)		Sseverity of ROW acquisition/displacements		Major utilities/infrastructure		Accommodates innovative financing		Accommodates development of TRZ	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt M	FM 1110 realignment and widening from I-10 to Herring widened sections.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	++	Much land available, proximity to I-10, proximity to population centers
Alt N1 (FM 1110 from west of Alameda Ave. to North Loop Dr.)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	++	Much land available, proximity to I-10, proximity to population centers
Alt O	Extend Hole-in-the-wall Rd from Socorro rd. north to tie to Herring Rd/ FM 1110 Connection.	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Somewhat far from population centers
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	+	Very few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Much land available, somewhat far from population centers, but located in likely path of future development, proximity to I-10
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much land available, somewhat far from population centers, proximity to I 10
Alt R	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - eastern bypass of Fabens.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much land available, somewhat far from population centers, proximity to I 10
Alt S	Extension of FM 1109 from I-10/FM 3380 to FM 76 - western bypass of Tornillo (Manuel Aguilera Freeway).	-	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	-	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Traffic to/from Tornillo POE, much land available, somewhat far from population centers, proximity to I-10
Alt T	New arterial connection from Gateway East (I-10 EB FR) to Angel Park development.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Short alignment and existing residential development
Alt U	Rio Bosque Park Connection.	- -	Rating based on cost per lane mile. If cost per lane mile exceeds $1M, than rated "- -"; if between $10K and $1M, rated "-"; less than $10K rated 0. Grade separations at I-10 and UPRR were considered.	0	Rating based on estimated required ROW acreage. If ROW needs exceed 100 acres, than rated "- -"; if between 10 and 100 acres, rated "-"; less than 10 acres rated 0.	0	Few utilities and crossings	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Improved access may increase visitor volume and lead to tourism development
Multimodal (Non-Roadway) Alternatives											
Transit Alternatives											
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd	0	No construction cost, although costs would be incurred by Sun Metro for purchase of BRT and other necessary infrastructure.	0	No ROW required.	+	Minor impact on few parallel utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	BRT may lead to higher density development and redevelopment at transit nodes
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 1109 / Manual Aguilera Freeway and Tornillo POE.	0	No construction cost.	0	No ROW required.	++	Negligible impact on utilities	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	++	Introducing transit service likely leads to potential retail sales benefits; proven economic result in border cities.
Bicycle and Pedestrian Alternatives											
Alt BP 1	Provide Bike/Ped connection from Proposed Border Trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso Rural County Transit stop for Routes 30, 40, and 84.	-	Minor cost associated with construction of multi-use path.	-	Minor amount of ROW would required for bike/ped connection.	+	Minor impact on few utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	0	Nearby residents could walk/bike to transit. Bike trail not expected to be high volume.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	-	Minor cost associated with construction of multi-use path.	-	Minor amount of ROW would required for bike/ped connection.	+	Minor impact on few utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	This would be an amenity for Park with some benefits. Could lead to increased visits/tourism but not expected to be high volume.
Alt BP 3	Provide Bike/Ped connection from proposed border trails to Socorro Rd for improved access to Socorro Entertainment Center.	-	Minor cost associated with construction of multi-use path.	-	Minor amount of ROW would required for bike/ped connection.	+	Minor impact on few utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	0	Beneficial for recreational use, but bike trail not expected to be high volume.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to Route 84 Bus Stop 5.	-	Minor cost associated with construction of multi-use path.	-	Minor amount of ROW would required for bike/ped connection.	+	Minor impact on few utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	0	Nearby residents could walk/bike to transit. Bike trail not expected to be high volume.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5	- -	Minor cost associated with construction of multi-use path, although length of proposed path is long and would mean higher cost. (Higher cost associated with this alternative as compared to the other proposed bike/ped connections)	- -	The length of the route of the bike/ped connection is longer than other alternatives and would require more ROW.(More ROW requirements associated with this alternative as compared to the other proposed bike/ped connections)	+	Minor impact on few utilities to adjust for new infrastructure	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	Accommodating bikes/pedestrians likely leads to potential retail sales benefits; proven economic result in border cities.

Level 2 - Environmental Screening

Study Goals		Developing the facility utilizing context sensitive						Avoiding and/or minimizing impacts to the human and natural environment																					
Criteria		Community Impacts						Cultural Resource Impacts						Natural Resource Impacts												Other Impacts			
		Neighborhood Character		Context Sensitive Solutions (CSS)		Socioeconomic and Environmental		Archaeological Resources		Historic Resources		Tigua Land		Park Land		Water Resources		Drainage Features		Floodplains		Biological Resources		Agricultural Resources		Hazardous Materials		Air Quality		Traffic Noise	
Measure		Impacts to existing and proposed neighborhoods		Design incorporates CSS principles, while also balancing system goals		Impact to environmental justice populations		Number of recorded archaeological sites and high probability areas (acres)		Number of NRHP, NRHP-eligible, historic-age properties, historic trails		Impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land		Impacts to known public parks		Number of surface water/wetland crossings		Affect to irrigation channels, canals, laterals, viaducts, etc.		Affect to floodplains		Potential to impact listed and non-listed, species and/or habitat, rare locally important species.		Existing ag land, farmland, grazing lands, or orchards.		Number of existing HazMat sites		Land use directly adjacent to alternative		Land use directly adjacent to alternative	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained).	0	No Build Alt would have no impact to neighborhoods.	0	No Build Alt would have no impact to CSS.	0	No Build Alt would have no impact to EJ populations.	0	No Build Alt would have no impact on archaeological resources.	0	No Build Alt would have no impact on historic resources.		No Build Alt would have no impact on Tigua land.	0	No Build Alt would have no impact to public parks.	0	No Build Alt would have no impact to water resources.	0	No Build Alt would have no impact to drainage features.	0	No Build Alt Would have no impact to floodplains.	0	No impact.	0	No impact.	0	No impact.	0	No impact.	0	No impact.
Roadway Alternatives Parallel to I-10																															
Widen Existing Roadways																															
Alt 1	Socorro Rd. from Loop 375 to Herring Rd.	- -	Passes through Mission Trail Historic District, in northern part of corridor is adjacent to various designated neighborhoods, cemeteries, schools, and places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is greater or equal to the study area median (97%).	- -	Runs adjacent to La Purisima cemetery and 2 Potentially Eligible/Eligible sites associated with the cemetery; through 2 Potentially Eligible/Eligible sites; and adjacent to the San Elizario Catholic cemetery and many sites associated with it.	--	This alternative is along the alignment of El Camino Real de Tierra Adentro National Historic Trail (per the National Park Service GIS data), passes by the NRHP-listed missions and state-designated historic properties, and is within the locally designated Mission Historic District. Also adjacent to La Purisima, Socorro Mission, San Elizario Catholic Church cemeteries. Also adjacent to San Elizario Historic District and centenial markers in San Elizario.	- -	This alternative passes through the Tigua Trust lands and Ceremonial lands.	-	Adjacent to Cougar Park (baseball field), Unnamed Park in San Elizario (San Elizario Rd.), and Alexandra Flores Park (near Herring Rd.) (skating terrain, playground, picnic shelters and BBQ pits, 2 baseball fields and 2 soccer fields).	0	None	- -	13 Impacts: 1. Mesa Drain Intercept 2. Glardon Lateral 3. Socorro Lateral 4. Socorro Lateral 5. Franklin Drain 6. San Elizario Lateral 7. North Side Lateral 8. Salatral Lateral 9. Clint Lateral 10. San Elizario Lateral (runs along eastern edge) 11. Del Monte Lateral 12. Barrial Lateral 13. River Spur Drain	-	2 Impacts: 1. At very northern edge of study area, just touching the eastern edge of the floodplain. 2. Crosses floodplain that follows Glardon Lateral and Mesa Drain Intercept.	0	Low potential due to existing roadway and urban setting.	-	Largely urban. Small amount of parallel ROW needed for widening.	-	Five LPST (gas stations) sites. HazMat potential exists.	- -	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area; and located adjacent to an intermodal freight distribution center.	- -	Area is mostly residential.
Alt 3	Alameda Ave. from Loop 375 to Herring	-	Northern part of corridor is adjacent to various designated neighborhoods. Schools and places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Percentage of minority population is greater or equal to the study area median (97%).	-	Runs adjacent to Potentially Eligible/Eligible site along Alameda Ave.	-	This alignment is parallel to the NRHP-listed Franklin Canal and passes by the NRHP-eligible Pena House near the intersection of Alameda Ave. and Horizon Blvd.	0	None	0	No impact to park land.	0	None	- -	14 Impacts: 1. Runs along Franklin Canal 2. Socorro Lateral 3. Franklin Lateral 4. Wadlington Lateral 5. Socorro Lateral 6. Daughterty Lateral 7. Bovee Lateral 8. Bovee Lateral 9. Salatral Lateral 10. Dolan Drain 11. Clint Lateral 12. Middle Drain 13. Clint Spur Drain 14. Green Lateral	- -	2 Impacts at northern end of study area. 1. Crossing floodplain following Glardon Lateral. 2. Running along western edge of floodplain between Franklin Canal and Middle Drain.	0	Low potential due to existing roadway and urban setting.	-	Largely urban. Small amount of parallel ROW needed for widening.	-	Six adjacent LPST sites. Auto Salvage Yard; gas station@ Moon Rd; gas @ N Rio Vista, HazMat potential exists.	- -	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area; located adjacent to an intermodal freight distribution center.	-	Area is mostly residential east of Alameda Ave. and mostly commercial west of Alameda Ave.
Alt 4	Alameda Ave. from Herring to Tornillo	- -	No impact to designated neighborhoods. Corridor passes through Fabens and Tornillo centers, cemeteries, adjacent to places of worship and schools.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level and LEP is greater than the study area median of 45%.	-	Runs adjacent to Our Lady of Guadalupe cemetery.	0	None	0	None	-	Adjacent to Risinger Park (Grace St.) in Fabens.	0	None	- -	8 Impacts. 1. Green Lateral 2. Clint Lateral 3. WA? 4. Runs Along Franklin Canal 5. Mesa Drain 6. Salatral Lateral 7. Arroyo 8. Runs between Tornillo Canal and Cook Interceptino Dr.	- -	3 Impacts. 1. Crosses floodplain where runs along Franklin Canal 2. Crosses floodplain that follows Arroyo. 3. Crosses floodplain at southern end of study area.	0	Low potential due to existing roadway, agriculture, and urban setting.	- -	Largely agricultural with parallel ROW needed for widening.	-	One adjacent LPST site and on NFRAP site.	+	Congestion relief by widening the existing roadway.	- -	Area is mostly agricultural, but with dense residential areas through communities.
Alt 5	North Loop from Loop 375 to Clint Cutoff Rd.	- -	Northern part of corridor is adjacent to a few designated neighborhoods. Schools and places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is greater or equal to the study area median (97%).	0	None	0	None	0	None	-	Adjacent to Joe Carrasco Park.	0	None	- -	11 Impacts. 1. Juan De Herrera Main 2. Juan De Herrera Bran 3. Ysleta Lateral 4. Runs along eastern edge of Ysleta Lateral 5. Y-197 Lateral 6. Y-197 Lateral 7. Y-197 Lateral 8. WA? 9. Y-197 Lateral 10. Y-197 Lateral 11. Mesa Drain	- -	3 Impacts. 1. Originates at edge of floodplain at northern end of study area 2. Passes less than 200 ft from floodplain near Juan de Herrera Main 3. Crosses into floodplain at point where it also crosses Mesa Drain at southern end of alternative.	0	Low potential due to existing roadway and urban setting.	-	Urban/Agricultural mix. Parallel ROW needed for widening.	-	Two adjacent LPST sites. Auto shop; gas stations @ N Rio Vista, HazMat potential.	0	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area.	- -	Area is mostly residential with some commercial land use and agricultural lands.
Alt 7	I-10 ML from Loop 375 to Fabens	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	LEP is less than the study area median of 45%. Widening I-10 mainlanes would not directly effect these populations.	0	None	0	None	0	None	0	No impacts to park land.	0	None	0	None	- -	Crosses floodplain 23 times along eastern edge of study area	0	Low potential due to existing roadway .	0	Undeveloped/No agricultural use.	0	None	-	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area. Promotes an increase in truck traffic.	-	Area is commercial, commercial undeveloped with some residential west of I-10.
Alt 20	Alameda Ave. (SH 20) from Loop 375 to Tornillo.	- -	Northern part of corridor is adjacent to various designated neighborhoods. Schools and places of worship adjacent to northern part of corridor. Southern part - No impact to designated neighborhoods. Corridor passes through Fabens and Tornillo centers, cemeteries, adjacent to places of worship and schools in southern part of corridor.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is less than the study area median (97%).	-	Runs adjacent to Potentially Eligible/Eligible site along Alameda Ave.	-	This alignment is parallel to the NRHP-listed Franklin Canal and passes by the NRHP-eligible Pena House near the intersection of Alameda Ave. and Horizon Blvd.	- -	This alternative passes through the Tigua Trust lands.	-	Adjacent to Risinger Park (Grace St.) in Fabens (sheltered picnic tables, basketball court, open area, playground).	0	None	- -	Same as Alt-3 &4 combined.	- -	Same as Alt-3 &4 combined.	0	Low potential due to existing roadway .	-	Largely agricultural with parallel ROW needed for widening.	0	None	0	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area.	- -	Northern end is mostly residential and southern portion in mostly agricultural with dense residential areas through communities.
Alt 22	I-10 ML from Loop 375 to OT Smith / FM 3380	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	LEP is less than the study area median of 45%. Widening I-10 mainlanes would not directly effect these populations.	0	None	0	None	0	None	0	No impacts to park land.	0	None	0	None	- -	Crosses floodplain 37 times along eastern edge of study area	0	Low potential due to existing roadway .	0	Undeveloped/No agricultural use.	0	None	-	Congestion relief by widening the existing roadway; located within the PM-10 non-attainment area. Promotes an increase in truck traffic.	-	Area is commercial, commercial undeveloped with some residential west of I-10.
New Location Roadways																															
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	No impact to neighborhood character - area is generally industrial.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment connects to Socorro Rd./ El Camino Real de Tierra Adentro National Historic Trail. Also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Trust lands and Ceremonial lands.	-	Adjacent to portion of Rio Bosque Park and near Cougar Park (baseball field).	0	None	- -	5 Impacts. 1. Runs along South Side Feeder Lateral at north end of study area 2. Playa Drain 3. runs along WA? 4. Runs along Riverside Canal 5. Runs along Franklin Canal	- -	2 Impacts. 1. Crosses wetlands following Playa Drain 2. Crosses southern end of floodplain between Riverside Canal and Franklin Drain.	-	Urban setting. Low to medium potential due to the connection into Rio Bosque Park.	0	Largely urban with little/no agricultural use.	0	None	0	Congestion relief by construction of a new location roadway; located within the PM-10 non-attainment area.	-	Area is mostly commercial undeveloped and commercial land use land, southern end of this alternative is near the Rio Bosque Park.
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	No impact to neighborhood character - area is generally industrial.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment connects to Socorro Rd./ El Camino Real de Tierra Adentro National Historic Trail. Also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Trust lands and Ceremonial lands.	-	Adjacent to portion of Rio Bosque Park and near Cougar Park (baseball field).	0	None	-	4 Impacts. 1. Playa Drain 2. Riverside Canal 3. Franklin Drain 4. Franklin Drain	- -	3 Impacts. 1. Crosses floodplain at northern end of study area 2. Crosses floodplain where follows Playa Drain 3. Runs along western edge of floodplain parallel to Franklin Drain	0	Urban setting. Low potential	0	Largely urban with little/no agricultural use.	-	One adjacent LPST site.	0	Congestion relief by construction of a new location roadway; located within the PM-10 non-attainment area.	-	Area is mostly commercial undeveloped and commercial land use land, southern end of this alternative is near the Rio Bosque Park.
Alt 10	I-10 EB FR from FM 1110 to Fabens Dr. / FM 793	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	0	None	0	None	0	No impact to park land.	0	None	0	None	- -	13 Impacts. Crosses 13 floodplain areas	0	Low potential due to proximity of existing interstate highway.	0	Undeveloped land. No agricultural use.	0	None	+	Congestion relief by construction of a new frontage roads along I-10.	0	Area is undeveloped commercial and agricultural.
Alt 11	I-10 WB FR from FM 1110 to Fabens Dr. / FM 793	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	0	None	0	None	0	No impact to park land.	0	None	0	None	- -	12 impacts. Crosses 12 floodplain areas.	0	Low potential due to proximity of existing interstate highway.	0	Undeveloped land. No agricultural use.	0	None	+	Congestion relief by construction of a new frontage roads along I-10.	0	Area is undeveloped commercial and agricultural.
Alt 12	BHE-South Connection - from Socorro Rd transition to border / Island Main Lateral / Robinson Rd - terminating at FM 1109.	-	No impact to neighborhood character but traverses through Mission Trail Historic District.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment connects to Socorro Rd./ El Camino Real de Tierra Adentro National Historic Trail. Also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	- -	12 Impacts. 1. San Elizario Lateral 2. River Drain 3. Runs along western edge of Riverside Canal 4. San Elizario Lateral 5. Riverside Canal 6. Runs along Island Main Lateral 7. Island Drain 8. Island Spur Drain 9. Island Lateral 10. Island Drain 11. Guadalupe Lateral 12. Borderland Spur Drain	-	2 impacts. 1. Runs along eastern side of floodplain near southern boundary of study area 2. Runs along western side of floodplain near southern boundary of study area.	0	Low to medium potential. Adjacent to the Rio Grande for a portion of the alignment.	- -	Largely agricultural with portions bisecting fields and orchards.	0	None	+	Congestion relief by construction of a new location roadway.	-	Northern portion has more residential land use; southern portion is agricultural.
Alt 13	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	- -	11 Impacts. 1. WA? 2. Island Main Lateral 3. River Drain 4. Riverside Int. Drain 5. Riverside Canal 6. Lee Moor Interception 7. Island Drain 8. Island Farmers Drain 9. Fabens Drain 10. Borderland Spur Drain 11. Runs along Borderland Spur Drain to southern edge of study area	- -	2 Impacts. 1. Runs along the edge of a floodplain where it crosses Lee Moor Interception. 2. Crosses floodplain at southern end of study area where runs along Island Drain.	0	Low potential. Active agricultural fields.	- -	Agricultural with portions bisecting fields and orchards.	0	None	+	Congestion relief by construction of a new location roadway.	0	Area is agricultural.
Alt 13 (MOD)	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	- -	8 Impacts. 1. River Drain 2. Island Main Lateral 3. Riverside Int. Drain 4. Lee Moor Interception 5. Runs along Island Drain 6. Island Farmers Drain 7. Runs along Island Drain 8. Ends at Borderland Spur Drain	- -	2 Impacts. 1. Runs along the edge of a floodplain where it crosses Lee Moor Interception. 2. Crosses floodplain at southern end of study area where runs along Island Drain.	0	Low potential. Active agricultural fields.	- -	Agricultural with portions bisecting fields and orchards.	0	None	+	Congestion relief by construction of a new location roadway.	0	Area is agricultural.
Alt 14 (MOD)	BHE-North Connection - from Socorro Rd transitioning to Island Tornillo Rd - terminating at FM 1109	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	- -	10 Impacts. 1. Riverside Canal 2. Hansen Feeder Interc 3. Hansen Lateral 4. I-243 Lateral 5. Fabens Drain 6. Hansen Lateral 7. WA? 8. Fabens Drain 9. Hansen Lateral 10. Runs along Fabens Drain	-	1 Impact. 1. Runs along western side of floodplain parallel to Riverside Canal	0	Low potential. Active agricultural fields.	- -	Agricultural with portions bisecting fields and orchards.	0	None	+	Congestion relief by construction of a new location roadway.	-	Area is agricultural, small portions of residential land use east of alternative.
Alt 15	I-10 EB FR from FM 1110 to OT Smith / FM 3380	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	Although, alternative in area with the median HH income less than or equal to poverty level and LEP is greater than the study area median of 45%, frontage roads would not directly effect these populations.	0	None	0	None	0	None	0	No impact to park land.	0	None	0	None	- -	1. Crosses floodplain following Arroyo 2. Crosses 12 more floodplain areas down to southern edge of project area.	0	Low potential due to proximity of existing interstate highway.	0	Undeveloped/No agricultural use.	0	None	+	Congestion relief by construction of a new frontage roads along I-10.	0	Area is agricultural.
Alt 16	I-10 WB FR from FM 1110 to OT Smith / FM 3380	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	Although, alternative in area with the median HH income less than or equal to poverty level and LEP is greater than the study area median of 45%, frontage roads would not directly effect these populations.	0	None	0	None	0	None	0	No impact to park land.	0	None	0	None	- -	Crosses 13 floodplain areas along the eastern edge of the study area.	0	Low potential due to proximity of existing interstate highway.	0	Undeveloped/No agricultural use.	0	None	+	Congestion relief by construction of a new frontage roads along I-10.	0	Area is agricultural.
Alt 17	BHE river running alignment through Socorro	-	No impact to neighborhood character - bisects Tigua property.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment is adjacent to Trenda de Carbajal, a Recorded Texas Historic Landmark that is potentially NRHP-eligible. Also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua property, Trust lands, and Ceremonial lands.	-	Adjacent to Rio Bosque Park.	-	1 impact. Runs along the eastern edge of the Rio Bosque wetland preserve.	- -	5 Impacts. 1. Riverside Canal 2. San Elizario Lateral 3. Riverside Int. Drain 4. River Drain 5. Runs along Riverside Canal	-	1 Impact. 1. Runs along western edge of floodplain area around Franklin Drain.	-	Urban setting. Low to medium potential due to the connection into Rio Bosque Park.	-	Urban/Agricultural mix with parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	-	Northern portion has more residential land use; southern portion is agricultural.
Alt 18	1997 Feasibility Study Alignment	-	No impact to neighborhood character - northern part of corridor in an generally industrial area; bisects Tigua property.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is greater or equal to the study area median (97%).	- -	Runs adjacent to a Potentially Eligible/Eligible site and through another Potentially Eligible/Eligible site.	--	This alignment goes through Ysleta del Sur Pueblo, and then crosses El Camino Real de Tierra Adentro National Historic Trail and the NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua property, Trust lands, and Ceremonial lands.	-	Adjacent to Rio Bosque Park.	-	One NWI water.	- -	1. Playa Drain 2. Franklin Drain 3. Socorro Lateral 4. Franklin Drain 5. Riverside Canal 6. River Drain 7. River Drain 8. San Elizario Lateral 9. River Spur Drain 10. Island Main Lateral 11. Riverside Canal 12. Island Drain 13. Island Drain 14. Lee Moor Interception 15. Island Drain 16. Fabens Drain 17. Borderland Spur Drain	-	4 Impacts. 1. Crosses floodplain at northern end of study area 2. Crosses floodplain at Playa Drain 3. Crosses floodplain at Franklin Drain 4. Crosses floodplain at southern end of study area at Island Drain.	-	Urban setting. Low to medium potential due to the connection into Rio Bosque Park.	- -	Urban/Agricultural mix with portions bisecting fields and orchards.	0	None	0	Congestion relief by construction of a new location roadway; located within the PM-10 non-attainment area.	-	Northern portion has more residential land use; southern portion is agricultural. Land near Loop 375 is commercial and undeveloped commercial.
Cross-Connecting Roadway Alternatives																															
Widen Existing Roadways																															

Level 2 - Environmental Screening

Study Goals		Developing the facility utilizing context sensitive																													
Criteria		Community Impacts						Cultural Resource Impacts						Avoiding and/or minimizing impacts to the human and natural environment																	
		Neighborhood Character		Context Sensitive Solutions (CSS)		Socioeconomic and Environmental		Archaeological Resources		Historic Resources		Tigua Land		Park Land		Water Resources		Natural Resource Impacts / Drainage Features		Floodplains		Biological Resources		Agricultural Resources		Hazardous Materials		Other Impacts / Air Quality		Traffic Noise	
Measure		Impacts to existing and proposed neighborhoods		Design incorporates CSS principles, while also balancing system goals		Impact to environmental justice populations		Number of recorded archaeological sites and high probability areas (acres)		Number of NRHP, NRHP-eligible, historic-age properties, historic trails		Impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land		Impacts to known public parks		Number of surface water/wetland crossings		Affect to irrigation channels, canals, laterals, viaducts, etc.		Affect to floodplains		Potential to impact listed and non-listed, species and/or habitat, rare locally important species		Existing ag land, farmland, grazing lands, or orchards.		Number of existing HazMat sites		Land use directly adjacent to alternative		Land use directly adjacent to alternative	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt A2	Widen Old Hueco Tanks Rd from North Loop drive to N. Moon Rd.	-	No impact to designated neighborhoods; 2 schools and one place of worship located south of Alt A2; generally residential area.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land	0	None	-	2 Impacts. 1. Juan De Herrera Bran 2. Ysleta Lateral	0	None	0	Low potential due to urban setting and existing roadway .	0	Urban. Little/no agricultural land.	0	None	+	Congestion relief by widening of an existing roadway.	- -	Area is mostly residential.
Alt C	Widen Horizon Blvd (FM 1281) from I-10 to Alameda w RR Grade Sep.	-	No impact to designated neighborhoods, place of worship located near UPRR crossing.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is greater or equal to the study area median (97%).	-	Runs adjacent to Potentially Eligible/Eligible site	-	This alignment is adjacent to the NRHP-eligible Pena House near the intersection of Alameda Ave. and Horizon Blvd. It also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	-	6 Impacts. 1. Begins just east of Ysleta Lateral 2. Middle Drain 3. Ysleta Lateral 4. Mesa Drain 5. Y- 147 Lateral 6. Mesa Spur Drain	- -	2 Impacts. 1. Crosses floodplain at Mesa Spur Drain 2. Runs along edge of floodplain at eastern edge of study area.	0	Low potential due to urban setting and existing roadway.	0	Urban. Little/no agricultural land.	-	Four adjacent LPST sites.	+	Congestion relief by widening of an existing roadway.	-	Area is mostly residential, with some agriculture and commercial land use.
Alt D	Widen Buford from Alameda to Socorro.	- -	Alternative adjacent to La Juna Addition (neighborhood), terminates in Mission Trail Historic District, and near 3 schools.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	-	Runs adjacent to 2 Potentially Eligible/Eligible sites.	--	This alignment is adjacent to the NRHP-listed Socorro Mission Archeological site and passes through the local Mission Historic District and crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	-	Adjacent to Bulldog Championship Park (The park amenities include an amphitheater, pavilions, a splash playground, playgrounds, detention pond, walking trails and over 90 parking spaces).	0	None	-	3 Impacts. 1. Begins just east of Socorro Lateral 2. Franklin Lateral 3. Ends at Franklin Canal.	0	None	0	Low potential due to urban setting and existing roadway .	0	Urban. Little/no agricultural land.	0	None	+	Congestion relief by widening of an existing roadway.	- -	Area is mostly residential.
Alt E	Widen San Elizario Rd (FM 1110) from new FM 1110 connection (E of UPRR) to Socorro Rd.	-	No impact to designated neighborhoods, near three places of worship, terminate in Mission Trail Historic District.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment connects to Socorro Rd./ El Camino Real de Tierra Adentro National Historic Trail. It also crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	- -	3 Impacts. 1. Barrial Lateral 2. Franklin Canal 3. Runs along Middle Drain	0	None	0	Low potential due to urban setting and existing roadway .	-	Urban/Agricultural mix with parallel ROW needed.	0	None	+	Congestion relief by widening of an existing roadway.	-	Area is mostly residential, with some commercial land use.
Alt F	Widen Herring Rd from new FM 1110 connection /Alameda UPRR) to future BHE.	-	No impact to designated neighborhoods, near various schools.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is less than the study area median of 45%.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	- -	6 Impacts. 1. River Drain 2. River Spur Drain 3. Franklin Drain 4. Franklin Canal 5. Middle Drain 6. Runs along Green Lateral	0	None	0	Low potential due to urban setting and existing roadway .	-	Agricultural with parallel ROW needed.	0	None	+	Congestion relief by widening of an existing roadway.	0	Area is mostly agricultural with some commercial development.
Alt G	Widen Fabens Dr. (FM 793) / Island Rd. from I-10/ FM 793 to Middle Island Rd.	- -	No impact to designated neighborhoods, corridor adjacent to library, various places of worship; alternative would traverse through downtown Fabens and residential areas.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	-	7 Impacts. 1. Island Drain 2. I-270 Lateral 3. Hansen Lateral 4. Fabens Drain 5. I-243 Lateral 6. Mesa Outlet Drain 7. Riverside Canal 8. Arroyo	-	1 Impact. 1. Crosses floodplain at Arroyo	0	Low potential due to urban setting and existing roadway .	-	Undeveloped/urban / agricultural used with parallel ROW needed.	-	One adjacent NFRAP site.	+	Congestion relief by widening of an existing roadway.	- -	Alternative traverses through center of Fabens.
Alt H	Widening of FM 1109 (Manuel Aguilera Freeway) from FM 76 to Tornillo POE / BHE.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level.	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	- -	3 Impacts. 1. Runs along Borderland Spur Drain 2. Island Drain 3. WA?	0	None	0	Low potential due to active agricultural land.	-	Agricultural with parallel ROW needed.	0	None	0	Congestion relief by widening of an existing roadway. Connection to POE so would likely increase truck traffic.	-	Area is mostly agricultural with some residential development near Alameda Ave.
Alt N2 (FM 1110 from North Loop Dr. to I-10)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	0	None	0	None	0	No impact to park land.	0	None	0	None	0	None	0	Low to moderate potential due to undeveloped setting and realigning of existing roadway.	0	Undeveloped/No agricultural use.	0	None	+	Congestion relief by widening of an existing roadway.	0	Area is commercial and agricultural.
Alt V	Widen/realign Jess Harris Rd. from Island Rd/Middle Island Rd to future BHE alignment (Alternative 12 or 18)	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	-	1 Impact. 1. Guadalupe Lateral	0	None	0	Low to moderate potential due to undeveloped setting and realigning of existing roadway .	-	Agricultural with parallel ROW needed.	0	None	0	Short connection would have little effect on air quality.	0	Area is agricultural.
New Location Roadways																															
Alt A1	Construct new location Old Hueco Tanks Rd from Gateway Blvd. E (I-10) to North Loop Drive.	-	No impact to designated neighborhoods. Near place of worship located in northeast quadrant of North Loop Dr. intersection.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	- -	Runs through Potentially Eligible/Eligible site.	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	2 lateral crossings: Mesa Spur Drain and U.S.R.S crosses floodplain	-	3 Impacts. 1. Mesa Drain 2. Juan de Herrera Main 3. Mesa Spur Drain	-	1 Impact. 1. Crosses floodplain at Mesa Spur Drain	0	Low potential due to urban setting, agriculture fields, and existing roadway.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	-	Area is mostly agricultural, few residential developments along southern side.
Alt I	New connection from Old Hueco Tanks/ North Loop to Alameda w RR Grade Sep.	-	Adjacent to Sunshine neighborhood.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	- -	Runs through Potentially Eligible/Eligible site.	-	No previously designated historic sites along this alternative, but the Franklin Canal is along the west side of Alameda Ave.	0	None	0	No impact to park land.	0	4 lateral crossings: Juan de Jerrera Main, Middle Drain, and Juan de Jerrera Branch (twice)	- -	6 Impacts. 1. Begins just east of Franklin Canal 2. Middle Drain 3. Juan De Herrera Bran 4. Runs along Juan De Herrera Bran 5. Ysleta Lateral 6. Juan De Herrera Bran	0	1 Impact. 1. Runs just south of floodplain at Middle Drain.	-	Low to moderate potential due to proximity to water feature, urban setting, and agriculture fields.	- -	Urban/Agricultural mix with bisecting/parallel ROW needed.	-	One adjacent TXMSWLF site.	+	Congestion relief by construction of a new location roadway.	-	Area is mostly agricultural and commercial, few residential developments along southern side.
Alt J	New connection from Horizon Blvd / Mesa Drain to Buford (s of Alameda) w RR Grade Sep.	-	Adjacent to Rio Vista Addition, near 3 schools.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45% and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1 and the individually NRHP-listed Franklin Canal.	0	None	-	Terminates near Bulldog Championship Park (The park amenities include an amphitheater, pavilions, a splash playground, playgrounds, detention pond, walking trails and over 90 parking spaces).	0	None	-	6 Impacts. 1. Franklin Canal 2. Wadlington Lateral 3.Middle Drain 4. Ysleta Lateral 5. Mesa Drain 6. De Groff Lateral	0	None	-	Low to moderate potential due to proximity to water feature, urban setting, and agriculture fields.	- -	Urban/Agricultural mix with bisecting/parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	-	Area is a mix of residential, commercial, agricultural and vacant land.
Alt K	Extend Tiwa Blvd along Ysleta Lateral from Socorro to Trent Rd. and New Location N/S connection.	-	Terminates in Mission Trail Historic District, no impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1 and the El Camino Real de Tierra Adentro National Historic Trail.	- -	This alternative passes through Tigua property, Trust lands, and Ceremonial lands.	0	No impact to park land.	0	None	- -	7 Impacts. 1. San Elizario Lateral 2. Clint Lateral 3. Runs along Salatral Lateral 4. Franklin Drain 5. Runs along Dolan Drain 6. Franklin Canal 7. Middle Drain	0	None	-	Low to moderate potential due to proximity to water feature, urban setting, and agriculture fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	0	Congestion relief by construction of a new location roadway. Adjacent to an intermodal freight distribution center.	- -	Area is mostly residential, with some commercial and industrial uses.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	-	Intersects Mission Trail Historic District.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level, LEP is greater than the study area median of 45%, and percentage of minority population is greater or equal to the study area median (97%).	-	Runs adjacent to San Elizario cemetery.	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1 and intersects with El Camino Real de Tierra Adentro National Historic Trail.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	-	One NWI water.	- -	12 Impacts. 1. River Drain 2. San Elizario Lateral 3. Franklin Drain 4. Runs Just North Of Perez Drain 5. Franklin Canal 6. Dolan Drain 7. Clint Lateral 8. Middle Drain 9. Salatral Lateral 10. Ysleta Lateral 11. Mesa Drain 12. Mesa Spur Drain	-	1 Impact. 1. Crosses floodplain at Mesa Spur Drain	-	Low to moderate potential due to urban setting, undeveloped land, and agriculture fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	-	Congestion relief by construction of a new location roadway. Connection to POE so would likely increase truck traffic. Adjacent to an intermodal freight distribution center.	-	Area is mostly agricultural, few residential developments along southern side.
Alt M	FM 1110 realignment and widening from I-10 to Herring widened sections.	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	1 lateral crossing: Green Lateral	-	1 Impact. 1. Green Lateral	0	None	0	Low potential due to urban setting and agriculture fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	0	Area is agricultural with a small area of commercial.
Alt N1 (FM 1110 from west of Alameda Ave. to North Loop Dr.)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	0	No impact to designated neighborhoods, near Clint Cemetery.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is less than the study area median of 45%.	-	Runs adjacent to Clint and San Lorenzo cemeteries.	-	Adjacent to Clint Cemetery. Crosses canals of NRHP-listed El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	-	6 Impacts. 1. Middle Drain 2. Clint Spur Drain 3. Green Lateral 4. Clint Lateral 5. Mesa Drain 6. Salatral Lateral	-	1 Impact. Crosses floodplain at Salatral Lateral	0	Low potential due to urban setting and agriculture fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	0	Area is mostly agricultural.
Alt O	Extend Hole-in-the-wall Rd from Socorro rd. north to tie to Herring Rd/ FM 1110 Connection.	0	No impact to designated neighborhoods. Near residential area, no other community amenities.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	-	Crosses the individually listed Franklin Canal as well as canals of NRHP-listed El Paso Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	-	5 Impacts. 1. Green Lateral 2. Middle Drain 3. Dorrough Drain 4. Franklin Canal 5. Franklin Drain	0	None	0	Low potential. Urban and active agricultural fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	+	Congestion relief by construction of a new location roadway.	-	Area is agricultural with a small area of residential near Denton Rd.
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	0	None	-	This alignment crosses the individually listed Franklin Canal as well as canals of NRHP-listed El Paso County Water Improvement District No. 1.	- -	This alternative passes through Tigua Ceremonial lands.	0	No impact to park land.	0	None	- -	10 Impacts. 1. Island Main Lateral 2. Island Drain 3.Riverside Canal 4. Riverside Int. Drain 5. River Drain 6. Franklin Canal 7. Middle Drain 8. Clint Lateral 9. WA? 10. WA?	- -	1 Impact. 1. Crosses floodplain near eastern edge of study area.	0	Low potential. Undeveloped desert land and active agricultural fields.	- -	Agricultural with bisecting/parallel ROW needed.	0	None	0	Congestion relief by construction of a new location roadway. Connection to POE would likely increase truck traffic.	0	Area is mostly agricultural.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	0	No impact to designated neighborhoods, outside of Fabens residential areas.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Alternative in area with the median HH income less than or equal to poverty level and percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses the individually listed Franklin Canal as well as canals of NRHP-listed El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	-	Two NWI wetlands.	- -	9 Impacts. 1. Island Drain 2. Hansen Lateral 3. Fabens Drain 4. I-243 Lateral 5. Riverside Canal 6. Fabens Intercepting 7. Franklin Canal 8. Mesa Drain 9. Salatral Lateral	- -	2 Impacts. 1. Crosses floodplain at Salatral Lateral 2. Crosses floodplain near eastern edge of study area	0	Low potential. Undeveloped desert land and active agricultural fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	0	Congestion relief by construction of a new location roadway. Connection to POE would likely increase truck traffic.	0	Area is mostly agricultural.
Alt R	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - eastern bypass of Fabens.	0	No impact to designated neighborhoods, outside of Fabens residential areas.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No LEP or EJ.	-	Runs adjacent to Our Lady of Guadalupe cemetery.	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	- -	9 Impacts. 1. Runs along Island Farmers Drain 2. I-270 Lateral 3. Hansen Lateral 4. Fabens Drain 5. I-243 Lateral 6. Fabens Waste Channel 7. Tornillo Canal 8. Cook Intercepting Dr 9. Arroyo	-	2 Impacts. 1. Runs along northern edge of floodplain near eastern edge of study area 2. crosses floodplain at Arroyo	0	Low potential. Undeveloped desert land and active agricultural fields.	- -	Largely agricultural with bisecting/parallel ROW needed.	0	None	0	Congestion relief by construction of a new location roadway. Connection to POE so would likely increase truck traffic.	0	Area is mostly agricultural.
Alt S	Extension of FM 1109 from I-10/FM 3380 to FM 76 - western bypass of Tornillo (Manuel Aguilera Freeway).	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	- -	Alternative in area with the median HH income less than or equal to poverty level and percentage of minority population is greater or equal to the study area median (97%).	-	Runs adjacent to 2 Potentially Eligible/Eligible sites.	0	None	0	None	0	No impact to park land.	0	None	0	None	-	3 Impacts. Crosses 3 floodplains at southeastern tip of study area.	0	Low potential. Undeveloped desert land.	- -	Largely undeveloped with small amount of parallel ROW needed.	0	None	0	Congestion relief by construction of a new location roadway. Indirect connection to POE so would likely increase truck traffic.	0	Area is mostly agricultural.
Alt T	New arterial connection from Gateway East (I-10 EB FR) to Angel Park development.	-	Alternative provides access to Angel Park Development by connecting existing local road to I-10 frontage roads.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	LEP is greater than the study area median of 45%.	0	None	0	None	0	None	0	No impact to parkland.	0	None	0	None	0	1. impact. 1. Approx. 150 ft south of a floodplain near the eastern edge of the study area.	0	Low potential. Short connection from I-10 into new development.	0	Urban. No agricultural lands.	0	None	0	Short connection would have little effect on air quality.	-	Area is undeveloped commercial, leading into a residential area.
Alt U	Rio Bosque Park Connection.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	-	Percentage of minority population is greater or equal to the study area median (97%).	0	None	-	This alignment crosses canals of NRHP-listed El Paso County Water Improvement District No. 1. Also intersects with El Camino Real de Terra Adentro National Historic Trail.	- -	This alternative passes through Tigua Ceremonial lands.	- -	Alternative traverses a portion of the Rio Bosque Park.	0	None	-	2 Impacts. 1. Riverside Canal 2. Franklin Drain	0	None	-	Urban setting. Low to medium potential due to the connection into Rio Bosque Park.	0	Urban. No agricultural lands.	0	None	+	Congestion relief by construction of a new location roadway.	0	Area includes park land and undeveloped commercial land.
Multimodal (Non-Roadway) Alternatives																															
Transit Alternatives																															
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd	0	Northern part of corridor is adjacent to various designated neighborhoods. Schools and places of worship adjacent to corridor. Proposed BRT would not impact existing infrastructure.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	+	Transit would provide additional transportation measures for EJ population	0	None	-	No previously designated historic sites along this alternative, but the Franklin Canal is along the west side of Alameda.	- -	This alternative passes through the Tigua Trust lands.	0	No impact to park land.	0	None	0	3 Impacts. 1. Runs along eastern edge of Franklin Canal 2. Juan De Herrera Bran 3. Wadlington Lateral	0	1 Impact. 1. Runs along western edge of floodplain between floodplain area and Franklin Drain at northern end of study area.	0	No impact.	0	Urban. No agricultural lands.	0	None	+	Future transit route.	-	Area is mostly residential east of Alameda Ave. and mostly commercial west of Alameda Ave. BRT would increase traffic noise.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 1109 / Manual Aguilera Freeway and Tornillo POE.	0	No impact to designated neighborhoods. Proposed transit route would pass through residential area of Tornillo, but no impacts to existing infrastructure with proposed transit.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	+	Transit would provide additional transportation measures for EJ population	0	None	0	None	0	None	0	No impact to park land.	0	None	0	4 Impacts. 1. Originates at Island Drain 2. WA? 3. Fabens Waste Channel 4. Tornillo Canal	0	1 Impact. 1. Crosses floodplain at southern tip of study area	0	No impact.	0	Urban. No agricultural lands.	0	None	+	Extension of existing transit route.	0	Area is mostly agricultural with some residential development near Alameda Ave. Alternative would increase traffic noise with bus route extension.
Bicycle and Pedestrian Alternatives																															

Border Highway East PEL Study
Level 2 Screening Detailed Evaluation Matrix
August 2014

Level 2 - Environmental Screening

Study Goals		Developing the facility utilizing context sensitive						Avoiding and/or minimizing impacts to the human and natural environment																					
Criteria		Community Impacts						Cultural Resource Impacts						Natural Resource Impacts												Other Impacts			
		Neighborhood Character		Context Sensitive Solutions (CSS)		Socioeconomic and Environmental		Archaeological Resources		Historic Resources		Tigua Land		Park Land		Water Resources		Drainage Features		Floodplains		Biological Resources		Agricultural Resources		Hazardous Materials		Air Quality		Traffic Noise	
Measure		Impacts to existing and proposed neighborhoods		Design incorporates CSS principles, while also balancing system goals		Impact to environmental justice populations		Number of recorded archaeological sites and high probability areas (acres)		Number of NRHP, NRHP-eligible, historic-age properties, historic trails		Impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land		Impacts to known public parks		Number of surface water/wetland crossings		Affect to irrigation channels, canals, laterals, viaducts, etc.		Affect to floodplains		Potential to impact listed and non-listed, species and/or habitat, rare locally important species		Existing ag land, farmland, grazing lands, or orchards.		Number of existing HazMat sites		Land use directly adjacent to alternative		Land use directly adjacent to alternative	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt BP 1	Provide Bike/Ped connection from Proposed Border Trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso Rural County Transit stop for Routes 30, 40, and 84.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No impact on EJ populations	0	None	-	This alignment is adjacent to the individually NRHP-listed Franklin Canal may cross drains of NRHP-listed El Paso County Water Improvement District No. 1. It also passes by the NRHP-eligible Pena House.	0	None	0	No impact to park land.	0	None	0	2 Impacts. 1. Wadlington Lateral 2. Middle Drain	0	None	0	No impact.	0	Urban. No agricultural lands.	0	None	+	New Bike/Ped connection to current transit.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No impact on EJ populations	0	None	-	This alignment intersects the El Camino Real de Terra Adentro National Historic Trail and crosses canals of NRHP-listed El Paso County Water Improvement District No. 1.	- -	This alternative passes through the Tigua Ceremonial lands.	- -	Alternative traverses a portion of the Rio Bosque Park.	0	None	0	1. Impact. 1. Riverside Canal	0	None	0	No impact.	0	Urban. No agricultural lands.	0	None	+	New Bike/Ped connection to Rio Bosque Park.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 3	Provide Bike/Ped connection from proposed border trails to Socorro Rd for improved access to Socorro Entertainment Center.	0	No impact to designated neighborhoods. Within Tigua Property, but would provide positive enhancement for pedestrians.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No impact on EJ populations	- -	Runs through Tigua property.	-	This alignment goes through Ysleta del Sur Pueblo. Crosses the NRHP-listed canals of El Paso County Water Improvement District No. 1.	- -	This alternative passes through the Tigua property, Trust lands, and Ceremonial lands.	0	No impact to park land.	0	None	0	1. Riverside Canal 2. River Drain	0	1. Crosses floodplain at western edge of study area near Riverside Canal	0	No impact.	0	Urban. No agricultural lands.	0	None	+	New Bike/Ped connection to Socorro Entertainment Center.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to Route 84 Bus Stop 5.	0	No impact to designated neighborhoods. Portion of bike/ped connection would pass through Mission Trail Historic District, but no impacts to existing infrastructure with proposed bike/ped connection are anticipated.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No impact on EJ populations	-	Alternative starts near San Elizario Catholic Church cemetery	-	This alignment is adjacent to NRHP-listed San Elizario Historic District, Presidio Chapel of San Elizario and may cross drains of NRHP-listed El Paso County Water Improvement District No. 1	0	None	0	No impact to park land.	0	None	0	2 Impacts. 1. Runs along eastern edge of Thompson Spur Drain 2. River Spur Drain	0	None	0	No impact.	0	Urban. No agricultural lands.	0	None	+	New Bike/Ped connection to current transit.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5	0	No impact to designated neighborhoods. Proposed transit route would pass through residential area of Tornillo, but no impacts to existing infrastructure with proposed bike/ped connection are anticipated.	0	PEL process is considering community needs and stakeholder input; more detailed design approaches/solutions will be completed during NEPA and design phase.	0	No impact on EJ populations	0	None	-	This alignment crosses the NRHP-listed canals of El Paso County Water Improvement District No. 1.	0	None	0	No impact to park land.	0	None	0	2 Impacts. 1. Originates from Island Drain 2. WA?	0	1 Impact. 1. Crosses floodplain at southern tip of study area	0	No impact.	0	Urban. No agricultural lands.	0	None	++	New Bike/Ped connection to current transit.	0	No impacts from traffic noise associated with bike/ped connections.

Level 2 - Public Involvement Screening

Study Goals		Ensuring an open public participation process		Ensuring compliance with the MTP	
Criteria		Public Input			
Measure		Assessment of public meeting comments and local resolutions of support.		Compatibility with programmed improvements	
		Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	- -	Public recognizes need for roadway improvements within the study area.	0	No Build Alt includes fiscally constrained projects, but does not include a border highway extension.
Roadway Alternatives Parallel to I-10					
Widen Existing Roadways					
Alt 1	Socorro Rd. from Loop 375 to Herring Rd.	-	3 public meeting participants expressed favor for alternative; 3 specifically opposed alternative; additional comments were made concerning impacts to the Mission Trail, San Elizario Catholic Church, and a church on Socorro Rd near Alarcon Rd.	0	Not a programmed improvement.
Alt 3	Alameda Ave. from Loop 375 to Herring	++	2 public meeting participants expressed favor for alternative	0	Not a programmed improvement.
Alt 4	Alameda Ave. from Herring to Tornillo	++	2 public meeting participants expressed favor for alternative	0	Not a programmed improvement.
Alt 5	North Loop from Loop 375 to Clint Cutoff Rd.	+	1 participant voiced concern over safety at existing North Loop Dr. and Celum Rd intersection (near FM 1110)	0	Not a programmed improvement.
Alt 7	I-10 ML from Loop 375 to Fabens	0	No public comments were received regarding improvements to I-10.	+	A portion of this proposed alternative is included in the 2040 MTP. Project includes widening I-10 to eight-lanes, from FM 659 to Eastlake Blvd./Old Hueco Tanks Rd. MTP Project ID: I402X-CAP
Alt 20	Alameda Ave. (SH 20) from Loop 375 to Tornillo.	++	Several meeting participants requested a right-turn lane at the intersection of Loop 375 with Alameda. 2 participants favored this alternative over other N-S alternatives.	0	Not a programmed improvement.
Alt 22	I-10 ML from Loop 375 to OT Smith / FM 3380	0	No public comments were received regarding improvements to I-10.	+	A portion of this proposed alternative is included in the 2040 MTP. Project includes widening I-10 to eight-lanes, from FM 659 to Eastlake Blvd./Old Hueco Tanks Rd. MTP Project ID: I402X-CAP
New Location Roadways					
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	1 public meeting participant expressed favor for alternative because of buffer to Rio Bosque Park. 1 participant noted that the alternatives traverses EPCWID property.	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	1 public meeting participant expressed favor for alternative because of buffer to Rio Bosque Park. 1 participant noted that the alternatives traverses EPCWID property.	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD
Alt 10	I-10 EB FR from FM 1110 to Fabens Dr. / FM 793	0	No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 11	I-10 WB FR from FM 1110 to Fabens Dr. / FM 793	0	No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 12	BHE-South Connection - from Socorro Rd transition to border / Island Main Lateral / Robinson Rd - terminating at FM 1109.	+	3 public meeting participants expressed favor for alternative; 2 specifically opposed alternative because of concern about impact to homes along Rio Grande	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane, divided roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 13	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	0	No public comments were received regarding this BHE-Mid connection.	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane, divided roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 13 (MOD)	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	++	1 public meeting participant expressed favor for alternative	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane, divided roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 14 (MOD)	BHE-North Connection - from Socorro Rd transitioning to Island Tornillo Rd - terminating at FM 1109	0	No public comments were received regarding this BHE-North connection.	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane, divided roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 15	I-10 EB FR from FM 1110 to OT Smith / FM 3380	0	No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 16	I-10 WB FR from FM 1110 to OT Smith / FM 3380	0	No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 17	BHE river running alignment through Socorro	0	3 public meeting participants expressed favor for alternative; 2 specifically opposed alternative; it was noted that this alternative would go through land planned to be converted to pond; 1 participant noted that the alternatives traverses EPCWID property	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD
Alt 18	1997 Feasibility Study Alignment	-	1 participant noted that the alternatives traverses EPCWID property; it was noted that this alternative would go through land planned to be converted to pond; 1 participant was concerned about impact to homes along Rio Grande;	+	This corridor has been identified as multiple projects in the 2040 MTP. The first project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD The second project includes construction of a two-lane, divided roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Cross-Connecting Roadway Alternatives					
Widen Existing Roadways					
Alt A2	Widen Old Hueco Tanks Rd from North Loop drive to N. Moon Rd.	0	1 meeting participant inquired when the Old Hueco Tanks Rd. project would be constructed.	0	Not a programmed improvement.
Alt C	Widen Horizon Blvd (FM 1281) from I-10 to Alameda w RR Grade Sep.	0	No public comments were received regarding improvements to Horizon Blvd.	++	This proposed alternative is included in the El Paso MPO 2040 MTP and in the TIP. Project includes widening existing Horizon Blvd., between North Loop Drive and Alameda Avenue, from two-lanes, to a four-lane, divided roadway. MTP Project ID: A506X-05A; CSJ: 8056-24-001
Alt D	Widen Buford from Alameda to Socorro.	-	1 public comment was received concerning impacts to the Mission Trail at the Buford and Socorro intersection.	+	This proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes widening Buford Rd. extension between FM 76 and Socorro Rd. MTP Project ID: A506X-05A; CSJ: 8056-24-001
Alt E	Widen San Elizario Rd (FM 1110) from new FM 1110 connection (E of UPRR) to Socorro Rd.	+	7 public meeting participants expressed favor for alternative; additional comments were made concerning impacts to the San Elizario Catholic Church	0	Not a programmed improvement.
Alt F	Widen Herring Rd from new FM 1110 connection /Alameda UPRR) to future BHE.	++	5 public meeting participants expressed favor for alternative	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing a new two-lane roadway from BHE to Riverside Rd. and rehabilitating existing Herring Road from Riverside Rd. to Alameda Ave. MTP Project ID: P520A-15A
Alt G	Widen Fabens Dr. (FM 793) / Island Rd. from I-10/ FM 793 to Middle Island Rd.	0	No public comments were received regarding improvements to Fabens Dr.	0	Not a programmed improvement.
Alt H	Widening of FM 1109 (Manuel Aguilera Freeway) from FM 76 to Tornillo POE / BHE.	0	No public comments were received regarding Alternative H.	0	Not a programmed improvement.
Alt N2 (FM 1110 from North Loop Dr. to I-10)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	0	No public comments were received regarding Alternative N2.	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing new two-lane roadway from Alameda Ave. to North Loop Dr. and rehabilitating existing Clint Cutoff Rd. between North Loop Dr. and I-10. MTP Project ID: P520B-15A
Alt V	Widen/realign Jess Harris Rd. from Island Rd/Middle Island Rd to future BHE alignment (Alternative 12 or 18)	0	No public comments were received regarding Alternative V.	0	Not a programmed improvement.

Level 2 - Public Involvement Screening

Study Goals		Ensuring an open public participation process		Ensuring compliance with the MTP	
Criteria		Public Input			
Measure		Assessment of public meeting comments and local resolutions of support.		Compatibility with programmed improvements	
		Rating	Evaluation	Rating	Evaluation
New Location Roadways					
Alt A1	Construct new location Old Hueco Tanks Rd from Gateway Blvd. E (I-10) to North Loop Drive.	0	1 meeting participant inquired when the Old Hueco Tanks Rd. project would be constructed.	++	This proposed corridor has been identified as a project by the El Paso MPO in the 2040 Horizon MTP and included in the TIP. Project includes constructing a new, four-lane divided roadway to extend Old Hueco Tanks Rd. at North Loop Drive to I-10. MTP Project ID: P509X-05A; CSJ: 0924-06-111
Alt I	New connection from Old Hueco Tanks/ North Loop to Alameda w RR Grade Sep.	0	No public comments were received regarding Alternative I.	0	Not a programmed improvement.
Alt J	New connection from Horizon Blvd / Mesa Drain to Buford (s of Alameda) w RR Grade Sep.	0	No public comments were received regarding Alternative J.	0	Not a programmed improvement.
Alt K	Extend Tiwa Blvd along Ysleta Lateral from Socorro to Trent Rd. and New Location N/S connection.	++	2 public meeting participants expressed favor for alternative	0	Not a programmed improvement.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	++	5 public meeting participants expressed favor for alternative	++	This proposed alternative is included in the 2040 MTP as various projects. First project includes extending Tiwa Blvd from BHE to Socorro Road, with a two-lane roadway. Second project includes extending Tiwa Blvd from Socorro Rd. to Alameda Ave. with a two-lane roadway. Third project includes construction a four-lane roadway from Alameda Ave. to I-10. MTP Project IDs: P512X-15A, P517A-15A, P517B-15A
Alt M	FM 1110 realignment and widening from I-10 to Herring widened sections.	- -	1 participant opposed the alternative	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing a new two-lane roadway from BHE to Riverside Rd. and rehabilitating existing Herring Road from Riverside Rd. to Alameda Ave. MTP Project ID: P520A-15A
Alt N1 (FM 1110 from west of Alameda Ave. to North Loop Dr.)	FM 1110 realignment and widening from I-10 to San Elizario widened sections.	++	5 public meeting participants expressed favor for alternative	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing new two-lane roadway from Alameda Ave. to North Loop Dr. and rehabilitating existing Clint Cutoff Rd. between North Loop Dr. and I-10. MTP Project ID: P520B-15A
Alt O	Extend Hole-in-the-wall Rd from Socorro rd. north to tie to Herring Rd/ FM 1110 Connection.	+	6 public meeting participants expressed favor for alternative; 1 participant opposed the alternative; 1 participant questioned why on top of lateral	0	Not a programmed improvement.
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	+	1 public meeting participants expressed favor for alternative	0	Not a programmed improvement.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	0	No public comments were received regarding Alternative Q.	0	Not a programmed improvement.
Alt R	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - eastern bypass of Fabens.	- -	1 participant opposed the alternative, 1 participant provided a modified route for Alternative R.	0	Not a programmed improvement.
Alt S	Extension of FM 1109 from I-10/FM 3380 to FM 76 - western bypass of Tornillo (Manuel Aguilera Freeway).	0	No public comments were received regarding Alternative S.	++	This proposed corridor has been identified as a fiscally constrained project by the El Paso MPO in the 2040 Horizon MTP and in the TIP. Project includes 2-lane, undivided roadway from SH 20 to I-10 at O.T. Smith Road. Includes an overpass at SH 20/UPRR. MPO project ID: A522C-MOD; CSJ 0924-06-311 In the 2040 MTP, an additional project for this corridor has been identified that includes widening Manuel Aguilera Highway from two-lanes to four-lanes, divided including overpass at SH 20/UPRR. MPO Project ID: A522D-CAP
Alt T	New arterial connection from Gateway East (I-10 EB FR) to Angel Park development.	0	No public comments were received regarding Alternative T.	0	Not a programmed improvement.
Alt U	Rio Bosque Park Connection	+	Participants expressed interest in providing better access to the park and providing pedestrian accommodations.	+	Alternative U would include a two-lane vehicular bridge across the Riverside Canal, and the roadway would end at a parking area within Rio Bosque Wetlands Park, as envisioned in the long-range development plan for the park.
Multimodal (Non-Roadway) Alternatives					
Transit Alternatives					
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd	0	No comments were received about BRT route.	++	BRT on Alameda is included in the 2040 MTP. Sun Metro is the developing agency for these plans in El Paso.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 1109 / Manual Aguilera Freeway and Tornillo POE.	0	No comments were received regarding proposed transit extension.	0	Extension not programmed with El Paso County Rural Transit.
Bicycle and Pedestrian Alternatives					
Alt BP 1	Provide Bike/Ped connection from Proposed Border Trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso Rural County Transit stop for Routes 30, 40, and 84.	0	No comments were received regarding proposed bike/ped improvements.	0	Not a programmed improvement.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	++	Participants expressed interest in providing better access to the park and providing pedestrian accommodations.	+	This alternative would provide a new entryway to the park from Socorro Road that is currently being designed and included in the Master Plan. It improves public access to the park and connects the park with the Mission Trail.
Alt BP 3	Provide Bike/Ped connection from proposed border trails to Socorro Rd for improved access to Socorro Entertainment Center.	0	No comments were received regarding proposed bike/ped improvements.	0	Not a programmed improvement.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to Route 84 Bus Stop 5.	0	No comments were received regarding proposed bike/ped improvements.	0	Not a programmed improvement.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5	0	No comments were received regarding proposed bike/ped improvements.	0	Not a programmed improvement.

Border Highway East PEL Study
Level 3 Screening Summary Evaluation Matrix
August 2014

Level 3 Screening Summary Matrix

Criteria	Travel Performance						Study Area Access	Bike/Ped Accommod-ation	Incident Mgmt	Construc-tion Impacts	Border Security Compatibility	Total Construction Cost		Construction Cost/Lane Mile		ROW Acquisition (acres)		ROW Acquisition (Number of Parcels)		Utilities & Infrastructure		Financing Opportunity	Economic Dvlpmnt Opportunity
	Level of Service		Average Speeds along Major Roadways (VHT)		Travel Efficiency (VMT)																		
No Build Alt	- -	0	- -	68,747	- -	2,236,135	- -	- -	0	0	0	-	$0	-	$0	0	0	0	0	0	0	0	- -
Socorro Road Improvements																							
Alt 1 Mod	0	0	+	-	0	-	++	++	0	- -	0	-	$13,780,000	- -	$2,000,000	0	9.9	-	76	- -	7.1	+	0
Alameda Ave Improvements																							
Alt 3	+	F	++	65,983	0	2,239,879	+	++	0	-	0	-	$78,710,000	- -	$1,500,000	-	44.1	- -	196	-	2.3	+	0
North Loop Drive Improvements																							
Alt 5 Mod	++	B	+	68,379	0	2,239,879	+	+	0	-	0	-	$44,980,000	- -	$2,000,000	-	37.8	- -	109	-	2.9	+	+
I-10 Improvements																							
Alt 22	++	D	++	64,351	0	2,238,411	+	0	0	-	0	- -	$173,490,000	- -	$1,330,000	0	0.0	0	0	0	0	++	- -
Alt 15	+	0	+	-	0	-	+	0	++	0	0	-	$50,890,000	- -	$2,000,000	0	0.0	0	0	0	0	+	-
Alt 16	+	0	+	-	0	-	+	0	++	0	0	-	$50,820,000	- -	$2,000,000	0	0.0	0	0	0	0	+	-
15 +16	0		+		0		+	0	++	0	0	- -	$101,710,000	- -	$2,000,000	0	0.0	0	0	0	0	+	-
All I-10	++		++		0		+	0	++	-	0	- -	$275,200,000	- -	$3,330,000	0	0.0	0	0	0	0	++	-
Border Highway																							
Alt 8	++	B	++	63,325	0	2,271,872	+	+	++	- -	0	0	$10,590,000	- -	$1,500,000	-	49.8	-	40	-	2.1	++	+
Alt 9	++	B	++	63,325	0	2,271,872	+	+	++	- -	0	0	$10,570,000	- -	$1,500,000	-	43.2	-	27	-	2.1	++	+
Alt 17	++	B	++	63,325	0	2,271,872	+	0	++	0	0	-	$31,860,000	- -	$1,500,000	- -	183.5	-	57	0	0.4	++	+
8 + 17	++		++		0		+	+	++	- -	0	-	$42,450,000	- -	$1,500,000	- -	233.3	-	97.0	-		++	+
9 + 17	++		++		0		+	+	++	- -	0	-	$42,430,000	- -	$1,500,000	- -	226.7	-	84.0	-		++	+
Alt 12	++	B	++	63,325	0	2,271,872	+	+	0	-	0	-	$31,410,000	- -	$2,000,000	- -	235.6	- -	138	-	2.3	++	0
Alt 13 Mod-Rev	++	B	++	63,325	-	2,249,656	+	0	0	-	0	-	$46,950,000	- -	$4,000,000	- -	183.3	-	62	0	1	+	0
12 + 13	++		++		0		+	+	0	-	0	-	$78,360,000	- -	$1,430,000	- -	418.9	- -	200.0	-		+	0
Entire BHE	++		++		0		+	+	++	- -	0	- -	$120,790,000	- -	$1,450,000	- -	645.6	- -	284.0	-		++	+
Socorro Connections																							
Alt D	+	B	0	63,322	0	2,274,116	++	++	0	- -	0	0	$8,420,000	- -	$2,000,000	0	9.1	-	66	0	0	+	-
Alt D Mod	+	B	0	63,322	0	2,274,116	+	++	+	- -	0	-	$10,300,000	- -	$3,380,000	0	8.9	-	61	-	3	+	0
Alt I Mod-Rev	++	B	+	62,794	0	2,276,015	++	++	++	-	0	-	$20,640,000	- -	$4,250,000	-	19.6	-	99	- -	5.7	+	+
Alt I Mod (Old)	++	B	+	62,794	0	2,276,015	++	+	+	- -	0	-	$18,670,000	- -	$2,930,000	-	22.9	-	98	- -	7	+	0
Alt L	++	B	++	61,647	0	2,252,978	++	+	++	-	0	-	$50,050,000	- -	$2,500,000	-	96.2	- -	135	-	4.8	+	++
San Elizario/Clint Connections																							
Alt E	+	0	0	-	0	-	+	++	0	- -	0	-	$39,510,000	- -	$2,240,000	-	56.9	- -	142	- -	5.1	+	+
Alt F	++	B	++	61,921	0	2,256,288	++	+	++	-	0	-	$37,380,000	- -	$2,320,000	-	64.2	-	81	- -	6.3	+	0
Alt N	++	B	++	61,921	0	2,256,288	++	0	0	- -	0	0	$9,460,000	- -	$2,000,000	0	0.0	0	0	-	2	+	+
N + E	++		++		0		+	++	0	- -	0	-	$48,970,000	- -	$2,440,000	-	56.9	- -	142	- -		+	+
N + F	++		++		0		++	++	++	- -	0	-	$46,840,000	- -	$2,530,000	-	64.2	-	81	- -		+	+
Fabens Connections																							
Alt P	++	B	+	63,104	0	2,272,437	++	0	0	-	0	-	$23,660,000	- -	$9,700,000	-	63.4	0	23	-	2.5	+	0
Alt Q	++	B	+	63,201	0	2,273,996	+	0	+	-	0	-	$31,430,000	- -	$2,010,000	-	73.3	-	47	-	2.4	+	0
Alt R Mod	++	B	+	63,201	0	2,273,996	+	0	+	-	0	-	$47,040,000	- -	$2,610,000	-	79.2	-	33	0	1	+	0
Multimodal (Non-Roadway) Alternatives																							
Transit Alternatives																							
Alt TR 1	+	0	+	0	+	0	++	++	+	0	0	0	$0	0	$0	0	0.0	0	0	0	0	+	+
Alt TR 2	+	0	+	0	+	0	++	++	0	0	0	0	$0	0	$0	0	0.0	0	0	0	0	+	++
Bicycle and Pedestrian Alternatives																							
Alt BP 1	+	0	+	0	+	0	+	++	0	0	0	- -	$220,000	- -	$54,000	0	0.0	0	0	- -	5.5	+	+
Alt BP 2	+	0	+	0	+	0	+	++	0	0	0	-	$0	-	$0	-	1.1	-	7	- -	5.4	+	+
Alt BP 3	+	0	+	0	+	0	+	++	0	0	0	-	$0	-	$0	-	1.2	- -	20	-	1.6	+	0
Alt BP 4	+	0	+	0	+	0	+	++	0	0	0	- -	$2,240,000	- -	$824,000	0	0.0	0	0	-	3.7	+	0
Alt BP 5	+	0	+	0	+	0	+	++	0	0	0	- -	$1,320,000	- -	$157,000	0	0.0	0	0	0	0.7	+	+

Criteria	Community Impacts			Cultural Resource Impacts				Natural Resource Impacts						Other Impacts			Public Input		Overall Category Rating			
	Neighbor-hood Character	CSS	EJ	Arch. Resources	Historic Resources	Potential 4(f)	Tigua Land	Park Land	Water Resources	Drainage Features	Floodplains	Biological Resources	Agricultural Resources	Hazmat	Air Quality	Traffic Noise	Public Opinion	MTP Compliance	Engineering	Cost	Environmental	Public Involvement
No Build Alt	0	0	0	0	0	No	0	0	0	0	0	0	0	0	-	0	- -	0	- -	-	0	- -
Socorro Road Improvements																						
Alt 1 Mod	- -	0	- -	- -	- -	Yes	- -	-	0	-	-	-	0	-	- -	- -	+	0	0	- -	- -	0
Alameda Ave Improvements																						
Alt 3	-	0	- -	-	- -	Yes	-	0	0	- -	-	-	0	-	- -	- -	++	0	+	- -	- -	+
North Loop Drive Improvements																						
Alt 5 Mod	-	0	- -	0	-	No	0	0	0	- -	-	- -	-	0	0	-	++	0	+	- -	-	+
I-10 Improvements																						
Alt 22	0	0	0	0	0	No	0	0	0	0	-	0	0	0	- -	-	+	+	+	-	0	+
Alt 15	0	0	0	0	0	No	0	0	-	0	-	- -	- -	0	0	0	0	0	+	-	-	-
Alt 16	0	0	0	0	0	No	0	0	-	0	-	- -	- -	0	0	0	0	0	+	-	-	-
15 +16	0	0	0	0	0	No	0	0	-	0	-	- -	- -	0	0	0	0	0	+	-	0	-
All I-10	0	0	0	0	0	No	0	0	-	0	-	- -	- -	0	- -	-	0	+	+ +	-	-	0
Border Highway																						
Alt 8	0	0	- -	0	- -	Yes	-	0	0	- -	- -	-	0	-	-	-	0	+	+ +	-	- -	0
Alt 9	0	0	- -	0	- -	Yes	-	0	0	0	-	-	0	-	-	0	+	+	+ +	-	-	+
Alt 17	- -	0	- -	0	- -	Yes	- -	0	- -	- -	-	- -	- -	0	0	-	0	+	+ +	-	- -	0
8 + 17	- -	0	- -	0	- -	Yes	- -	0	-	- -	-	-	-	-	-	-	0	+	+ +	-	- -	0
9 + 17	- -	0	- -	0	- -	Yes	- -	0	-	- -	-	-	-	-	-	-	0	+	+ +	-	- -	0
Alt 12	0	0	- -	0	- -	Yes	- -	0	-	- -	-	- -	- -	0	0	-	- -	+	+	- -	- -	- -
Alt 13 Mod-Rev	0	0	-	0	-	No	0	0	0	- -	-	-	- -	0	0	-	- -	+	0	- -	-	- -
12 + 13	-	0	- -	0	- -	Yes	- -	0	0	- -	-	- -	- -	0	0	-	-	+	+	- -	- -	-
Entire BHE	- -	0	- -	0	- -	Yes	- -	-	-	- -	-	- -	- -	-	-	-	0	+	+ +	- -	- -	0
Socorro Connections																						
Alt D	- -	0	- -	- -	- -	Yes	0	-	0	0	0	0	-	0	+	-	-	+	0	-	-	-
Alt D Mod	- -	0	- -	- -	- -	Yes	0	-	0	0	-	-	-	-	+	-	+	++	0	-	- -	+ +
Alt I Mod-Rev	- -	0	- -	- -	- -	Yes	-	0	0	-	-	- -	-	-	+	-	+	++	+ +	- -	- -	+ +
Alt I Mod (Old)	- -	0	- -	- -	- -	Yes	0	0	0	- -	-	-	-	-	+	-	0	0	+	- -	- -	-
Alt L	-	0	- -	-	- -	Yes	-	0	- -	- -	0	- -	- -	0	0	-	++	++	+ +	-	- -	+ +
San Elizario/Clint Connections																						
Alt E	-	0	- -	0	- -	No	0	0	0	- -	-	-	- -	0	0	-	+	+	0	- -	-	+
Alt F	-	0	- -	0	- -	Yes	-	0	0	- -	-	-	- -	0	+	-	++	+	+ +	- -	- -	+ +
Alt N	0	0	0	0	0	No	0	0	0	0	0	0	-	0	+	0	++	+	+	0	+	+ +
N + E	-	0	- -	-	- -	Yes	0	0	0	- -	-	- -	-	0	+	-	+	+	+	- -	- -	+
N + F	-	0	- -	-	- -	Yes	-	0	0	- -	-	- -	- -	0	+	-	++	+	+ +	- -	- -	+ +
Fabens Connections																						
Alt P	0	0	0	0	- -	Yes	-	0	0	-	-	- -	- -	0	0	0	+	0	+	-	-	0
Alt Q	0	0	-	0	-	No	0	0	-	- -	-	- -	- -	-	0	-	0	0	+	- -	-	-
Alt R Mod	0	0	0	0	-	No	0	0	-	-	-	- -	- -	- -	0	0	+	0	+	-	-	0
Multimodal (Non-Roadway) Alternatives																						
Transit Alternatives																						
Alt TR 1	0	0	+	0	-	Yes	0	0	0	0	0	0	0	0	+	0	+	++	+ +	+	+	+ +
Alt TR 2	0	0	+	0	0	No	0	0	0	0	0	0	0	0	+	0	+	0	+ +	+	+	0
Bicycle and Pedestrian Alternatives																						
Alt BP 1	0	0	++	0	-	No	0	0	0	0	0	0	0	0	0	0	+	0	+ +	-	+	0
Alt BP 2	0	0	++	0	- -	Yes	-	0	0	0	0	-	0	0	0	0	++	+	+ +	-	0	+ +
Alt BP 3	0	0	++	0	- -	No	-	0	0	0	-	-	-	0	0	0	+	0	+ +	- -	0	0
Alt BP 4	0	0	++	-	-	No	0	0	0	0	0	0	0	0	0	0	+	0	+ +	-	+	0
Alt BP 5	0	0	++	0	-	No	0	0	0	-	-	0	-	0	0	0	+	0	+ +	-	0	0

Border Highway East PEL Study
Level 3 Screening
Alternative Details
August 2014

Level 3 - Alternative Details

Alternative		Length (miles)	Proposed Number of Lanes	Existing ROW Width (ft)	Required ROW Width (from proposed typical section) (ft)	Proposed Roadway Type	Area of Take (ac)	Width of Take (ft)	No. of Parcels Impacted
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	0	0	0	0	N/A	0	0	0
Roadway Alternatives Parallel to I-10									
Widen Existing Roadways									
Alt 1 Mod	Widen Socorro Rd. from Loop 375 to Alt I Mod, implement TSM/CSM improvement between Alt I Mod and Herring Rd.	1.72	4	75	122	Arterial	9.90	47.41	76.00
Alt 3	Widen Alameda Ave. from Loop 375 to Herring Rd.	8.75	6	80	122	Arterial	44.08	41.58	196.00
Alt 5 Mod	Widen North Loop Drive from Horizon Blvd. to Clint Cutoff Rd.	5.62	4	67	122	Arterial	37.81	55.48	109.00
Alt 13 Mod-Rev	BHE-Mid Connection - utilizing FM 76 (Middle Island Road) roadway, terminating at the Manuel F. Aguilera Highway (FM 3380).	5.87	4	28	286	Freeway/Controlled Access	183.33	257.70	62.00
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Road (FM 1109)	21.69	6	400	322	Freeway/Controlled Access	0.00	0.00	0.00
New Location Roadways									
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	1.77	4	0	286	Freeway/Controlled Access	49.80	232.72	40.00
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	1.76	4	0	286	Freeway/Controlled Access	43.20	202.36	27.00
Alt 12	BHE-South Connection - from San Elizario terminating at Middle Island Road.	7.85	4	0	286	Freeway/Controlled Access	235.60	247.53	138.00
Alt 15	I-10 EB FR from FM 1110 to O.T. Smith Road (FM 1109)	12.72	2	100	91	Arterial	0.00	0.00	0.00
Alt 16	I-10 WB FR from FM 1110 to O.T. Smith Road (FM 1109)	12.70	2	100	91	Arterial	0.00	0.00	0.00
Alt 17	BHE river running alignment through Socorro	5.31	4	0	286	Freeway/Controlled Access	183.51	285.15	57.00
Cross-Connecting Roadway Alternatives									
Widen Existing Roadways									
Alt D	Widen Buford from Alameda to Socorro.	1.05	4	50	122	Arterial	9.14	71.63	66.00
Alt E	Widen San Elizario Rd (FM 1110) from N. Loop Dr. to Socorro Rd. Includes grade seperation at UPRR.	4.41	4	16	122	Arterial	56.90	106.44	142.00
Alt F	Re-align FM 1110 to Herring Rd from FM 1110 at N. Loop Dr. to future BHE. Includes grade seperation at UPRR.	4.02	4	varies	122	Arterial	64.23	131.72	81.00
Alt N	Widen FM 1110 from I-10 to North Loop Dr.	1.18	4	132	122	Arterial	0.00	0.00	0.00
New Location Roadways									
Alt D Mod	Improve Buford from Alameda to Socorro and extend west with a new 2-lane connection to the proposed Border Highway Extension.	1.52	2	varies	80	Arterial	8.88	48.12	61.00
Alt I Mod-Rev (New)	Extend Old Hueco Tanks Rd. (2-lanes) from FM 76 to the proposed Border Highway Extension. A portion of the roadway would be utilize S. Nevarez Rd. and Winn Rd, while two segments of the roadway would be on new location.	2.43	2	varies	80	Arterial	19.58	66.48	99.00
Alt I Mod	New connection from Old Hueco Tanks/N. Loop Dr. to Socorro Rd. w RR Grade Sep.	1.59	4	varies	122	Arterial	22.89	118.62	98.00
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	5.01	4	0	168	Arterial	96.21	158.48	135.00
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	3.90	4	0	138	Arterial	63.42	134.00	23.00
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	4.51	4	0	138	Arterial	73.32	134.21	47.00
Alt R Mod	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - eastern bypass of Fabens.	5.17	4	0	138	Arterial	79.17	126.34	33.00
Multimodal (Non-Roadway) Alternatives									
Transit Alternatives									
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd and enhance existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road.	2.73	N/A	N/A	N/A	N/A			
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 3380/Manuel F. Aguilera Freeway and the Fabens International POE.	1.60	N/A	N/A	N/A	N/A			
Bicycle and Pedestrian Alternatives									
Alt BP 1	Provide Bike/Ped connection from proposed border trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso County Rural Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive.	2.04	N/A	0	8	Shared Use	Within ROW	0.00	0.00
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	0.58	N/A	0	16	Pedestrian Facility	1.10	15.52	7.00
Alt BP 3	Provide Bike/Ped connection from proposed border trails along the Rio Grande to Socorro Rd for improved access to Socorro Entertainment Center.	0.64	N/A	0	16	Pedestrian Facility	1.22	15.61	20.00
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.	1.36	N/A	0	8	Shared Use	Within ROW	0.00	0.00
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5 along the Manuel Aguilera Hwy.	4.21	N/A	0	8	Shared Use	Within ROW	0.00	0.00

Level 3 - Engineering Screening

Study Goals		Enhancing east-west mobility									Improve local and regional access		Provide pedestrian and bicycle friendly facilities		Reduce incidents delay / congestion on I-10 / parallel rdwys.		Minimizing disruption to traffic during construction		Developing a design that coexists with border security	
Criteria		Travel Performance									Access within/through the study area		Bicycle and pedestrian accommodation		Incident management		Construction Impacts		Border security compatibility	
		Level of Service			Travel Times/Average Speed			Travel Efficiency												
Measure		LOS along Roadways			Average Speeds along Major Roadways (VHT)			System Wide Benefits (VMT)			Assessment of connections between I-10 and other E/W roadways and to heavy traffic locations in the study area.		Qualitative assessment of Bike/Ped accommodate users through shared use or dedicated lanes/sidewalks		Reduces occurrence of incidents in study area		Impacts to motorists - amount of lane closures/detours		Compliments and supports border security initiatives	
		Rating	LOS	Evaluation	Rating	VHT	Evaluation	Rating	VMT	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	- -		Continued reduction in LOS compared to existing conditions	- -	68,747	105% increase in VHT compared to existing conditions	- -	2,236,135	75% increase in VMT compared to existing conditions	- -	No Build Alt would not improve local or regional access.	- -	No Build Alt would not enhance pedestrian facilities.	0	No Build Alt would not improve incident management.	0	No Build Alt would have no construction impacts.	0	No Build Alt would have no impact on border security.
Roadway Alternatives Parallel to I-10																				
Widen Existing Roadways																				
Alt 1 Mod	Widen Socorro Rd. from Loop 375 to Alt I Mod, implement TSM/CSM improvement between Alt I Mod and Herring Rd.	0		Minimal improvement to LOS	+		Reduced VHT with increase capacity and TSM/CSM.	0		Minimal change to VMT.	++	Alternative 1 Mod would enhance capacity of a portion of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the northwestern portion of the study area. Alt 1 Mod in conjunction with the Old Hueco Tanks Rd extension would enhance the connection of Socorro Rd. with I-10 and Loop 375.	++	Widening of a portion of the existing Socorro Rd. would include some sort of pedestrian enhancement with a shared use lane/sidewalk. Since the alt considers improving an existing roadway, traverses through populated areas, and is on the El Paso County Rural Transit Bus Route 84, Alt 1 Mod was given the highest rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of existing roadway with approximately 2.3 intersections/mile. Additionally, there is no other parallel route in the vicinity, so construction could be very disruptive.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 3	Widen Alameda Ave. from Loop 375 to Herring Rd.	+	F	The LOS on Alameda Ave would improve but remain LOS F compared to the no-build. Traffic volume would increase 18% on Alameda with reductions on adjacent roads.	++	65,983	A 4% reduction in VHT for the study area compared to the No Build Alt.	0	2,239,879	A 0.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 3 would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the northwestern portion of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alt 3 would enhance the connection of Alameda Ave. with Loop 375. The corridor would pass through Socorro and Clint, providing additional capacity to these communities.	++	Widening existing Alameda Ave. would include some sort of pedestrian enhancement. Since the alt considers improving an existing roadway, traverses through populated areas, and is on the El Paso County Rural Transit Bus Route 40, Bus Route 84, and proposed BRT route, Alt 3 was given the highest rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Alternative would involve reconstruction of existing roadway with approximately 0.9 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 5 Mod	Widen North Loop Drive from Horizon Blvd. to Clint Cutoff Rd.	++	B	The LOS on North Loop would improve from LOS F in no-build to LOS B with improvement. Traffic volume would increase 33% on North Loop with reductions on adjacent roads.	+	68,379	A 0.5% reduction in VHT for the study area compared to the No Build Alt.	0	2,239,879	A 0.2% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 5 Mod would enhance capacity of an existing roadway that is anticipated to operate at unacceptable LOS in 2040; therefore, providing possible congestion relief in the central portion of the study area. While not directly affecting connection between I-10 and other parallel roadways, Alt 5 Mod would enhance the connection of North Loop Dr. with Loop 375 while improving connectivity between El Paso, Socorro, and Clint.	+	Widening existing North Loop Dr. would include some sort of pedestrian enhancement. Since the alt considers improving an existing roadway and traverses through mostly residential areas in the northern portion of the corridor and mostly rural areas south of Socorro, Alt was given a positive rating for the bike/ped criteria.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	-	Alternative would involve reconstruction of existing roadway with approximately 0.9 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 13 Mod-Rev	BHE-Mid Connection - utilizing FM 76 (Middle Island Road) roadway, terminating at the Manuel F. Aguilera Highway (FM 3380).	++	B	The LOS on BHE would be LOS B. Traffic volumes would decrease on adjacent roads.	++	63,325	A 7.9% reduction in VHT for the study area compared to the No Build Alt.	-	2,249,656	A 1.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 13 Mod-Rev would provide an improved FM 76 new roadway from the eastern end of San Elizario to FM 1109 at the Fabens POE. Existing parallel roadways are not anticipated to exceed capacity in 2040. Alt 13 Mod-Rev would provide an improved roadway near the western limit of the study area, connecting to the proposed Border Highway extension and terminating at FM 1109 at the Fabens POE. This would create a direct connection between the San Elizario and the Fabens POE, while still having connectivity Loop 375 via Socorro Rd. Alt is part of Border Highway Extension corridor that has been identified in the 2040 MTP.	0	Alternative 13 Mod-Rev would improve an existing roadway that does not connect to any existing transit routes. At its terminus, near the Future Tornillo-Guadalupe POE, Alt 13 Mod-Rev would connect to proposed Alternatives BP5 and TR2. Alt 13 Mod-Rev passes through a very rural area.	0	Alternative 13 Mod-Rev would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would involve reconstruction of existing roadway with approximately 0.9 intersections/mile.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Road (FM 1109)	++	D	The LOS on I-10 would improve from LOS F in no-build to LOS D with improvement. Traffic volumes would increase 13% on I-10 with reductions on adjacent roads.	++	64,351	A 6.4% reduction in VHT for the study area compared to the No Build Alt.	0	2,238,411	A 0.1% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 22, includes Alt 7, would enhance capacity of I-10, which is anticipated to operate at unacceptable LOS in 2040; therefore, improving system connectivity along the eastern limit of the study area. Alt 22 would enhance the connection of I-10 with Loop 375. The corridor would improve access to Socorro, Clint, Fabens, and Tornillo.	0	Alternative 22 does not address bicycle and pedestrian access because of the interstate classification.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this freeway with no adjacent relief routes.	-	Construction on I-10 would be somewhat disruptive.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
New Location Roadways																				
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	++	B	The LOS on BHE would be LOS B. Traffic volumes would decrease on adjacent roads.	++	63,325	A 7.9% reduction in VHT for the study area compared to the No Build Alt.	0	2,271,872	A 1.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 8 would provide a new roadway west of Socorro Rd., at Southside Rd., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alt 8 would provide an alternate route in the northwest portion of the study area. While not directly improving connectivity with I-10, Alt 8, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alt 17, Alt 8 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	+	Alternative 8 is a new location alternative that traverses through an industrial/commercial area, although it is near a MPO proposed bike/ped trail near the Zaragoza POE. Alt 8 would connect to Sun Metro Route 69 and El Paso County Rural Transit Route 84.	++	Alternative 8 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	- -	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 2.8 intersections/mile. Construction could be impactful to existing network, since a portion of the alternative is on new alignment.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	++	B	The LOS on BHE would be LOS B. Traffic volumes would decrease on adjacent roads.	++	63,325	A 7.9% reduction in VHT for the study area compared to the No Build Alt.	0	2,271,872	A 1.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 9 would provide a new roadway west of Socorro Rd., at Pan American Dr., from Loop 375 to Socorro Rd. near Cougar Park. The existing roadways in this area are anticipated to exceed capacity in 2040, Alt 9 would provide an alternative route in northwest portion of the study area. While not directly improving connectivity with I-10, Alt 9, as a stand-alone improvement, would provide improved connectivity between Loop 375, the Zaragoza POE and Socorro. In combination with Alt 17, Alt 9 would extend connectivity beyond Socorro to San Elizario and the Tigua properties.	+	Alternative 9 is a new location alternative that traverses through an industrial/commercial area, although it is near a MPO proposed bike/ped trail near the Zaragoza POE. Alternative 9 would connect to Sun Metro Route 60 and El Paso County Rural Transit Route 84.	++	Alternative 9 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS. Alt 9 would serve as a parallel route if an incident forced closure of Socorro Rd.	- -	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 2.8 intersections/mile. Construction could be impactful to existing network, since a portion of the alternative is on new alignment.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 12	BHE-South Connection - from San Elizario terminating at Middle Island Road.	++	B	The LOS on BHE would be LOS B. Traffic volumes would decrease on adjacent roads.	++	63,325	A 7.9% reduction in VHT for the study area compared to the No Build Alt.	0	2,271,872	A 1.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 12 would provide improved access as a new roadway near the western limit of the study area as a border alternative to Socorro Rd. Alternative 12 would provide improved network connectivity near the western limit of the study area, connecting Socorro Rd. to FM 1109 at the Fabens POE. This would create a direct connection between the southwestern limit of Socorro, San Elizario and the Fabens POE, while still having connectivity Loop 375 via Socorro Rd. Additional connectivity to Loop 375 would be provided through a connection to Alternatives 17, 8 and 9.	+	Alternative 12 would be a new roadway that connects to the existing El Paso County Rural Transit Route 84. In San Elizario, Alt 12 would connect to the proposed MPO ped/bike trail. At its terminus, near the Future Tornillo-Guadalupe POE, Alt 12 would connect to proposed Alternatives BP5 and TR2; passes through a very rural area.	0	Alternative 12 would provide a new roadway parallel to Socorro Rd. Rating is neutral because Socorro Rd. operates at reasonable LOS and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.8 intersections/mile. Construction could be impactful to existing network, since a portion of the alternative is on new alignment.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 15	I-10 EB FR from FM 1110 to O.T. Smith Road (FM 1109)	+		I-10 forecasted for LOS F and LOS E for I-10 in the study area without frontage roads. Frontage roads will increase capacity and improve access.	+		Travel time on I-10 will decrease with improved access and reduced congestion.	0		Minimal impact to VMT	+	Alternative 15 would add an eastbound frontage road along I-10, between Clint Cutoff Rd. and OT Smith Rd. I-10 is anticipated to exceed capacity in 2040, Alt 15 would provide an alternative roadway parallel to I-10. Frontage roads would provide direct connectivity between Fabens and Tornillo.	0	The proposed I-10 FR would provide a shared use lane. Alt 15 would be a new roadway and would traverse a generally rural/agricultural area and have limited connectivity to existing transit routes.	++	Alternative 15 would provide a frontage road parallel to I-10. Alt 15 would serve as a parallel route if an incident forced closure of I-10; providing redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.2 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 16	I-10 WB FR from FM 1110 to O.T. Smith Road (FM 1109)	+		I-10 forecasted for LOS F and LOS E for I-10 in the study area without frontage roads. Frontage roads will increase capacity and improve access.	+		Travel time on I-10 will decrease with improved access and reduced congestion.	0		Minimal impact to VMT	+	Alternative 16 would add an westbound frontage road along I-10, between Clint Cutoff Rd and OT Smith Rd. I-10 is anticipated to exceed capacity in 2040, Alt 16 would provide an alternative roadway parallel to I-10. Frontage roads would provide direct connectivity between Fabens and Tornillo.	0	The proposed I-10 FR would provide a shared use lane. Alt 16 would be a new roadway and would traverse a generally rural/agricultural area and have limited connectivity to existing transit routes.	++	Alternative 16 would provide a frontage road parallel to I-10. Alt 16 would serve as a parallel route if an incident forced closure of I-10; providing redundancy to this key interstate route.	0	Alternative would be on all new alignment and would have approximately 0.2 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt 17	BHE river running alignment through Socorro	++	B	The LOS on BHE would be LOS B. Traffic volumes would decrease on adjacent roads.	++	63,325	A 7.9% reduction in VHT for the study area compared to the No Build Alt.	0	2,271,872	A 1.6% increase in VMT for the study area compared to the No Build Alt.	+	Alternative 17 would provide a new, four-lane roadway, connecting various new location alternatives in the northwestern portion of the study area. Alternative 17, in conjunction with other proposed alternatives, would provide a new location roadway that parallels existing alignments that are anticipated to exceed capacity in 2014. Overall system connectivity is dependent on other proposed alternatives. Alternative 17 does not provide continuity as a stand-alone improvement, other proposed alternatives that parallel I-10, such as Alts 8, 9, or 12 would need to be implemented. Additionally, connectivity to I-10 is dependent on proposed Alt L. Alt 17 is part of Border Highway Extension identified in the 2040 MTP.	0	Alternative 17 would be a new roadway that does not connect to any existing transit routes and passes through a very rural area.	++	Alternative 17 would provide a new roadway parallel to Socorro Rd. which operates at poor LOS up to San Elizario. This alternative would serve as a parallel route if an incident forced closure of Socorro Rd.	0	Alternative would be on all new alignment and would have approximately 0 intersections/mile. Construction would have minor construction impacts.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Cross-Connecting Roadway Alternatives																				
Widen Existing Roadways																				
Alt D	Widen Buford from Alameda to Socorro.	+	B	The LOS on Buford would remain LOS B compared to the no-build. Traffic volumes would increase 106% on Buford.	0	63,322	Minimal additional reduction in VHT when included with a BHE alternative.	0	2,274,116	An additional 0.1% increase in VMT for the study area when included with a BHE alternative.	++	Alternative D would widen Buford Rd. between Alameda Ave. and Socorro Rd., providing an improved connection to those two major roadways which are anticipated to exceed capacity in 2040. Alt D is limited in providing improved access to the roadway network. The improvement would primarily serve the area of northwestern Socorro. This improvement is in the 2040 MTP.	++	Alternative D would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84 and Route 40 and the proposed BRT. The improvements also align with a MPO proposed ped/bike trail. The area it traverses is generally populated/residential.	0	Added lanes on this congested route provide redundancy for incident management. Traffic may increase with the widening on Buford, although will not congested. There are no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 2.0 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt E	Widen San Elizario Rd (FM 1110) from N. Loop Dr. to Socorro Rd. Includes grade separation at UPRR.	+		Would provide additional capacity on San Elizario Rd. (FM 1110) between Alameda Ave. and Socorro Rd.	0		Minimal additional reduction in VHT.	0		Minimal change to VMT along existing roadway.	+	Alternative E would enhance access between Clint and San Elizario via a widened S. San Elizario Rd., generally between Alameda Ave to Socorro Rd. Alternative E is proposed to connect the realignment of FM 1110 in Clint (Alternative N). The major roadways intersected by Alternative E have a need for additional capacity in 2040. Alternative E improves local connectivity between I-10, Alameda and Socorro Rd. Improvements to the FM 1110 corridor have been programmed in the 2040 MTP.	++	Alternative E would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84. The improvements also align with a MPO proposed ped/bike trail and Alt BP4. The area it traverses is generally populated/residential.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of existing FM 1110 and would have approximately 0.9 crossings/mile. Construction would be disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt F	Re-align FM 1110 to Herring Rd from FM 1110 at N. Loop Dr. to future BHE. Includes grade separation at UPRR.	++	B	The LOS on FM 1110 corridor from I-10 to BHE would improve from LOS F in no-build to LOS B with improvement. This segment along Herring Rd from Alameda to BHE would remain LOS B with improvement. Traffic volumes would increase 33% on FM 1110 with reductions on adjacent roads.	++	61,921	An additional 2.2% reduction in VHT for the study area when included with a BHE alternative.	0	2,256,288	An additional 0.7% increase in VMT for the study area when included with a BHE alternative.	++	Alternative F would include widening the existing Herring Rd. along with segments on new location. Alt F would intersect with two primary arterials, Socorro Rd. and Alameda Rd. in an area where these facilities are anticipated to exceed capacity in 2040. Alt F would enhance connectivity between Clint and San Elizario to I-10. Alt F would span west from N. Loop Dr. to the western limit of the study area where it would intersect with the proposed Border Highway Extension. This connectivity would enhance the linkages between Clint and San Eli, while potentially providing connectivity to an alternate route parallel to I-10 through implementation of proposed Border Highway Extension.	+	Alternative F would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 40. The area is generally rural.	++	Alternative F would help with incident management by providing a new alternate route with grade separation at railroad. Also serves as a loop road surrounding Clint and San Elizario.	-	Alternative would involve reconstruction of an existing, local roadway and would have approximately 0.9 crossings/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt N	Widen FM 1110 from I-10 to North Loop Dr.	++	B	The LOS on FM 1110 corridor from I-10 to BHE would improve from LOS F in no-build to LOS B with improvement. This segment along FM 1110 from I-10 to North Loop would improve from LOS E in no-build to LOS B with improvement. Traffic volumes would increase 33% on FM 1110 with reductions on adjacent roads.	++	61,921	An additional 2.2% reduction in VHT for the study area when included with a BHE alternative.	0	2,256,288	An additional 0.7% increase in VMT for the study area when included with a BHE alternative.	++	Alternative N would improve access from I-10 to Clint and San Elizario via a widened FM 1110. With the implementation of Alts E or F, the FM 1110 corridor would connect to the City of San Elizario and Clint. Improvements to the FM 1110 corridor have been programmed in 2040 MTP.	0	Alternative N would widen existing Clint Cut Off Rd, Alt N has limited connectivity to existing transit routes.	0	Added lanes on this congested route provide redundancy for incident management. Traffic remains rather concentrated on this one roadway with no adjacent relief routes.	- -	Alternative would involve reconstruction of an existing roadway and would have approximately 1.7 crossings/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input will be sought during the Level 3 screening process.
New Location Roadways																				
Alt D Mod	Improve Buford from Alameda to Socorro and extend west with a new 2-lane connection to the proposed Border Highway Extension.	+	B	The LOS on Buford would remain LOS B compared to the no-build. Traffic volumes would increase 106% on Buford.	0	63,322	Minimal additional reduction in VHT when included with a BHE alternative.	0	2,274,116	An additional 0.1% increase in VMT for the study area when included with a BHE alternative.	+	Alternative D Mod would provide a new connection between the proposed Border Highway and Socorro Rd., connecting to the existing Buford Rd. This alternative would include improving the 2-lane Buford Rd. between Alameda Ave. and Socorro Rd. This alternative would provide direct connectivity between the proposed Border Highway and I-10. The improvement would primarily serve the area of northwestern Socorro.	++	Alternative D Mod would improve an existing roadway and would connect to El Paso County Rural Transit Bus Route 84 and Route 40 and the proposed BRT. The improvements also align with a MPO proposed ped/bike trail. The area it traverses is generally populated/residential.	+	Alternative provides connection from proposed Border Highway Extension to I-10, could provide alternative route to Loop 375 although does not provide an railroad overpass.	- -	Alternative would be on existing roadway and new alignment and would have approximately 1.0 intersections/mile. Construction could be disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt I Mod-Rev (NEW)	Extend Old Hueco Tanks Rd. (2-lanes) from FM 76 to the proposed Border Highway Extension. A portion of the roadway would be utilize S. Nevarez Rd. and Winn Rd, while two segments of the roadway would be on new location.	++	B	The LOS on Old Hueco Tanks would be LOS B. Traffic volumes would decrease on adjacent roads.	+	62,794	An additional 0.8% reduction in VHT for the study area when included with a BHE alternative.	0	2,276,015	An additional 0.2% increase in VMT for the study area when included with a BHE alternative.	++	Alternative I Mod-Rev (new) is a combination of new location roadway and improve existing. Alt I Mod-Rev would provide a new direct connection from the proposed Border Highway Extension to I-10, utilizing S. Nevarez Rd and new roadway that would connect to the proposed improvements at Old Hueco Tanks Rd. Improvements would include a grade-separated RR crossing. Roadways in this area are anticipated to exceed capacity in 2040.	++	Alternative I Mod (New) is a new direct connection roadway from the proposed Border Highway Extension to FM 76 that would connect to existing El Paso County Rural Transit Route 84 and Route 40 and the proposed BRT route. The area it traverses is generally populated/residential.	++	This proposed connecting roadway would help with incident management by providing a new alternate route through Socorro with grade separation at railroad.	-	Alternative would be on existing roadway and new alignment and would have approximately .6 intersections/mile. Construction could be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt I Mod (OLD)	New connection from Old Hueco Tanks/ North Loop to Socorro Rd. w RR Grade Sep.	++	B	The LOS on Old Hueco Tanks would be LOS B. Traffic volumes would decrease on adjacent roads.	+	62,794	An additional 0.8% reduction in VHT for the study area when included with a BHE alternative.	0	2,276,015	An additional 0.2% increase in VMT for the study area when included with a BHE alternative.	++	Alternative I Mod is a new roadway that generally runs parallel to N. Moon Rd. and spans between Socorro Rd. and North Loop Dr. and includes a grade-separated RR crossing. Roadways in this area are anticipated to exceed capacity in 2040. Alt I Mod would connect to I-10 via Old Hueco Tanks Rd. Alt I Mod would provide a new connection to I-10 from Socorro Rd. in the northeastern portion of the study area. Improvements to Old Hueco Tanks are in the TIP and the 2040 MTP.	+	Alternative I Mod is a new roadway that would connect to existing El Paso County Rural Transit Route 84 and Route 40 and the proposed BRT route. The roadway traverses a generally rural area.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Roadway is not long enough to be highly ranked.	- -	Alternative would be on existing roadway and new alignment and would have approximately 2.5 intersections/mile. Construction could be disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	++	B	The LOS on Alt L would be LOS B. Traffic volumes would decrease on adjacent roads.	++	61,647	An additional 2.7% reduction in VHT for the study area when included with a BHE alternative.	0	2,252,978	An additional 0.8% increase in VMT for the study area when included with a BHE alternative.	++	Alternative L is a proposed 4-lane, new location roadway originating at I-10 with interchange and traversing west to connect to proposed Border Highway Extension, south of the Tigua Property. Alt L would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. and include a grade-separated RR crossing. Alt L would span almost the entire width of the study area, providing increased connectivity to the areas south of Socorro and north of San Eli; providing a new cross connection in an area currently lacking that connectivity. Alt L would connect I-10 to proposed Border Highway Extension along the western limit of the study area. Connectivity to the following communities would be enhanced: Socorro, Clint, San Elizario, and the Tigua property.	+	Alternative L is a new roadway that would connect to existing El Paso County Rural Transit Route 40 and Route 84. The area is generally rural between BHE and Alameda Ave and populated between Alameda Ave and I-10.	++	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Also serves as a loop road surrounding Socorro and San Elizario.	-	Alternative would be on all new alignment and would have approximately 2.0 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	++	B	The LOS on Alt P would be LOS B. Traffic volumes would decrease on adjacent roads.	+	63,104	An additional 0.4% reduction in VHT for the study area when included with a BHE alternative.	0	2,272,437	Minimal additional change in VMT when included with a BHE alternative.	++	Alternative P is a proposed 4-lane, new location roadway originating at I-10 with interchange and traversing west to connect to proposed Alt 12. Alternative P would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd. while including a grade-separated RR crossing. I-10 and Alameda Ave. are anticipated to exceed capacity in 2040. Alt P would increase connectivity to I-10 midway between FM 1109 and Fabens Dr. Alt P would terminate at a proposed parallel corridor along the west limit of the study area (Alt 12). Due to its location, direct connectivity to border communities would be limited.	0	Alternative P is a new roadway that would connect to El Paso County Rural Transit Bus Route 40. The area it traverses is generally rural.	0	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. Rating is neutral because of reasonable LOS on nearby roads and traffic consequences of incidents are lower in this predominantly rural area.	-	Alternative would be on all new alignment and would have approximately 1.3 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	++	B	The LOS on Alt Q would be LOS B. Traffic volumes would decrease on adjacent roads.	+	63,201	An additional 0.2% reduction in VHT for the study area when included with a BHE alternative.	0	2,273,996	Minimal additional change in VMT when included with a BHE alternative.	+	Alternative Q is a proposed 4-lane, new location roadway originating at I-10 and traversing northwest to connect to Jess Harris Rd., including a grade-separated RR crossing. Alt Q would connect with the following existing major corridors: I-10, North Loop Dr., Alameda Ave., and Socorro Rd, while providing a northern bypass of Fabens and spanning almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040. Since Fabens Dr. currently intersects I-10, Alt Q would not enhance connectivity to I-10, but could potentially connect to the proposed Border Highway East Extension along the western limit of the study area (Alt 13 Mod-Rev).	0	Alternative Q is a new roadway that would circumnavigate Fabens, although it would connect to El Paso County Rural Transit Bus Route 40.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. It also helps to provide an alternate route around Town of Fabens and to POE.	-	Alternative would be on all new alignment and would have approximately 1.1 intersections/mile. Construction would be somewhat disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt R Mod	New location arterial from I-10 / FM 793 to future BHE Connection - eastern bypass of Fabens. Modified to minimize parcel disruption	++	B	The LOS on Alt Q would be LOS B. Traffic volumes would decrease on adjacent roads.	+	63,201	An additional 0.2% reduction in VHT for the study area when included with a BHE alternative.	0	2,273,996	Minimal additional change in VMT when included with a BHE alternative.	+	Alternative R Mod is a proposed 4-lane, new location roadway originating at I-10 and traversing southwest to connect to the proposed Border Highway Extension, including a grade-separated RR crossing. Alt R Mod would connect with the following existing major corridors: I-10, North Loop Dr., and Alameda Ave., while providing a southern bypass of Fabens and spanning almost the entire width of the study area. Alameda Ave. and Fabens Dr. are anticipated to exceed capacity in 2040. Since Fabens Dr. currently intersects I-10, Alt R Mod would not enhance connectivity to I-10.	0	Alternative R Mod is a new roadway that would circumnavigate Fabens to the south, although it would connect to El Paso County Rural Transit Bus Route 40.	+	This proposed connecting roadway would help with incident management by providing a new alternate route with grade separation at railroad. It also helps to provide an alternate route around Town of Fabens and alternate route to POE.	-	Alternative would involve reconstruction of a portion of an existing roadway. Total alignment would have approximately 0.5 intersections/mile. Construction would be very disruptive to existing network.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Multimodal (Non-Roadway) Alternatives																				
Transit Alternatives																				
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd and enhance existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road.	+		Increased regular transit service could decrease traffic volumes up to 3%.	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	++	Alternative TR 1 would improve access and connectivity in the north end of the study area by providing an alternative link to Loop 375. Alt TR 1 does not directly link to the Zaragoza POE from Socorro, but would provide an improved Socorro link to Loop 375.	++	The proposed BRT would connect to various MPO proposed bike/ped trails and also link to other El Paso County Rural Transit routes.	+	BRT may help commuters reach Loop 375 if incident causes closures.	0	No construction required.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 3380/Manuel F. Aguilera Freeway and the Fabens International POE.	+		Increased regular transit service could decrease traffic volumes up to 3%.	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	++	Alt TR 2 would improve access and connectivity in the south end of the study area by providing an alternative link between the future Tornillo POE and existing El Paso County Rural bus transit to Loop 375. Alt TR 2 does directly link the Tornillo POE to border communities and Loop 375 via El Paso County Rural Transit.	++	Proposed extension of transit route would provide enhanced access for pedestrians between the future Tornillo-Guadalupe POE and Tornillo. Would connect to existing El Paso County Rural Transit route 40.	0	This short proposed connection does not significantly help with incident management	0	No construction required.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Bicycle and Pedestrian Alternatives																				
Alt BP 1	Provide Bike/Ped connection from proposed border trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso County Rural Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive.	+		Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	+	Alt BP 1 would improve access and connectivity in the northern section of the study area including Socorro by providing additional bicycle and pedestrian connections. Alt BP 1 provides local access between transit and pedestrian networks in the northern section of the study area, but does not provide direct access to I-10.	++	Alternative BP1 would enhance pedestrian access and links to proposed BRT route and existing El Paso County Rural Transit Route 84 and Route 40.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	+		Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	+	Alt BP 2 would improve access and connectivity to Rio Bosque Park from transportation modal options along Socorro Rd. including El Paso County Rural transit bus routes. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance pedestrian access to Rio Bosque Park. Would connect to existing El Paso County Rural transit route 84.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 3	Provide Bike/Ped connection from proposed border trails along the Rio Grande to Socorro Rd for improved access to Socorro Entertainment Center.	+		Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	+	Alt BP 3 would improve access and connectivity to Tigua properties including the Socorro Entertainment Center from future bicycle and pedestrian facilities along the border. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance pedestrian access to the Socorro Entertainment Center. Would connect to existing El Paso County Rural Transit Route 84.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.	+		Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	+	Alt BP 4 would improve access and connectivity to San Elizario and El Paso County Rural Transit bus routes from future bicycle and pedestrian facilities along the border. Alt BP 2 does not address linkages to I-10 or Loop 375.	++	Alternative would enhance bike/ped facilities between existing El Paso County Rural Transit Route 84 and the City of San Elizario.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5 along the Manuel Aguilera Hwy.	+		Providing Bike/Ped facilities could decrease traffic volumes up to 3%	+		With decreased traffic volumes travel times would also decrease	+		Reduces VMT with less vehicles on the road	+	Alt BP 5 would improve access and connectivity to Tornillo and El Paso County Rural Transit bus routes from the future Tornillo POE. Alt BP 5 does not address linkages to I-10, but would link indirectly to Loop 375 via El Paso County Rural Transit bus routes.	++	Alternative would enhance bike/ped facilities between the future Tornillo-Guadalupe POE and Tornillo. Alternative is contiguous with Alt TR2.	0	This short proposed connection does not significantly help with incident management	0	Minor construction impacts associated with construction of multi-use trail.	0	Border Security will be an important consideration during more detailed alternative development. Coordination with federal agencies during the PEL process is ongoing and further input is continually sought. This criteria may be further refined during the NEPA phase since concerns would be at the project level of the alternative development.

Level 3 - Cost Screening

Study Goals		Maximizing cost efficiency														Maximizing cost efficiency			Accelerating delivery through innovative financing options		Optimizing opportunities for economic development	
Criteria		Construction Cost						ROW Acquisition						Utilities and Infrastructure			Financing Opportunities		Economic Development Opportunities	
		Conceptual Estimate ($)			Cost per Lane Mile			Number/severity of ROW Acquisition and Displacements			Parcel Impact Rating			Impact to major utilities and infrastructure			Accommodates innovative financing and accelerated project delivery		Accommodates/supports development of TRZ	
Measure		Rating	$	Evaluation	Rating	$	Evaluation	Rating	Acres	Evaluation	Rating	No. of Parcels	Evaluation	Rating	Total Major Utility Conflict Index	Evaluation	Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	-	$ -	No Build Alt would have maintenance and life cycle costs associated with existing roadway network.	-	$ -	No Build Alt would have maintenance and life cycle costs associated with existing roadway network.	0	0	No Build Alt has no ROW requirements.	0	0	No Build Alt has no ROW requirements.	0	0	No Build Alt has no impact to utilities or existing infrastructure.	0	No Build Alt has no cost.	- -	No Build Alt would provide no additional opportunities for economic development.
Roadway Alternatives Parallel to I-10																						
Widen Existing Roadways																						
Alt 1 Mod	Widen Socorro Rd. from Loop 375 to Alt I Mod, implement TSM/CSM improvement between Alt I Mod and Herring Rd.	-	$ 13,780,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	9.90	Minimal ROW requirements.	-	76	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	7.1	Alternative crosses Time Warner Cable (TWC) line, 2 major Texas Gas main lines, and 5 major water mains. Alignment is parallel to Texas gas line and water main. Alternative has major conflict index of 7. Rated as "-–" since => 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	0	Residential is most common land use, although there is some developable land at north end.
Alt 3	Widen Alameda Ave. from Loop 375 to Herring Rd.	-	$ 78,710,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 1,500,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	44.08	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	196	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.3	Alternative crosses Time Warner Cable (TWC) line, 1 major sewer line, 6 major Texas Gas main lines, and 4 major water mains. Alternative has major utility index of 2. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much of south frontage is blocked by Franklin Canal, although there is some developable land.
Alt 5 Mod	Widen North Loop Drive from Horizon Blvd. to Clint Cutoff Rd.	-	$ 44,980,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	37.81	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	109	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.9	Alternative crosses Time Warner Cable (TWC) line, 2 major Texas Gas main lines, and 3 major water mains. Alignment is parallel to water mains. Alternative has major utility index of 3. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Moderate amount of commercial development, moderate amount of developable land
Alt 13 Mod-Rev	BHE-Mid Connection - utilizing FM 76 (Middle Island Road) roadway, terminating at the Manuel F. Aguilera Highway (FM 3380).	-	$ 46,950,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 4,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	- -	183.33	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	62	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	1.0	Alignment parallel to primary overhead lines. Alternative has major utility index of 1. Rated as "0" since one or less conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Far from population centers, but close to Tornillo Port
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Road (FM 1109)	- -	$ 173,490,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 1,330,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	0.00	No ROW required for I-10 improvements.	0	0	No ROW required for I-10 improvements.	0	0	Alternative crosses 1 major Texas Gas line. Minimal utility conflicts.	++	Alternative has the ability to pursue revenue through managed lanes if the project has secured funding.	- -	Mainlanes would not significantly help economic development (compared to frontage roads)
New Location Roadways																						
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	$ 10,590,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$1,500,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	49.80	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	40	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.1	Alternative has 2 major Texas gas crossings. Alignment is parallel to primary overhead lines. Alternative has major utility index of 2. Rated as "-" since => 2 but less than 5.	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	+	Better if access to properties is provided. Passes through desirable commercial/industrial land uses near Loop 375 and Zaragoza POE; also passes near Rio Bosque Park
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	$ 10,570,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$1,500,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	43.20	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	27	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.1	Alternative has 2 major Texas gas crossings. Alignment is parallel to Texas Gas lines. Alternative has major utility index of 2. Rated as "-" since => 2 but less than 5.	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	+	Better if access to properties is provided. Passes through desirable commercial/industrial land uses near Loop 375 and Zaragoza POE; also passes near Rio Bosque Park
Alt 12	BHE-South Connection - from San Elizario terminating at Middle Island Road.	-	$ 31,410,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	- -	235.60	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	138	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.3	Alternative crosses Time Warner Cable (TWC) line, 1 sewer line, and 1 major water main. Alignment is parallel to primary overhead lines. Alternative has major utility index of 2. Rated as "-" since => 2 but less than 5.	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	0	Far from population centers, but close to Tornillo Port
Alt 13 (MOD)	BHE-Mid Connection - from Socorro Rd transition to Island Main Lateral / Middle Island Rd - terminating at FM 1109.	-	$ 40,800,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	- -	0.00	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	0	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	0	Minimal utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Far from population centers, but close to Tornillo Port
Alt 14 (MOD)	BHE-North Connection - from Socorro Rd transitioning to Island Tornillo Rd - terminating at FM 1109	-	$ 23,900,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	- -	0.00	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	0	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	1	Minimal utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Far from population centers, but close to Tornillo Port
Alt 15	I-10 EB FR from FM 1110 to O.T. Smith Road (FM 1109)	-	$ 50,890,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	0.00	No ROW required for I-10 improvements.	0	0	No ROW required for I-10 improvements.	0	0	Alternative crosses 1 major Texas Gas line. Minimal utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt 16	I-10 WB FR from FM 1110 to O.T. Smith Road (FM 1109)	-	$ 50,820,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	0.00	No ROW required for I-10 improvements.	0	0	No ROW required for I-10 improvements.	0	0	Alternative crosses 1 major Texas Gas line. Minimal utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Far from population centers
Alt 17	BHE river running alignment through Socorro	-	$ 31,860,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$1,500,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	- -	183.51	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	57	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	0.4	Alternative crosses 1 major sewer and one major water main. Minimal utility conflicts.	++	This alternative has the ability to pursue revenue through tolls if the project has secured funding.	+	Better if access to properties is provided. Passes through desirable commercial/industrial land uses near Loop 375 and Zaragoza POE; also passes near Wildlife Refuge and existing residential
Cross-Connecting Roadway Alternatives																						
Widen Existing Roadways																						
Alt D	Widen Buford from Alameda to Socorro.	0	$ 8,420,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	9.14	Minimal ROW requirements.	-	66	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	0	No utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	-	Mostly developed with existing residential and school and Bulldog park
Alt E	Widen San Elizario Rd (FM 1110) from N. Loop Dr. to Socorro Rd. Includes grade separation at UPRR.	-	$ 39,510,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,240,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	56.90	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	142	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	5.1	Alternative crosses 2 major sewer lines, 2 major Texas Gas main line. Alignment is parallel to Texas gas line, sewer, and primary overhead line. Alternative has major utility index of 5.1. Rated as "- -" since > 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Some developable land, also some existing residential
Alt F	Re-align FM 1110 to Herring Rd from FM 1110 at N. Loop Dr. to future BHE. Includes grade separation at UPRR.	-	$ 37,380,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,320,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	64.23	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	81	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	6.3	Alternative crosses Time Warner Cable (TWC) line, 1 major sewer line, 3 major Texas Gas main lines, and 2 water mains. Alignment is parallel to Texas gas line, water main, and primary overhead line. Alternative has major utility index of 6.3. Rated as "- - " since > 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Somewhat far from population centers
Alt N	Widen FM 1110 from I-10 to North Loop Dr.	0	$ 9,460,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	0.00	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	0	0	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2	Alignment runs parallel to water main and Texas gas line. Alternative has major utility index of 2.0. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	Proximity to I-10 and accessible from population centers
New Location Roadways																						
Alt D Mod	Improve Buford from Alameda to Socorro and extend west with a new 2-lane connection to the proposed Border Highway Extension.	-	$ 10,300,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 3,380,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	8.88	Minimal ROW requirements.	-	61	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	3	Alternative crosses 1 major water main, 1 major Texas gas line, 1 major sewer line and is parallel to an overhead electrical line.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Along Buford Rd. land is mostly developed with existing residential and school and Bulldog park. Opportunity may exist for development along the new roadway between Border Highway Extension and Socorro Rd.
Alt I Mod-Rev (NEW)	Extend Old Hueco Tanks Rd. (2-lanes) from FM 76 to the proposed Border Highway Extension. A portion of the roadway would be utilize S. Nevarez Rd. and Winn Rd, while two segments of the roadway would be on new location.	-	$ 20,640,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 4,250,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	19.58	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	99	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	5.7	Alternative crosses 2 water mains, 5 Texas gas lines, 2 sewer line, and has conflict with Verizon communication line. Alignment is parallel to overhead electrical line. Alternative has major conflict index greater than 5, rated as "-–".	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	+	About half of this area is built out. Some developable land. Opportunity may exist for development along the new roadway between Border Highway Extension and Socorro Rd.
Alt I Mod (OLD)	New connection from Old Hueco Tanks/ North Loop to Socorro Rd. w RR Grade Sep.	-	$ 18,670,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,930,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	22.89	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	98	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	7	Alternative crosses 3 water mains, 3 Texas gas lines, 1 sewer line, and Verizon communication line. Alignment is parallel to water main. Alternative has major conflict index of 7. Rated as "-–" since => 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	About half of this area is built out. Some developable land.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	-	$ 50,050,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,500,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	96.21	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	- -	135	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	4.8	Alternative crosses Verizon communication line, Time Warner Cable (TWC), 3 major sewer lines, 6 major Texas Gas main lines, and 5 major water mains. Alternative has major utility index of 4.8. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	++	Much land available, proximity to I-10, proximity to population centers
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	-	$ 23,660,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 9,700,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	63.42	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	0	23	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.5	Alternative crosses Verizon communication line, Time Warner Cable (TWC), major Texas Gas main line, and major water main. Alternative has major utility index of 2.5. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Land available, somewhat far from population centers, but located in likely path of future development, proximity to I-10
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	-	$ 31,430,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,010,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	73.32	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	47	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	-	2.4	Alternative crosses Verizon communication line, Time Warner Cable (TWC), major Texas Gas main line, and major water main. Alternative has major utility index of 2. Rated as "-" since => 2 but less than 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much land available, somewhat far from population centers, proximity to I-10
Alt R Mod	New location arterial from I-10 / FM 793 to future BHE Connection - eastern bypass of Fabens. Modified to minimize parcel disruption	-	$ 47,040,000	For alternative's total construction cost, alt was rated as "-–" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,610,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "-–"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	-	79.17	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "-–"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	-	33	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "-–"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	0	1	Alternative crosses Verizon communication line. Minimal utility conflicts.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through TRZ or vehicle registration tax.	0	Much land available, somewhat far from population centers, proximity to I-10

Level 3 - Cost Screening

Study Goals		Maximizing cost efficiency												Maximizing cost efficiency			Accelerating delivery through innovative financing options		Optimizing opportunities for economic development	
Criteria		Construction Cost						ROW Acquisition						Utilities and Infrastructure			Financing Opportunities		Economic Development Opportunities	
		Conceptual Estimate ($)			Cost per Lane Mile			Number/severity of ROW Acquisition and Displacements			Parcel Impact Rating			Impact to major utilities and infrastructure			Accommodates innovative financing and accelerated project delivery		Accommodates/supports development of TRZ	
Measure		Rating	$	Evaluation	Rating	$	Evaluation	Rating	Acres	Evaluation	Rating	No. of Parcels	Evaluation	Rating	Total Major Utility Conflict Index	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt U	Rio Bosque Park Connection.	0	$ 20,680,000	For alternative's total construction cost, alt was rated as "--" if the total cost exceeds $100M, as "-" if the total cost is between $10M and $100M, and as "0" if less than $10M.	- -	$ 2,000,000	For alt's construction cost per lane mile, cost per mile exceeded $1M rated "--"; cost per lane mile between $10K and $1M rated "-"; less than $10K rated "0".	0	3.15	For alt's ROW, the acreage of ROW was considered; ROW needs exceed 100 acres rated "--"; ROW needs between 10 and 100 acres rated "-"; less than 10 acres rated "0".	0	7	For alt's ROW, the no. of parcels required was considered: no. of parcels exceed 100 rated "--"; number of parcels between 25 and 100 rated "-"; less than 25 parcels rated "0".	- -	7.4	Alternative one major water main and one major Texas gas line. Based on its short length, Alternative has major conflict index of 7. Rated as "--" since => 5.	+	All roadway improvement or new roadway projects would have the ability to pursue financing techniques through Transportation Reinvestment Zones (TRZ) or vehicle registration tax.	+	Improved access may increase visitor volume and lead to tourism development
Multimodal (Non-Roadway) Alternatives																				
Transit Alternatives																				
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd and enhance existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road.	0	$ -	No construction cost, although costs would be incurred by Sun Metro for purchase of BRT and other necessary infrastructure.	0	$ -	No construction cost, although costs would be incurred by Sun Metro for purchase of BRT and other necessary infrastructure.	0	0	No ROW required.	0	0	No ROW required.	0	0	No utility conflicts.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	BRT may lead to higher density development and redevelopment at transit nodes
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 3380/Manuel F. Aguilera Freeway and the Fabens International POE.	0	$ -	No construction cost.	0	$ -	No construction cost.	0	0	No ROW required.	0	0	No ROW required.	0	0	No utility conflicts.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	++	Introducing transit service likely leads to potential retail sales benefits; proven economic result in border cities.
Bicycle and Pedestrian Alternatives																				
Alt BP 1	Provide Bike/Ped connection from proposed border trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso County Rural Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive.	- -	$ 220,000	Relatively high construction cost of the shared use lane because length of trail is about 2 miles. Cost greater than a $1M and rated "--".	- -	$ 54,000	Relatively high cost per lane mile for shared use path. Cost greater than $250K; rated "--".	0	0	Proposed shared use lane would be within existing ROW.	0	0	Proposed shared use lane would be within existing ROW.	- -	5.5	Alternative crosses 1 water main, 2 major Texas gas lines, 2 major sewer lines, Verizon communication line, and TWC. Alignment is parallel to sewer lines. Alternative has major conflict index of 5.5. Rated as "-- " since => 5.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	Accommodating bikes/pedestrians likely leads to potential retail sales benefits; proven economic result in border cities.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	-	$ -	Minor cost associated with construction of multi-use path. Cost less than $1M and rated "-".	-	$ -	Low cost per lane mile for stand alone multi-use path. Cost less than $250k, rated "-".	-	1.10	Minor amount of ROW would required for standalone bike/ped connection.	-	7	Multi-use path would impact 7 parcels.	- -	5.4	Alternative crosses 1 water main, 1 major Texas gas line, and TWC. Alignment is parallel to sewer lines. Alternative has major conflict index of 5.4. Rated as "-- " since => 5.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	This would be an amenity for Park with some benefits. Could lead to increased visits / tourism but not expected to be high volume.
Alt BP 3	Provide Bike/Ped connection from proposed border trails along the Rio Grande to Socorro Rd for improved access to Socorro Entertainment Center.	-	$ -	Minor cost associated with construction of multi-use path. Cost less than $1M and rated "-".	-	$ -	Low cost per lane mile for stand alone multi-use path. Cost less than $250k, rated "-".	-	1.22	Minor amount of ROW would required for standalone bike/ped connection.	- -	20	Multi-use path would impact 20 parcels.	-	1.6	Alternative crosses 1 Texas gas line. Minimal utility conflicts.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	0	Beneficial for recreational use, but bike trail not expected to be high volume.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.	- -	$ 2,240,000	Relatively high construction cost of the shared use lane because length of trail is about 1.4 miles. Cost greater than a $1M and rated "--".	- -	$ 824,000	Relatively high cost per lane mile for shared use path. Cost greater than $250K; rated "--".	0	0	Proposed shared use lane would be within existing ROW.	0	0	Proposed shared use lane would be within existing ROW.	-	3.7	Alternative crosses 1 water main, 1 major Texas gas line, and 3 major sewer lines. Alternative has major utility index of 3.7. Rated as "-" since => 2 but less than 5.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	0	Nearby residents could walk/bike to transit. Bike trail not expected to be high volume.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5 along the Manuel Aguilera Hwy.	- -	$ 1,320,000	Relatively high construction cost of the shared use lane because length of trail is about 4 miles. Cost greater than a $1M and rated "--".	- -	$ 157,000	Relatively high cost per lane mile for shared use path. Cost greater than $250K; rated "--".	0	0	Proposed shared use lane would be within existing ROW.	0	0	Proposed shared use lane would be within existing ROW.	0	0.7	Alternative crosses 2 major sewer lines and 1 major water main. Minimal utility conflicts.	+	All non-roadway projects would have the ability to pursue unique and innovative financing techniques	+	Accommodating bikes/pedestrians likely leads to potential retail sales benefits; proven economic result in border cities.

Border Highway East

Level 3 - Environmental Screening

Alt	Study Goals / Criteria / Measure	Neighborhood Character Rating	Neighborhood Character Evaluation	CSS Rating	CSS Evaluation	Socioeconomic and Environmental Rating	Socioeconomic and Environmental Evaluation	Archaeological Resources Rating	Archaeological Resources Evaluation	Historic Resources Rating	Historic Resources Evaluation	Potential 4(f) (Y/N)	Section 4(f) Evaluation
Study Goals		Developing the facility utilizing context		Avoiding and/or minimizing impacts to the human and natural environment									
Criteria		Community Impacts: Neighborhood Character		Community Impacts: Context Sensitive Solutions (CSS)		Community Impacts: Socioeconomic and Environmental		Cultural Resource Impacts: Archaeological Resources		Cultural Resource Impacts: Historic Resources			
Measure		Impacts to existing and proposed neighborhoods		Design incorporates CSS principles (community needs and regional character), while also balancing system goals		Assessment was based on income, ethnic composition and Limited English Proficiency (LEP) along the alternatives.		Number of recorded archaeological sites and high probability areas (acres) potentially impacted		Based on level of importance scoring and potential to impact historic resources [NRHP-listed, NRHP-eligible, historic-age properties, historic trails, and Tigua traditional cultural places (TCPs) (owned, trust, ceremonial lands)].		Potential Section 4(f) Analysis: Based on potential for significant impacts to resources with high level of importance.	
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	0	No Build Alt would have no impact to neighborhoods.	0	No Build Alt would have no impact to CSS.	0	No Build Alt would have no impact to EJ populations.	0	No Build Alt would have no impact on archaeological resources.	0	No Build Alt would have no impact on historic resources.	No	No impacts.
Roadway Alternatives Parallel to I-10													
Widen Existing Roadways													
Alt 1 Mod	Widen Socorro Rd. from Loop 375 to Alt I Mod, implement TSM/CSM improvement between Alt I Mod and Herring Rd.	- -	Passes through Mission Trail Historic District, in northern part of corridor is adjacent to various designated neighborhoods, cemeteries, schools, and places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	- -	Adjacent (within 200 ft) of 3 cemeteries, 1 site listed on the NR, 1 site eligible for the NR, and 3 sites recommended potentially eligible for the NRHP. Total score =75.	- -	Alt 1 MOD would: 1) be within the Mission Historic District; 2) would be located along the El Camino Real de Tierra Adentro National Historic Trail; 3) would cross an EPWID1 canal; 4) would cross Tigua Trust Land; and 5) would cross Tigua Trust Land Buffer.	Yes	Widening of Socorro Rd. may require a regular Section 4(f) analysis because the proposed alternative would: 1) be within the Mission Historic District; 2) would be along the El Camino Real de Tierra Adentro National Historic Trail; 3) would cross an EPWID1 canal; 4) would cross Tigua Trust Land; 5) and would cross Tigua Trust Land Buffer.
Alt 3	Widen Alameda Ave. from Loop 375 to Herring Rd.	-	Northern part of corridor is adjacent to various designated neighborhoods. Schools and places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	-	Adjacent (within 200 ft) of one potentially eligible archaeological site. Total score = 5.	- -	Alt 3 would: 1) go through the Tigua Trust Land Buffer; 2) go through Tigua Trust Land; 3) include ROW that overlaps a NRHP-listed EPCWD1 system canal; 4) include ROW that overlaps the NRHP-listed Franklin Canal; and 5) pass by the NRHP-eligible Pena House near the intersection of Alameda Ave. and Horizon Blvd.	Yes	The Tribal Historic Preservation Officer (THPO) would determine if the project would have an adverse effect to a Traditional Cultural Place (TCP) and depending on that determination, this alternative may or may not have an adverse effect to a Section 4(f) property. This alternative would require a Section 4(f) analysis, but with proper planning and engineering the effects could result in a de minimus Section 4(f) determination for non-tribal issues as long as the canals are left in place and their function is not affected; and if effects to the Pena House property were avoided, which seems likely because of its location southwest of the Franklin Canal (Alameda Ave. is located northeast of the Franklin Canal).
Alt 5 Mod	Widen North Loop Drive from Horizon Blvd. to Clint Cutoff Rd.	-	Places of worship adjacent to corridor.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	-	Alt 5 Mod would cross EPCWID1 canals.	No	This alternative would require a Section 4(f) analysis, but with proper planning and engineering the effects could result in a de minimus Section 4(f) determination as long as the canals are left in place and their function is not affected.
Alt 13 Mod-Rev	BHE-Mid Connection - utilizing FM 76 (Middle Island Road) roadway, terminating at the Manuel F. Aguilera Highway (FM 3380).	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	-	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	-	Alt 13 Mod-Rev would cross EPCWID1 canals.	No	With proper planning and engineering, the effects to canals of the EPCWID1 could result in a de minimus Section 4(f) determination.
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Road (FM 1109)	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	0	None	No	No impacts.
New Location Roadways													
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	No impact to neighborhood character - area is generally industrial.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt 8 would: 1) cross NRHP-listed canals of EPWID1; and 2) cross Tigua Ceremonial Land and Tigua Trust Land.	Yes	Depending on the THPO's determination regarding TCPs, Alt 8 may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to canals of the EPCWID1 could result in a de minimus Section 4(f) determination.
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	No impact to neighborhood character - area is generally industrial.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt 9 would: 1) cross NRHP-listed canals of EPWID1 and 2) cross Tigua Ceremonial Land and Tigua Trust Land.	Yes	Depending on the THPO's determination regarding TCPs, Alt 9 may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to canals of the EPCWID1 could result in a de minimus Section 4(f) determination.
Alt 12	BHE-South Connection - from San Elizario terminating at Middle Island Road.	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt 12 would: 1) cross NRHP-listed canals of EPWID1; 2) cross Tigua Ceremonial Land; and 3) cross Tigua Ceremonial Land Buffer.	Yes	Depending on the THPO's determination regarding TCPs, Alt 12 may or may not require a regular Section 4(f) analysis. With careful planning and engineering, the effects to canals of the EPCWID1 could result in a de minimus Section 4(f) determination.
Alt 15	I-10 EB FR from FM 1110 to O.T. Smith Road (FM 1109)	0	No impact to neighborhood character.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	0	None	No	No impacts.
Alt 16	I-10 WB FR from FM 1110 to O.T. Smith Road (FM 1109)	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	0	None	No	No impacts.
Alt 17	BHE river running alignment through Socorro	- -	No impact to neighborhood character - bisects Tigua property.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt 17 would: 1) cross NRHP-listed canals of EPWID1; 2) cross Ysleta de Sur Pueblo Land; 3) cross Tigua Ceremonial Land and Trust Land; and 4) cross edge of the site of Tienda de Carbajal, a Recorded Texas Historic Landmark that is potentially NRHP-eligible.	Yes	Unless the nation of Ysleta del Sur Pueblo is willing to negotiate with TxDOT, this alternative would probably face substantial tribal opposition. If the project required land from the site of Tienda de Carbajal and if that site were determined to be NRHP-eligible, the project would require a regular Section 4(f) analysis. In general, the effects associated with a controlled access facility are more likely to cause adverse effects to historic properties. With proper planning and engineering, the effects to the canals of the EPCWID1 and to the site of Tienda de Carbajal may result in a de minimus Section 4(f) determination.
Cross-Connecting Roadway Alternatives													
Widen Existing Roadways													
Alt D	Widen Buford from Alameda to Socorro.	- -	Alternative adjacent to La Juna Addition (neighborhood), terminates in Mission Trail Historic District, and near 3 schools.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	- -	Adjacent (within 200 ft) to four eligible archaeological site. Total score=40.	- -	Alt D would: 1) be within the Mission Historic District; 2) would intersect the El Camino Real de Tierra Adentro National Historic Trail; 3) would abut two EPWID1 canals; and 4) would use land from the NRHP-eligible Pena House on the southwest corner of Buford Rd. and Alameda Ave.	Yes	Alt D would likely require a regular Section 4(f) analysis because it is currently proposed to use land: 1) within the Mission Historic District; and 2) from the NRHP-eligible Pena House on the southwest corner of Buford Rd. and Alameda Ave. It would likely also require a Section 4(f) de minimus evaluation because it would intersect the El Camino Real de Tierra Adentro National Historic Trail; and would abut two EPWID1 canals.
Alt E	Widen San Elizario Rd (FM 1110) from N. Loop Dr. to Socorro Rd. Includes grade separation at UPRR.	-	No impact to designated neighborhoods, near three places of worship, terminate in Mission Trail Historic District.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt E would 1) be within the Mission Trail Historic District; 2) intersect the El Camino Real de Tierra Adentro National Historic Trail; and 3) would require ROW (near Hansard Dr.) from an NRHP-listed canal of EPCWID1.	No	With proper planning and engineering, the effects to the Mission Trail Historic District, EPCWID1 (by shifting the alignment away from the canal), and the National Historic Trail may result in a de minimus Section 4(f) determination.
Alt F	Re-align FM 1110 to Herring Rd from FM 1110 at N. Loop Dr. to future BHE. Includes grade separation at UPRR.	-	No impact to designated neighborhoods, near various schools.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	0	No impact to archaeological sites or cemeteries.	- -	Alt F would: 1) cross NRHP-listed canals of EPCWID1; and 2) cross Tigua Ceremonial Land.	Yes	Depending on the THPO's determination regarding TCPs, Alt F may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to canals of EPCWID1 could result in a de minimus Section 4(f) determination.
Alt N	Widen FM 1110 from I-10 to North Loop Dr.	0	No impact to designated neighborhoods.	0	The PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	0	None	No	Planning and engineering would be required to avoid any disturbance of San Lorenzo Cemetery.
New Location Roadways													
Alt D Mod	Improve Buford from Alameda to Socorro and extend west with a new 2-lane connection to the proposed Border Highway Extension.	- -	Alternative adjacent to La Juna Addition (neighborhood), terminates in Mission Trail Historic District, and near 3 schools.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	- -	Runs adjacent (within 200 ft) to four eligible archaeological sites = 40	- -	Alt D would: 1) be partially within the Mission Trail Historic District; 2) would be near the Socorro Mission Archeological Site; 3) would cross the El Camino Real de Tierra Adentro National Historic Trail; 4) would cross three EPWID1 canals; and 4) would use land from the NRHP-eligible Pena House on the southwest corner of Buford Rd. and Alameda Ave.	Yes	Alt D would likely require a regular Section 4(f) analysis because it is currently proposed to : 1) use land within the Mission Trail Historic District; 2) would be near the Socorro Mission Archeological Site and could possibly impact the site; 3) use land from the NRHP-eligible Pena House on the southwest corner of Buford Rd. and Alameda Ave.; 4) would cross the El Camino Real de Tierra Adentro National Historic Trail; and 5) would cross three EPWID1 canals.
Alt I Mod-Rev (NEW)	Extend Old Hueco Tanks Rd. (2-lanes) from FM 76 to the proposed Border Highway Extension. A portion of the roadway would be utilize S. Nevarez Rd. and Winn Rd, while two segments of the roadway would be on new location.	- -	Alternative adjacent to Vista Del Prado #1 and Sunshine designated neighborhoods. Alternative may impact Valley South Subdivision.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	- -	Runs adjacent to two eligible sites (20) and two potentially eligible sites (10) = 30	- -	Alt I MOD would: 1) be adjacent to Socorro Mission; 2) be partially within the Mission Trail Historic District; 3) would cross the El Camino Real de Tierra Adentro National Historic Trail; 4) would cross eight EPWID1 canals; 5) and would cross one Tigua Ceremonial Land parcel.	Yes	Widening of S. Nevarez Rd. and extending the roadway west may require a regular Section 4(f) analysis because the proposed alternative would use land: 1) adjacent to Socorro Mission; 2) within the Mission Trail Historic District; 3) would cross one Tigua ceremonial Land parcel; 4) would cross the El Camino Real de Tierra Adentro National Historic Trail; and 5) would cross eight EPWID1 canals.
Alt I Mod (Old)	New connection from Old Hueco Tanks/ North Loop to Socorro Rd. w RR Grade Sep.	- -	Alternative adjacent to Vista Del Prado #1 and Sunshine designated neighborhoods. Alternative may impact Valley South Subdivision.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	- -	Adjacent to 2 eligible sites and 1 potentially eligible site. Total score= 25.	- -	Alt I Mod would: 1) use land from the Socorro Mission Historic District; 2) use land within the Mission Trail Historic District; 3) cross canals of NRHP-listed EPCWID1; and 4) and intersect with the El Camino Real de Tierra Adentro National Historic Trail.	Yes	If additional ROW were required from the Socorro Historic District, then this alternative would require a regular Section 4(f) analysis. With proper planning and engineering, the effects to the Mission Trail Historic District; the National Historic Trail; and to the EPCWID1 structures could result in a de minimus Section 4(f) determination.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	-	Intersects Mission Trail Historic District.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	- -	Percentage of minority population is greater than the study area average of 84.2% and LEP is greater than study area average of 40.9%.	-	Adjacent to one cemetery. Total score=10.	- -	Alt L would: 1) use land within the Mission Trail Historic District; 2) cross canals of NRHP-listed EPCWID1; 3) cross Tigua Ceremonial land; and 4) cross the El Camino Real de Tierra Adentro National Historic Trail.	Yes	Depending on the THPO's determination regarding TCPs, Alt L may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to the Mission Historic District, EPCWID1, and the National Historic Trail may result in a de minimus Section 4(f) determination. If project activities were to disturb the San Elizario Cemetery, the project would also require extensive coordination per the Health and Safety Code and possibly a Section 4(f) analysis.
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	- -	Alt P would: 1) cross the individually listed Franklin Canal as well as structures of NRHP-listed EPCWID1; and 3) Tigua Ceremonial land.	Yes	Depending on the THPO's determination regarding TCPs, Alt P may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to the Franklin Canal and other EPCWID1 structures could result in de minimus Section 4(f) determinations.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	0	No impact to designated neighborhoods, outside of Fabens residential areas.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	-	Percentage of minority population is greater than the study area average of 84.2%.	0	No impact to archaeological sites or cemeteries.	-	Alt Q would: 1) cross the individually listed Franklin Canal; and 2) cross as canals of NRHP-listed EPCWID1.	No	With proper planning and engineering, the effects to the Franklin Canal and other EPCWID1 structures could result as de minimus Section 4(f) determinations.

Alt	Tigua Land Rating	Tigua Land Evaluation	Park Land Rating	Park Land Evaluation	Water Resources Rating	Water Resources Evaluation	Drainage Features Rating	Drainage Features Evaluation	Floodplains Rating	Floodplains Evaluation	Biological Resources Rating	Biological Resources Evaluation	Agricultural Resources Rating	Agricultural Resources Evaluation	Hazardous Materials Rating	Hazardous Materials Evaluation	Air Quality Rating	Air Quality Evaluation	Traffic Noise Rating	Traffic Noise Evaluation
Study Goals	Avoiding and/or minimizing impacts to the human and natural environment																			
Criteria	Cultural Resource Impacts: Tigua Land		Natural Resource Impacts: Park Land		Natural Resource Impacts: Water Resources		Natural Resource Impacts: Drainage Features		Natural Resource Impacts: Floodplains		Natural Resource Impacts: Biological Resources		Natural Resource Impacts: Agricultural Resources		Other Impacts: Hazardous Materials		Other Impacts: Air Quality		Other Impacts: Traffic Noise	
Measure	Impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land.		Impacts to known public parks		Number of surface water/wetland crossings		Affect to irrigation channels, canals, laterals, viaducts, etc.		Affect to floodplains		Potential to impact listed and non-listed, species and/or habitat, rare locally important species.		Existing agriculture land, farmland, grazing lands, or orchards converted to transportation use.		Number of existing hazardous material sites		Scored if alternative is located within and area of NAAQS non-attainment, its potential to increase diesel truck traffic, its proximity to intermodal freight facility, or its potential to improve air quality through congestion relief.		Scoring was based on number of adjacent receivers (residential parcels, schools, churches, daycares and parks)	
No Build Alt	0	No Build Alt would have no impact on Tigua land.	0	No Build Alt would have no impact to public parks.	0	No Build Alt would have no impact to water resources.	0	No Build Alt would have no impact to drainage features.	0	No Build Alt Would have no impact to floodplains.	0	No impact.	0	No impact.	0	No impact.	-	Increased congestion over time would potentially degrade air quality.	0	No impact.
Alt 1 Mod	- -	Crosses 10 Tigua property parcels, 163 Trust Land parcels, and 10 Ceremonial Land parcels.	-	Impacts to Cougar Park (approx. 0.02 acre) and Unnamed Park (approx. 0.002 acre) on San Elizario Rd. in San Elizario. Section 4(f) would be required.	0	NWI mapped areas are shown on existing roadway. No features are present. No impacts anticipated.	-	Nine crossings of features (Barrial Lateral, Clint Lateral, Del Monte Lateral, Franklin Drain, Glardon Lateral, Mesa Drain Interceptor, River Spur Drain, Salatral Lateral, and Socorro Lateral). Approximately 400 ft of Glardon Lateral is located within the corridor.	-	Less than 20% of area is within 100-year floodplain.	-	Habitat threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to existing drainage features.	0	Less than 10% of area is considered agriculture land.	-	One mapped SPILLS site within the corridor. Five mapped LPST sites and six PST sites adjacent to corridor.	- -	TSM/CSM congestion relief ; located within the PM-10 non-attainment area; and located adjacent to an intermodal freight distribution center.	- -	Adjacent to 510 residential parcels, 4 schools, 4 churches, 1 daycare and 3 parks.
Alt 3	-	Crosses 19 Trust Land parcels.	0	No impact to park land.	0	No impacts to NWI mapped features.	- -	Thirteen crossings of features (Bovee Lateral, Clint Lateral, Clint Spur Drain, Daugherty Lateral, Franklin Canal (2x), Glardon Lateral, Green Lateral, Juan De Herrera Branch Canal, Mesa Drain Interceptor, Middle Drain, Salatral Lateral, and Wadlington Lateral). Approximately 9,500 ft of Franklin Canal is located within the corridor.	-	Less than 20% of area is within 100-year floodplain.	-	Habitat threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to existing drainage features.	0	Less than 10% of corridor is considered agriculture land.	-	Six mapped LPST sites, three PST sites, and two RCRAG sites adjacent to corridor.	- -	Congestion relief by widening the existing roadway; however, located within the PM-10 non-attainment area and adjacent to an intermodal freight distribution center.	- -	Adjacent to 333 residential parcels, 2 schools, 5 churches, and 2 daycares.
Alt 5 Mod	0	No impact to Tigua parcels.	0	No impacts to mapped parks. Adjacent to Joe Carrasco Park.	0	No impacts to NWI mapped features.	- -	Six crossings of features (Daugherty Lateral, Mesa Drain, Y-197 Lateral, Y-252 Lateral, Y-303 Lateral, and the Ysleta Lateral). Approximately 8,000 ft of the Ysleta Lateral is located within the corridor.	-	Less than 20% of corridor is within 100-year floodplain.	- -	Habitat threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat and sand prickly-pear. Impacts would occur to existing drainage features and agricultural land.	-	More than 10% but less than 50% of corridor considered agriculture.	0	One mapped LPST site adjacent to the corridor.	0	Congestion relief by widening the existing roadway; however, located within the PM-10 non-attainment area.	-	Adjacent to 107 residential parcels, 3 churches, and 1 park.
Alt 13 Mod-Rev	0	No impact to Tigua parcels.	0	No impact to mapped parks.	0	No impacts to NWI mapped features.	- -	Two crossings of features (Fabens Drain and Island Farmers Drain). Potential impacts to a section of Island Farmers Drain (approx. 2,600 ft) located within the corridor.	-	Less than 20% of corridor is within the 100-year floodplain.	-	Habitat threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat and sand prickly-pear. Impacts would occur to existing drainage features and agricultural land.	- -	Greater than 50% of corridor is considered agriculture.	0	No impacts to mapped sites.	0	Congestion relief by construction of a new location roadway. Near future POE so likely to increase truck traffic.	-	Adjacent to 2 residential parcels.
Alt 22	0	No impact to Tigua parcels.	0	No impact to mapped park land.	0	No impacts to NWI mapped features. Based on aerials, some arroyos are present.	0	No impacts to drainage canals, laterals, drains, etc.	-	Less than 20% of corridor is located within the 100-year floodplain.	0	Existing habitat does not match mapped MOU habitat. No impacts as corridor is along existing roadway. Within TXNDD mapped range of sand prickly-pear. Impacts would occur along existing roadway and no impacts anticipated.		No impacts to agriculture land.	0	Multiple LPST adjacent to corridor.	- -	Congestion relief by widening the existing roadway; however, located within the PM-10 non-attainment area. Likely to increase in truck traffic.	-	Adjacent to 8 residential parcels.
Alt 8	-	Crosses 5 Trust Land parcels.	0	No impacts to mapped parks. Not immediately adjacent to any mapped parks.	0	No impacts to NWI mapped features.	- -	Two features crossed by corridor (South Side Feeder Lateral and Playa Drain). Approximately 9,000 ft of South Side Feeder Lateral is located within the corridor.	- -	More than 20% of the corridor is within the 100-year floodplain.	-	Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to existing drainage features.	0	Less than 10% of corridor is considered agriculture.	-	Two mapped PST sites, three RCRAG sites, and one MSWLF site are adjacent to corridor.	-	Congestion relief by construction of a new location roadway; however, located within the PM-10 non-attainment area. Provides a nearby connection to a POE so likely to increase truck traffic.	-	Adjacent to 2 residential parcels.
Alt 9	-	Crosses 11 Trust Land parcels and 7 Ceremonial Land parcels.	0	No impacts to mapped parks. Not immediately adjacent to any mapped parks.	0	No impacts to NWI mapped features.	0	Two features crossed by corridor (South Side Feeder Lateral and Playa Drain).	-	Less than 20% of corridor is located within the 100-year floodplain.	-	Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to existing drainage features.	0	No mapped agriculture land within the corridor.	-	One mapped IHW site, six RCRAG sites, and one LPST site are adjacent to corridor.	-	Congestion relief by construction of a new location roadway; however, located within the PM-10 non-attainment area. Provides a nearby connection to a POE so likely to increase truck traffic.	0	There are no adjacent sensitive receivers.
Alt 12	- -	Crosses 227 Ceremonial Land parcels.	0	No impacts to mapped parks.	-	Impacts to mapped NWI features would occur.	- -	Eight features crossed by the corridor (San Elizario Lateral, Riverside Canal (2x), Riverside Intercepting Drain, River Drain, Lee Moor Intercepting, Hansen Lateral, Island Main Lateral, and I-F Island Feeder Intercepting). Potential impacts to a section of River Side Intercepting Drain (approx. 15,000 ft) and Lee Moor Intercpting Drain (approx. 10,000 ft) located within the corridor.	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat and the sand prickly-pear. Impacts would occur to existing drainage features.	- -	Greater than 50% of the corridor is considered agriculture land. (62%)	0	No impacts to mapped sites.	0	Congestion relief by construction of a new location roadway. However, alternative is connected to Alt 13 Mod Rev which is connected to future POE.	-	Adjacent to 84 residential parcels.
Alt 15	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	-	No impacts to NWI mapped features. Aerials indicate potential arroyos intersecting corridor.	0	No impacts to canals, laterals, drains, etc.	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Alternative is new location and entire corridor is located within native habitat. Threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Impacts to native habitat. Within TXNDD mapped range of sand prickly-pear.	- -	Greater than 50% of the corridor is considered agriculture land.	0	One mapped PST site adjacent to the corridor.	0	Congestion relief by construction of a new frontage road along I-10. However, likely to increase truck traffic.	0	There are no adjacent sensitive receivers.
Alt 16	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	-	No impacts to NWI mapped features. Aerials indicate potential arroyos intersecting corridor.	0	No impacts to canals, laterals, drains, etc.	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Alternative is new location and entire corridor is located within native habitat. Threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Impacts to native habitat. Within TXNDD mapped range of sand prickly-pear.	- -	Greater than 50% of the corridor is considered agriculture land.	0	No impacts to mapped sites.	0	Congestion relief by construction of a new frontage road along I-10. However, likely to increase truck traffic.	0	There are no adjacent sensitive receivers.
Alt 17	- -	Crosses 7 Tigua Property parcels, 48 Trust Land parcels, and 86 Ceremonial Land parcels.	0	No impacts to mapped parks.	- -	Greater than 0.50 acre of NWI mapped features impacted.	- -	Five features crossed by the corridor (Riverside Canal (3x), Riverside Intercepting Drain, and the San Elizario Lateral). Potential impacts to Riverside Intercepting Drain (approx. 13,500 ft) located within corridor.	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Alternative is new location and entire corridor is located within native habitat. Threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Impacts to native habitat. Within TXNDD mapped range of sand prickly-pear.	- -	Greater than 50% of the corridor is considered agriculture land.	0	Old WWTP located adjacent to corridor.	0	Congestion relief by construction of a new location roadway. However, connection to a nearby POE would likely increase truck traffic.	-	Adjacent to 31 residential parcels and 1 park.
Alt D	0	No impact to Tigua parcels.	-	Additional ROW adjacent to existing park (Bulldog Championship Park).	0	No impacts to NWI mapped features.	0	Only one feature is crossed by the corridor (Franklin Canal).	0	Corridor is not located within the 100-year floodplain.	0	Habitat does not match the MOU mapped habitat types. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to earthen channel in urbanized area.	-	More than 10% and less than 50% of corridor is considered agriculture land.	0	One LPST site adjacent to the corridor. Not anticipated impacts.	+	Congestion relief by widening of an existing roadway.	-	Adjacent to 93 residential parcels, 3 schools, 1 daycare and 1 park.
Alt E	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	0	No impacts to NWI mapped features.	- -	Nine features are crossed by the corridor (Barrial Lateral, Clint Lateral, Clint Spur Drain, Franklin Canal, Green Lateral, Mesa Drain, Middle Drain (2x), and Salatral Lateral).	-	Less than 20% of corridor is located within the 100-year floodplain.	-	All of the habitat within the entire corridor does not match the MOU mapped habitat types. Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of the Pecos River Muskrat and sand prickly pear. Impacts to earthen drainage feature.	- -	More than 50% of corridor is considered agriculture. (55%)	0	No impacts to mapped sites.	0	Congestion relief by widening of an existing roadway.	-	Adjacent to 136 residential parcels and 4 churches.
Alt F	-	Crosses 6 Ceremonial Land parcels.	0	No impacts to mapped parks.	0	No impacts to NWI mapped features.	- -	Ten features are crossed by the corridor (unnamed drain, Clint Lateral, Franklin Canal, Green Lateral, Mesa Drain, Middle Drain (2x), River Drain, River Spur Drain, Salatral Lateral). Potential impacts to the Green Lateral (approx. 2,000 ft) located within the corridor.	-	Less than 20% of corridor is located within the 100-year floodplain.	-	Corridor is existing roadway and new location. Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Impacts to agriculture habitat. Within TXNDD mapped range of Pecos River Muskrat. Minimal habitat present within corridor.	- -	More than 50% of corridor is considered agriculture. (55%)	0	No impacts to mapped sites.	+	Congestion relief by widening of an existing roadway.	-	Adjacent to 8 residential parcels and 2 schools.
Alt N	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	0	No impacts to NWI mapped features.	0	No impacts to features.	0	Corridor is not located within the 100-year floodplain.	0	Existing habitat does not match mapped MOU habitat. Within TXNDD mapped range of sand prickly-pear and Pecos River Muskrat. No impacts as corridor is along existing roadway.	-	More than 10% and less than 50% of alternative is considered agriculture.	0	No impacts to mapped sites.	+	Congestion relief by widening of an existing roadway.	0	There are no adjacent sensitive receivers.
Alt D Mod	0	No impact to Tigua parcels.	-	Additional ROW adjacent to existing park (Bulldog Championship Park). Estimated 0.1 acre impact to park.	0	No impacts to NWI mapped features.	0	Three features are crossed by the corridor (Socorro Lateral, Franklin Drain, and Franklin Canal).	-	Less than 20% of corridor is located within the 100-year floodplain.	-	Corridor is existing roadway and new location. Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat.	-	More than 10% and less than 50% of the corridor is considered agriculture.	0	One LPST site adjacent to the corridor. No anticipated impacts.	+	Congestion relief by widening and construction of a new location roadway.	-	Adjacent to 79 residential parcels, 3 schools, 1 daycare and 1 park.
Alt I Mod-Rev (NEW)	-	Crosses 1 Ceremonial Land parcel	0	No impact to park land.	0	No impacts to NWI mapped features.	-	Seven features are crossed by the corridor (South Side Feeder Lateral, Socorro Lateral, Juan de Herrera Branch Canal, Juan de Herrera Main Lateral, Franklin Drain, Franklin Canal, and Middle Drain).	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Corridor is existing roadway and new location. Habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Impacts would occur to existing drainage features. Within TXNDD mapped range of Pecos River Muskrat.	-	More than 10% and less than 50% of the corridor is considered agriculture.	-	One MSWLF site and one PST site is mapped adjacent to corridor. These sites could potentially impact construction.	+	Congestion relief by construction of a new location roadway.	-	Adjacent to 117 residential parcels.
Alt I Mod (Old)	0	No impact to Tigua parcels.	0	No impact to park land.	0	No impacts to NWI mapped features.	- -	Six features crossed by the corridor (Franklin Canal, Juan De Herrera Branch Canal (2x), Juan De Herrera Lateral, Middle Drain, and Ysleta Lateral). Impacts to Juan De Herrera Branch Lateral (approx. 1,300 ft) located within the corridor.	-	Less than 20% of corridor is located within the 100-year floodplain.	-	Habitat within new location areas do not match the mapped MOU habitat. Minimal habitat present; however, impacts would occur to existing drainage features. Within TXNDD mapped range of Pecos River Muskrat. Threshold requiring additional coordination with TPWD per MOU would be exceeded.	-	Less than 50% and more than 10% of corridor is considered agriculture.	-	One PST site is located within the corridor and One MSWLF is located partially within corridor. The MSWLF does not appear to be active and is currently being utilized by other activities.	+	Congestion relief by construction of a new location roadway.	-	Adjacent to 144 residential parcels.
Alt L	-	Crosses 11 Ceremonial Land parcels.	0	No impacts to mapped parks.	- -	Impacts to mapped NWI features would exceed 0.50 acre.	- -	Eleven features are crossed by the corridor (Clint Lateral, Dolan Drain, Franklin Canal, Mesa Drain, Mesa Spur Drain, Middle Drain, River Drain, Rodriquena Lateral, Salatral Lateral, San Elizario Lateral, and Ysleta Lateral).	0	Corridor is not located within the 100-year floodplain.	- -	Alternative is primarily new location. Threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would occur to existing drainage features.	- -	More than 50% of land is considered agriculture.	0	No impacts to mapped sites.	0	Congestion relief by construction of a new location roadway. Adjacent to an intermodal freight distribution center.	-	Adjacent to 61 residential parcels.
Alt P	-	Crosses 11 Ceremonial Land parcels.	0	No impacts to mapped parks.	0	No impacts to NWI mapped features.	-	Eight features are crossed by the corridor (Clint Extension, Clint Lateral, Franklin Canal, Mesa Drain, Middle Drain, River Drain, Rivserside Intercepting Drain, and Salatral Lateral).	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Corridor is new location. Threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat and sand prickly-pear. Habitat for the muskrat is minimal. Potential habitat for the prickly-pear is present.	- -	More than 50% of corridor is considered agriculture.	0	No impacts to mapped sites.	0	Congestion relief by construction of a new location roadway. Connection to a nearby POE would likely increase truck traffic.	0	There are no adjacent sensitive receivers.
Alt Q	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	-	Potential impacts to more than 0.10 acre and less than 0.50 acre of NWI mapped features.	- -	Nine features crossed by the corridor (unnamed lateral Cuadrilla Intercepting Drain, Fabens Drain, Fabens Intercepting Drain, Franklin Canal, Mesa Drain, River Drain, River Outlet Drain, Riverside Canal, and Salatral Lateral). Impacts to the Fabens Drain (approx. 3,300 ft) located within the corridor.	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Corridor is new location. Threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat and sand prickly-pear. Potential habitat for the muskrat and prickly-pear is present.	- -	More than 50% of corridor is considered agriculture.	-	No impacts to mapped sites. However, corridor encroaches on airport runway/property that contains regulated materials.	0	Congestion relief by construction of a new location roadway. Connection to a nearby POE would likely increase truck traffic.	-	Adjacent to 2 residential parcels.

Border Highway East PEL Study
Level 3 Screening Detailed Evaluation Matrix
August 2014

Level 3 - Environmental Screening

Study Goals		Developing the facility utilizing context		Avoiding and/or minimizing impacts to the human and natural environment										Avoiding and/or minimizing impacts to the human and natural environment															
Criteria		Community Impacts						Cultural Resource Impacts						Natural Resource Impacts										Other Impacts					
		Neighborhood Character		Context Sensitive Solutions (CSS)		Socioeconomic and Environmental		Archaeological Resources		Historic Resources				Tigua Land		Park Land		Water Resources		Drainage Features		Floodplains		Biological Resources		Agricultural Resources		Hazardous Materials		Air Quality		Traffic Noise	
Measure		Impacts to existing and proposed neighborhoods		Design incorporates CSS principles (community needs and regional character), while also balancing system goals		Assessment was based on income, ethnic composition and Limited English Proficiency (LEP) along the alternatives.		Number of recorded archaeological sites and high probability areas (acres) potentially impacted		Based on level of importance scoring and potential to impact historic resources [NRHP-listed, NRHP-eligible, historic-age properties, historic trails, and Tigua traditional cultural places (TCPs)] (owned, trust, ceremonial lands)].		Potential Section 4(f) Analysis: Based on potential for significant impacts to resources with high level of importance.		Impacts to Ysleta del Sur Pueblo Land, Tigua Trust Land, and Ceremonial Land.		Impacts to known public parks		Number of surface water/wetland crossings		Affect to irrigation channels, canals, laterals, viaducts, etc.		Affect to floodplains		Potential to impact listed and non-listed, species and/or habitat, rare locally important species.		Existing agriculture land, farmland, grazing lands, or orchards converted to transportation use.		Number of existing hazardous material sites		Scored if alternative is located within and area of NAAQS non-attainment, its potential to increase diesel truck traffic, its proximity to intermodal freight facility, or its potential to improve air quality through congestion relief.		Scoring was based on number of adjacent receivers (residential parcels, schools, churches, daycares and parks)	
		Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Potential 4(f) (Y/N)	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation	Rating	Evaluation
Alt R Mod	New location arterial from I-10 / FM 793 to future BHE Connection - eastern bypass of Fabens. Modified to minimize parcel disruption	0	No impact to designated neighborhoods, outside of Fabens residential areas.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	0	No LEP or low income or high minority.	0	No impact to archaeological sites or cemeteries.	-	Alt R Mod would: 1) cross the individually listed Franklin Canal; and 2) cross canals of NRHP-listed EPCWID1.	No	With proper planning and engineering, the effects to EPCWD1 and the Franklin Canal could result as de minimus Section 4(f) determinations.	0	No impact to Tigua parcels.	0	No impacts to mapped parks.	-	No impacts to NWI mapped features. Aerial indicates possible arroyos are present.	-	Eight features crossed by the corridor (unnamed lateral, Alamo Alto Drain, Arroyo, Fabens Drain, Fabens Waste Channel, Hansen Lateral, Tornillo Canal, and Tornillo Intercepting #2 Drain).	-	Less than 20% of corridor is located within the 100-year floodplain.	- -	Corridor is primarily new location. Threshold requiring additional coordination with TPWD per MOU would be exceeded. Within TXNDD mapped range of sand prickly-pear. Potential habitat is present.	- -	More than 50% of corridor is considered agriculture.	- -	One MSWLF site is mapped adjacent to corridor and one PST site is within the corridor. Could potentially impact construction.	0	Congestion relief by construction of a new location roadway. Connection to a nearby POE would likely increase truck traffic.	0	There are no adjacent sensitive receivers.
Multimodal (Non-Roadway) Alternatives																																			
Transit Alternatives																																			
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd and enhance existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road.	0	Northern part of corridor is adjacent to various designated neighborhoods. Schools and places of worship adjacent to corridor. BRT would not impact existing infrastructure.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	+	Would provide an alternate mode of transportation with cost savings.	0	No impact to archaeological sites or cemeteries.	-	Alt TR1 would go through Tigua Trust Land and would cross canals of NRHP-listed EPCWID1.	Yes	Depending on the THPO's determination regarding TCPs, Alt TR 1 may or may not require a regular Section 4(f) analysis. With proper planning and engineering, the effects to canals of the EPCWID1 could result in a de minimus Section 4(f) determination.	0	No impact to Tigua parcels.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	+	Future transit route. Beneficial to air quality as it would potentially reduce number of vehicles on the roads.	0	Neutral because alternative would not involve traffic noise.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 3380/Manuel F. Aguilera Freeway and the Fabens International POE.	0	No impact to designated neighborhoods. Proposed transit route would pass through residential area of Tornillo, but no impacts to existing infrastructure with proposed transit.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	+	Would provide an alternate mode of transportation with cost savings.	0	No impact to archaeological sites or cemeteries.	0	No impacts.	No	N/A	0	No impact to Tigua parcels.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	0	No impacts anticipated as improvements are on existing roadways.	+	Future transit route. Beneficial to air quality as it would potentially reduce number of vehicles on the roads.	0	Neutral because alternative would not involve traffic noise.
Bicycle and Pedestrian Alternatives																																			
Alt BP 1	Provide Bike/Ped connection from proposed border trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso County Rural Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	++	Would provide an alternate mode of transportation with maximum opportunity cost savings.	0	No impact to archaeological sites or cemeteries.	-	Alt BP1 would: 1) cross a NRHP-listed EPCWD1 canal; and 2) pass by the NRHP-eligible Pena House near the intersection of Alameda Ave. and Horizon Blvd.	No	This alternative may require a Section 4(f) analysis, but with proper planning and engineering, it may result in a de minimus Section 4(f) determination, as long as the canals are left in place and their function is not affected; and if impacts to the Pena House property were avoided which seems likely because it is located southwest of the Franklin Canal (Alameda Ave. is located northeast of the Franklin Canal.	0	No impact to Tigua parcels.	0	No impact to park land.	0	No impacts to NWI mapped features.	0	Alternative crosses two features (Wadlington Lateral and Middle Drain).	0	Alternative is not located within the 100-year floodplain.	0	No impacts anticipated as improvements are adjacent to existing roadways.	0	No mapped agriculture land within alternative.	0	Two mapped LPST sites and two PST sites adjacent. No impacts anticipated.	0	Beneficial to air quality as it would potentially reduce number of vehicles on the roads by increasing availability to other modes of transportation.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	0	No impact to designated neighborhoods.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	++	Would provide an alternate mode of transportation with maximum opportunity cost savings.	0	No impact to archaeological sites or cemeteries.	- -	Alt BP 2 would: 1) cross Tigua Ceremonial Land; 2) cross canals of NRHP-listed EPWID1; 3) intersect with El Camino Real de Tierra Adentro National Historic Trail; and 4) intersect the Mission Trail Historic District.	Yes	Depending on the THPO's determination regarding TCPs, Alt BP 2 may or may not require a regular Section 4(f) analysis; because this alternative would probably enhance the recreational land of the Tiguas, it may not be an insurmountable issue. With proper planning and engineering, the effects of Alt BP 1 to EPCWD1 and to the El Camino Real de Tierra Adentro National Historic Trail and the Mission Trail Historic District could result in de minimus Section 4(f) determinations.	-	Crosses 2 Ceremonial Land parcels.	0	Alternative traverses a portion of the Rio Bosque Park.	0	Alternative crosses one NWI mapped wetland. Minimal impacts anticipated.	0	Alternative crosses two features (Franklin Drain and Riverside Canal).	0	Alternative is not located within the 100-year floodplain.	0	No mapped agriculture land within corridor.	0	No impacts to mapped sites.	0	Beneficial to air quality as it would potentially reduce number of vehicles on the roads by increasing availability to other modes of transportation.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 3	Provide Bike/Ped connection from proposed border trails along the Rio Grande to Socorro Rd for improved access to Socorro Entertainment Center.	0	No impact to designated neighborhoods. Within Tigua property, would provide positive enhancement for pedestrians.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	++	Would provide an alternate mode of transportation with maximum opportunity cost savings.	0	No impact to archaeological sites or cemeteries.	- -	Alt BP 3 goes through Ysleta del Sur Pueblo land; and 2) crosses the NRHP-listed canals of EPCWID1.	No	Per the April 8, 2014 meeting with the Ysleta del Sur Pueblo, a priority of the tribe is to increase the amount of recreational land and therefore, this proposal for a bike/ped connection appears to be compatible with those priorities and therefore is not anticipated to be an insurmountable issue even though it would be constructed on land owned by the tribe. With proper planning and engineering, the effects to the EPCWID1 structures could result in a de minimus Section 4(f) determination.	-	Crosses 17 Tigua Property parcels, 17 Trust Land parcels, and 17 Ceremonial Land parcels.	0	No impacts to park land.	0	No impacts to NWI mapped features.	0	Alternative crosses three features (Riverside Canal, River Drain, and Riverside Intercepting Drain).	-	Less than 20% of corridor is located within the 100-year floodplain.	-	Alternative is new location. Threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. Within TXNDD mapped range of Pecos River Muskrat. Impacts would be minimal.	-	More than 10% and less than 50% of alternative is considered agriculture.	0	No impacts to mapped sites.	0	Beneficial to air quality as it would potentially reduce number of vehicles on the roads by increasing availability to other modes of transportation.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.	0	No impact to designated neighborhoods. Portion of bike/ped connection would pass through Mission Trail Historic District, but no impacts to existing infrastructure are anticipated.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	++	Would provide an alternate mode of transportation with maximum opportunity cost savings.	-	Originates near one cemetery. Total score=10.	-	Alt BP 4 would be: 1) adjacent to NRHP-listed San Elizario Historic District; adjacent to Presidio Chapel of San Elizario; and 3) would cross drains of NRHP-listed EPCWID1.	No	Because this alternative proposes a bike and pedestrian connection rather than a road, with proper planning and engineering, the effects to San Elizario Historic District; Presidio Chapel of San Elizario; and the EPCWID1 structures may result in de minimus Section 4(f) determinations. Planning also required to avoid any disturbance to San Elizario Catholic Church Cemetery.	0	No impact to Tigua parcels.	0	No impacts to park land.	0	No impacts to NWI mapped features.	0	Alternative would cross one feature (River Spur Drain.	0	Alternative is not located within the 100-year floodplain.	0	No impacts anticipated as improvements are adjacent to existing roadways.	0	No mapped agriculture land within corridor.	0	No impacts to mapped sites.	0	Beneficial to air quality as it would potentially reduce number of vehicles on the roads by increasing availability to other modes of transportation.	0	No impacts from traffic noise associated with bike/ped connections.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5 along the Manuel Aguilera Hwy.	0	No impact to designated neighborhoods. Proposed transit route would pass through residential area of Tornillo, but no impacts to existing infrastructure are anticipated.	0	PEL process is considering community needs and stakeholder input, although more detailed design approaches and solutions will be completed during the NEPA and design phase.	++	Would provide an alternate mode of transportation with maximum opportunity cost savings.	0	No impact to archaeological sites or cemeteries.	-	This alignment crosses the NRHP-listed canals of EPCWID1.	No	Because this alternative proposes a bike and pedestrian connection rather than a road, with proper planning and engineering, the effects to EPCWID1 could result in de minimus Section 4(f) determinations.	0	No impact to Tigua parcels.	0	No impacts to park land.	0	No impacts to NWI mapped features.	-	Alternative crosses seven features (Alamo Alto Drain, Upper Tornillo Drain, Tornillo Intercepting #2 Drain, Tornillo Canal, Fabens Waste Channel, unnamed lateral, and Island Drain)>	-	Less than 20% of corridor is located within the 100-year floodplain.	0	Alternative is along existing roadway. Mapped habitat types do not match existing habitat. Within TXNDD mapped range of the sand prickly-pear. Impacts would be minimal.	-	More than 10% and less than 50% of alternative is considered agriculture.	0	No impacts to mapped sites.	0	Beneficial to air quality as it would potentially reduce number of vehicles on the roads by increasing availability to other modes of transportation.	0	No impacts from traffic noise associated with bike/ped connections.

Level 3 - Public Involvement Screening

Study Goals		Ensuring an open public participation process		Ensuring compliance with the MTP	
Criteria		Public Input			
Measure		Assessment of comments received during public meetings and stakeholder meetings, along with consideration for local resolutions of support.		Compatibility with programmed improvements	
		Rating	Evaluation	Rating	Evaluation
No Build Alt	Baseline condition, no additional improvements other than those already programmed (fiscally constrained)	- -	Public recognizes need for roadway improvements within the study area.	0	No Build Alt includes fiscally constrained projects, but does not include a border highway extension.
Roadway Alternatives Parallel to I-10					
Widen Existing Roadways					
Alt 1 Mod	Widen Socorro Rd. from Loop 375 to Alt I Mod, implement TSM/CSM improvement between Alt I Mod and Herring Rd.	+	PM Series 2: While residents expressed concern for minimizing impacts to Mission Trail and La Purisema Cemetery, residents recognized that improvements are necessary for Socorro Rd. Alt 1 Mod, would provide widening within the City of El Paso while also implementing intersection and other spot improvements throughout the Socorro Rd. corridor. PM Series 3: This alternatives was not included in the draft recommended alternatives presented to the public. The public did express concern over the existing congestion and need for improvement. Although this alternative is not recommended as part the BHE PEL Study, it is recognized that improvements are warranted and it is recommended that the City of Socorro initiate and implement spot improvements.	0	Not a programmed improvement.
Alt 3	Widen Alameda Ave. from Loop 375 to Herring Rd.	++	PM Series 2: 2 public meeting participants expressed favor for alternative PM Series 3: No public comments were received to date.	0	Not a programmed improvement.
Alt 5 Mod	Widen North Loop Drive from Horizon Blvd. to Clint Cutoff Rd.	++	PM Series 2: 1 participant voiced concern over safety at existing North Loop Dr. and Celum Rd intersection (near FM 1110). Farmer Stakeholder Mtg Oct. 2013: At the local farmer stakeholder meeting, held on Oct. 24, 2013, farmers noted that N. Loop Drive should be widened to 4 lanes. Also at this meeting, the farmers noted that it was very difficult/dangerous for trucks at the intersection of FM 1110 and N. Loop Dr. PM Series 3: 1 comment was received in favor of improving North Loop Dr.	0	Not a programmed improvement.
Alt 13 Mod-Rev	BHE-Mid Connection - utilizing FM 76 (Middle Island Road) roadway, terminating at the Manuel F. Aguilera Highway (FM 3380).	- -	PM Series 2: Proposed new alignment for Level 3, no public comments received to date. Farmer Stakeholder Mtg Oct. 2013: At the local farmer stakeholder meeting, held on Oct. 24, 2013, farmers suggested locating new roadways in the sand hills [near I-10] and to not "destroy what is left of this beautiful valley". PM Series 3: While the public recognizes the need for the future Border Highway, there was concern raised over destroying valuable agricultural land and bisecting existing farming parcels.	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 22	I-10 Mainlanes from Loop 375 to O.T. Smith Road (FM 1109)	+	PM Series 2: No public comments were received regarding improvements to I-10. PM Series 3: 2 comments received regarding favor to improve existing roads (including I-10) over constructing proposed Border Highway Extension.	+	A portion of this proposed alternative is included in the 2040 MTP. Project includes widening I-10 to eight-lanes, from FM 659 to Eastlake Blvd./Old Hueco Tanks Rd. MTP Project ID: I402X-CAP
New Location Roadways					
Alt 8	BHE-South Connection - Southside Rd from Loop 375 to Socorro Rd (Mod 1997 Alignment).	0	PM Series 2: 1 public meeting participant expressed favor for alternative because of buffer to Rio Bosque Park. 1 participant noted that the alternatives traverses EPCWID property. PM Series 3: This alternatives was not included in the draft recommended alternatives presented to the public. The public does recognize need for future Border Highway and no concern was voiced about this part of the study area.	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD Southside also identified in 2008 BHE Extension Study as the corridor to use for direct connectors to BHW.
Alt 9	BHE-South Connection - Pan American Dr. from Loop 375 to Socorro Rd (Mod 1997 Alignment).	+	PM Series 2: 1 public meeting participant expressed favor for alternative because of buffer to Rio Bosque Park. 1 participant noted that the alternatives traverses EPCWID property. PM Series 3: This alternative was part of the draft recommended alternatives presented to the public. The public does recognize the need for future Border Highway and no concern was voiced about this part of the study area. It was also noted that connectivity to Loop 375 is important.	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD Pan American identified in 2008 BHE Extension Study as the corridor for local traffic and access to Loop 375. Only improvements made included an extension of Pan American at Winn Rd to connect to BHE.
Alt 12	BHE-South Connection - from San Elizario terminating at Middle Island Road.	- -	PM Series 2: 3 public meeting participants expressed favor for alternative; 2 specifically opposed alternative because of concern about impact to homes along Rio Grande. Farmer Stakeholder Mtg Oct. 2013: At the local farmer stakeholder meeting, held on Oct. 24, 2013, farmers suggested locating new roadways in the sand hills [near I-10] and to not "destroy what is left of this beautiful valley". AYUDA Mtg April 2014: Additionally, residents of Petunia Dr. are vocal about opposition to Border Highway (input from AYUDA meeting (4/8/14)). PM Series 3: While the public recognizes the need for the future Border Highway, there was concern raised over destroying valuable agricultural land and bisecting existing farming parcels. Petunia Dr. residents were vocal about potentially being displaced from the future Border Highway.	+	A portion of this corridor has been identified as a project in the 2040 MTP. The project includes construction of a two-lane roadway from the Herring Rd. extension to the Tornillo-Guadalupe POE. MTP Project ID: P505D-MOD
Alt 15	I-10 EB FR from FM 1110 to O.T. Smith Road (FM 1109)	0	PM Series 2: No public comments were received regarding improvements to I-10. PM Series 3: No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 16	I-10 WB FR from FM 1110 to O.T. Smith Road (FM 1109)	0	PM Series 2: No public comments were received regarding improvements to I-10. PM Series 3: No public comments were received regarding improvements to I-10.	0	Not a programmed improvement.
Alt 17	BHE river running alignment through Socorro	0	PM Series 2: 3 public meeting participants expressed favor for alternative; 2 specifically opposed alternative; it was noted that this alternative would go through land planned to be converted to pond; 1 participant noted that the alternatives traverses EPCWID property. Tigua Mtg April 2014: A stakeholder meeting with the Ysleta del Sur Pueblo Indian Nation was held on April 8, 2014; the Nation expressed concern for alternatives traversing through their land, although the study team has taken action to minimize impacts to their property. PM Series 3: This alternative was part of the draft recommended alternatives presented to the public. The public does recognize the need for future Border Highway and no concern was voiced about this part of the study area. It was also noted that connectivity to Loop 375 is important and minimizing impacts to existing wetlands is important. There was also concern for accommodating the potential increase in number of visitors to the Rio Bosque Park in existing parking facilities.	+	This alternative has been included in the 2040 MTP as part of the Border Highway East Extension project. Project includes constructing two-lane roadway from Loop 375 to the Herring Road Extension. MTP Project ID: P505E-MOD
Cross-Connecting Roadway Alternatives					
Widen Existing Roadways					
Alt D	Widen Buford from Alameda to Socorro.	-	PM Series 2: 1 public comment was received concerning impacts to the Mission Trail at the Buford and Socorro intersection. PM Series 3: This alternatives was not included in the draft recommended alternatives presented to the public.	+	Extending corridor to Border Highway has been identified as a future project in the 2040 Horizon MTP. Project includes extending Belen Rd. to the future Border Highway.
Alt E	Widen San Elizario Rd (FM 1110) from N. Loop Dr. to Socorro Rd. Includes grade separation at UPRR.	+	PM Series 2: 7 public meeting participants expressed favor for alternative; additional comments were made concerning impacts to the San Elizario Catholic Church PM Series 3: This alternatives was not included in the draft recommended alternatives presented to the public.	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing new two-lane roadway from Alameda Ave. to North Loop Dr.

Level 3 - Public Involvement Screening

Study Goals		Ensuring an open public participation process		Ensuring compliance with the MTP	
Criteria		Public Input			
Measure		Assessment of comments received during public meetings and stakeholder meetings, along with consideration for local resolutions of support.		Compatibility with programmed improvements	
		Rating	Evaluation	Rating	Evaluation
Alt F	Re-align FM 1110 to Herring Rd from FM 1110 at N. Loop Dr. to future BHE. Includes grade separation at UPRR.	++	PM Series 2: 5 public meeting participants expressed favor for alternative; 1 participant opposed the connection to FM 1110 (formerly Alt M). At the meeting with Mayor Reinhardt, held on Oct. 24, 2013, the Mayor discussed a possible east/west Clint connection. PM Series 3: Public supported the upcoming FM 1110 project. It was noted that at the proposed intersection of Alternative F/Herring Rd. with Socorro Rd there are several schools and it currently, there is traffic here.	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing a new two-lane roadway from BHE to Riverside Rd. and rehabilitating existing Herring Road from Riverside Rd. to Alameda Ave. MTP Project ID: P520A-15A
Alt N	Widen FM 1110 from I-10 to North Loop Dr.	++	PM Series 2: 5 public meeting participants expressed favor for alternative PM Series 3: Comments received regarding favor to improve existing connections to I-10. Public supported the upcoming FM 1110 project.	+	A portion of this proposed corridor has been identified as a fiscally constrained project in the 2040 Horizon MTP. Project includes constructing new two-lane roadway from Alameda Ave. to North Loop Dr. and rehabilitating existing Clint Cutoff Rd. between North Loop Dr. and I-10. MTP Project ID: P520B-15A
New Location Roadways					
Alt D Mod	Improve Buford from Alameda to Socorro and extend west with a new 2-lane connection to the proposed Border Highway Extension.	+	PM Series 2: One comment was received regarding the original Alt D alignment, concerning the impacts to the Mission Trail at the Buford/Socorro intersection. This intersection would still be improved under Alt D Mod. City of Socorro Mtg July 2014: At a meeting held on 7/7/14 with TxDOT and the City of Socorro, the City voiced their support of an improved roadway in this part of the City as well as a connection to the proposed Border Highway Extension. PM Series 3: This alternatives was developed during the public meeting period and was not presented to public.	++	Extending corridor to Border Highway has been identified as a future project in the 2040 Horizon MTP. Project includes extending Belen Rd. to the future Border Highway. Additionally, the extension of Buford Rd to the future Border Highway is consistent with the City of Socorro's Comprehensive Master Plan (January 2013).
Alt I Mod-Rev (New)	Extend Old Hueco Tanks Rd. (2-lanes) from FM 76 to the proposed Border Highway Extension. A portion of the roadway would be utilize S. Nevarez Rd. and Winn Rd, while two segments of the roadway would be on new location.	+	City of Socorro Mtg July 2014: At a meeting held on 7/7/14 with TxDOT and the City of Socorro, the City voiced their support of an improved roadway in this part of the City as well as a connection to the proposed Border Highway Extension. PM Series 3: This alternatives was developed during the public meeting period and was not presented to public.	++	The extension of Eastlake Blvd/Old Hueco Tanks Rd identified in City of Socorro Comprehensive Master Plan (January 2013).
Alt I Mod (Old)	New connection from Old Hueco Tanks/ North Loop to Socorro Rd. w RR Grade Sep.	0	PM Series 2: Proposed modified alignment for Level 3, no public comments received to date. PM Series 3: This alternatives was not included in the draft recommended alternatives presented to the public.	0	Not a programmed improvement, but would extend from Old Hueco Tanks Rd project.
Alt L	New location arterial from I-10 to future BHE Connection / Socorro near Socorro city limit southern boundary.	++	PM Series 2: 5 public meeting participants expressed favor for alternative PM Series 3: Comments received regarding favor to provide new connections to I-10.	++	This proposed alternative is included in the 2040 MTP as various projects. First project includes extending Tiwa Blvd from BHE to Socorro Road, with a two-lane roadway. Second project includes extending Tiwa Blvd from Socorro Rd. to Alameda Ave. with a two-lane roadway. Third project includes construction a four-lane roadway from Alameda Ave. to I-10. MTP Project IDs: P512X-15A, P517A-15A, P517B-15A
Alt P	New location arterial from I-10 to future BHE Connection / Socorro mid-way between FM 793 and FM 1110.	+	PM Series 2: 1 public meeting participants expressed favor for alternative PM Series 3:Comments received regarding favor to provide new connections to I-10	0	Not a programmed improvement.
Alt Q	New location arterial from I-10 / FM 793 to future BHE Connection / Socorro - western bypass of Fabens.	0	PM Series 2: No public comments were received regarding Alternative Q. PM Series 3: Alternative was not presented at public meeting as a Draft Recommended Alternative.	0	Not a programmed improvement.
Alt R Mod	New location arterial from I-10 / FM 793 to future BHE Connection - eastern bypass of Fabens. Modified to minimize parcel disruption	+	PM Series 2: Alignment of Alt R was modified based on public comment received during the second public meeting series. No additional comments received to date on Alt R Mod. PM Series 3: Comments received in support of improving existing connections to I-10.	0	Not a programmed improvement.
Multimodal (Non-Roadway) Alternatives					
Transit Alternatives					
Alt TR 1	BRT along Alameda from Loop 375 to Horizon Blvd and enhance existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road.	+	PM Series 2: No comments were received about BRT route. PM Series 3: 2 public comments were received regarding enhancing existing bus services.	++	BRT on Alameda is included in the 2040 MTP. Sun Metro is the developing agency for these plans in El Paso.
Alt TR 2	Proposed extension of El Paso Rural County Transit Route 40 from stop 5 to proposed FM 3380/Manuel F. Aguilera Freeway and the Fabens International POE.	+	PM Series 2: No comments were received regarding proposed transit extension. PM Series 3: 2 public comments were received regarding enhancing existing bus services.	0	Extension not programmed with El Paso County Rural Transit.
Bicycle and Pedestrian Alternatives					
Alt BP 1	Provide Bike/Ped connection from proposed border trails along Old Hueco Tanks Rd. and Horizon Blvd to El Paso County Rural Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive.	+	PM Series 2: No comments were received regarding proposed bike/ped improvements. PM Series 3: 1 public comment were received regarding enhancing bicycle and pedestrian paths in study area.	0	Not a programmed improvement.
Alt BP 2	Provide Bike/Ped footbridge connection from Rio Bosque Park across Socorro Rd. to parking lot located across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.	++	PM Series 2: Participants expressed interest in providing better access to the park and providing pedestrian accommodations. PM Series 3: 1 public comment were received regarding enhancing bicycle and pedestrian paths in study area.	+	This alternative would provide a new entryway to the park from Socorro Road that is currently being designed and included in the Master Plan. It improves public access to the park and connects the park with the Mission Trail.
Alt BP 3	Provide Bike/Ped connection from proposed border trails along the Rio Grande to Socorro Rd for improved access to Socorro Entertainment Center.	+	PM Series 2: No comments were received regarding proposed bike/ped improvements. PM Series 3: 1 public comment were received regarding enhancing bicycle and pedestrian paths in study area.	0	Not a programmed improvement.
Alt BP 4	Provide Bike/Ped connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.	+	PM Series 2: No comments were received regarding proposed bike/ped improvements. PM Series 3: 1 public comment were received regarding enhancing bicycle and pedestrian paths in study area.	0	Not a programmed improvement.
Alt BP 5	Provide Bike/Ped connection from proposed Tornillo POE to route 40 Stop 5 along the Manuel Aguilera Hwy.	+	PM Series 2: No comments were received regarding proposed bike/ped improvements. PM Series 3: 1 public comment were received regarding enhancing bicycle and pedestrian paths in study area.	0	Not a programmed improvement.

Attachment D

Railroad Grade Crossing Delay and Level of Service Analysis

Border Highway East
Railroad Grade Crossing Delay and Level of Service Analysis

The Texas Department of Transportation – El Paso District (TxDOT) is assessing the long-term transportation infrastructure needs in southeastern El Paso County. The study of corridor transportation needs is in the initial phase, with the first step being the completion of the Planning and Environmental Linkages (PEL) process, which will compare transportation alternatives to determine potential solutions. These alternatives will be evaluated further in subsequent stages of project development. The Border Highway East (BHE) study area is bounded by Interstate 10 (I-10), the Rio Grande, Loop 375 and the future Tornillo-Guadalupe Port of Entry (POE) and O.T. Smith Road. Improvements within the study area are needed to address the following issues:

- Lack of connecting facilities and capacity along existing arterials linking to I-10 and Loop 375;
- High volumes of truck traffic along the existing arterials parallel to I-10 in the corridor impact mobility and safety;
- Lack of alternate cross-connecting routes between the neighborhoods / farms and I-10 that avoid at-grade rail crossings; and
- Limited integration of the existing transportation network with other existing and planned transportation modes.

These issues lead to increased vehicle delay for area residents, farmers, commuters, businesses, and emergency responders. The BHE PEL study will develop conceptual transportation alternatives to address the system capacity, system linkage, safety, and modal interrelationships issues mentioned above by:

- Improving mobility parallel to I-10 within the study area;
- Improving the Level of Service (LOS) along the primary arterials parallel to I-10;
- Improving transportation facilities that connect or are parallel to I-10 and Loop 375 to provide alternate routes of travel;
- Implementing Transportation Systems Management (TSM), Transportation Demand Management (TDM), and/or Intelligent Transportation Systems (ITS) improvements; and
- Improving or expanding existing transportation facilities for transit and non-motorized transportation (e.g. bicycles and pedestrians).

In summary, the purpose of the BHE PEL study is to develop transportation alternatives that improve mobility and safety in the BHE study area to help manage vehicle congestion, promote efficient use of existing transportation facilities, minimize impacts to the natural and built environment and complement other modes of transportation.

One element of improving safety and mobility in the corridor is an analysis of year 2040 grade crossing delays attributable to the Union Pacific Railroad (UPRR) single track main line, which parallels Alameda Avenue (SH 20) for the length of the study area. Within the study area, there are approximately 16 grade crossings and all study area cross-connecting (perpendicular to I-10) arterials cross the UPRR track; grade crossing delays occasioned by train passage were frequently mentioned at BHE public meetings as a source of frustration for travelers and concern for emergency responders.

It should also be noted that the *El Paso Region Freight Rail Study* (Phase II Final Report, July 2013) evaluated potential railroad operational and capital improvements in the El Paso region, and also identified potential grade-crossing improvements in the region that would facilitate efficient rail operations as well as reduce vehicle operating costs, reduce travel time, increase safety, and improve regional air quality. This study identified the Horizon Boulevard/Buford Road, FM 1110 and Fabens Drive grade crossings – from a railroad operations perspective – as potential candidates for grade-separation construction, citing positive cost/benefit ratios.

An analysis was therefore conducted of the projected Year 2040 grade-crossing delay at major arterials crossing the UPRR track, prioritizing the need for grade separations as part of the recommended roadway improvements. To this end, UPRR operating data (e.g., no. of daily through movements, speed, length, time of day) were obtained from the UPRR (summarized below) as a means to measure grade crossing vehicular delay. One daily Amtrak movement was also included in the analysis.

- Daily through movements: 25 to 36 scheduled trains
- Time of Day Operations: primarily daytime, but can occur at any time, 24 hours/day, 7 days/week. For purposes of this analysis, a worst case scenario of two UPRR and one Amtrak movements during the PM peak hour were assumed.
- Length:
    - UPRR train between 5,200 and 8,000 feet long
    - Amtrak train is 900 feet long
- Speed: Between 50 and 55 mph (speed limit is 70 mph)
- Check in and check out detector distances: 2,000 feet upstream of crossing, and 300 feet downstream. Given the train speed and length noted above, the average closure time at each crossing would be approximately 127, 93 and 40 seconds for the 8,000, 5,200 and 900-foot long train movements, respectively.

Grade crossings evaluated included Old Hueco Tanks Road (Moon Road) – Alternative I Mod, Horizon Boulevard – Alternative D, FM 1110 (Alternative E/F) and Fabens Road (FM 793) – Alternative Q/R Mod. The analysis was conducted using the 2040 regional travel demand model. The model was used to gather the average daily traffic (ADT) volumes for each of the above cross streets and a K-factor of 12 percent was applied to derive the peak hour volumes. **Table 1,** below presents the ADT and the peak hour volumes for the cross streets that were assumed in the analysis

Table 1: ADTs and Peak Hour Volumes

Cross streets	Direction	Number of lanes	ADTs	Peak Hour Volumes
Old Hueco Tanks (Alt I MOD)	EB	2	6636	796
	WB	2	6255	751
FM 1281 (Horizon Blvd, Alt D)	EB	2	7879	945
	WB	2	7568	908
FM 1110 (Alt M/ N1)	EB	2	8000	960
	WB	2	8000	960
Fabens (ALT Q)	EB	2	1073	129
	WB	2	1003	120

Using the above assumptions and volumes, the arrival times of the trains were distributed evenly during the peak hour at all the crossings under evaluation. To perform the analysis, VISSIM version 5.4-12 (a microscopic simulation software) was used to extract the delay at all of the at-grade crossings during the peak hour. Traffic volumes on nearby cross streets were not included in the impact analysis, as the data was not available for this preliminary analysis. Intuitively, it seems clear that inclusion of these volumes would magnify the impact. For example, Alameda Avenue runs parallel and close to the UPRR track for the length of the study area. Train passage during the peak hour would have some spillover effect on Alameda Avenue operations.

Table 2 shows the approach delay, intersection delay, approach LOS, intersection LOS, average queue and maximum queue that were recorded during the peak hour.

Table 2: Delay and LOS

Intersection	Approach Direction	Approach Volume (Output) (vph)	Approach Volume (Input) (vph)	Output / Input	Intersection (vph)	Mvmt. Delay Weighted by Volume (sec)	Delay (All Veh) by movement (sec)	Weighted Delay by Approach (sec)	Approach LOS	Intersection Delay (sec)	Intersection LOS	Avg Queue (feet)	Max Queue (feet)
Old Hueco Tanks	EB	787	796	99%	1549	6.5	6.5	6.5	A	6.29	A	15	458
	WB	762	751	101%		6.1	6.1	6.1	A			13	401
Horizon Blvd	EB	961	945	102%	961	6.7	6.7	6.7	A	6.30	A	20	572
	WB	911	908	100%		5.9	5.9	5.9	A			16	460
FM 1110	EB	971	960	101%	971	6.6	6.6	6.6	A	6.47	A	18	467
	WB	968	960	101%		6.3	6.3	6.3	A			20	563
Fabens	EB	121	129	94%	121	3.8	3.8	3.8	A	3.59	A	2	63
	WB	120	120	100%		3.4	3.4	3.4	A			1	57

In conclusion, given the year 2040 projected traffic volumes and the above assumptions, the average delay (in seconds/vehicle) and the maximum queue length (in feet) experienced during the train event does not have a significant adverse effect on traffic operations on the major cross streets within the BHE PEL study area. Each grade-crossing intersection continues to operate at LOS A. The maximum eastbound queue ranges from 63 feet (Fabens Drive) to 572 feet (Horizon Boulevard). The maximum westbound queue length ranges from 57 feet (Fabens Drive) to 563 feet (FM 1110). However, these delays will continue to have an adverse impact on emergency vehicle access to and from the areas impacted by the at-grade crossings. We therefore recommend that grade separations be implemented whenever possible along this study corridor.