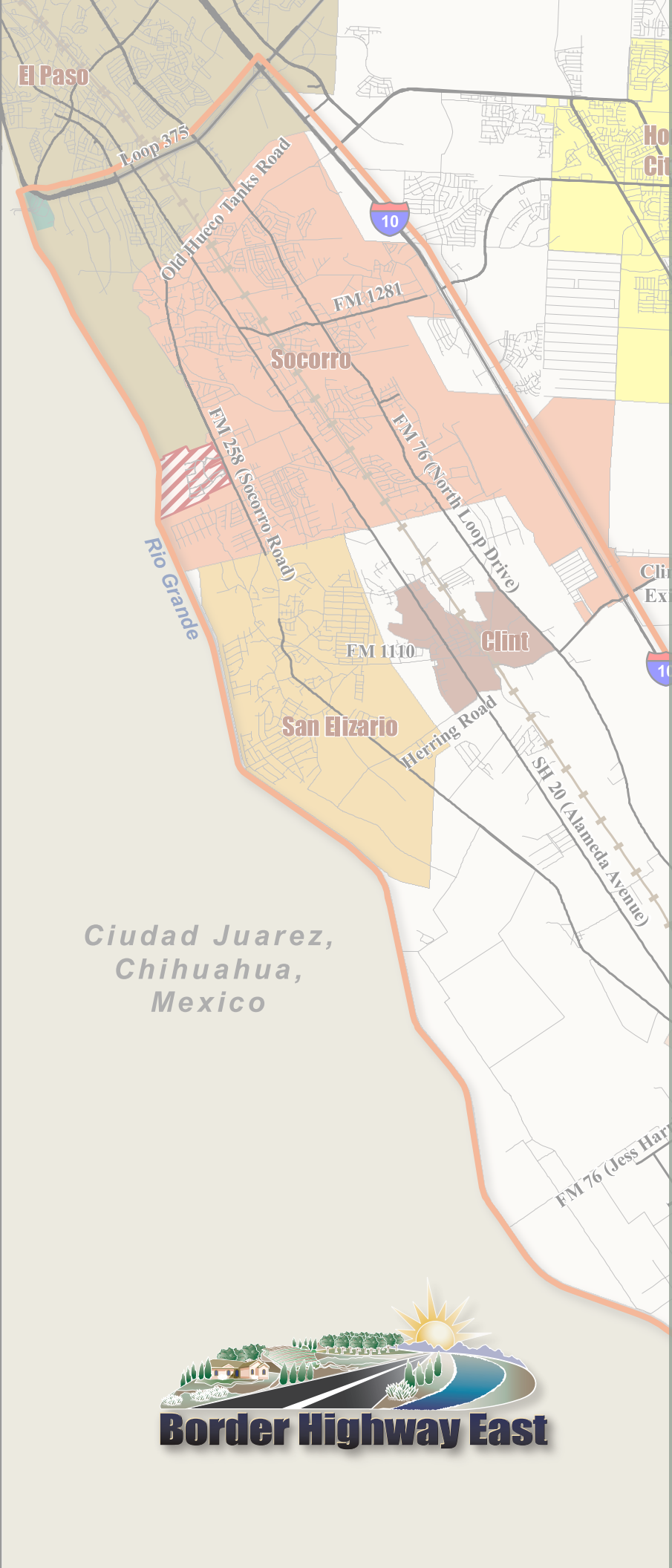


PLANNING AND ENVIRONMENTAL LINKAGES STUDY

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

AUGUST 2015

Texas Department of Transportation

TABLE OF CONTENTS

1.0 INTRODUCTION....1
2.0 PLANNING CONTEXT....2
3.0 STUDY OVERVIEW AND BACKGROUND INFORMATION....2
3.1 What is a PEL Study?....2
3.2 BHE PEL Study Overview....3
3.2.1 Purpose of the BHE PEL Study....3
3.2.2 BHE PEL Study Area....4
4.0 PREVIOUS STUDIES AND PLANS....7
4.1 1997 Border Highway Extension Feasibility Study....7
4.2 2006 County Route Study....7
4.3 Border Highway Extension-East (El Paso District) Pass-Through Tolling Analysis....8
4.4 2008 Comprehensive Mobility Plan....9
5.0 PURPOSE AND NEED....9
5.1 BHE PEL Study Goals....10
6.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION....11
7.0 ENVIRONMENTAL CONSTRAINTS AND AFFECTED ENVIRONMENT....11
8.0 ALTERNATIVES DEVELOPMENT....12
8.1 Alternatives Development....12
8.2 Description of Alternatives....14
8.2.1 No-Build Alternative....14
8.2.2 Build Alternatives....14
9.0 ALTERNATIVE SCREENING PROCESS AND RESULTS....15
9.1 Level 1 Screening Process and Results....15
9.2 Level 2 Screening Process and Results....16
9.3 Level 3 Screening Process and Results....17
10.0 RECOMMENDATIONS FOR NEPA....22
11.0 REFERENCES....23

LIST OF FIGURES

Figure 1: BHE PEL Study Area....6
Figure 2: Alternative Screening Process....14
Figure 3: 2040 Recommended Alternatives....21

LIST OF APPENDICES

Appendix A	BHE PEL Study Summary of Previous Studies Report
Appendix B	BHE PEL Study Environmental Constraints Report
Appendix C	BHE PEL Study Purpose and Need Technical Report
Appendix D	BHE PEL Study Agency Coordination Technical Report
Appendix E	BHE PEL Study Public Meeting Summary report Series #1, #2, and #3
Appendix F	BHE PEL Study Alternative Development and Screening Technical Report
Appendix G	BHE PEL Study Affected Environment Technical Report
Appendix H	BHE PEL Study NEPA Transition Report
Appendix I	BHE PEL Study Planning and Environmental Linkages Study Questionnaire
Appendix J	El Paso Metropolitan Planning Organization Resolution

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 National Environmental Policy Act (NEPA) studies.

In an effort to link planning studies to environmental processes that are compliant with NEPA, the Federal Highway Administration (FHWA) developed *Guidance on Using Corridor and Subarea Planning to Inform NEPA*, April 5, 2011. This guidance encourages the integration of initial highway and transit planning efforts into a NEPA process to minimize duplication of effort, number of review cycles, and project costs. Through the implementation of a PEL Study approach, the BHE analysis and planning activities were conducted with input from the resource agencies and the public.

The purpose of the BHE PEL Study is to develop conceptual transportation solutions that would address existing operational deficiencies, lack of connectivity to Interstate 10 (I-10) and Loop 375 (Americas Avenue), and anticipated future demand on the existing transportation network identified within the study area. The resulting planning documents identify the purpose and need for improvements, document the existing environment, determine possible viable alternatives for long-term solutions, and recommend preferred alternatives or projects that can be used to inform future NEPA phases of development.

Multiple technical reports are provided as appendices to this report in order to provide a record of the detailed analysis completed during this study. **Appendix A** provides a history of previous projects in the corridor. **Appendix B** supplies detailed information regarding the study area's environmental constraints. **Appendix C** includes the purpose and need statement and provides supporting information for the development of the recommended alternatives. **Appendices D** and **E** contain documentation of the agency coordination and public involvement efforts which have taken place since the inception of the BHE PEL Study. The alternative development and screening technical report, provided in **Appendix F,** describes the process and key technical findings used to screen alternatives and define the Recommended Alternatives. **Appendix G** provides a summary of the potential environmental impacts associated with the evaluated alternatives in the form of an affected environment technical report. **Appendix H** provides information on moving the 2040 Recommended Alternatives into the next phase of project development during NEPA. **Appendix I** is the *BHE PEL Study Planning and Environmental Linkages Study Questionnaire* which will be utilized by FHWA to determine if an effective PEL process has been followed and if the BHE PEL Study can be used as a resource for future NEPA documentation during the project-specific development process.

On August 21, 2015, the El Paso Metropolitan Planning Organization adopted the BHE PEL Study, incorporating its results and recommendations into the long-term planning process. The resolution is provided in **Appendix J**.

2.0 PLANNING CONTEXT

The El Paso Metropolitan Planning Organization (MPO) is responsible for long-range transportation planning in the greater El Paso metropolitan area. The most recently approved Metropolitan Transportation Plan (MTP) is the *Horizon 2040 MTP*. The MPO's MTP incorporates polices, goals and objectives, projected transportation demand, regional forecast of land use, housing and employment patterns/trends, and identifies over $9.4 billion in funded transportation improvements for the region over the 2013 to 2040 time period. The *Horizon 2040 MTP* was adopted by the MPO on October 4, 2013 and received conformity approval by the U.S. Environmental Protection Agency (EPA) on October 4, 2013.

Currently, a new two-lane divided roadway within the study area referred to by the El Paso MPO as the "Loop 375 Border Highway East", is listed in the *Horizon 2040 MTP*. This project would extend from Loop 375 to the Herring Road extension and is planned to be open to traffic by 2025. This roadway section and a new roadway between the Herring Road extension and the future Tornillo-Guadalupe International Port of Entry (POE) are included in the *Horizon 2040 MTP* project list approved by the Transportation Policy Board in March 2013; however, the PEL process may determine that further refinements to the MTP are required as project(s) are identified and recommended in coordination with El Paso MPO, other agencies, local communities, and the public.

3.0 STUDY OVERVIEW AND BACKGROUND INFORMATION

3.1 What is a PEL Study?

A PEL Study represents an approach that fosters a collaborative and integrated transportation decision-making process. A PEL Study is generally executed early in the transportation planning process when decision-makers consider environmental, community, and economic goals and carry these goals through to the project development and environmental review process, and ultimately through design, construction, and maintenance. The goal of the PEL is to create a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delay from planning through project implementation.[1]

PEL studies are generally more focused than regional planning efforts, but broader than traditional project-specific environmental analyses typically conducted during the NEPA process. The PEL studies, or corridor and subarea studies, can be used to produce a wide range of analyses or decisions for FHWA review, consideration, and possible adoption during the NEPA process for an individual transportation project, including:[2,3]

- Purpose and need or goals and objective statement(s);
- General travel corridor and/or general mode(s) definition;

[1] FHWA. 2008. *Planning and Environmental Linkages Implementation Resource Guide*.
[2] FHWA. 2011. *Guidance on Using Corridor and Subarea Planning to Inform NEPA*.
[3] AASHTO. 2008. *Using the Transportation Planning Process to Support the NEPA Process.*

- Preliminary screening of alternatives and elimination of unreasonable alternatives;
- Basic description of the environmental setting; and/or
- Preliminary identification of environmental impacts and environmental mitigation.

All corridor and subarea studies utilizing the PEL study approach must adhere to certain standards and must include extensive public involvement and agency coordination to advance to the NEPA process. The regulations for a PEL study are formalized in the *Statewide Transportation Planning; Metropolitan Transportation Planning; Final Rule* (23 CFR 450), which details how results or decisions of transportation planning studies may be used as part of the overall project development process consistent with NEPA. Appendix A to Part 450—*Linking the Transportation Planning and NEPA Processes* (23 USC 139) describes how information, analysis, and products from transportation planning can be incorporated into and relied upon in NEPA documents under existing laws.[4] Some of the key criteria that a Federal agency must consider in deciding whether to adopt planning-level analyses or decisions in the NEPA process include:[4]

- Involvement of interested state, local, tribal, and Federal agencies;
- Public review;
- Reasonable opportunity to comment during the development of the corridor or subarea planning study;
- Documentation of relevant decisions in a form that is identifiable and available for review during the NEPA scoping process and can be appended to or referenced in the NEPA document; and
- The review by FHWA and the Federal Transit Administration (FTA), as appropriate.

To help maximize the utility of the results from subarea or corridor plans to inform NEPA, FHWA has developed a PEL Questionnaire. The questionnaire is intended to act as both a guide and summary of the planning process and ease the transition from planning to NEPA analysis. The questionnaire is consistent with the planning regulations contained in 23 CFR 450 and other FHWA policies on the PEL process.

3.2 BHE PEL Study Overview

3.2.1 Purpose of the BHE PEL Study

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. These problems have been identified in previous planning studies. The *1997 Border Highway Extension Feasibility Study* (TxDOT 1997) initially identified the transportation needs in the Lower Valley. The communities of the Lower Valley include Socorro, San Elizario, Town of Clint, Fabens and Tornillo Census Designated Places (CDP). The study concluded that the anticipated growth of the City of El Paso and Ciudad Juarez, Mexico will continue to affect the communities of the Lower Valley

[4] FHWA. 2008. *Planning and Environmental Linkages Implementation Resource Guide*.

by bringing increased economic opportunities, as well as substantial challenges to the existing transportation system. Overall, the Lower Valley is experiencing a change from its primarily agricultural and rural communities to one of residential, commercial, and industrialized urban communities.

In addition to the 1997 study, the BHE PEL Study builds upon the results of previous planning studies, including:

- Projects identified in the current El Paso MPO regional transportation plan, *Horizon 2040* MTP;
- Projects identified in the El Paso County 2013 *Comprehensive Mobility Plan* (CMP); and
- Feasible route for the Border Highway extension identified in the *1997 Border Highway Extension Feasibility Study* (TxDOT 1997).

These documents have all identified a need for transportation improvements within the study area, but not all identified projects have advanced to the NEPA process for further development and impacts analysis. The PEL approach provides a tool for re-engaging the public and agencies in developing improvements within the study area and creates a link between past, current, and future transportation decisions, thus potentially minimizing any duplication of effort and time lost between studies. Additionally, the BHE PEL Study has the potential to shorten the time needed to implement a project by allowing planning-level decisions to be carried into future, more detailed environmental studies. Ultimately, the goal of the BHE PEL Study is to help plan for long-term transportation improvements within the Lower Valley region. In order to produce results that will be most useful to future NEPA studies, the BHE PEL Study:

- Engaged stakeholders (public, agencies, etc.) and the Tigua Sovereign Nation early and often throughout the planning process;
- Identified the transportation needs and issues within the study area;
- Identified potential solutions (alternatives)[5] to meet the identified needs, and evaluated them for their potential mobility benefits and impacts;
- Recommended viable transportation alternatives that can be carried forward into future, more specific environmental studies; and
- Documented all activities, coordination, and results related to the BHE PEL Study.

3.2.2 BHE PEL Study Area

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 CDPs. The northern limit of the study area is Loop 375 between the Zaragoza International POE

[5] The Recommended Alternatives identified during the BHE PEL Study are potential, individual projects that were developed to meet the needs of the study. It should also be noted that the Recommended Alternatives were only developed to be conceptual and do not include a defined alignment of an alternative.

and 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**.

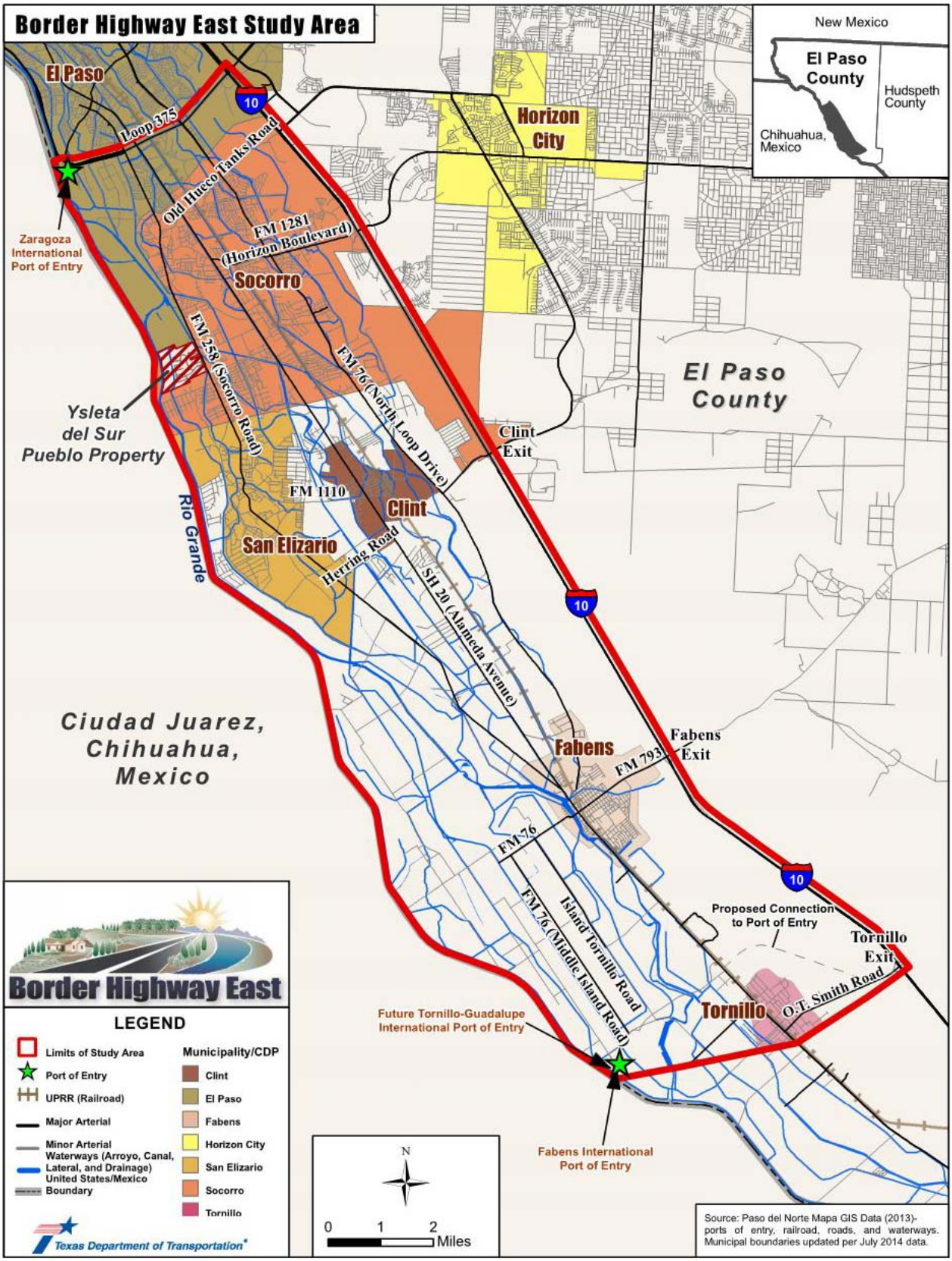
As shown on **Figure 1**, I-10 is the primary route through southwest El Paso County. North Loop Drive (Farm-to-Market 76 (FM 76)), Alameda Avenue (State Highway 20 (SH 20)), and Socorro Road (FM 258) are the primary arterials which provide routes from the City of El Paso to the southeastern portion of the county, the Lower Valley. The study area connects six local communities: City of Socorro, City of San Elizario, Town of Clint, Fabens CDP, the majority of the Tornillo CDP, and a small portion of the City of El Paso.

The study area is located within the El Paso MPO boundary, and is characterized as a mix of landscape features including an abundance of irrigated farmland situated along arroyos and canals running northwest to southeast in the study area's western and central portions, desert land in the eastern portion of the study area, scattered low-density suburban residential development mostly concentrated in the northern portion of the study area, and small pockets of low-density commercial and industrial land throughout.

Sun Metro and El Paso County Rural Transit provide public transportation services in the study area. Sun Metro completed the design phase for two of the four corridors of Sun Metro's Brio Rapid Transit System (City of El Paso 2013). In summer 2014, the Mesa Street corridor is anticipated to see Brio Rapid Transit System Service that offers similar benefits to light rail transit, such as improved speed and reliability, using 60-foot articulated vehicles. The Alameda Avenue corridor is anticipated to see the improved transit service in early 2016 (Sun Metro 2014).

Union Pacific Railroad (UPRR) also maintains and operates the railroad line that generally parallels Alameda Avenue through the study area. There are no other railroad lines within the study area.

Figure 1: BHE PEL Study Area



4.0 PREVIOUS STUDIES AND PLANS

There have been previous studies conducted within the BHE PEL study area. These studies have identified the need for transportation improvements in the study area but have not progressed to the environmental study or implementation phases of project development due to a lack of funding. This section summarizes the major plans and studies that are relevant to the BHE PEL Study, including the *1997 Border Highway Extension Feasibility Study* (TxDOT 1997), 2006 El Paso County Border Highway Extension-East route study, *Border Highway Extension-East (El Paso District) Pass-Through Tolling Analysis* and the *El Paso County Comprehensive Mobility Plan*. The *BHE PEL Study Summary of Previous Studies Report* (**Appendix A**) contains a detailed account of the previous studies conducted within the study area.

4.1 1997 Border Highway Extension Feasibility Study

The *1997 Border Highway Extension Feasibility Study* (TxDOT 1997) identified and analyzed constraints within the study area, assessed the existing transportation system, developed traffic projections, and considered alternatives. The southern limit of the 1997 study area differs from the BHE PEL study area. The 1997 study area extends further south of the Fabens International POE (future Tornillo-Guadalupe International POE). The differences in the study areas are illustrated on **Figure 2** in the *BHE PEL Study Summary of Previous Studies Report* (**Appendix A**).

The 1997 study integrated the public involvement process and technical evaluation to develop a purpose and need, analyze and screen alternatives, and determine a feasible alignment/route. The study concluded that based on travel demand in the 1997 study area, a new highway would best serve the corridor. The most feasible route would connect with Loop 375 approximately at Southside Feeder Road (Southside Drive) and continue along this road; cross the Riverside Canal to the north and across the Riverside International Industrial Center; cross the Riverside Canal once more and head southeast; cross the El Gran Valle, Las Azaleas and Bosque Bonito subdivisions; and continue in an easterly direction across mostly agricultural areas in the Lower Valley to its terminus at the Manuel F. Aguilera Highway (FM 3380). The alternatives developed during the 1997 study were considered and incorporated into the Universe of Alternatives developed for the BHE PEL Study.

4.2 2006 County Route Study

A proposed alignment was developed for the Border Highway Extension-East by El Paso County in 2006. The proposed alignment generally follows the U.S./Mexico International border. The proposed extension begins at Loop 375 near the Ysleta POE and traverses generally south terminating at the Fabens International POE (future Tornillo-Guadalupe International POE), connecting to the Manuel F. Aguilera Highway.

The proposed extension also included connections to existing roadways, including the following:

- Horizon Boulevard (FM 1281) via Belen Street;

- Timothy via Tiwa Boulevard;
- San Elizario Road (FM 1110) via Luisa Guerra Drive; and
- Chicken Ranch and FM 1110 via Saltillo Road.

The 2006 County Route Study was considered and incorporated into the Universe of Alternatives developed for the BHE PEL Study.

4.3 Border Highway Extension-East (El Paso District) Pass-Through Tolling Analysis

The *Border Highway Extension-East Pass-Through Tolling Analysis* document was prepared by TxDOT in January 2007. This document compared pass-through toll feasibility with conventional toll feasibility for the proposed Border Highway Extension-East. Four alternatives were analyzed: two pass-through tolling alternatives (Alternatives 1 and 2) and two conventional toll alternatives (Alternatives 3 and 4).

Alternative 1 assumed that a public or private entity would finance and construct the project and would be willing to accept a return on investment equal to the inflation rate. Under this alternative, TxDOT would repay the project cost by reimbursing, on behalf of the users, the amount that each user would pay in tolls if conventionally tolled, paid annually up to the cumulative amount equaling the total project cost, $279.2 million (2006 dollars). This alternative assumed a low-growth rate for the traffic and revenue forecast.

Alternative 2 also assumed that a public or private entity would finance and construct the project and would be willing to accept a return on investment equal to the inflation rate, same as Alternative 1. This alternative used the same project cost as Alternative 1, but assumed a high-growth rate for the traffic and revenue forecast based on the historical trends in the corridor, which resulted in a forecast that was higher than the 2030 TransCAD model.

Alternative 3 assumed that TxDOT would be the owner/operator of the facility, would finance through selling bonds, and would collect tolls from motorists to reimburse all or a portion of the construction financing, operations, and maintenance costs. Toll collection was assumed to be by means of an Electronic Toll Collection (ETC) Only method over a 40-year analysis period.

Alternative 4 assumed that TxDOT would be the owner/operator of the facility, and would finance through collecting tolls from motorists to reimburse all or a portion of the construction, operations, and maintenance costs. Toll collection was assumed to be by means of an ETC-Only method over a 40-year analysis period. Alternative 4 demonstrated the application of conventional tolling as an alternative funding strategy without bonding.

Based on the financial analysis, the Border Highway Extension-East, between Loop 375 and the Fabens International POE (future Tornillo-Guadalupe International POE), was not determined to be viable for tolling because the cost to build, operate, and maintain

the roadway would be greater than the revenue the tolling would generate. This tolling analysis conducted in 2007 was used to evaluate the viability of instituting toll collection on the alternatives developed in the BHE PEL Study.

4.4 2008 Comprehensive Mobility Plan

The *2008 Comprehensive Mobility Plan* (July 2008) was developed by the Partners for Mobility, which included El Paso MPO, the City of El Paso, Camino Real Regional Mobility Authority (CRRMA), and TxDOT. The Plan identified challenges in the region and developed solutions to address those challenges through mobility enhancements and agency partnerships.

On December 16, 2013, the El Paso Commissioners Court approved 16 transportation projects that had been presented by the County, TxDOT, and the CRRMA. The projects originated from the *2008 Comprehensive Mobility Plan* and would be included in the *2013 Comprehensive Mobility Plan*. Of the 16 approved projects, four projects are within the BHE PEL study area and are anticipated to be let for construction in 2015. The approved projects within the BHE PEL study area include:

- Old Hueco Tanks (Construct new four-lane road to extend Eastlake from North Loop Drive/FM 76 to I-10);
- FM 1110 Extension (Construct/upgrade to a four-lane, divided arterial from I-10 to Alameda Avenue);
- FM 1110/I-10 (Bridge Replacement); and
- FM 3380/Manuel F. Aguilera Highway Connection (Construct new location non-freeway facility from south of Alameda Avenue to I-10).

The *2008 Comprehensive Mobility Plan* was used during the development of the Universe of Alternatives to identify potential solutions.

5.0 PURPOSE AND NEED

A purpose and need statement was developed for the BHE PEL Study and was used to compare transportation alternatives and determine solutions that will be evaluated further in subsequent stages of project development. The following needs were identified during the BHE PEL Study:

- 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.).

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 *BHE PEL Study Purpose and Need Technical Report* (**Appendix C**) contains a detailed description of the conditions within the study area and provides data to support the need for major transportation improvements.

5.1 BHE PEL Study Goals

In addition to the purpose and need, the following goals and objectives were used to guide the PEL process and the development and evaluation of transportation solutions:

- 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.

6.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

As part of the public and agency participation process, TxDOT and the Study Team formed a Technical Work Group (TWG) to provide advice and recommendations regarding transportation needs and proposed improvements within the study area. The TWG met four times throughout the BHE PEL Study process to receive project updates and provide feedback and guidance. In addition to conducting meetings with the TWG, the Study Team also conducted one-on-one meetings with a number of key stakeholders and agencies, including the Tigua Sovereign Nation. Summaries of agency and stakeholder coordination conducted during the course of the BHE PEL Study are provided in the *BHE PEL Study Agency Coordination Technical Report* (**Appendix D**).

Three series of public meetings were held to provide a forum where the public could provide feedback on transportation needs and possible solutions in the study area. The first series of public meetings was held in November 2013 and focused on introducing the BHE PEL Study process and developing the purpose and need statement. The second series of public meetings was held in March 2014 and focused on presenting the Universe of Alternatives and the results of the Level 1 alternatives screening. In July 2014, a final series of public meetings was held to review the PEL process and present the draft recommended alternatives or projects. The *BHE PEL Study Public Involvement – Public Meeting Summary Reports* are provided in **Appendix E**.

The information obtained from the public involvement and agency coordination efforts will be used during the development of the specific project. The PEL stakeholders will continue to be engaged by TxDOT as projects identified during the PEL stage transition to NEPA.

7.0 ENVIRONMENTAL CONSTRAINTS AND AFFECTED ENVIRONMENT

Environmental resources were examined in the BHE PEL Study to establish a baseline context and generally describe the existing conditions within the study area. The resource information was also utilized during the alternatives screening process to broadly assess the potential impacts associated with each of the recommended alternatives.

The existing conditions for the following social, economic and environmental resources located within the study area were analyzed and documented:

- Utilities;
- Existing Transportation Infrastructure;
- Socioeconomic Factors;
- Land Use;
- Parklands and Recreation Areas;
- Natural Resources;
    - Vegetation

  - Wildlife Habitat and Migration Patterns
  - Threatened and Endangered Species
  - Waters of the U.S., including Wetlands
  - Floodplains
  - Soils
- Historic and Cultural Resources;
- Hazardous Materials;
- Traffic Noise; and
- Air Quality.

The *BHE PEL Environmental Constraints Report* (**Appendix B**) contains existing conditions/inventories for each of the resources listed above. The information contained in the Environmental Constraints Report was used throughout the alternatives screening process, which is further examined in the *BHE PEL Study Affected Environment Technical Report* (**Appendix G**). The Affected Environment Technical Report will serve as a starting point for further refinement in future, project-specific environmental analyses.

8.0 ALTERNATIVES DEVELOPMENT

This section describes the alternatives concept development process for the BHE PEL Study and provides summary descriptions for the three types of alternatives that were considered. Detailed descriptions of the alternatives, the screening process and methodology, results, and recommendations are provided in the *BHE PEL Study Alternatives Development and Screening Technical Report* (**Appendix F**).

8.1 Alternatives Development

The alternatives development process for the BHE PEL Study builds upon previous studies, and incorporates current technical analyses and input from the public and agencies. Previous planning efforts served as a starting point for developing the Universe of Alternatives under consideration in the BHE PEL Study.

The BHE PEL Study identified three general needs for transportation projects within the study area including inadequate system capacity, inadequate system linkage, and lack of model connectivity. The BHE PEL Study identified three types of alternatives to address these needs, including enhancing capacity of roadways parallel to I-10 (system capacity), improving transportation facilities that connect to I-10 to provide alternate routes of travel (system linkage), and enhancing transit, bus, and pedestrian options within the study area (modal connectivity). Alternatives identified in the BHE PEL Study were developed from various sources, including:

- Projects identified in the current El Paso MPO regional transportation plan, *Horizon 2040 MTP*;
- Projects identified in the El Paso County 2013 CMP;
- Feasible route for the Border Highway extension identified in the *1997 Border*

Highway Extension Feasibility Study;

- Projects identified from future traffic demand using the Horizon 2040 traffic demand model; and
- Public input (documented in **Appendices D** and **E)**.

The identified needs and recommendations from these planning efforts were considered and were encompassed in the Universe of Alternatives.

Development of alternative concepts for the BHE PEL Study involved a three level screening and evaluation process.

- Level 1 was a fatal flaw evaluation that screened alternatives against the BHE PEL Study purpose and need statement. The alternatives that passed the fatal flaw screening were then considered Preliminary Alternatives.
- Level 2 further refined the Preliminary Alternatives by qualitatively assessing the alternatives against evaluation criteria established from the study goals. The criteria were grouped into categories, including: engineering, cost feasibility/effectiveness, environmental, and public involvement. The alternatives that moved forward from the Level 2 screening were considered Reasonable Alternatives.
- Level 3 further refined the Reasonable Alternatives by quantitatively assessing the alternatives against the evaluation criteria, established from the study goals. The alternatives that passed the Level 3 screening are the Recommended Alternatives.

An overview of the alternatives development and screening process utilized for the BHE PEL Study is provided in **Figure 2**.

Figure 2: Alternative Screening Process

8.2 Description of Alternatives

8.2.1 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 the *Horizon 2040 MTP*).

The No-Build Alternative provides a baseline to gauge how effective various build alternatives would 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.

8.2.2 Build Alternatives

Alternatives were developed to address the various needs identified in the study area. Three general needs were identified for improvement: 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 and FM 3380). 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 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 future Tornillo-Guadalupe International POE) to Loop 375 and I-10. Alternatives were identified to address inadequate 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 inadequate 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 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 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 that address 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 Public Meetings.

9.0 ALTERNATIVE SCREENING PROCESS AND RESULTS

This section describes the three alternative screening levels that were utilized to evaluate the alternatives of the BHE PEL Study. The three levels of screening were defined in the *BHE PEL Study Alternative Screening Methodology.* More detailed information regarding the alternative development, screening, and results can be found in the *BHE PEL Study Alternatives Development and Screening Technical Report* (**Appendix F**).

9.1 Level 1 Screening Process and Results

The Level 1 alternative screening process was conducted to identify those alternatives that passed the fatal flaw evaluation. The screening criteria utilized focused on high-level, qualitative measures that were directly related to the purpose and need. Based on the fatal flaw evaluation, alternatives that were determined to meet the purpose and need (addressed inadequate system capacity, inadequate system linkage, or lack of model connectivity) were carried forward to the next evaluation phase.

Each alternative included in the Universe of Alternatives, which included 61 roadway alternatives and seven non-roadway, or multi-modal alternatives, was examined with regard to the Level 1 screening criteria and a score was assigned based on the assessment criteria. Eight roadway alternatives were determined to not meet the purpose and need of the study and were therefore eliminated from further study.

The alternatives moving forward from the Level 1 screening are known as the Preliminary Alternatives. 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. The Preliminary Alternatives were evaluated against the study goals during the Level 2 screening process.

9.2 Level 2 Screening Process and Results

The Level 2 alternative screening process included evaluating the Preliminary Alternatives against detailed screening criteria 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 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.

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

The Preliminary Alternatives moving forward from the Level 2 screening process are known as the Reasonable Alternatives. This set of alternatives included 11 roadway alternatives parallel to I-10, 13 roadway alternatives connecting to I-10, and seven non-roadway alternatives.

9.3 Level 3 Screening Process and Results

The Level 3 alternative screening process involved a thorough evaluation of the Reasonable Alternatives identified from the Level 2 alternatives screening. Reasonable 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 based on the same range of criteria and measures as the Level 2 screening.

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 typical sections. The result of this final level of screening was used to identify the Recommended Alternatives or projects to be carried forward to the next phase of project development.

During the Level 3 alternatives screening, alternatives were grouped together to create functional corridors that would work together to meet the purpose and need and study goals of the BHE PEL Study. These functional corridors were compared to ratings and travel performance to determine the Recommended Alternatives.

The Level 3 screening process resulted in the recommendation of 10 roadway corridors, which were comprised of various alternatives. Additionally, the 7 non-roadway alternatives were recommended for further evaluation. The non-roadway alternatives would not provide the additional capacity needed to meet future demand on the roadway network; however, these alternatives are recommended to be implemented in conjunction with the roadway alternatives.

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.

The Recommended Alternatives are illustrated in **Figure 3**. The following is a description of the Recommended Alternatives:

Roadway Alternatives

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 to Horizon Boulevard.

Border Highway Extension

The northern portion of the Border Highway Extension utilizing **Alternative 9** was considered a Recommended Alternative because it would utilize Pan American Drive, which provides access to Loop 375. Continuing south of Pan American Drive, the Border Highway Extension would include **Alternative 17** and a portion of **Alternative 12** to Herring Road. This series of alternatives 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.

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. **Alternative 13 Mod-Rev** would utilize existing TxDOT right-of-way along Middle Island Road (FM 76).

I-10 Improvements

Improvements to I-10 are recommended and include **Alternative 22**, mainlane widening from Loop 375 to O.T. Smith Road (FM 1109), 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 because the 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. This alternative is 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 that would 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. Because 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.

Non-Roadway Alternatives

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.

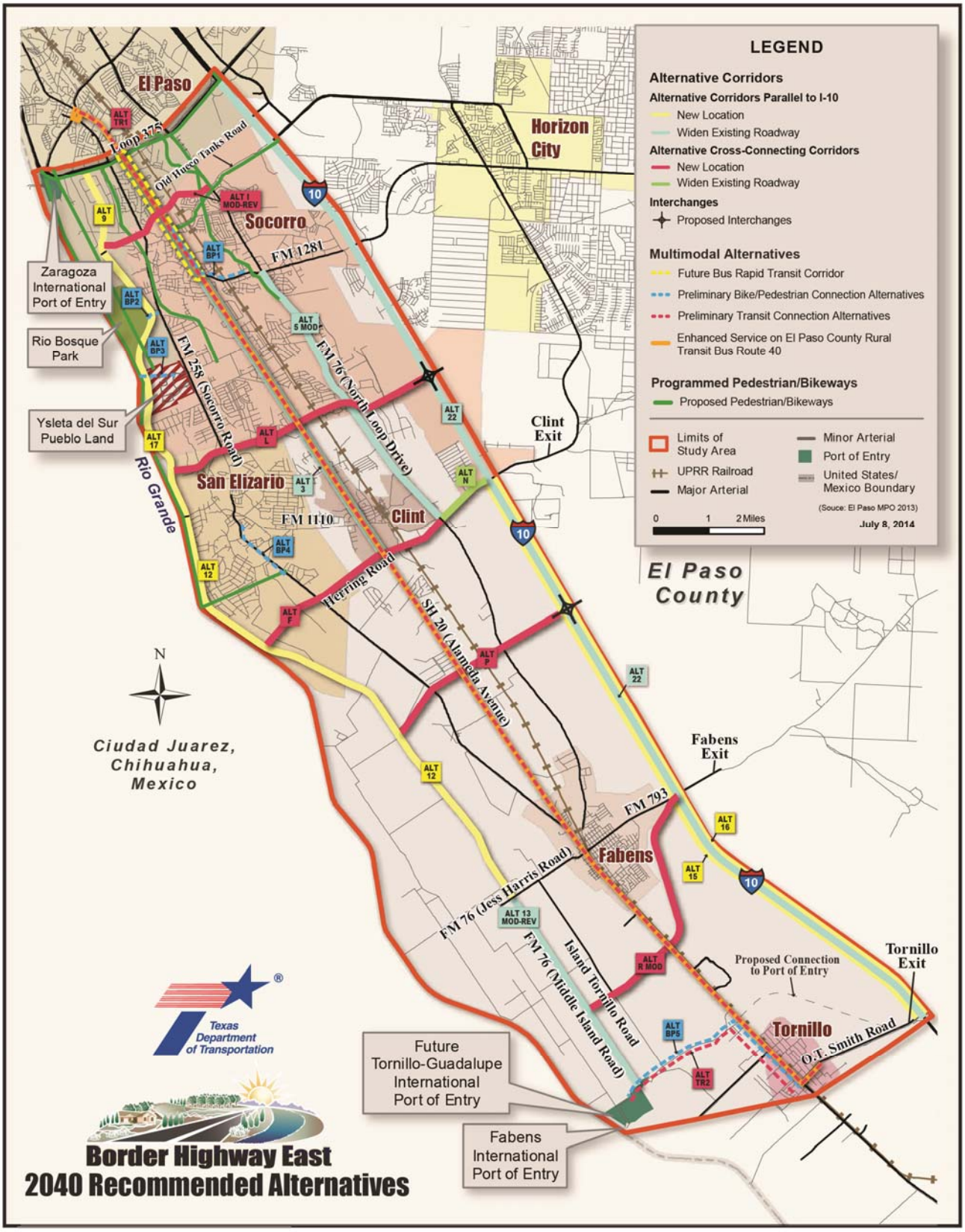
Alternative BP-2 is a proposed bicycle/pedestrian footbridge connection to Rio Bosque Park from a parking lot across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road.

Alternative BP-3 is a proposed 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 is a proposed 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 is a proposed 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 terminating at the O.T. Smith Road at Alameda Avenue.

Figure 3: 2040 Recommended Alternatives



10.0 RECOMMENDATIONS FOR NEPA

Based on the results of the screening process, it is recommended to carry forward 10 roadway corridors into the NEPA process. The set of recommended alternatives involve the construction of additional roadway capacity on existing facilities and the construction of new location alternatives throughout the study area. It was determined that these roadway improvements would improve system linkage, system linkage, and modal connectivity in accordance with the purpose and need and study goals defined by the Study Team, agencies and the public.

Project-specific determinations regarding the proposed number of lanes to add to existing facilities or construct on new location, construction approaches (i.e., elevated, at-grade, depressed, or some combination thereof), exact roadway location, and project funding or tolling remain to be analyzed and decided upon through the NEPA process. These options and recommendations are further detailed in the *BHE PEL Study NEPA Transition Report* (**Appendix H**).

The *BHE PEL Study Planning and Environmental Linkages Study Questionnaire* (**Appendix I**) provides a summary, in the format of questions and answers, describing the steps completed and the methodology utilized during the PEL process. The questionnaire is consistent with 23 CFR 450 (Planning regulations) and other FHWA policy on the PEL process.

11.0 REFERENCES

City of El Paso. Mass Transit – Sun Metro: Summary of the Year. Web. December 2013. http://annualreport.elpasotexas.gov/sunmetro.php.

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

County of El Paso, CRRMA, TxDOT. 2013. *2013 El Paso County Comprehensive Mobility Plan* Presentation to the El Paso Commissioners Court on December 16, 2013.

El Paso MPO. *Horizon 2040 Metropolitan Transportation Plan*. October 2013. Web. November 2013. http://www.elpasompo.org/MTPDocs/HorizonMTPFinalCOMP.pdf

Partners for Mobility. 2008 Comprehensive Mobility Plan. July 2008. Available online at: http://www.elpasomobility.org/pdf/2008-comprehensive-mobility-plan.pdf.

Sun Metro. City of El Paso: Sun Metro Legislative Briefing Presentation. Updated March 2014. Available online at: http://www.sunmetro.net/pdf/legisagenda.pdf.

Texas Department of Transportation – El Paso District. “Border Highway Extension Feasibility Study.” February 1997. Print.

Texas Department of Transportation – El Paso District. *Border Highway Extension-East (El Paso District) Pass-Through Tolling Analysis*. Prepared by HNTB Corporation. January 2007.

Texas Secretary of State. “What is a Colonia?” December 2010. Web. December 2010. http://www.sos.state.tx.us/border/colonias/what_colonia.shtml