Border Crossing Travel Time Study

FINAL Study Report
Volume II: TxDOT Laredo District

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Final Report
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1.0 INTRODUCTION

RJ RIVERA Associates, Inc. (RJRA) was contracted by the Texas Department of Transportation (TxDOT) Transportation Planning and Programming Division (TPP) to conduct a Border Crossing Travel Time Study. This report documents the outcomes of that study for the TxDOT Laredo District.

1.1 Study Overview

The purpose of the Border Crossing Travel Time Study was to conduct a targeted assessment of short-term improvement options for passenger and freight flow on roadways within the immediate study area of each international border crossing. Based upon travel time analysis of passenger cars and freight flow, the study identified and documented traffic congestion and operational and safety deficiencies on both the state system and local roadways on the US side, leading to and from the 26 Texas-Mexico international border crossings within the three TxDOT Districts (El Paso, Laredo, and Pharr) along the Texas-Mexico border. The study will also identify low cost (short-term) improvements that could be implemented within a five-year timeframe.

The major elements of the study included Regional Technical Work Group (RTWG) meetings, stakeholder meetings, traffic data collection, travel time runs along routes near the border crossings and the development and evaluation of alternatives. The study also included:

- Developing conceptual drawings,
- Collecting environmental data,
- Evaluating environmental impacts
- Developing traffic models, and
- Preparing preliminary construction, right of way (ROW) and mitigation cost estimates

The following TxDOT Laredo District crossings were evaluated as part of the 26 Texas-Mexico international border crossings included in the study. To read more about the other crossings included in the study, please refer to Volumes I and III of the Border Crossing Travel Time Study Report.

- Gateway to the Americas Bridge
- Juarez-Lincoln Bridge
- Laredo-Colombia Solidarity Bridge
- World Trade Bridge
- Eagle Pass Bridge 1
• Camino Real International Bridge
• Del Rio-Ciudad Acuña International Bridge
• Lake Amistad Dam Crossing
1.1.1 Gateway to the Americas Bridge

The Gateway to the Americas Bridge (Gateway to the Americas) Crossing is located in Laredo, Texas. The crossing, which is known locally as “Bridge #1”, is located in downtown Laredo on Convent Ave. near its intersection with US 83. As shown in Figure 1, the study area will encompass a five-mile stateside-radius from the Gateway to the Americas Crossing.


Figure 1 – Gateway to the Americas Crossing Study Area NTS

1.1.2 Juarez-Lincoln Bridge

The Juarez-Lincoln Bridge (Juarez-Lincoln) Crossing is located in Laredo, Texas. The crossing, which is known locally as “Bridge #2” is located in downtown Laredo on San Dario Ave. near its intersection with US 83. San Dario Ave. turns into IH 35 north of US 83. As shown in Figure 2, the study area will encompass a five-mile stateside-radius from the Juarez-Lincoln Crossing.


Figure 2 – Juarez-Lincoln Crossing Study Area NTS
1.1.3 Laredo-Colombia Solidarity Bridge

The Laredo-Colombia Solidarity Bridge (Colombia) Crossing is located in Webb County and 19.5 miles from downtown Laredo, Texas. The crossing is located on FM 255 near its intersection with FM 1472, locally known as Mines Rd. As shown in Figure 3, the study area will encompass a five-mile stateside-radius from the Colombia Crossing.

1.1.4 World Trade Bridge

The World Trade Bridge (World Trade) Crossing is located in Webb County and four miles from downtown Laredo, Texas. The crossing is located on LP 20, locally known as Bob Bullock Loop near its intersection with FM 1472, locally known as Mines Rd. As shown in Figure 4, the study area will encompass a five-mile stateside-radius from the World Trade Crossing.
1.1.5 Eagle Pass Bridge 1

The Eagle Pass Bridge 1 (Eagle Pass) Crossing is located in Eagle Pass, Texas. The crossing is located on US 57, locally known as E. Garrison St., near its intersection with Spur 240, locally known as Commercial St. As shown in Figure 5, the study area will encompass a five-mile stateside-radius from the Eagle Pass Crossing.
1.1.6 Camino Real International Bridge

The Camino Real International Bridge (Camino Real) Crossing is located in Eagle Pass, Texas. The crossing is located on S. Monroe St., about one-half a mile south of the Eagle Pass Crossing. Approximately one mile northeast of the crossing, S. Monroe St. intersects FM 1021. As shown in Figure 6, the study area will encompass a five-mile stateside-radius from the Camino Real Crossing.

Figure 6 – Camino Real Crossing Study Area NTS
1.1.7 Del Rio-Ciudad Acuña Bridge

The Del Rio-Ciudad Acuña Bridge (Del Rio) Crossing is located in Del Rio, Texas. The crossing is located on US 277S/Spur 239. As shown in Figure 7, the study area will encompass a five-mile stateside-radius from the Del Rio Crossing.


Figure 7 – Del Rio Crossing Study Area NTS

1.1.8 Lake Amistad Dam Crossing

The Lake Amistad Dam Crossing (Lake Amistad Dam) Crossing is located in southern Val Verde County. The crossing is located on Spur 349 and US 90. As shown in Figure 8, the study area will encompass a five-mile stateside-radius from the Lake Amistad Dam Crossing.


Figure 8 – Lake Amistad Dam Crossing Study Area NTS

1.2 Report Overview

The purpose of this report is to delineate the activities and efforts undertaken as part of the Border Crossing Travel Time Study. The study team began by defining the need and purpose and determining the goals and objectives of the study. These efforts were followed by collecting field and traffic data, developing initial alternatives, conducting stakeholder input meetings, refining and screening the alternatives, and providing study recommendations for each border crossing in the TxDOT Laredo District. These items are discussed in order along with descriptions of the actions taken to complete each activity. Individual technical memorandums, which were developed as part of the study, are also incorporated in this report.

1.2.1 Study Approach

The study team employed a study approach that utilized an iterative process by which data was collected and analyzed to develop an initial list of alternatives that were systematically refined and reduced to a list of recommendations. Figure 9 illustrates how stakeholder involvement efforts ran parallel to this process and provided feedback at key points throughout the study. Opportunities for input included two RTWG meetings specific to the TxDOT Laredo District, a bilingual study website and hotline, and numerous individual stakeholder meetings.

![Figure 9 – Study Approach](image-url)
1.2.2 Need and Purpose
The study team began by identifying the Need and Purpose for a study of transportation infrastructure improvements near each border crossing. The findings constitute the Need and Purpose of the study and documents why transportation improvements are needed within a specific study area. It recognizes the problems and shortcomings of the present transportation system and declares that they can be solved with system improvements, in this case, through low cost, short-term improvements that can be implemented within a five-year timeframe. Chapter 2.0 details the information gathered by the study team for documenting the Need and Purpose.

1.2.3 Goals and Objectives
The Goals and Objectives provide a framework and a guide for the study. It identifies the benefits the study should provide and establishes the acceptable level of negative consequences that can occur. Chapter 3.0 gives more detail on the Goals and Objectives developed for the Border Crossing Travel Time Study.

1.2.4 Preliminary Constraints Map
With the Need and Purpose documented and the Goals and Objectives identified, a preliminary constraints map was developed for each crossing study area that identifies relevant features that may be impacted by the proposed improvements. In distinguishing possible constraints, the study team is able to develop options that minimize negative impacts in later steps. Chapter 5.0 describes the efforts in generating the Preliminary Constraints Map for this study.

1.2.5 Initial Alternatives
In the initial alternatives step of the process, the study team identified possible operational and safety improvements for each border crossing. While these initial alternatives may or may not be feasible, it is important to consider all possible options so as not to eliminate any options without thorough analysis. Development of initial alternatives is further defined in Chapter 6.0.

1.2.6 Initial Alternatives Screening
The initial alternatives screening involved narrowing down the initial alternatives to a manageable number of alternatives for detailed analysis. The initial screening included the elimination of alternatives that did not fulfill the Need and Purpose or comply with Goals and Objectives for the particular border crossing in question. Initial alternatives were also eliminated if they did not adhere to the cost, implementation, and geographical parameters set forth in the scope of services for the study. The study team’s efforts and methods for initial alternatives screening are explained in Chapter 7.0.

1.2.7 Refined Alternatives
The alternatives remaining after the initial screening were developed in more detail into refined alternatives. This involved combining alternatives, expanding the limits of construction, or adding elements that complement the initial intent of the alternative to yield a greater benefit. Alternatives were also reviewed for general compliance with established design standards and avoidance of constraints identified on the previously prepared maps. Alternatives were
modified accordingly to meet minimum requirements. The refined alternatives are noted in Chapter 7.0.

1.2.8 Detailed Analysis for Screening Criteria Development
After refinement, the alternatives were subjected to detailed analysis. This state of analysis involved more in-depth qualitative and quantitative study. The results of the quantitative analysis are numerical indications of the level of negative impacts, traffic operation measures of effectiveness, and preliminary cost estimates. The study team’s detailed analysis is described in Chapter 7.0.

1.2.9 Final Screening
Once the detailed analysis was completed and input from all parties involved in the study was collected, recorded, and considered, the study team performed the final screening of alternatives. In this step, the study team was required to make decisions as to which alternative(s) best fulfills the need, purpose, goals, and objectives of the study. The decision involves consideration of what impacts are more acceptable than others and how the cost of an alternative is related to its benefits. Final Screening is discussed in Chapter 7.0.

1.2.10 Recommended Alternatives
The results of the final screening are the recommendations for each of the 26 border crossings evaluated by the study. The recommended alternative for each crossing can be a build alternative or it may be a “no-build” alternative. The recommended alternatives and the reasoning behind their selection are located in Chapter 11.0.
2.0 NEED AND PURPOSE FOR IMPROVEMENTS

Need and Purpose statements were developed for each border crossing. Currently, there are 26 international border crossings between the United States and Mexico in the state of Texas. These crossings are a link between the two countries and communities on both sides of the international border and they serve an essential component of daily life. Their direct impact to daily commuting, the economy and cultural ties are significant.

For years, population growth, increased trade, and greater mobility by the citizens of both countries has resulted in a greater strain on the ability of these crossings, and their surrounding infrastructure, to keep up with the demands of their users. The strain on the system is becoming increasingly evident in the form of recurring congestion and increased travel times.

While extensive efforts have gone into the analysis and design of ports of entry (POE) and major roadway networks surrounding the POEs to improve overall operations of border crossings, the ability to identify smaller needs and short-term improvements that can provide timely, incremental improvements to mobility in the immediate area of each border crossing should not be overlooked.

This section of the report incorporates the Need and Purpose Statements developed for TxDOT Laredo District Bridges.

2.1 Gateway to the Americas Crossing

2.1.1 Existing Conditions
The Gateway to the Americas Crossing is a tolled facility that handles privately owned vehicles (POV) and pedestrian traffic. The bridge facility is accessed southbound from Santa Maria Ave. and northbound via Convent Ave. These roadways are three-lane and two-lane streets, respectively. See Figure 10 and Figure 11 for street typical sections. The bridge is a four-lane facility, two lanes in each direction. Pedestrian accommodations exist on both sides of the bridge both sides of the roadway width. The total length of the bridge is 1,050 ft., and it operates 24 hours a day for POV only.

Convent Ave. and Santa Maria Ave. run north and south and intersect with Matamoros St. and Houston St. that connect to IH 35 and US 83.
2.1.2 Previous Plans and Studies
In 2006, the TxDOT International Relations Office (IRO) produced a publication that listed the existing and proposed bridges along the Texas-Mexico border. The publication also described the permit process between the United States and Mexico for a proposed bridge. All other studies, such as TxDOT’s Statewide Transportation Improvement Plan (STIP) and Unified Transportation Program, do not mention the Gateway to the Americas Crossing specifically. The same is true for the Laredo Master Transportation Plan study.

2.1.3 Land Use
Land use surrounding the border crossing is predominately commercial, as the Gateway to the Americas Crossing ties into the Laredo's central business district. East of the crossing, there are several historic districts in close proximity to the bridge. These historic districts are the San Agustin Historic District, the Barrio Azteca Historic District, the Villa San Agustin de Laredo Historic District and the Old Mercado Historic District.
2.1.4 Mobility: Existing and Historic

Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local metropolitan planning organizations (MPOs).

Table 1 shows the Annual Average Daily Traffic (AADT) using BUS 35 and US 83. The average annual growth rates for these facilities are shown in the last column of Table 1. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for BUS 35 and US 83 is depicted graphically in Figure 12. The AADT growth rates show a general increase in vehicle usage along US 83 and a general decrease along BUS 35, with the peak AADT 16400 for BUS 35 occurring in 1996 and the peak AADT 17800 occurring in 1996. See Figure 13 for count-locations used for this analysis.

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<tr>
<td>BUS 35</td>
<td>16000</td>
<td>16400</td>
<td>16200</td>
<td>14000</td>
<td>13900</td>
<td>13200</td>
<td>13900</td>
<td>12800</td>
<td>13100</td>
<td>12900</td>
<td>12610</td>
<td>-2.21%</td>
</tr>
<tr>
<td>US 83</td>
<td>15300</td>
<td>17800</td>
<td>17600</td>
<td>16300</td>
<td>15400</td>
<td>16000</td>
<td>16700</td>
<td>15800</td>
<td>17100</td>
<td>16700</td>
<td>16770</td>
<td>1.15%</td>
</tr>
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</table>

The volume of traffic handled at the border crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, for the
year 2005, northbound yearly totals at this crossing showed a total of over 1.4 million POV crossings and over 1.2 million pedestrian crossings.

2.1.5 Population Growth
According to the US Census Bureau, there was an approximate 41.2% population increase in the City of Laredo between 1990 and 2000. The population in 1990 was documented at 125,053 and in 2000 at 176,576. Additionally, an approximate 22% increase is estimated between 2000 and 2006, where the 2006 population is estimated to be 215,484.

Also, according to the US Census Bureau, an approximate 19.9% population growth between 2000 and 2006 was predicted to have occurred in Webb County.

2.1.6 Congestion
The predominate factor impacting mobility at the Gateway to the Americas Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Gateway to the Americas Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.1.7 Safety
The safety concerns identified for the Gateway to the Americas Crossing were related to the Automatic Vehicle Identification (AVI) lane. Lane assignments for the AVI were difficult to identify from the pavement markings. Drivers unfamiliar with the area tend to become confused, which in turn contributes to the possibility of collisions.

2.2 Juarez-Lincoln Crossing

2.2.1 Existing Conditions
The Juarez-Lincoln Crossing is a tolled facility that handles POV and bus-only traffic. The crossing is accessed via a pair of one-way, five-lane major arterials, as shown in Figure 14. Santa Ursula Ave. operates southbound toward the crossing and San Dario Ave. operates northbound away from the crossing. The bridge is an eight-lane facility, four lanes in each direction, and a non-commercial AVI dedicated lane. The length of the bridge is 1008 ft. The bridge operates 24 hours a day for POV. Intelligent transportation systems (ITS) are deployed on the northbound and southbound approaches to the bridge on the US side of the border.
2.2.2 Previous Plans and Studies
In 2006, TxDOT IRO produced a publication that listed the existing and proposed bridges along the Texas and Mexico border. The publication also described the permit process between the United States and Mexico for a proposed bridge. All other studies, such as TxDOT’s STIP and Unified Transportation Program, do not mention the Juarez-Lincoln Crossing specifically. The same is true for the Laredo Master Transportation Plan study.

2.2.3 Land Use
Land use surrounding the border crossing is predominately commercial, with park land and plazas located between Santa Ursula Ave and San Dario Ave. Additionally, there are several historic districts in close proximity to the Juarez-Lincoln Crossing. Those historic districts are the San Agustin Historic District, the Barrio Azteca Historic District, the Villa San Agustin de Laredo Historic District and the Old Mercado Historic District.

2.2.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 2 shows the AADT using IH 35 and US 83. The average annual growth rates for these facilities are shown in the last column of Table 2. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for IH 35 and US 83 is depicted graphically in Figure 15. The AADT for IH 35 depicts a trend that varies year to year with an average upward trend from 1995 to 2005. The AADT for the US 83 corridor does depict a steady upward trend between the years 1995 and 2005. See Figure 16 for count-locations used for this analysis.
### Table 2 – Annual Average Daily Traffic (AADT), 1995-2005

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<tbody>
<tr>
<td>IH 35</td>
<td>60000</td>
<td>71000</td>
<td>64000</td>
<td>64000</td>
<td>62000</td>
<td>65000</td>
<td>68000</td>
<td>73000</td>
<td>65000</td>
<td>60000</td>
<td>65060</td>
<td>1.19%</td>
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<tr>
<td>US 83</td>
<td>25000</td>
<td>27000</td>
<td>30000</td>
<td>28000</td>
<td>31000</td>
<td>32000</td>
<td>33000</td>
<td>35000</td>
<td>31000</td>
<td>31000</td>
<td>35170</td>
<td>3.76%</td>
</tr>
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**Figure 15 – Annual Average Daily Traffic (AADT), 1995-2005**

![Annual Average Daily Traffic (AADT), 1995-2005](image-url)
The volume of traffic handled at the crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, for the year 2005, northbound yearly totals at this crossing show a total of almost 36,000 bus crossings and 4.6 million POV crossings.

### 2.2.5 Population Growth

According to the US Census Bureau, there was an approximate 41.2% population increase in the City of Laredo between 1990 and 2000. The population in 1990 was documented at 125,053 and in 2000 at 176,576. Additionally, an approximate 22% increase is estimated between 2000 and 2006, where the 2006 population is estimated to be 215,484.

Also according to the US Census Bureau, an approximate 19.9% population growth between 2000 and 2006 was predicted to have occurred in Webb County.

### 2.2.6 Congestion

The predominate factor impacting mobility at the Juarez-Lincoln Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale,
long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Juarez-Lincoln Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.2.7 Safety
Safety issues concerning the Juarez-Lincoln Crossing consisted of turning movement conflicts and lane assignment. The left-turn movement conflicts were primarily at the intersections of San Dario Ave. with Victoria St. and Santa Ursula Ave. with Matamoros St. The lane assignment issue consisted of a lack of pavement markings and signs depicting lane assignments at the point where San Dario Ave. becomes IH 35.

2.3 Colombia Crossing

2.3.1 Existing Conditions
The Colombia Crossing is a tolled facility that handles commercial, POV, freight, and pedestrian traffic on an eight-lane bridge with sidewalks on both sides of the bridge width. The length of the bridge is 1,216 ft.

FM 255 is the primary ingress and egress to the border crossing. Currently, FM 255 is configured as a four-lane, divided facility with 10-ft. outside shoulders, as shown in Figure 17.

Approximately one mile from the crossing, FM 255 and FM 1472 intersect. FM 1472 has the same configuration as FM 255. Both facilities feature wide grassy medians. Beyond this intersection, FM 255 becomes the Camino Colombia Toll Road.

![Existing FM 255 Typical Section NTS](source:image)


Figure 17 – Existing FM 255 Typical Section NTS

2.3.2 Previous Plans and Studies
A previous study was conducted in November of 2002 by the Texas Transportation Institute (TTI) for TxDOT. The study was primarily for analyzing truck traffic through border crossings. The issues identified in this study for the Colombia Crossing include the lack of data collection and benchmarks for internal analysis, POE configuration and outdated facility layouts, POE configuration and new inspection technologies which cannot be accommodated,
POE configuration and poor internal POE circulation, and inadequate informal stakeholder activity scheduling and coordination.

2.3.3 Land Use
Land use surrounding the border crossing is predominately rural and undeveloped. This land use limits the volume of pedestrian traffic crossing at the Colombia Crossing because there are very few destination points within walking distance of the bridge.

2.3.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 3 shows the AADT using FM 255 and FM 1472. The average annual growth rates for these facilities are shown in the last column of Table 3. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for FM 255 and FM 1472 is depicted graphically in Figure 18. The AADT has increased nearly five-fold along FM 255 and nearly three times along FM 1472. See Figure 19 for count-locations used for this analysis.

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<tbody>
<tr>
<td>FM 255</td>
<td>850</td>
<td>1300</td>
<td>4300</td>
<td>4400</td>
<td>3600</td>
<td>4500</td>
<td>5600</td>
<td>5100</td>
<td>4800</td>
<td>4600</td>
<td>5070</td>
<td>30.85%</td>
</tr>
<tr>
<td>FM 1472</td>
<td>2100</td>
<td>2100</td>
<td>5600</td>
<td>5700</td>
<td>4800</td>
<td>6100</td>
<td>6800</td>
<td>5500</td>
<td>5100</td>
<td>5700</td>
<td>6240</td>
<td>18.61%</td>
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The volume of traffic handled at the border crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, for the year 2005, northbound yearly totals at this crossing show a total of approximately
311,000 truck freight crossings, 253,000 POV crossings, and 12,000 pedestrian crossings.

2.3.5 Population Growth
According to the US Census Bureau, there was an approximate 41.2% population increase in the City of Laredo between 1990 and 2000. The population in 1990 was documented at 125,053 and in 2000 at 176,576. Additionally, an approximate 22% increase is estimated between 2000 and 2006, where the 2006 population is estimated to be 215,484.

Also according to the US Census Bureau, an approximate 19.9% population growth between 2000 and 2006 was predicted to have occurred in Webb County.

2.3.6 Congestion
The predominate factor impacting mobility at the Colombia Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Colombia Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.3.7 Safety
Potential safety issues identified for this crossing were isolated to the intersection of FM 255 and FM 1472. Specifically, traffic queues at the Border Safety Inspection Facility (BSIF) site and turning movements at the intersection were identified as potential safety issues.

2.4 World Trade Crossing

2.4.1 Existing Conditions
The World Trade Crossing is a tolled facility that handles commercial traffic only. The bridge has eight lanes and is 977 ft. in length.

LP 20 is the primary ingress and egress to the border crossing. Currently, LP 20 is a four-lane divided freeway with two-lane frontage roads on both sides, as shown in Figure 20.

FM 1472 is the nearest cross street. It is a major arterial composed of six lanes separated by a median with three lanes in each direction as shown in Figure 21.
2.4.2 Previous Plans and Studies

A previous study was conducted in November of 2002 by TTI for TxDOT. The study analyzed truck traffic through border POE. The issues identified for the World Trade Crossing were the lack of data collection and benchmarks for internal analysis, lack of congestion pricing, lack of fee-based priority shipping lanes, and co-mingling of commercial traffic types. Also identified were capacity deficiencies, lack of sufficient number of primary inspection booths, a lack of mechanisms to predict and prevent queue development, and finally, inadequate scheduling and coordination of informal stakeholder activity.
2.4.3 Land Use
Land use immediately adjacent to LP 20 near the border crossing is undeveloped and becomes residential to the south and industrial to the north of LP 20.

2.4.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 4 shows the AADT using LP 20 and FM 1472. The average annual growth rates for these facilities are shown in the last column of Table 4. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for LP 20 and FM 1472 is depicted graphically in Figure 22. The AADT data shows an increase in vehicle usage along LP 20 and FM 1472/Mines Rd. between 1995 and 2005. See Figure 23 for count-locations used for this analysis.

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<tbody>
<tr>
<td>LP 20</td>
<td>11900</td>
<td>13000</td>
<td>16200</td>
<td>14200</td>
<td>17000</td>
<td>19400</td>
<td>21000</td>
<td>20000</td>
<td>24000</td>
<td>25000</td>
<td>27990</td>
<td>9.50%</td>
</tr>
<tr>
<td>FM 1472</td>
<td>4200</td>
<td>4400</td>
<td>7600</td>
<td>6600</td>
<td>6700</td>
<td>6500</td>
<td>9000</td>
<td>9400</td>
<td>10700</td>
<td>13500</td>
<td>16000</td>
<td>16.43%</td>
</tr>
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Figure 22 – Annual Average Daily Traffic (AADT), 1995-2005

The volume of traffic handled at the border crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, for the year 2005, northbound yearly totals at this crossing show a total of approximately 1,144,908 freight crossings and 97,284 pedestrian crossings.

### 2.4.5 Population Growth

According to the US Census Bureau, there was an approximate 41.2% population increase in the City of Laredo between 1990 and 2000. The population in 1990 was documented at 125,053 and in 2000 at 176,576. Additionally, an approximate 22% increase is estimated between 2000 and 2006, where the 2006 population is estimated to be 215,484.

Also according to the US Census Bureau, an approximate 19.9% population growth between 2000 and 2006 was predicted to have occurred in Webb County.

### 2.4.6 Congestion

The predominate factor impacting mobility at the World Trade Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to
mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the World Trade Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.4.7 Safety
No safety issue were identified for this border crossing.

2.5 Eagle Pass Crossing

2.5.1 Existing Conditions
The Eagle Pass Crossing is a tolled facility that handles pedestrian and POV traffic. It is located near downtown Eagle Pass. The bridge is a two-lane structure that is 1,855 ft. long with sidewalks for pedestrian accommodations.

US 57 is a five-lane urban facility with a continuous two-way left-turn lane, as shown in Figure 24. Parallel to US 57 to the north is BUS 277, locally known as E. Main St., which has the same lane configuration as US 57.


2.5.2 Previous Plans and Studies
No previous studies or plans were discovered by the study team.

2.5.3 Land Use
The Eagle Pass Crossing is less than a mile away from the heart of Eagle Pass, a heavy commercial and residential area. This land use lends to a high volume of pedestrian traffic.

2.5.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 5 shows the AADT using US 57 and Spur 240. The average annual growth rates for these facilities are shown in the last column of Table 5. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for US 57
and Spur 240 is depicted graphically in Figure 25. The AADT growth rates show a slight increase in vehicle usage along Spur 240. Conversely, US 57 has seen a 2.07% decrease. See Figure 26 for count-locations used for this analysis.

Table 5 – Annual Average Daily Traffic (AADT), 1995-2005

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<tbody>
<tr>
<td>Spur 240 (N-S)</td>
<td>3600</td>
<td>3300</td>
<td>4600</td>
<td>4500</td>
<td>4200</td>
<td>3900</td>
<td>3600</td>
<td>4500</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>2.13%</td>
</tr>
<tr>
<td>US 57</td>
<td>1470</td>
<td>1290</td>
<td>1340</td>
<td>1420</td>
<td>1620</td>
<td>1240</td>
<td>1020</td>
<td>1200</td>
<td>1180</td>
<td>1050</td>
<td>1090</td>
<td>-2.07%</td>
</tr>
<tr>
<td>Spur 240 (E-W)</td>
<td>7400</td>
<td>8400</td>
<td>9100</td>
<td>8200</td>
<td>8000</td>
<td>8900</td>
<td>9300</td>
<td>8300</td>
<td>8000</td>
<td>8100</td>
<td>8100</td>
<td>1.21%</td>
</tr>
</tbody>
</table>


Figure 25 – Annual Average Daily Traffic (AADT), 1995-2005
The volume of traffic handled at the crossing is also indicative of the demands placed on the facilities. According to the TxDOT IRO, over 1.6 million northbound POV crossings and over 600,000 northbound pedestrian crossings were handled at this crossing in 2005. Freight traffic is not handled at this border crossing.

2.5.5 Population Growth
According to the US Census Bureau, an approximate 10.6% population growth between 2000 and 2006 is predicted in Maverick County. Population for the county in 2000 was documented at 47,297. Population in 2006 is estimated as 52,298.

In Eagle Pass, according to the US Census Bureau, there was an 8.5% population growth between 1990 and 2000. The 1990 population was documented at 20,651 and the 2000 population at 22,413. Additionally, there was an approximate 17.79% population growth estimated between 2000 and 2006. The 2006 population was estimated as 26,401.

2.5.6 Congestion
The predominate factor impacting mobility at the Eagle Pass Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.
However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Eagle Pass Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.5.7 Safety
The commercial/retail zoning that is present near the border crossing lends to high volumes of pedestrian, truck and POV traffic. This volume is especially high during the holidays, creating a safety issue through the intermingling of POV, truck and pedestrian traffic.

2.6 Camino Real Crossing

2.6.1 Existing Conditions
The Camino Real Crossing is a tolled facility that handles pedestrian, POV, transit and freight traffic on a six-lane bridge that also contains two sidewalks. The bridge is 1384 ft. in length. Adjacent is a separate railroad bridge structure.

The approach and departure to the bridge occurs along S. Monroe St. S. Monroe St. is a four-lane, undivided roadway with sidewalks, as shown in Figure 27. FM 1021 varies between a section similar to S. Monroe St. and an urban, five-lane facility with a continuous left-turn lane, as shown in Figure 28. Sources indicate that trains are present a majority of the time, causing locals to use side streets to avoid the at-grade railroad crossing located on FM 1021, approximately 1000 ft. east of the intersection of S. Monroe St. and FM 1021.
2.6.2 Previous Plans and Studies
TxDOT staff indicated TxDOT is planning to signalize the truck route to FM 1021 by the end of 2007. TxDOT is also planning a railroad overpass structure at FM 1021 and US 277. Additionally, construction on an outer loop in Eagle Pass is expected to begin in February 2008.

2.6.3 Land Use
The Camino Real Crossing is about a mile away from the heart of Eagle Pass, a heavy commercial, industrial and residential area. This land use lends to a high volume of POV traffic.

2.6.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth along in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 1 shows the AADT using FM 1021 and LP 3443. Average annual growth rates for these facilities are shown in the last column of Table 6. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for LP 3443 and FM 1021 is depicted graphically in Figure 29. The AADT growth rates show an increase in vehicle usage along both facilities that lead towards the crossing. FM 1021 has seen a 4.43% growth increase, and LP 3443 has seen a 6.84% increase. See Figure 30 for count-locations used for this analysis.

Table 6 – Annual Average Daily Traffic (AADT), 1995-2005

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<td>FM 1021</td>
<td>11400</td>
<td>11400</td>
<td>12600</td>
<td>13800</td>
<td>15000</td>
<td>13300</td>
<td>15700</td>
<td>14000</td>
<td>14100</td>
<td>16600</td>
<td>16800</td>
<td>4.43%</td>
</tr>
<tr>
<td>LP 3443</td>
<td>8200</td>
<td>8400</td>
<td>9000</td>
<td>8700</td>
<td>9700</td>
<td>9200</td>
<td>12100</td>
<td>12600</td>
<td>11500</td>
<td>14000</td>
<td>15000</td>
<td>6.84%</td>
</tr>
</tbody>
</table>

The volume of traffic handled at the crossing is also indicative of the needs placed on the corridor facilities. According to the TxDOT IRO, for the year 2005, northbound yearly totals at this crossing show a total of 2 million POV crossings, over 97,000 truck freight crossings, and over 50,000 pedestrian crossings. The Camino Real Crossing is the only crossing in Eagle Pass that handles truck freight traffic.
2.6.5 Population Growth
According to the US Census Bureau, an approximate 10.6% population growth between 2000 and 2006 is predicted in Maverick County. Population for the county in 2000 was documented at 47,297. Population in 2006 is estimated as 52,298.

In Eagle Pass, there was an 8.5% population growth between 1990 and 2000. The 1990 population was documented at 20,651 and the 2000 population at 22,413. Additionally, there was an approximate 17.79% population growth estimated between 2000 and 2006. The 2006 population was estimated as 26,401.

2.6.6 Congestion
The predominate factor impacting mobility at the Camino Real Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Camino Real Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.6.7 Safety
The commercial/retail zoning that is present near the border crossing lends to high volumes of POV traffic and pedestrian traffic. This volume is especially high during the holidays, creating a safety issue as a result of conflicts between POV and pedestrian traffic.

2.7 Del Rio Crossing

2.7.1 Existing Conditions
The Del Rio Crossing is a tolled facility that handles POV, freight, and bicycle/pedestrian traffic on a four-lane bridge. The bridge was constructed in 1930 and reconstructed in 1987. The bridge also utilizes AVI lanes for vehicles traveling southbound.

Currently, US 277S/Spur 239 is configured as a five-lane facility with a continuous two-way left-turn lane and 10-ft. shoulders, as shown in Figure 31. The turn lane ends within a few hundred feet of the border crossing.

Less than a mile north of the border crossing, US 277S/Spur 239 separates into two roadways, with US 277S turning in an easterly direction and Spur 239 proceeding north. Las Vacas St. intersects the state routes at the same location.
as US 277S and Spur 239 separate. Las Vacas St. is a two-lane undivided facility with no shoulders, as shown in Figure 32.

![Existing US 277S/Spur 239 Typical Section NTS](source)

**Figure 31 – Existing US 277S/Spur 239 Typical Section NTS**

2.7.2 Previous Plans and Studies
Presently TxDOT has a safety project scheduled for Spur 239 for safety lighting in fiscal year 2008. No other studies or plans were discovered by the study team.

2.7.3 Land Use
The land use in the immediate area surrounding the border crossing is undeveloped and agricultural. Further north of the bridge is the city of Del Rio with commercial and residential land use. Northwest of the bridge is the Del Rio International Airport with industrial and undeveloped land surrounding the airport.

2.7.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 7 shows the AADT using US 277S and Spur 239. The average annual growth rates for these facilities are shown in the last column of Table 7. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then
determining the straight-line average for the entire period. AADT data for US 277S/Spur 239 is depicted graphically in Figure 33. The AADT growth rates show an increase in vehicle usage along the corridor approaching the crossing. Segments of Spur 239 have seen an increase of 3.88% and 14.94%. See Figure 34 for count-locations used for this analysis.

Table 7 – Annual Average Daily Traffic (AADT), 1995-2005

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<tbody>
<tr>
<td>US 277S/Spur 239</td>
<td>6300</td>
<td>7000</td>
<td>9000</td>
<td>9700</td>
<td>9600</td>
<td>10000</td>
<td>9100</td>
<td>9200</td>
<td>9400</td>
<td>8700</td>
<td>8820</td>
<td>3.88%</td>
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<td>US 277S</td>
<td>9800</td>
<td>10400</td>
<td>5400</td>
<td>7200</td>
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<td>5500</td>
<td>4400</td>
<td>4700</td>
<td>4200</td>
<td>4400</td>
<td>4360</td>
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<tr>
<td>Spur 239</td>
<td>6100</td>
<td>5900</td>
<td>13400</td>
<td>17600</td>
<td>17700</td>
<td>12600</td>
<td>13300</td>
<td>14500</td>
<td>13300</td>
<td>14500</td>
<td>15530</td>
<td>14.94%</td>
</tr>
</tbody>
</table>

The volume of traffic handled at the border crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, for the year 2005, northbound yearly totals at this crossing show a total of over 1.7 million POV crossings, over 88,000 pedestrian crossings, and close to 65,000 truck freight crossings.

2.7.5 Population Growth
According to the US Census Bureau, an approximate 7.3% population growth between 2000 and 2006 is predicted in Val Verde County. Population for the county in 2000 was documented at 44,856. Population in 2006 is estimated as 48,856.

In Del Rio, population was estimated as 33,867 as of the year 2000, an 8.5% increase from 1990. Furthermore, an approximate 3.7% increase is estimated between 2000 and 2003. Population in 2003 is estimated to be 35,136.

2.7.6 Congestion
The predominate factor impacting mobility at the Del Rio Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.
However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Del Rio Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.7.7 Safety
The border crossing is essentially in a rural setting surrounded by undeveloped and agricultural land. The lack of safety lighting or lighting in general could be considered a safety issue.

2.8 Lake Amistad Dam Crossing

2.8.1 Existing Conditions
Lake Amistad was built for flood control, conservation, irrigation, power and recreation in 1969. The Lake Amistad Dam Crossing is a non-tolled facility that handles POV almost exclusively. Currently, Spur 349, which acts as the main artery for the crossing, is configured as a two-lane undivided facility with no shoulders, as shown in Figure 35. US 90 is configured as a four-lane, divided facility with shoulders, as shown in Figure 36.

![Existing Spur 239 Typical Section NTS](source: RJ RIVERA Associates, Inc., 2008, using current orthophotography.)
2.8.2 Previous Plans and Studies
No previous studies or plans were discovered by the study team.

2.8.3 Land Use
North of US 90, the Amistad National Recreation Area surrounds the crossing.
South of US 90, the land use is predominantly rural. This land use does not lend itself to pedestrian or freight traffic.

2.8.4 Mobility: Existing and Historic
Historic traffic growth rates provide good insight into the potential growth in the study area. The study team sought historical traffic data from multiple sources, including TxDOT and local MPOs. Table 8 shows the AADT using Spur 349 and US 90. The average annual growth rates for these facilities are shown in the last column of Table 8. The average annual growth rate was derived by calculating the annual growth rate for each year in the period studied, then determining the straight-line average for the entire period. AADT data for Spur 349 and US 90 is depicted graphically in Figure 37. The AADT growth rates show a steady increase in vehicle usage along Spur 349 and US 90 heading towards the crossing. See Figure 38 for count-locations used for this analysis.

Table 8 – Annual Average Daily Traffic (AADT), 1995-2005

<table>
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<tr>
<td>Spur 349</td>
<td>380</td>
<td>400</td>
<td>430</td>
<td>500</td>
<td>540</td>
<td>440</td>
<td>400</td>
<td>390</td>
<td>430</td>
<td>530</td>
<td>540</td>
<td>4.23%</td>
</tr>
<tr>
<td>US 90</td>
<td>1750</td>
<td>1600</td>
<td>1600</td>
<td>1900</td>
<td>2100</td>
<td>2100</td>
<td>2100</td>
<td>2100</td>
<td>2000</td>
<td>2200</td>
<td>2540</td>
<td>4.14%</td>
</tr>
</tbody>
</table>

The volume of traffic handled at the crossing is also indicative of the demands placed on the corridor facilities. According to the TxDOT IRO, over 65,000 northbound POV were handled at this crossing in 2005.

### 2.8.5 Population Growth

According to the US Census Bureau, an approximate 8.9% population growth between 2000 and 2006 is predicted in Val Verde County. Population for the
county in 2000 was documented at 44,856. Population in 2006 is estimated as 48,856.

2.8.6 Congestion
The predominate factor impacting mobility at the Lake Amistad Dam Crossing is directly attributed to the disruption of the free flow of traffic by POE operations. This disruption, albeit inconvenient, is a fundamental component of the sensitive activities that are part of the POE operations. Moreover, POE operations are beyond the jurisdiction of TxDOT.

However, it should be noted that as long as the metering of traffic by POE operations is a by-product of the essential function that they perform, efforts to mitigate congestion will be significantly compromised. Therefore, large-scale, long-term roadway infrastructure improvements performed independently from comprehensive POE expansions or upgrades will yield limited reductions in overall congestion. Consequently, TxDOT would be better served by regularly monitoring overall mobility in the area surrounding the Lake Amistad Dam Crossing and identifying and implementing short-term improvements to mitigate congestion.

2.8.7 Safety
The dam is in a rural setting surrounded by undeveloped, park, and agricultural land. The lack of safety lighting or lighting in general could be considered a safety issue in this type of setting.
3.0 GOALS AND OBJECTIVES

The study team evaluated the Need and Purpose document and the scope of services for the study to identify the goals and objectives of the proposed improvement alternatives. As the study progressed and additional information on the study area and the concerns of the community were obtained, the study goals and objectives were updated and refined.

As with most transportation related projects, safety and mobility goals are fundamental to all the proposed alternatives. However, community and environmental goals were included to balance mobility with potential negative impacts on the surrounding community. Other goals identified included design goals for evaluating ROW, construction, and drainage issues, cost effectiveness goals for evaluating the use of public funds, and a development goal to measure the impacts on current and future land use. Collectively, these goals define the measures by which proposed alternatives were evaluated and constitute the Goals and Objectives of the study. The Goals and Objectives identified for each of the crossings are shown below.

3.1 Gateway to the Americas Crossing

**Mobility Goal**

- Address existing and anticipated congestion along Convent Ave., Santa Maria Ave., US 83, and nearby roadways within the study area
- Consider travel time approaching the Gateway to the Americas POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the Gateway to the Americas POE
- Consider lane configuration of Convent Ave.

**Support Future Development Goal**

- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation

**Safety Goal**

- Consider driver expectancy
- Consider pedestrian accommodations

**Community and Environmental Goal**

- Minimize ROW acquisition
- Minimize adverse displacements of residential, commercial, and industrial properties
- Minimize impacts to wetlands, water resources, and sensitive habitats
Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets

Avoid adverse impacts to regional air quality

Avoid or minimize disturbance of known hazardous material sites

Consider vehicle emissions and fuel consumption related to idling time

**Design Goal**

- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

**Cost Effectiveness Goal**

- Consider absolute cost
- Consider options that may cost more, but meet long-term needs
- Consider implementation time

3.2 Juarez-Lincoln Crossing

**Mobility Goal**

- Address existing and anticipated congestion along San Dario Ave., Santa Ursula Ave., US 83, and nearby roadways within the study area
- Consider travel time approaching the Juarez-Lincoln POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the Juarez-Lincoln POE
- Consider lane configuration of Santa Ursula Ave. and San Dario Ave.

**Support Future Development Goal**

- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation

**Safety Goal**

- Consider driver expectancy
- Consider pedestrian accommodations

**Community and Environmental Goal**

- Minimize ROW acquisition
Minimize adverse displacements of residential, commercial, and industrial properties

Minimize impacts to wetlands, water resources, and sensitive habitats

Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets

Avoid adverse impacts to regional air quality

Avoid or minimize disturbance of known hazardous material sites

Consider vehicle emissions and fuel consumption related to idling time

**Design Goal**

- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

**Cost Effectiveness Goal**

- Consider absolute cost
- Consider options that may cost more, but meet long-term needs
- Consider implementation time

### 3.3 Colombia Crossing

**Mobility Goal**

- Address existing and anticipated congestion along Camino Colombia Toll Rd., FM 255, FM 1472, and any nearby roadways within the study area
- Consider travel time approaching the Colombia POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the Colombia POE
- Consider lane configuration of FM 255 and FM 1472

**Support Future Development Goal**

- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation

**Safety Goal**

- Consider driver expectancy
- Consider pedestrian accommodations
Community and Environmental Goal
- Minimize ROW acquisition
- Minimize adverse displacements of residential, commercial, and industrial properties
- Minimize impacts to wetlands, water resources, and sensitive habitats
- Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets
- Avoid adverse impacts to regional air quality
- Avoid or minimize disturbance of known hazardous material sites
- Consider vehicle emissions and fuel consumption related to idling time

Design Goal
- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
- Consider absolute cost
- Consider options that may cost more, but meet long-term needs
- Consider implementation time

3.4 World Trade Crossing

Mobility Goal
- Address existing and anticipated congestion along LP 20, FM 1472, and any nearby roadways within the study area.
- Consider travel time approaching the World Trade POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the World Trade POE
- Consider lane configuration of LP 20 and FM 1472

Support Future Development Goal
- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation
Safety Goal
- Consider driver expectancy
- Consider pedestrian accommodations

Community and Environmental Goal
- Minimize ROW acquisition
- Minimize adverse displacements of residential, commercial, and industrial properties
- Minimize impacts to wetlands, water resources, and sensitive habitats
- Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets
- Avoid adverse impacts to regional air quality
- Avoid or minimize disturbance of known hazardous material sites
- Consider vehicle emissions and fuel consumption related to idling time

Design Goal
- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
- Consider absolute cost
- Consider options that may cost more, but meet long-term needs
- Consider implementation time

3.5 Eagle Pass Crossing

Mobility Goal
- Address existing and anticipated congestion along US 57, Spur 240, and nearby roadways within the study area
- Consider travel time approaching the Eagle Pass POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the Eagle Pass POE
- Consider lane configuration of US 57 and Spur 240
Support Future Development Goal
- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation

Safety Goal
- Consider driver expectancy
- Consider pedestrian accommodations

Community and Environmental Goal
- Minimize ROW acquisition
- Minimize adverse displacements of residential, commercial, and industrial properties
- Minimize impacts to wetlands, water resources, and sensitive habitats
- Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets
- Avoid adverse impacts to regional air quality
- Avoid or minimize disturbance of known hazardous material sites
- Consider vehicle emissions and fuel consumption related to idling time

Design Goal
- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
- Consider absolute cost
- Consider options that may cost more, but meet long-term needs
- Consider implementation time

3.6 Camino Real Crossing

Mobility Goal
- Address existing and anticipated congestion along S. Monroe St., FM 1021, and nearby roadways within the study area
- Consider travel time approaching the Camino Real POE during peak hours and seasonal periods
• Consider all modes of transportation utilizing the Camino Real POE

• Consider lane configuration of S. Monroe St. and FM 1021

Support Future Development Goal
• Complement existing and anticipated future land uses

• Coordinate with pertinent agencies on gate operation

Safety Goal
• Consider driver expectancy

• Consider pedestrian accommodations

Community and Environmental Goal
• Minimize ROW acquisition

• Minimize adverse displacements of residential, commercial, and industrial properties

• Minimize impacts to wetlands, water resources, and sensitive habitats

• Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets

• Avoid adverse impacts to regional air quality

• Avoid or minimize disturbance of known hazardous material sites

• Consider vehicle emissions and fuel consumption related to idling time

Design Goal
• Consider constructability within study area

• Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
• Consider absolute cost

• Consider options that may cost more, but meet long-term needs

• Consider implementation time

3.7 Del Rio Crossing

Mobility Goal
• Address existing and anticipated congestion along US 277S, Spur 239, and nearby roadways within the study area
• Consider travel time approaching the Del Rio POE during peak hours and seasonal periods

• Consider all modes of transportation utilizing the Del Rio Crossing POE

• Consider lane configuration of US 277S and Spur 239

Support Future Development Goal
• Complement existing and anticipated future land uses

• Coordinate with pertinent agencies on gate operation

Safety Goal
• Consider driver expectancy

• Consider pedestrian accommodations

Community and Environmental Goal
• Minimize ROW acquisition

• Minimize adverse displacements of residential, commercial, and industrial properties

• Minimize impacts to wetlands, water resources, and sensitive habitats

• Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets

• Avoid adverse impacts to regional air quality

• Avoid or minimize disturbance of known hazardous material sites

• Consider vehicle emissions and fuel consumption related to idling time

Design Goal
• Consider constructability within study area

• Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
• Consider absolute cost

• Consider options that may cost more, but meet long-term needs

• Consider implementation time
3.8 Lake Amistad Dam Crossing

Mobility Goal
- Address existing and anticipated congestion along Spur 349, US 90 and nearby roadways within the study area
- Consider travel time approaching the Lake Amistad Dam POE during peak hours and seasonal periods
- Consider all modes of transportation utilizing the Lake Amistad Dam POE
- Consider lane configuration of Spur 349 and US 90

Support Future Development Goal
- Complement existing and anticipated future land uses
- Coordinate with pertinent agencies on gate operation

Safety Goal
- Consider driver expectancy
- Consider pedestrian accommodations

Community and Environmental Goal
- Minimize ROW acquisition
- Minimize adverse displacements of residential, commercial, and industrial properties
- Minimize impacts to wetlands, water resources, and sensitive habitats
- Avoid direct and indirect impacts to parks, schools, historical or archeological resources, and public assets
- Avoid adverse impacts to regional air quality
- Avoid or minimize disturbance of known hazardous material sites
- Consider vehicle emissions and fuel consumption related to idling time

Design Goal
- Consider constructability within study area
- Complement or, if possible, improve upon drainage in the area

Cost Effectiveness Goal
- Consider absolute cost
• Consider options that may cost more, but meet long-term needs
• Consider implementation time
4.0 DATA COLLECTION

From the initial stages of the Border Crossing Travel Time Study, the study team collected field and traffic data in support of the study efforts. Traffic data collection efforts for the crossings in the TxDOT Laredo District were performed during the months of March, May, and August of 2007, and included average daily traffic (ADT) volumes, turning movement counts (TMC) along major intersections, and travel time runs (TTR) along key routes identified for each border crossing. Other data collected included site photographs of the roadway conditions, identification of existing traffic control devices and roadway, and intersection configurations.

The study team also identified local agency representatives and stakeholders from the TxDOT Laredo District to obtain further information on each of the eight Texas-Mexico border crossings in the district, and to better identify local concerns present in the study areas.

4.1 Field Reconnaissance

The study team performed field reconnaissance work at the eight TxDOT Laredo District border crossings in two separate trips on March 22, 2007, through March 23, 2007, and March 28, 2007, through March 30, 2007. This work included thorough reviews of each study area through a series of trips along the local roadways leading to and away from each POE. The study team took photos of these roadways and identified issues in the study areas. This work also included identification of any constraints within the study areas, such as historical sites, commercial development, and residential constraints.

Refer to Appendix A for a CD which contains all photos of the study areas taken by the study team during each field reconnaissance trip.

4.2 Traffic Data – Average Daily Traffic Volumes

The study team collected twenty-four hour traffic data in March 2007 along key routes leading to two of the four major international border crossings in the TxDOT Laredo District. For the two remaining bridges, the study team was able to obtain data from the City of Laredo to complete the analysis of those two border crossings. These border crossings include the Gateway to the Americas Crossing, Juarez-Lincoln Crossing, Colombia Crossing, and World Trade Crossing.

The twenty-four hour traffic data collected served to evaluate existing traffic demand/conditions and to evaluate the traffic growth. The results of the analysis were used as part of an overall evaluation of proposed improvements to relieve traffic congestion. The traffic data sheets and location maps are included in Appendix D.

4.2.1 Gateway to the Americas Crossing
No twenty-four hour traffic data was collected for this border crossing.

4.2.2 Juarez-Lincoln Crossing
No twenty-four hour traffic data was collected for this border crossing.
4.2.3 Colombia Crossing
Twenty-four hour traffic data was collected along five strategic locations for key routes leading to and from this border crossing. These five locations included:

- FM 1472 south of FM 255
- FM 1472 north of FM 255
- FM 255 west of FM 1472
- FM 255 east of FM 1472
- FM 255 (excluding BSIF) west of FM 1472

4.2.4 World Trade Crossing
Twenty-four hour traffic data was collected along 24 strategic locations for key routes leading to and from this border crossing. These 24 locations included:

- LP 20 eastbound mainlanes west of FM 1472
- LP 20 westbound mainlanes west of FM 1472
- LP 20 eastbound mainlanes between FM 1472 and IH 35
- LP 20 westbound mainlanes between FM 1472 and IH 35
- LP 20 eastbound exit ramp to FM 1472
- Southbound FM 1472 to eastbound LP 20 Direct Connector Ramp
- LP 20 eastbound entrance ramp from FM 1472
- LP 20 eastbound exit ramp to IH 35
- LP 20 eastbound to northbound IH 35 Direct Connector Ramp
- Southbound IH 35 to westbound LP 20 Direct Connector Ramp
- LP 20 westbound entrance ramp from IH 35
- LP 20 westbound exit ramp to FM 1472
- LP 20 westbound entrance ramp from FM 1472
- LP 20 eastbound frontage road east of FM 1472
- LP 20 westbound frontage road east of FM 1472
- LP 20 westbound frontage road west of FM 1472
• Northbound FM 1472 south of LP 20
• LP 20 eastbound frontage road west of FM 1472
• Southbound FM 1472 north of LP 20
• LP 20 westbound frontage road east of FM 1472
• Northbound IH 35 frontage road south of LP 20
• LP 20 eastbound frontage road west of IH 35
• Southbound IH 35 frontage road north of LP 20
• LP 20 westbound frontage road east of IH 35

4.3 Traffic Data – Turning Movement Counts

The study team collected TMC data during morning (7:00 AM – 9:00 AM) and afternoon (4:00 PM – 6:00 PM) peak periods at critical intersections within the study network of the four major international border crossings. The turning movement count sheets and location maps are included in Appendix D.

4.3.1 Gateway to the Americas Crossing
TMC data was collected within the study area of this border crossing. The intersections included:

• All Intersections along Salinas Ave. from Zaragoza St. to Washington St.
• All intersections along Convent Ave. from Zaragoza St. to Washington St.
• All Intersections along Flores Ave. from Grant St. to Washington St.
• All intersections along San Augustine Ave. from Hidalgo St. to Washington St.
• All intersections along San Bernardo Ave. from Matamoros St. to Washington St.

4.3.2 Juarez-Lincoln Crossing
TMC data was collected within the study area of this border crossing. The intersections included:

• Santa Ursula Ave. at Victoria St.
• Santa Ursula Ave. at Houston St.
• Santa Ursula Ave. at Matamoros St.
• Santa Ursula Ave. at Farragut St.
• Santa Ursula Ave. at Hidalgo St.
• San Dario Ave. at Victoria St.
• San Dario Ave. at Houston St.
• San Dario Ave. at Matamoros St.
• San Dario Ave. at Farragut St.
• San Dario Ave. at Hidalgo St.

4.3.3 Colombia Crossing
TMC data was collected within the study area of this border crossing. The intersections included:

• FM 1472 at westbound FM 255
• FM 1472 at eastbound FM 255

4.3.4 World Trade Crossing
TMC data was collected within the study area of this border crossing. The intersections included:

• FM 1472 at LP 20 westbound frontage road.
• FM 1472 at LP 20 eastbound frontage road
• IH 35 southbound frontage road at LP 20 westbound frontage road
• IH 35 southbound frontage road at LP 20 eastbound frontage road
• IH 35 northbound frontage road at LP 20 westbound frontage road
• IH 35 northbound frontage road at LP 20 eastbound frontage road
• LP 20 eastbound frontage road at turnaround
• LP 20 westbound frontage road at turnaround

4.4 Traffic Data – Travel Time Runs
TTR data was collected within the study corridor for each of the four major international crossings. Data gathered from the travel time runs will help identify locations with relatively high delays within the study corridor. The TTR served as part of an overall evaluation of the effectiveness of proposed improvements to traffic operations. The complete set of travel time data sheets and route maps are included in Appendix D.
4.4.1 Gateway to the Americas Crossing
TTR data was collected for the Gateway to the Americas Crossing along two routes. The routes included:

- Northbound Convent Ave. between the POE and Victoria St., then along Victoria St. from Convent Ave. to San Dario Ave.
- San Dario Ave. to Juarez Ave. along Washington St., then along Juarez Ave. from Washington St. to Zaragoza St.

4.4.2 Juarez-Lincoln Crossing
TTR data was collected for the Juarez-Lincoln Crossing along three routes. The routes included:

- Northbound San Dario Ave./IH 35 frontage road between the POE and Lafayette St.
- Southbound (return route) along Santa Ursula Ave./IH 35 frontage road between the POE and Lafayette St.
- Northbound and southbound (return route) along IH 35 mainlanes between Victoria St. and Lafayette St.

4.4.3 Colombia Crossing
TTR data for the Colombia Crossing was collected along a 1.7 mile route traveling eastbound and westbound (return route) on FM 255 between POE and the FM 1472 interchange.

4.4.4 World Trade Crossing
TTR data for the World Trade Crossing was collected along a 3.2 mile route traveling eastbound and westbound (return route) along LP 20 mainlanes and frontage roads between the POE and McPherson Rd.

4.5 Agency Stakeholder Outreach

In addition to field reconnaissance work and traffic data collection, the study team identified various representatives from local agencies in the TxDOT Laredo District to collect feedback and comments on congestion issues in the study areas and to learn about future improvement and construction plans in the area. These local agencies included the TxDOT Laredo District, local MPOs, United States Customs and Border Protection (CBP), International Boundary and Water Commission (IBWC) representatives, members from local cities and counties, and the Texas DPS.

The study team held a series of individual stakeholder meetings, in addition to the six RTWG Meetings (two of which were held for the TxDOT Laredo District), with members from the agencies previously mentioned. A total of 29 individual stakeholder meetings were conducted by the team for the entire border crossing study, seven of which were held in the TxDOT Laredo District. Table 9 provides a brief description of each individual stakeholder meeting held in the TxDOT Laredo District. Refer to Appendix B for a copy
of individual stakeholder meeting minutes and corresponding documentation from all seven meetings.

Table 9 – TxDOT Laredo District Individual Stakeholder Meetings

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>Location</th>
<th>Purpose</th>
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</thead>
<tbody>
<tr>
<td>Captain Mario Salinas, Lieutenant Rene Garza, Lieutenant Andrew Sitgreaves, Sergeant Oscar Garza, Texas DPS</td>
<td>3/22/07</td>
<td>Laredo, Texas</td>
<td>The study team met with Captain Salinas and other members of DPS to document their concerns and opinions on current issues at various crossings in the TxDOT Laredo District.</td>
</tr>
<tr>
<td>Sergeant Oscar Garza, State Trooper Derek Colbert, State Trooper Daniel Martinez, Texas DPS</td>
<td>3/22/07</td>
<td>Laredo, Texas</td>
<td>The study team met with Sergeant Garza at the Laredo-Colombia Bridge. He is the leading DPS official for this port of entry, and wanted to show the study team problems at the entrance and exit of the DPS inspection facility.</td>
</tr>
<tr>
<td>Joseph Mendiola, Timothy Francis-Timm, Roger Creery, Daniel B. Hastings, Laredo Development Foundation</td>
<td>3/23/07</td>
<td>Laredo, Texas</td>
<td>The Laredo Development Foundation met with the study team to share their opinions on problem areas in the Laredo area located in the study areas of the TxDOT Laredo District crossings.</td>
</tr>
<tr>
<td>Melisa Montemayor, Baltazar Avila, Eduardo DeLeon, Alberto Ramirez, Christen Longoria, Hector Cayanan, Walter Kolodziej, Danny Magee, Mohammed Moabed, Randy Aguilar, TxDOT LRD; Vanessa Guerra, Mario Maldonado, Art Botello, Keith Selman, City of Laredo; Billy Parks, TCB/AECOM</td>
<td>4/16/07</td>
<td>Laredo, Texas</td>
<td>The study team held a kickoff meeting to introduce the study and its objectives to TxDOT Laredo District and the City of Laredo in efforts to keep all informed and involved throughout the course of the study.</td>
</tr>
<tr>
<td>Raul Moreno, GSA; Richard Simpson, United States Customs and Border Protection; Herbin NG, Sal Tranchina, Aaron Tweedie, Garrison Architects; Pete Feverman, Pete and Co.; Shiba Sircar, Louis Berger Group</td>
<td>10/10/07</td>
<td>Laredo, Texas</td>
<td>Mr. Moreno, GSA, invited the study team to their meeting in order for the study team to provide an overview about the Border Crossing Travel Time Study. GSA held the meeting to plan upcoming changes and improvements to the Juarez-Lincoln Bridge.</td>
</tr>
<tr>
<td>Raul Moreno, GSA; Rogelio Rivera, Beto Ramirez, Mario Maldonado, Keith Selman, City of Laredo; Richard Simpson, United States Customs and Border Protection; Herbin NG, Sal Tranchina, Aaron Tweedie, Garrison Architects; Pete Feverman, Pete and Co.; Shiba Sircar, Louis Berger Group</td>
<td>10/10/07</td>
<td>Laredo, Texas</td>
<td>Mr. Moreno, GSA, invited the study team to their second meeting to learn more about improvements to the Juarez-Lincoln Bridge, and about any plans the City of Laredo was working on at or near the border crossing.</td>
</tr>
<tr>
<td>Baltazar Avila, Melissa D. Montemayor, Christen Longoria, Mohammas Moabed, TxDOT Laredo District</td>
<td>11/07/07</td>
<td>Laredo, Texas</td>
<td>The study team met with TxDOT Laredo District to review and discuss draft copies of all crossing maps with improvement alternatives. Attendees were encouraged to mark on these maps with any changes or recommendations they had, in order for the study team to implement these changes for the second RTWG meeting to be held the following week.</td>
</tr>
</tbody>
</table>
The study team established a bilingual, toll-free hotline and bilingual website to facilitate the constituents of the local communities in voicing their concerns and ideas for improvements to the study team. The website was part of the official TxDOT site, and contained overview information about the study, a brief description of the 26 crossings statewide, external links for additional information, and study team contact information. Media advisories and news releases were developed in both English and Spanish to announce the opening of the hotline and website, which were then sent to the three TxDOT District Public Information Officers (PIO). The PIOs distributed these media announcements to their local media contacts. Refer to Appendix B for a copy of all media releases developed by the study team, and copies of all local articles about the study.

As the local community learned about the hotline and website, local stakeholders contacted the study team to ask questions and provide input about the study. The stakeholders also provided notable suggestions for the study team to consider when evaluating improvement alternatives. For example, various local stakeholders inquired about whether or not improvements would be developed to decrease wait times at the POE, primarily when traveling northbound. Other stakeholders called the hotline to request that the study team consider improving bicycle and pedestrian accommodations. The study team kept a detailed log describing all phone calls and e-mail correspondence, which can be found in Appendix B.

### 4.6 Information from Local Agencies

In the early stages of the study, the study team contacted local agency representatives to collect information on all 26 Texas-Mexico crossings, information on similar previous studies conducted in the area, and available traffic information. The study team utilized the *Texas-Mexico International Crossings Existing and Proposed, 2006* guide provided by the TxDOT IRO for basic crossing information including the length of each bridge, the layout of the crossing at the POE, a list of local crossing names, and for aerial images of each crossing. The study team also utilized *Truck Route*, a map from the City of Laredo, 1998 Saturation Traffic Count Maps from TxDOT, and the *Texas Urban Mobility Plan: “Breaking the Gridlock”* developed by the Laredo MPO. Table 10 shows a list of general information collected by the study team, and Table 11 shows a list of information specific to the TxDOT Laredo District collected by the study team.

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>Location</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>US/Mexico Joint Working Committee</td>
<td>6/10/08</td>
<td>Laredo, Texas</td>
<td>The study team presented to the US/Mexico Joint Working Committee an update for the progress of the TPP Border Travel Time Study. The US/Mexico Joint Working Committee is comprised of members associated with the development and maintenance of the infrastructure promoting trade between the US and Mexico.</td>
</tr>
</tbody>
</table>

### Table 10 – General Information from Local Agencies

<table>
<thead>
<tr>
<th>Data Name</th>
<th>Date Received</th>
<th>Received From</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas Statewide Mobility Program</td>
<td>2/28/2007</td>
<td>TxDOT</td>
</tr>
<tr>
<td>Statewide and ELP/LRD/PHR MPO TIP’s</td>
<td>3/1/2007</td>
<td>TxDOT</td>
</tr>
<tr>
<td>“Bottleneck Study” – Transportation Infrastructure Management Analysis of Cross Border Bottlenecks</td>
<td>2/28/2007</td>
<td>CalTrans website</td>
</tr>
<tr>
<td>Bi-national Border Transportation Infrastructure Needs Assessment Study</td>
<td>2/28/2007</td>
<td>FHWA</td>
</tr>
<tr>
<td>Blank POE Survey Summary Workbook</td>
<td>2/28/2007</td>
<td>FHWA</td>
</tr>
<tr>
<td>Truck Transportation Through Border POEs: Analysis of Coordination Systems</td>
<td>2/28/2007</td>
<td>TTI</td>
</tr>
<tr>
<td>El Paso Border Wizard Transborder Travel Demand Model</td>
<td>2/28/2007</td>
<td>FHWA</td>
</tr>
<tr>
<td>Texas-Mexico International Crossings, 2006</td>
<td>2/28/2007</td>
<td>TxDOT IRO</td>
</tr>
<tr>
<td>Unified Transportation Program – Statewide Mobility Program, TxDOT</td>
<td>3/05/2007</td>
<td>TxDOT</td>
</tr>
<tr>
<td>Fact Sheets for Highway Provisions in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, (SAFETEA-LU), FHWA</td>
<td>2/05/2007</td>
<td>TxDOT</td>
</tr>
<tr>
<td>Transportation Programming and Scheduling Manual, TxDOT</td>
<td>2/05/2007</td>
<td>TxDOT</td>
</tr>
<tr>
<td>Maintenance Management Manual, TxDOT</td>
<td>1/05/2008</td>
<td>TxDOT</td>
</tr>
</tbody>
</table>


### Table 11 – TxDOT Laredo District Information from Local Agencies

<table>
<thead>
<tr>
<th>Data Name</th>
<th>Date Received</th>
<th>Received From</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laredo River Road Corridor Study</td>
<td>11/13/2007</td>
<td>TxDOT Laredo District</td>
</tr>
<tr>
<td>Texas Urban Mobility Plan: “Breaking the Gridlock”</td>
<td>2/20/2007</td>
<td>Laredo MPO</td>
</tr>
<tr>
<td>Long Range Thoroughfare Plan – Laredo, TX</td>
<td>2/20/2007</td>
<td>City of Laredo</td>
</tr>
<tr>
<td>Laredo Transit System Map and Schedules</td>
<td>2/20/2007</td>
<td>Laredo El Metro</td>
</tr>
<tr>
<td>Laredo Parks Map</td>
<td>2/20/2007</td>
<td>City of Laredo</td>
</tr>
<tr>
<td>Laredo Truck Routes</td>
<td>2/20/2007</td>
<td>City of Laredo</td>
</tr>
<tr>
<td>2003 District Highway Traffic Map – TxDOT Laredo District</td>
<td>2/14/2007</td>
<td>TxDOT TPP Division</td>
</tr>
<tr>
<td>2005 District Highway Traffic Map – TxDOT Laredo District</td>
<td>2/14/2007</td>
<td>TxDOT TPP Division</td>
</tr>
<tr>
<td>1998 Saturation Traffic Counts Map Detail</td>
<td>2/14/2007</td>
<td>TxDOT TPP Division</td>
</tr>
<tr>
<td>2003 Saturation Traffic Counts Map Detail</td>
<td>2/14/2007</td>
<td>TxDOT TPP Division</td>
</tr>
<tr>
<td>Laredo MTP 2003 – 2030, Laredo MPO</td>
<td>3/05/2007</td>
<td>Laredo MPO</td>
</tr>
<tr>
<td>World Trade Bridge Traffic Data Collection Plan</td>
<td>3/1/2007</td>
<td>CEC</td>
</tr>
<tr>
<td>Preliminary Study Area Maps</td>
<td>3/1/2007</td>
<td>CEC</td>
</tr>
<tr>
<td>Blank POE Survey Summary Workbook</td>
<td>2/28/2007</td>
<td>FHWA</td>
</tr>
</tbody>
</table>

Appendix C contains a CD copy of all outside information listed in Table 10 and Table 11.
5.0 ENVIRONMENTAL CONSTRAINTS MAP

In order to identify the environmental, economic, and social constraints within each study area, the study team performed an environmental baseline data collection effort and a constraints analysis. This analysis was done in sufficient detail to assess feasible and practical conceptual alternatives and identify impacts that differentiate between alternatives. To better understand and visualize the impacts to the surrounding environment, environmental constraints maps were developed utilizing geographic information systems (GIS) software. The maps were used during the alternative screening evaluation and at the RTWG Meeting #2 as reference material and information. The process by which the environment constraints maps for this study were created is described in this chapter.

The datasets for the constraints maps were collected from a variety of sources, mostly public agencies such as the Texas Natural Resources Information System (TNRIS), MPO data resources, county central appraisal districts, and city planning departments. Datasets from these agencies were used mostly unaltered, though some layers were edited to reflect updated or additional information. Also, some datasets were created by the study team referencing information not readily available in a GIS-compatible format, including comments received from stakeholders, involved agencies, TxDOT, TPP and district staff, and data from previous studies conducted in the vicinity of each crossing.

5.1 Aerial Orthophotography

Aerial orthophotography is the base layer for all the constraints maps prepared for this study. For the border crossings within Webb County (Gateway to the Americas Crossing, Juarez-Lincoln Crossing, Colombia Crossing, and World Trade Crossing), grayscale, three-inch pixel orthophotography was provided by TxDOT. Infrared, one-meter pixel orthophotography was collected from TNRIS for the crossings in Maverick and Val Verde Counties (Eagle Pass Crossing, Camino Real Crossing, Del Rio Crossing, and Lake Amistad Dam Crossing), which was displayed in grayscale on the maps. All orthophotography was adjusted for brightness and contrast, so as to allow the layers on top to remain legible.

5.2 Transportation

Transportation layers are line datasets that depict the centerline of roadways and railroads. Transportation datasets from the Texas Strategic Mapping Program of TNRIS were used as the roadway layers. The symbology for this layer is categorized as highways if the roadway had a shield type designation and as a road if it did not. The railroad dataset for the entire State of Texas was also downloaded from the TNRIS website (http://www.tnris.state.tx.us).

5.3 Parcel Outlines

Property parcel outlines, available only for border crossings in Webb County, from the City of Laredo, were displayed only for parcels with an identified land use. Parcel information was also used to delineate parcel ownership and ROW limits.
5.4 Existing Land Use

The existing land use layer depicts the current categorized utilization of a unit of land. The border crossings within Webb County employed the parcel dataset from the City of Laredo as a base for the land use layer. Then, the study team performed a spatial join of the parcel dataset with a land use coverage dataset, also from the City of Laredo, attaching the attributes of the land use layer to that of the parcel layer. If the information from the land use coverage was insufficient to determine land use, the study team utilized the parcel name attributes and aerial orthophotography to make best judgments on the existing land use of the parcel. The border crossings in Maverick and Val Verde Counties did not have any datasets or other information regarding land use, so the study team generated the land use layer manually, using their best judgment based on the aerial orthophotography available for the area.

Land use was categorized into thirteen categories, each with a unique symbology. The layer was displayed at 50% transparency to allow the orthophotography to remain visible underneath. The land use categories and symbology are described in Table 12 below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Symbology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Single and multi-family homes</td>
<td>Solid yellow</td>
</tr>
<tr>
<td>Low-Income Residential</td>
<td>Public housing or housing provided by a non-profit organization</td>
<td>Yellow diamonds</td>
</tr>
<tr>
<td>Commercial</td>
<td>Non-manufacturing businesses</td>
<td>Solid red</td>
</tr>
<tr>
<td>Industrial</td>
<td>Manufacturing businesses</td>
<td>Solid purple</td>
</tr>
<tr>
<td>Civic</td>
<td>Non-profit or community organization</td>
<td>Solid blue</td>
</tr>
<tr>
<td>Federal Owned</td>
<td>Owned by the United States of America</td>
<td>Blue stars</td>
</tr>
<tr>
<td>State Owned</td>
<td>Owned by the State of Texas</td>
<td>Blue cross-hatching</td>
</tr>
<tr>
<td>County Owned</td>
<td>Owned by the local county government</td>
<td>Blue zero degree stripes</td>
</tr>
<tr>
<td>City Owned</td>
<td>Owned by the local municipal government</td>
<td>Blue 90 degree stripes</td>
</tr>
<tr>
<td>Park/Recreational Facility</td>
<td>Public recreational facility</td>
<td>Solid green</td>
</tr>
<tr>
<td>Utility</td>
<td>Utility facility</td>
<td>Solid orange</td>
</tr>
<tr>
<td>Agricultural</td>
<td>Farm or ranchland</td>
<td>Solid dark green</td>
</tr>
<tr>
<td>Cemetery</td>
<td>Recognized cemetery land</td>
<td>Solid gray with black crosses</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>Vacant land with no or abandoned improvements</td>
<td>Solid brown</td>
</tr>
</tbody>
</table>


5.5 Environmental Constraints Map Exhibits

The final environmental constraints map exhibits, which incorporated comments collected from the RTWG meetings, for the Gateway to the Americas Crossing, Juarez-Lincoln Crossing, Colombia Crossing, World Trade Crossing, Eagle Pass Crossing, Camino Real Crossing, Del Rio Crossing, and Lake Amistad Dam Crossing are displayed in Figure 39 through Figure 44.
Gateway to the Americas Crossing and Juarez-Lincoln Crossing Constraints Map


Figure 39 – Gateway to the Americas and Juarez-Lincoln Crossings Constraints Map NTS
Figure 40 – Colombia Crossing Constraints Map NTS

Figure 41 – World Trade Crossing Constraints Map NTS

Figure 42 – Eagle Pass Crossing and Camino Real Crossings Constraints Map NTS
Figure 43 – Del Rio Crossing Constraints Map NTS

Figure 44 – Lake Amistad Dam Crossing Constraints Map NTS
6.0 INITIAL ALTERNATIVES

6.1 Introduction

The development of initial alternatives technically began while the study team conducted several reconnaissance visits to all the bridges in the TxDOT Laredo District. While there, study team members made general observations of locations and documented traffic congestion and operational deficiencies. The team also collected information from different sources such as TxDOT’s District Office, the bridge operators themselves, and data that was readily available online to supplement their findings. See Chapter 4.0 for additional information on data collection efforts.

The study team proceeded to brainstorm and develop the initial alternatives that would be presented at the first RTWG meeting. The study team’s strategy for the meeting was to develop and present initial alternatives that addressed the issues observed by the study team while encouraging attendees themselves to provide input and develop additional alternatives. Following is a list of the initial alternatives, an illustration exhibit of the alternative, plus a brief description of the improvement strategy.

6.2 Gateway to the Americas Crossing

The study team created two improvement alternatives for the Gateway to the Americas Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.2.1 Alternative 1
Alternative 1 proposed to synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Salinas Ave. By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications, thereby, improving overall mobility and reducing travel times. See Figure 45 for Alternative 1.

6.2.2 Alternative 2
Alternative 2 proposed the installation of ITS devices such as video cameras and dynamic message signs for motorist information along Salinas Ave. at each intersection to Victoria St. This would forewarn drivers of delays and congestion at the Gateway to the Americas Crossing thereby allowing them the opportunity to proceed to another crossing. This alternative could potentially reduce congestion and traffic volumes at the crossing. See Figure 45 for Alternative 2.
Figure 45 – Gateway to the Americas Crossing Alternatives 1 and 2 NTS
6.3 Juarez-Lincoln Crossing

The study team created two improvement alternatives for the Juarez-Lincoln Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.3.1 Alternative 1
Alternative 1 proposed to synchronize traffic signals within a five block area from the crossing. This area begins at the crossing, and extends east to San Eduardo Ave. and west to Santa Ursula Ave. It then continues north to Washington St. By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications, thereby, improving overall mobility and reducing travel times. See Figure 46 for Alternative 1.

6.3.2 Alternative 2
Alternative 2 proposed the installation of ITS devices such as video cameras and dynamic message signs for motorist information within the same five block area. This would forewarn drivers of delays and congestion at the crossing thereby allowing them the opportunity to proceed to another crossing. This alternative could potentially reduce congestion and traffic volumes at the crossing. See Figure 46 for Alternative 2.
Figure 46 – Juarez-Lincoln Crossing Alternatives 1 and 2 NTS
6.4 Colombia Crossing

The study team created one alternative for this crossing. This alternative was displayed on a map with an aerial image of the crossing.

6.4.1 Alternative 1

Alternative 1 proposed to relocate the existing Texas Department of Public Safety (DPS) BSIF onto its current location at FM 255 between the border crossing and the intersection with FM 1472. This alternative would move the DPS BSIF facility away from the intersection of FM 1472 and FM 255. Presently, the traffic queue lengths created by vehicles entering and exiting the BSIF interfere with the operation of the intersection. See Figure 47 for Alternative 1.
Figure 47 – Colombia Crossing Alternative 1 NTS
6.5 World Trade Crossing

The study team created two alternatives for the World Trade Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.5.1 Alternative 1
Alternative 1 proposed traffic signal phasing and timing improvements at the intersection of LP 20 and FM 1472 and at the intersection of IH 35 and LP 20. Optimizing traffic signal phasing and timing plans result in improved signal operation in the form of less delay, improved capacity and greater mobility. See Figure 48 for Alternative 1.

6.5.2 Alternative 2
Alternative 2 proposed to relocate the DPS BSIF towards LP 20. This alternative proposed to locate the temporary BSIF to its permanent location. See Figure 48 for Alternative 2.
Figure 48 – World Trade Crossing Alternatives 1 and 2 NTS

6.6 Eagle Pass Crossing

The study team created two improvement alternatives for the Eagle Pass Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.6.1 Alternative 1
For Alternative 1, the study team proposed traffic signal phasing and timing improvements along E. Garrison St. As with previous crossing alternatives, this alternative provided more efficient operations at the intersection. By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications thereby improving overall mobility and reducing travel times. See Figure 49 for Alternative 1.

6.6.2 Alternative 2
Alternative 2 proposed the addition of ITS devices for motorist information along E. Garrison St. This would forewarn drivers of delays and congestion at the crossing thereby allowing them the opportunity to proceed to the other crossing. This alternative could potentially reduce congestion and traffic volumes along the streets that are used to travel between the crossings. See Figure 49 for Alternative 2.
Figure 49 – Eagle Pass Crossing Alternatives 1 and 2 NTS
6.7 Camino Real Crossing

The study team created three improvement alternatives for the Camino Real Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.7.1 Alternative 1
For Alternative 1, the study team proposed traffic signal phasing and timing improvements along S. Monroe St., starting at Bliss St. then traveling away from the crossing. This alternative provided more efficient operations at the intersection. By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications thereby improving overall mobility and reducing travel times. See Figure 50 for Alternative 1.

6.7.2 Alternative 2
Alternative 2 proposed to place ITS devices such as video cameras and dynamic message signs for motorist information at the intersection of S. Monroe St. and Bliss St. This would forewarn drivers of delays and congestion at the crossing thereby allowing them the opportunity to proceed to another crossing. This alternative could potentially reduce congestion and traffic volumes on streets that are used to travel between crossings. See Figure 50 for Alternative 2.

6.7.3 Alternative 3
Alternative 3 proposed to construct an advance warning system along Highway Blvd. in advance of its intersection with the railroad tracks. The alternative was a short-term safety improvement. Long-term improvements possibly involved a grade separation over the railroad tracks. See Figure 50 for Alternative 3.
Figure 50 – Camino Real Crossing Alternatives 1 through 3 NTS

6.8 Del Rio Crossing

The study team created two improvement alternatives for the Del Rio Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.8.1 Alternative 1
Alternative 1 proposed to improve traffic signal phasing and timing along US 277/Spur 239. This alternative provided more efficient operations at the intersection. By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications thereby improving overall mobility and reducing travel times. See Figure 51 for Alternative 1.

6.8.2 Alternative 2
Alternative 2 proposed the addition of ITS devices for motorist information along US 277/Spur 239. This would forewarn drivers of delays and congestion at the crossing thereby allowing them the opportunity to proceed to another crossing. This alternative could potentially reduce congestion and traffic volumes. See Figure 51 for Alternative 2.
Figure 51 – Del Rio Crossing Alternatives 1 and 2 NTS
6.9 Lake Amistad Dam Crossing

The study team created two alternatives for the Lake Amistad Dam Crossing. These alternatives were displayed on maps with aerial images of the crossing.

6.9.1 Alternative 1
Alternative 1 proposed to add signs at US 90. This alternative would utilize warning signs to inform motorists of the proximity and configuration of the intersections. See Figure 52 for Alternative 1.

6.9.2 Alternative 2
Alternative 2 proposed the addition of a flashing beacon at US 90 and Spur 349, an improvement focused on safety. The rural setting, especially at night, makes the intersection at US 290 and Spur 349 a prime candidate for a safety improvement, such as a flashing beacon. See Figure 52 for Alternative 2.
Figure 52 – Lake Amistad Dam Crossing Alternatives 1 and 2 NTS
6.10 Study Continuation

The alternatives described above represent the initial alternatives for the TxDOT Laredo District. The study team presented the alternatives described above at the first RTWG Meeting. These initial alternatives served as a starting point in the alternative development process. They also provided a means of soliciting additional input from RTWG meeting attendees. See RTWG Meeting #1 Report for the TxDOT Laredo District for additional information.

From these comments, the study team developed additional alternatives that were added to the alternatives presented at the meeting for further analysis. The additional alternatives and the ensuing analysis process will be further described in the following chapter of the report.
7.0 REFINEMENT AND SCREENING PROCESS

7.1 Refined Alternatives

The comments from the first RTWG meeting provided the study team with sufficient information to develop additional alternatives for the crossings. The resulting set of initial and additional alternatives was identified as the refined alternatives. Specific information on the refined initial alternatives for each of the crossings is detailed in the following sections of this chapter.

The refined alternatives would then go to the initial screening phase. Following the initial screening phase, an additional process of analysis, screening, evaluation, refinement, and another RTWG meeting were utilized to identify alternatives that became part of the recommendation process of the study. The latter sections of Chapter 7.0 of this report will describe the methodology the study team used to analyze and evaluate them.

7.1.1 Refined Alternative for the Gateway to the Americas Crossing

One additional alternative for the Gateway to the Americas Crossing was developed from the comments received at the first RTWG meeting. That alternative was alternative 3. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.

Alternative 1
Synchronize traffic signals from the POE north to Washington St.

Alternative 2
Installations of ITS devices such as video cameras and dynamic message signs for motorist information along Salinas Ave. and at each intersection too Victoria St.

Alternative 3
Alternative 3 proposed to improve and add signage in the downtown area, particularly in order to better disseminate lane assignments. See Figure 53 for Alternative 3.
Figure 53 – Gateway to the Americas Crossing Alternative 3 NTS
7.1.2 Refined Alternatives for the Juarez-Lincoln Crossing

Four additional alternatives for the Juarez-Lincoln Crossing were developed from the comments received at the first RTWG meeting. Those additional alternatives were 3 through 6. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.

**Alternative 1**
Synchronize traffic signals within a five block area from the crossing.

**Alternative 2**
Installations of ITS devices such as video cameras and dynamic message signs for motorist information within the same five block area.

**Alternative 3**
Alternative 3 proposed additional signage and signage improvements in the downtown area. Particularly, the signage was to assist in the dissemination of lane assignment information. See Figure 54 for Alternative 3.
Figure 54 – Juarez-Lincoln Crossing Alternative 3 NTS

Alternative 4

Alternative 4 proposed to improve the intersection geometry on Santa Ursula Ave. between Matamoros St. and Houston St. with dual left-turn lanes. See Figure 55 for Alternative 4.


Figure 55 – Juarez-Lincoln Crossing Alternative 4 NTS
Alternative 5
Alternative 5 improved intersection geometry by providing a dual left-turn at Victoria St. traveling eastbound to IH 35/US 83. See Figure 56 for Alternative 5.

Figure 56 – Juarez-Lincoln Crossing Alternative 5 NTS

Alternative 6
Alternative 6 proposed restriping and adding lane assignment signs at the intersection of San Dario Ave. and Victoria St., as San Dario Ave. as it splits to IH 35. See Figure 57 for Alternative 6.

7.1.3 Refined Alternatives for the Colombia Crossing
Five additional alternatives for the Colombia Crossing were developed from the comments received at the first RTWG meeting. Those alternatives were 2 through 6. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.

Alternative 1
Relocate the existing DPS BSIF from its current location

Alternative 2
Alternative 2 proposed to add a traffic signal at the intersection of FM 1472 and FM 255, if warranted. See Figure 58 for Alternative 2.
Alternative 3 consisted of improvements implemented for commercial traffic once they exited the temporary, existing DPS facility. The stated improvements were to improve striping, improve and add signage upon exiting the temporary DPS facility, increase the acceleration lane for commercial trucks upon exiting the DPS facility, and improve the radius of the facility exit. See Figure 59 for Alternative 3.
Alternative 4

Alternative 4 proposed improvements for commercial traffic entering the temporary, existing DPS facility in the form of a designated right-turn lane upon entering the DPS facility for commercial trucks and improve and add signage, primarily for lane designation. See Figure 60 for Alternative 4.
Alternative 5
Alternative 5 proposed additional signage along FM 1472. No exhibit was developed for this alternative.

Alternative 6
Alternative 6 proposed a contra flow lane on the bridge facility. No exhibit was developed for this alternative.

7.1.4 Refined Alternative for the World Trade Crossing
One additional alternative for the World Trade Crossing was developed from the comments received at the first RTWG meeting. That alternative was alternative 3. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.

Alternative 1
Traffic signal phasing and timing improvements at the intersection of LP 20 and FM 1472

Alternative 2
Relocate the DPS BSIF towards LP 20
Alternative 3
Alternative 3 proposed to improve and add signage in the study area. See Figure 61 for Alternative 3.
Figure 61 – World Trade Crossing Alternative 3 NTS

7.1.5 Refined Alternatives for the Eagle Pass Crossing
The study team did not develop additional alternatives for the Eagle Pass Crossing following the RTWG #1 meeting.

7.1.6 Refined Alternative for the Camino Real Crossing
One additional alternative for the Camino Real Crossing was developed from the comments received at the first RTWG meeting. That alternative was alternative 4. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.

Alternative 1
Traffic signal phasing and timing improvements along S. Monroe St. beginning at Bliss St. and traveling away from the crossing

Alternative 2
Place ITS devices such as video cameras and dynamic message signs for motorist information at the intersection of S. Monroe St. and Bliss St.

Alternative 3
Construct an advance warning system along Highway Blvd. in advance of its intersection with the railroad tracks

Alternative 4
The one additional alternative developed by the study team for the Camino Real Crossing was Alternative 4. Alternative 4 proposed to widen S. Monroe St. to an arterial typical section. See Figure 62 for Alternative 4.

![Figure 62 – Camino Real Crossing Alternative 4 NTS](source: RJ RIVERA Associates, Inc., 2008.)

7.1.7 Refined Alternative for the Del Rio Crossing
One additional alternative for the Del Rio Crossing was developed from the comments received at the first RTWG meeting. That alternative was alternative 3. The following subsections list the initial alternatives and describe the additional alternatives that progressed to initial screening.
Alternative 1
Improve traffic signal phasing and timing along US 277/Spur 239

Alternative 2
Addition of ITS devices such as video cameras and dynamic message signs for motorist information along US 277/Spur 239.

Alternative 3
Alternative 3 had the southbound right-turn bay from US 277/Spur 239 to Rio Grande Rd. extended. The primary reason for this improvement was to provide easier access to the duty-free shop located on Rio Grande Rd. See Figure 63 for Alternative 3.

7.1.8 Refined Alternatives for the Lake Amistad Dam Crossing
The study team did not develop additional alternatives for the Lake Amistad Dam Crossing following the RTWG #1 meeting.

7.2 Initial Screening
The first phase of the evaluation process consisted of an initial screening that identified alternatives with one or more fatal flaws. The study team based this initial screening on criteria set forth in the scope of the study. Any alternative, identified through the initial screening that did not meet the criteria described below was deemed to have a fatal flaw and would not proceed past this phase of the study. As such, the criterion for the initial screening was:

- The alternative represented a short-term improvement. Short-term was defined as being open to traffic within five years.
- The alternative represented a low cost improvement. Low cost was defined as having an estimated construction and ROW cost, in 2008 dollars, of less than one million dollars.
- The alternative was within the study area, five-mile stateside-radius, of the crossing.
• The authority to implement the alternative lay with TxDOT or the local municipality. As such, improvements on federal property, modifications to the international bridge or border crossing operations were deemed as having a fatal flaw.

The study team used the constraint mapping generated for this study during this phase of the analysis. The constraint mapping provided property owner information and identified possible environmental constraints.

The no-build alternative, or the do nothing option, would move forward as a viable option throughout the study process.

7.2.1 Alternatives Eliminated for the Gateway to the Americas Crossing
Three alternatives for the Gateway to the Americas Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The alternatives that would move forward to the next screening process are listed below.

• Alternative 1: Synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Salinas Ave.

• Alternative 2: Install ITS devices for motorist information in the same study area.

• Alternative 3: Improve and add signage in the downtown area, primarily for disseminating lane assignments.

7.2.2 Alternatives Eliminated for the Juarez-Lincoln Crossing
Six alternatives for the Juarez-Lincoln Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The alternatives that would move forward to the next screening process are listed below.

• Alternative 1: Synchronize traffic signals within a five-block area from the crossing. The area begins at the bridge and extends east to San Eduardo Ave., extends west to Santa Ursula Ave., and continues north to Washington St.

• Alternative 2: Install ITS devices for motorist information within this same five block area.

• Alternative 3: Improve and add signage in the downtown area, primarily for disseminating lane assignments.

• Alternative 4: Improve intersection geometry by installing dual left-turn lanes at Santa Ursula Ave. and Matamoros St.

• Alternative 5: Improve intersection geometry by dual left-turn lanes at Victoria St. traveling eastbound to San Dario Ave.

• Alternative 6: Restripe and add lane assignment signs at the intersection of San Dario Ave. and Victoria St., as San Dario Ave. splits to IH 35.
7.2.3 Alternatives Eliminated for the Colombia Crossing

Six alternatives for the Colombia Crossing advanced to the initial screening process. After comparing them to the criteria, the study team found two alternatives that would not proceed beyond the initial screening process.

Alternative 1 was eliminated during the fatal flaw analysis. This alternative relocated the current BSIF to another site. Since the BSIF was on GSA property, the alternative contained a fatal flaw as the GSA would need to be in control of any relocation project.

Alternative 6 was also eliminated during the fatal flaw analysis. This alternative implemented contra flow lanes on the bridge facility. Since the bridge was within GSA jurisdiction, the alternative contained a fatal flaw as the GSA would need to be in control of any bridge reconfiguration project.

With the elimination of initial Alternatives 1 and 6, the study team renumbered Alternative 2 as Alternative 1, Alternative 3 as Alternative 2, Alternative 4 as Alternative 3, and Alternative 5 as Alternative 4.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Add a traffic signal light at FM 1472 and FM 255 if meets signal warrants
- Alternative 2*: Improvements once commercial traffic has exited the DPS facility:
  - Stripping improvements
  - Improve and add signage upon exiting the temporary DPS facility
  - Increase acceleration lane for commercial trucks upon exiting the DPS facility
  - Exit radius improvements
- Alternative 3*: Improvements to area as commercial traffic is entering the DPS BSIF facility
  - Add a designated right-turn lane upon entering the DPS BSIF for commercial trucks
  - Improve and add signage, primarily for lane designation
- Alternative 4: Provide additional signage along FM 1472.

*Alternatives 2 and 3 are proposed improvements surrounding the temporary BSIF area. Those improvements will apply until the permanent BSIF opens.

7.2.4 Alternatives Eliminated for the World Trade Crossing

Four alternatives for the World Trade Crossing advanced to the initial screening process. After comparing them to the criteria, the study team found one alternative that would not proceed beyond the initial screening process.
Alternative 2 was eliminated during the fatal flaw analysis. This alternative relocated the current BSIF to another site. Since the BSIF was on GSA property, the alternative contained a fatal flaw as the GSA would need to be in control of any relocation project.

Initial Alternative 1 was then split into two separate alternatives, becoming Alternatives 1 and 2.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Improve traffic signal phasing and timing at the intersection of LP 20 and FM 1472/Mines Rd.
- Alternative 2: Improve traffic signal phasing and timing at the intersection of IH 35 and LP 20
- Alternative 3: Improve and add signage in the study area

7.2.5 Alternatives Eliminated for the Eagle Pass Crossing

Two alternatives for the Eagle Pass Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Improve traffic signal phasing and timing along E. Garrison St.
- Alternative 2: Install ITS devices for motorist information along E. Garrison St.

7.2.6 Alternatives Eliminated for the Camino Real Crossing

Three alternatives for the Camino Real Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The initial Alternatives 2 and 3 were combined and Alternative 4 was renumbered to Alternative 3.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Improve traffic signal phasing and timing along S. Monroe St., starting at Bliss St. and traveling away from the bridge.
- Alternative 2: Install ITS devices for motorist information.
  - At the intersection of S. Monroe St. and Bliss St.
  - Add railroad crossing gates in the study area, as train activity is anticipated to increase due to the addition of the large beer factory on the Mexican side of the border (plan to primarily ship goods via railroad).
- Alternative 3: Widen S. Monroe St. to arterial typical section.
7.2.7 Alternatives Eliminated for the Del Rio Crossing
Three alternatives for the Del Rio Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Improve traffic signal phasing and timing along US 277S/Spur 239.
- Alternative 3: Extend the existing southbound right-turn bay for traffic traveling west onto Rio Grande Rd. (for easier access to the duty free shop located on this road).

7.2.8 Alternatives Eliminated for the Lake Amistad Dam Crossing
Two alternatives for the Lake Amistad Dam Crossing advanced to the initial screening process. After comparing them to the criteria, none were eliminated and all alternatives would proceed beyond the initial screening process.

The alternatives that would move forward to the next screening process are listed below.

- Alternative 1: Add signage at US 90.
- Alternative 2: Add a flashing beacon at US 90 and Spur 349.

7.3 Final Screening
For the final screening process, the study team needed to determine a methodology by which to evaluate and rank the alternatives, including the no-build alternative. This required the study team to develop a screening matrix and evaluation criteria, define the use of traffic modeling data in the matrix, devise a scoring system, and define a process for paring down the list of alternatives. The methodology used by the study team to complete these tasks is described below.

7.3.1 Screening Matrix
The screening matrix developed for this study included criteria based on the Need and Purpose statement and the scope of the study. The criteria were categorized based on the Goals and Objectives and included mobility, safety, economy, environment, security, design, and cost effectiveness. These categories were further divided into sub-categories that were adjusted slightly from the Goals and Objectives in order to fit the conditions identified during the study process.

The criteria would employ both qualitative and quantitative measures to differentiate between the alternatives. For the criterion with qualitative measures, ratings were based on whether the alternative had a positive, neutral, or negative affect on the individual goal. This rating method lent itself to the use of a plus, zero, or minus indication for positive, neutral, or negative, respectively. Qualitative measures were used in all the categories of criteria; however, some criterion within the mobility, economy, environment and cost effectiveness included quantitative measures.
For the mobility, economy and environment criteria categories, the study team was able to apply quantitative measures to the individual criterion. The units of measures, or measures of effectiveness (MOE), for this criterion varied and were generated using the CORSIM and Synchro traffic software. For example, Level of Service (LOS), was measured with a rating of A through F, with A being the best and F being the worst. Similarly, traffic delays were measured by time, seconds of delay, and queue lengths were measured in feet. Other criterion using quantitative measures included fuel economy in the Economy category that was measured in miles per gallon, and air quality in the Environment category that used kilograms to measure emissions.

The study team did not collect traffic data at all of the crossings and all the alternatives could not be effectively modeled (i.e. install ITS) as part of this study. These alternatives were evaluated using the same criteria but were rated using only qualitative measures. The study team enlisted the support of additional staff with technical expertise in these fields, as well as their own experience, to qualitatively rate the alternatives.

The other category of criteria that utilized quantitative MOEs was the cost effectiveness category. The criterion included construction cost, ROW cost, implementation time and total cost. The study team developed construction cost estimates based on TxDOT’s unit bid prices, and ROW costs based on land and improvement values from county tax records. Implementation time estimates were based on a timeline that included design, ROW acquisition, environmental documentation and actual construction time. Based on the implementation time, the study team factored in an inflation rate of 5% per year to the construction estimates. See Appendix E for cost estimates for each alternative that remained after the initial screening.

The study team further enhanced the matrix by color coding the ratings that were previously defined. The color green was used as a background with a plus for positive scores; yellow was used with a zero for neutral scores, red with a minus for negative scores and purple for “N/A”. The color coding made the matrix easier to read and aided in the presentation of the matrix at the second RTWG meeting. Other colors, such as light green and orange, were used in the matrix to highlight totals and results. See Figure 64 for an example of the screening matrix used to screen the crossings.

7.3.2 Traffic Analysis Methodology

The study team developed a methodology for consistently selecting the modeling results incorporated in the quantitative criterion of the screening matrix. This proved necessary because different roadways or segments of roadways within the study area operate at different levels of efficiency. By developing a consistent method of selecting modeling results, all alternatives could be compared to each other.

Key elements of the process were as follows:

- The study established 2009 as the current year and 2014 as the build-out year. The build-out year would be used in the evaluation process for all alternatives, including the no-build alternative.

- Comparing alternatives required that a roadway or segment of roadway be identified for comparison between current conditions and conditions once each alternative was implemented. From the travel routes identified, the study team selected the roadway...
or segment of roadway with the poorest no-build alternative LOS during the build-out year as the segment used for comparison.

- All the MOEs used in the screening matrix represent the data for that segment of roadway

Furthermore, the no-build alternative measures would be projected to the year 2014. This was done in order to compare the no-build alternative to all the alternatives which would be in place by 2014. A more detailed analysis of the traffic data collection and the traffic operations were discussed in Chapters 4.0 and 8.0 of this report.

### 7.3.3 Scoring Process

With a screening matrix in place, the screening process required a scoring process in order to evaluate the alternatives. As such, the study team developed a process consistent with the goals and objectives of the study. Based on this premise, it was determined that each criteria category within the matrix would be weighed equally and each criterion within a category would be weighed equally with all other criterion within that category. The scoring process would be as follows:

Each criterion would receive a score of +1 for a plus rating, a -1 for a minus rating and a zero for a zero rating. To calculate the score for a criteria category, the sum of the scores for the criterion was divided by the number of criterion in the category. As such, the minimum and maximum score for each criteria category was -1 and +1, respectively.

For example, in the mobility criteria category, there are 11 individual criterions; therefore, each individual criterion is worth 1/11th of the cumulative score for the mobility criteria category.

The screening and scoring of the alternatives occurred during a series of meetings by the study team’s screening panel. The panel consisted of four technical members, two engineers, two transportation planners, and a non-technical person to represent the traveling public’s perspective. The panel met, discussed the alternative, applied the screening matrix, assigned a rating to each criterion and calculated a score.

### 7.3.4 Alternative Screening

The final component of the screening process involved identifying the alternatives that would advance to the next step in the alternative analysis process. In observing the results of the scoring process, the study team identified a natural statistical gap that emerged between the scores. The gap was determined based on the overall improvement the alternative would provide compared to the no-build alternative. The gap was also based on the overall improvement the alternative would provide compared to each other. This gap, or break point, was selected as the point at which to separate alternatives. Those that scored at or above the break point moved forward in the study process and were presented at the second RTWG meeting. For details and exhibits from the RTWG #2 meeting please refer to RTWG #2 Meeting Report. As mentioned previously, the no-build alternative moved forward as a viable option throughout the study process.

The results from the final screening process for all the alternatives are in the following section of this chapter.
## 7.3.5 Gateway to the Americas Crossing

The Gateway to the Americas Crossing had four alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 65 for the screening matrix for this crossing.

### Figure 64 – Sample Screening Matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>No Build</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
<th>Alternative 4</th>
<th>Alternative 5</th>
<th>Alternative 6</th>
<th>Alternative 7</th>
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<td>A thru F (A being the best)</td>
<td>A thru F (A being the best)</td>
<td>A thru F (A being the best)</td>
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<td>$ thousands (ROW + Const)</td>
<td>$ thousands (ROW + Const)</td>
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</table>
For the Mobility criteria category, the study team selected Convent St. as the segment for analysis. The analysis utilized the LOS for the AM peak period in the no build alternative model for the build-out year. The subsequent MOEs (i.e. queue length, delays) were an average for the travel time route/network. For more detail on the MOEs see Chapter 8.0. Only the alternatives that were modeled had MOEs; the other alternatives were measured qualitatively for this set of criteria.

The study team identified the break point for this crossing at 1.2. Alternatives 1 through 3 scored 1.2 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Salinas Ave.
- Alternative 2: Install ITS devices for motorist information in the same study area
- Alternative 3: Improve and add signage in the downtown area, primarily for disseminating lane assignments.
## Border Crossing Travel Time Study Report

### Volume II: Laredo District

**Criteria Measure**

**Gateway to the Americas Bridge**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>No build</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
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<tbody>
<tr>
<td>Mobility</td>
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<tr>
<td>Alleviate Congestion</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>0</td>
<td>improves</td>
</tr>
<tr>
<td>Increase Capacity</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>0</td>
<td>improves</td>
</tr>
<tr>
<td>Accessability</td>
<td>improves, maintains, opposes</td>
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<td>0</td>
<td>maintains</td>
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<td>Pedestrian Accommodations</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>0</td>
<td>improves</td>
</tr>
<tr>
<td>Transit Accommodations</td>
<td>improves, maintains, opposes</td>
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<td>Provide More Route Options to/from Ports of Entry</td>
<td>improves, maintains, opposes</td>
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<td>Use As Evacuation Route</td>
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**Source:** RJ RIVERA Associates, Inc., 2008.

**Figure 65 – Gateway to the Americas Crossing Screening Matrix**
7.3.6 Juarez-Lincoln Crossing
The Juarez-Lincoln Crossing had seven alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 66 for the screening matrix for this crossing.

For the Mobility criteria category, the study team selected Victoria St. as the segment for analysis. The analysis utilized the LOS for the PM peak period in the no build alternative model for the build-out year. The subsequent MOEs (i.e. queue length, delays) were an average for the travel time route/network. For more detail on the MOEs see Chapter 8.0. Only the alternatives that were modeled had MOEs; the other alternatives were measured qualitatively for this set of criteria.

The study team identified the break point for this crossing at 1.2. Alternatives 1 through 6 scored 1.2 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Synchronize traffic signals within a five block area from the crossing. Area begins at the bridge and extends east to San Eduardo Ave., west to Santa Ursula St., and continues north to Washington St.
- Alternative 2: Install ITS devices for motorist information within this same five block area.
- Alternative 3: Improve and add signage in the downtown area, primarily for disseminating lane assignments.
- Alternative 4: Improve intersection geometry by installing dual left-turn lanes at Santa Ursula St. and Matamoros St.
- Alternative 5: Improve intersection geometry by installing dual left-turn lanes at Victoria St. traveling eastbound to San Dario Ave.
- Alternative 6: Restripe and add lane assignment signs at the intersection of San Dario St. and Victoria St., as San Dario Ave. splits to IH 35.
## Border Crossing Travel Time Study Report
### Volume II: Laredo District

**Table: Influence of Border Crossings on Transportation**

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**Figure 66 – Juarez-Lincoln Crossing Screening Matrix**
7.3.7 Colombia Crossing
The Colombia Crossing had five alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 67 for the screening matrix for this crossing.

For the Mobility criteria category, the study team selected FM 1472 as the segment for analysis. The analysis utilized the LOS for the PM peak period in the no build alternative model for the build-out year. The subsequent MOEs (i.e. queue length, delays) were an average for the travel time route/network. For more detail on the MOEs see Chapter 8.0. Only the alternatives that were modeled had MOEs; the other alternatives were measured qualitatively for this set of criteria.

The study team identified the break point for this crossing at 2.7. Alternatives 1 through 3 scored 2.7 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

When compared to the other alternatives for this crossing, Alternative 4 did not score well enough to advance further in the study process. The study team felt this alternative did not provide a major benefit compared to the other alternatives.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Add a traffic signal light at Mines Rd. and Colombia Rd. if meets signal warrants.
- Alternative 2*: Improvements once commercial traffic has exited the DPS facility:
  - Striping improvements.
  - Improve and add signage upon exiting the temporary DPS facility.
  - Increase acceleration lane for commercial trucks upon exiting the DPS facility.
  - Exit radius improvements.
- Alternative 3*: Improvements to area as commercial traffic is entering the DPS facility.
  - Add a designated right-turn lane upon entering the DPS facility for commercial trucks.
  - Improve and add signage, primarily for lane designation.

*Alternatives 2 and 3 are proposed improvements surrounding the temporary BSIF area, until the permanent BSIF is opened.
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Figure 67 – Colombia Crossing Screening Matrix
7.3.8 World Trade Crossing
The World Trade Crossing had four alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 68 for the screening matrix for this crossing.

For the Mobility criteria category, the study team selected LP 20 as the segment for analysis. The analysis utilized the LOS for the noon peak period in the no build alternative model for the build-out year. The subsequent MOEs (i.e. queue length, delays) were an average for the travel time route/network. For more detail on the MOEs see Chapter 8.0. Only the alternatives that were modeled had MOEs; the other alternatives were measured qualitatively for this set of criteria.

The study team identified the break point for this crossing at 1.6. Alternatives 1 through 3 scored 1.6 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Improve traffic signal phasing and timing at the intersection of LP 20 and FM 1472/Mines Rd.
- Alternative 2: Improve traffic signal phasing and timing at the intersection of IH 35 and LP 20.
- Alternative 3: Improve and add signage in the study area.
### Border Crossing Travel Time Study Report

**Volume II: Laredo District**

#### Figure 68 – World Trade Crossing Screening Matrix

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<th>Criteria</th>
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<td><strong>Security</strong></td>
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</tr>
<tr>
<td>Accommodations for Border Security</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>maintains</td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Driver Expectancy</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>maintains</td>
<td>improves</td>
<td>0</td>
</tr>
<tr>
<td>Drainage</td>
<td></td>
<td>n/a</td>
<td>maintains</td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Cost Effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td>$ thousands (ROW + Const)</td>
<td>0</td>
<td>39.60</td>
<td>79.20</td>
<td>0</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>$ thousands</td>
<td>0</td>
<td>39.60</td>
<td>79.20</td>
<td>0</td>
</tr>
<tr>
<td>Right Of Way Costs</td>
<td>$ thousands</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<td>Months</td>
<td>0</td>
<td>18.00</td>
<td>18.00</td>
<td>0</td>
</tr>
</tbody>
</table>

**LEGEND:**
- Good
- Neutral
- Bad
- N/A

7.3.9 Eagle Pass Crossing

The Eagle Pass Crossing had three alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 69 for the screening matrix for this crossing.

Since the study scope only required a qualitative analysis of operational measures of this crossing, no traffic data was collected for this crossing and there was also no modeling effort to simulate traffic operations. The study team evaluated the alternatives using qualitative measures in lieu of MOEs.

The study team identified the break point for this crossing at 1.6. Alternatives 1 and 2 scored 1.6 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Improve traffic signal phasing and timing along E. Garrison St.
- Alternative 2: Install ITS devices for motorist information along E. Garrison St.
### Figure 69 – Eagle Pass Crossing Screening Matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>No build</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
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</thead>
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<td><strong>Mobility</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Alleviate Congestion</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>improves</td>
<td>improves</td>
</tr>
<tr>
<td>Increase Capacity</td>
<td>maintains</td>
<td>0</td>
<td>improves</td>
<td>maintains</td>
</tr>
<tr>
<td>Accessibility</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Pedestrian Accommodations</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Transit Accommodations</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Level of Service</td>
<td>A thru F (A being the best)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delays</td>
<td>Seconds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queue Lengths</td>
<td>Feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate Traffic (Trucks from</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Passenger Vehicles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide More Route Options to</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>improves</td>
</tr>
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<td>Ports of Entry</td>
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<td>Use As Evacuation Route</td>
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<td><strong>Safety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collision Risk</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Safety for Passenger Vehicles</td>
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<td>maintains</td>
<td>maintains</td>
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<tr>
<td>Safety for Trucks</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Safety for Pedestrians</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Economy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railroad Operations</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td>Fuel Economy</td>
<td>MPG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Development</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Hazardous Materials Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
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<td>Impacts to Air Quality (Emissions)</td>
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<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Impacts to Low Income Housing Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
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</tr>
<tr>
<td>Impacts to Fed Property</td>
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<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Impacts to Perceived Wetlands</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodations for Border Security</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>minimal</td>
<td>minimal</td>
</tr>
<tr>
<td>Driver Expectancy</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>improves</td>
</tr>
<tr>
<td>Drainage</td>
<td>improves, maintains, opposes</td>
<td></td>
<td>maintains</td>
<td>maintains</td>
</tr>
<tr>
<td><strong>Cost Effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total Cost</td>
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<tr>
<td>Construction Cost</td>
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<td>98.90</td>
<td>189.80</td>
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<td>Right Of Way Costs</td>
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<td>Implementation Time</td>
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<td></td>
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<td></td>
<td></td>
<td>+5</td>
<td>12</td>
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</table>


### 7.3.10 Camino Real Crossing

The Camino Real Crossing had four alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 70 for the screening matrix for this crossing.
Since the study scope only required a qualitative analysis of operational measures of this crossing, no traffic data was collected for this crossing and there was also no modeling effort to simulate traffic operations. The study team evaluated the alternatives using qualitative measures in lieu of MOEs.

The study team identified the break point for this crossing at 1.6. Alternatives 1 and 2 scored 1.6 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

Alternative 3 did not score well. This alternative proposed to widen Monroe St. to an arterial typical section. The study team had reservations about this alternative as it required additional ROW. Despite the reservations, it was presented at the RTWG #2. The additional ROW impacts public recreational facilities. The study team felt this alternative approached an implementation time of five years and beyond. The environmental process and the ROW acquisition process would be lengthy. The alternative was presented as an example of the kind of impacts the study team was looking for, when determining long-term implications.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Improve traffic signal phasing and timing along S. Monroe St., starting at Bliss St. and traveling away from the bridge.

- Alternative 2: Install ITS devices for motorist information.
  - At the intersection of S. Monroe St. and Bliss St.
  - Add railroad crossing gates in the study area, as train activity is anticipated to increase due to the addition of the large beer factory on the Mexican side of the border (plan to primarily ship goods via railroad).

- Alternative 3: Widen S. Monroe St to an arterial typical section.
## Criteria Measure

### Camino Real

<table>
<thead>
<tr>
<th>Mobility</th>
<th>2014</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
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</thead>
<tbody>
<tr>
<td>Alleviate Congestion</td>
<td>opposes</td>
<td>improves</td>
<td>+ maintains</td>
<td>+ improves</td>
</tr>
<tr>
<td>Increase Capacity</td>
<td>- improves</td>
<td>maintains</td>
<td>0 improves</td>
<td>+ maintains</td>
</tr>
<tr>
<td>Accessibility</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Pedestrian Accommodations</td>
<td>improves</td>
<td>maintains</td>
<td>0 improves</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Transit Accommodations</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Level of Service</td>
<td>A thru F (A being the best)</td>
<td>-</td>
<td>0 improves</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Delays</td>
<td>Seconds</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Queue Lengths</td>
<td>Fast</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Separate Traffic (Trucks from Passenger Vehicles)</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Provide More Route Options to/from Ports of Entry</td>
<td>improves</td>
<td>maintains</td>
<td>0 improves</td>
<td>+ maintains</td>
</tr>
<tr>
<td>Use As Evacuation Route</td>
<td>n/a</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collision Risk</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Safety for Passenger Vehicles</td>
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<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Safety for Trucks</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Safety for Pedestrians</td>
<td>improves</td>
<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Economy</td>
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<td></td>
</tr>
<tr>
<td>Railroad Operations</td>
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<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fuel Economy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Development</td>
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<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Environment</td>
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<td></td>
</tr>
<tr>
<td>Impacts to Hazardous Materials Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>+ neutral</td>
<td>+ neutral</td>
</tr>
<tr>
<td>Impacts to Air Quality (Emissions)</td>
<td>(KG)</td>
<td>+</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Impacts to Low Income Housing Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>+ neutral</td>
<td>+ neutral</td>
</tr>
<tr>
<td>Impacts to Fed Property</td>
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<td>+ neutral</td>
<td>+ neutral</td>
</tr>
<tr>
<td>Impacts to Potential Historic Sites</td>
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<td>neutral</td>
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<td>+ neutral</td>
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<td></td>
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<tr>
<td>Accommodations for Border Security</td>
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<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
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<tr>
<td>Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td>adverse, minimal, neutral</td>
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<td>0 minimal</td>
</tr>
<tr>
<td>Driver Expectancy</td>
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<td>maintains</td>
<td>0 improves</td>
<td>+ maintains</td>
</tr>
<tr>
<td>Drainage</td>
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<td>maintains</td>
<td>0 maintains</td>
<td>0 maintains</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
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</tr>
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<td>Construction Cost</td>
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<td>0</td>
</tr>
<tr>
<td>Right Of Way Costs</td>
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<tr>
<td>Implementation Time</td>
<td>Months</td>
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</tr>
</tbody>
</table>

**Figure 70 – Camino Real Crossing Screening Matrix**

7.3.11 Del Rio Crossing
The Del Rio Crossing had four alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 71 for the screening matrix for this crossing.

Since the study scope only required a qualitative analysis of operational measures of this crossing, no traffic data was collected for this crossing and there was also no modeling effort to simulate traffic operations. The study team evaluated the alternatives using qualitative measures in lieu of MOEs.

The study team identified the break point for this crossing at 1.6. Alternatives 1 through 3 scored 1.6 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Improve traffic signal phasing and timing along US 277/Spur 239.
- Alternative 2: Install ITS devices for motorist information along US 277/Spur 239.
- Alternative 3: Extend the existing southbound right-turn bay for traffic traveling west onto Rio Grande Rd. (for easier access to the duty free shop located on this road).
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>No Build</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
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<td>improves</td>
<td>improves</td>
<td>improves</td>
</tr>
<tr>
<td>Increase Capacity</td>
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<td>0</td>
<td>improves</td>
<td>maintains</td>
</tr>
<tr>
<td>Accessibility</td>
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<tr>
<td>Pedestrian Accommodations</td>
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<td>maintains</td>
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<td>maintains</td>
</tr>
<tr>
<td>Transit Accommodations</td>
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<td>Seconds</td>
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<td>+</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Queue Lengths</td>
<td>Feet</td>
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<td>+</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Separate Traffic (Trucks from Passenger Vehicles)</td>
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<td>maintains</td>
<td>0</td>
</tr>
<tr>
<td>Provide More Route Options to/from Ports of Entry</td>
<td>improves, maintains, opposes</td>
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<td>maintains</td>
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<td>Use As Evacuation Route</td>
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<td>Safety</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Collision Risk</td>
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<td>maintains</td>
<td>0</td>
<td>maintains</td>
</tr>
<tr>
<td>Safety for Passenger Vehicles</td>
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<td>maintains</td>
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<td>Safety for Trucks</td>
<td>improves, maintains, opposes</td>
<td>opposes</td>
<td>maintains</td>
<td>0</td>
<td>maintains</td>
</tr>
<tr>
<td>Safety for Pedestrians</td>
<td>improves, maintains, opposes</td>
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<td>maintains</td>
<td>0</td>
<td>maintains</td>
</tr>
<tr>
<td>Economy</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Railroad Operations</td>
<td>improves, maintains, opposes</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fuel Economy</td>
<td>MPG</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Future Development</td>
<td>improves, maintains, opposes</td>
<td>opposes</td>
<td>maintains</td>
<td>0</td>
<td>maintains</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts to Hazardous Materials Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Impacts to Air Quality (Emissions)</td>
<td>(KG)</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Impacts to Low Income Housing Sites</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Impacts to Fed Property</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Impacts to Perceived Wet Lands</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
<td>neutral</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodations for Border Security</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>0</td>
<td>maintains</td>
<td>0</td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td>adverse, minimal, neutral</td>
<td>neutral</td>
<td>minimal</td>
<td>0</td>
<td>minimal</td>
</tr>
<tr>
<td>Driver Expectancy</td>
<td>improves, maintains, opposes</td>
<td>maintains</td>
<td>0</td>
<td>improves</td>
<td>+</td>
</tr>
<tr>
<td>Drainage</td>
<td>improves, maintains, opposes</td>
<td>n/a</td>
<td>maintains</td>
<td>0</td>
<td>maintains</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td>$ thousands (ROW + Const)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>264.90</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>$ thousands</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Right Of Way Costs</td>
<td>$ thousands</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Implementation Time</td>
<td>Months</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


Figure 71 – Del Rio Crossing Screening Matrix
7.3.12 Lake Amistad Dam Crossing
The Lake Amistad Dam Crossing had three alternatives, including the no-build alternative, which advanced to the final screening process. See Figure 72 for the screening matrix for this crossing.

Since the study scope only required a qualitative analysis of operational measures of this crossing, no traffic data was collected for this crossing and there was also no modeling effort to simulate traffic operations. The study team evaluated the alternatives using qualitative measures in lieu of MOEs.

The study team identified the break point for this crossing at 1.9. Alternatives 1 and 2 scored 1.9 and above and proceeded forward in the study. As can be seen by the number of red squares on the screening matrix, the no build alternative ranked very low.

The study team prepared detailed exhibits of the alternatives that moved forward and presented the exhibits at the RTWG #2 meeting. The alternatives, listed below, were ranked in order of implementation importance by the work group attendees.

- Alternative 1: Add signage at US 90.
- Alternative 2: Add a flashing beacon at US 90 and Spur 349.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>No Build</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Add a Flashing Beacon @ US 290 &amp; Spur 349</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lake Amistad Dam</strong></td>
<td></td>
<td>2014</td>
<td>Add signs US 290</td>
<td>Add</td>
<td></td>
</tr>
</tbody>
</table>

### Mobility
- **Avoid Congestion**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Increase Capacity**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Accessibility**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Pedestrian Accommodations**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Transit Accommodations**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Level of Service**: A thru F (A being the best); 0, maintains, opposes
- **Delays**: seconds; 0, 0, 0
- **Queue Lengths**: feet; 0, 0, 0
- **Separate Traffic (Trucks from Passenger Vehicles)**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Provide More Route Options to/from Ports of Entry**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Use As Evacuation Route**: improves, maintains, opposes; opposes, maintains, 0, maintains 0

### Safety
- **Collision Risk**: improves, maintains, opposes; opposes, maintains, 0, improves +
- **Safety for Passenger Vehicles**: improves, maintains, opposes; opposes, maintains, 0, improves +
- **Safety for Trucks**: improves, maintains, opposes; opposes, maintains, 0, improves +
- **Safety for Pedestrians**: improves, maintains, opposes; opposes, maintains, 0, improves +

### Economy
- **Railroad Operations**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Fuel Economy**: improves, maintains, opposes; opposes, maintains, 0, maintains 0
- **Future Development**: improves, maintains, opposes; opposes, maintains, 0, maintains 0

### Environment
- **Impacts to Hazardous Materials Sites**: adverse, minimal, neutral; neutral, neutral, neutral +
- **Impacts to Air Quality (Emissions)**: (KG); 0, 0, 0
- **Impacts to Low Income Housing Sites**: adverse, minimal, neutral; neutral, neutral, neutral +
- **Impacts to Fed Property**: adverse, minimal, neutral; neutral, neutral, neutral +
- **Impacts to Perceived Wet Lands**: adverse, minimal, neutral; neutral, neutral, neutral +

### Security
- **Accommodations for Border Security**: improves, maintains, opposes; maintains, 0, maintains 0

### Design
- **Constructability**: adverse, minimal, neutral; neutral, minimal, minimal +
- **Driver Expectancy**: improves, maintains, opposes; maintains, 0, improves +
- **Drainage**: improves, maintains, opposes; opposes, maintains, 0, maintains 0

### Cost Effectiveness
- **Total Cost**: $ thousands (ROW + Const); 0, 1.00, + 30.91, 0
- **Construction Cost**: $ thousands; 0, 1.00, + 30.91, 0
- **Right Of Way Costs**: $ thousands; 0, 0.00, + 0.00, +
- **Implementation Time**: Months; 0, 12.00, 0, 18.00, 0

---


Figure 72 – Lake Amistad Dam Crossing Screening Matrix
7.4 Study Continuation

The study team utilized a screening matrix that employed criteria based on the goals and objectives previously established for the study. The criteria included a combination of qualitative and quantitative measures to evaluate the alternatives for each of the crossings. During the process, the study team made minor refinements to several of the alternatives. The refinements yielded alternatives that provided greater benefits, were easier to implement or fit conditions in the field.

The final screening process identified the alternatives that would advance to the second RTWG meeting. At the meeting, attendees were asked to rank the alternatives. The ranking was based on which alternative they would like to have implemented first. For details of the RTWG #2 meeting please refer to RTWG #2 Meeting Report.
8.0 TRAFFIC SIMULATION AND ANALYSIS

The study team collected traffic data, as discussed in Chapter 4.0, as a component of a targeted assessment of short-term improvement options for the border crossings in the TxDOT Laredo District. The data collected was used to identify traffic congestion and operational deficiencies of roadway systems on the US side leading to and from the POE. After the initial screening described in Chapter 7.0, the alternatives deemed viable for each crossing were subjected to detailed traffic analysis and simulation modeling. However, some viable alternatives that would not yield conclusive data were not selected to be modeled. The study team performed a qualitative and quantitative analysis of the proposed alternatives utilizing relevant screening criteria to narrow down the viable alternatives. As part of the quantitative screening process, these alternatives were then further analyzed and modeled using one of two traffic software applications, CORSIM and Synchro.

8.1 Traffic Simulation Analysis

The simulation modeling process began with traffic data collection. Field reconnaissance ADT counts, TMC, and TTR were conducted at the early phase of study and were then assembled and prepared. The simulation process involves developing a 2007 base model and projecting the data to 2009 existing conditions and a 2014 No-build alternative condition. The models for the proposed improvements are then created by performing modifications to the 2014 No-Build alternative which enables an even base comparison between alternatives. Refer to the traffic analysis reports, published under separate cover, for each respective bridge for complete information on the methodology and analysis of traffic simulation modeling.

8.2 Traffic Simulation Results and Observations

There are limitations to microsimulation as a tool for analysis. Therefore, it is important to note that only alternatives that support the purpose, needs, and scope of work were modeled using the simulation software as indicated in the traffic analysis reports. Alternatives which could not justifiably be modeled with the CORSIM component of the simulations software or Synchro went through a qualitative analysis process.

Traffic models were created for proposed alternatives at the four major international crossings within the TxDOT Laredo District. These crossings include Colombia Crossing, Gateway to the Americas Crossing, Juarez-Lincoln Crossing and World Trade Crossing.

8.2.1 Gateway to the Americas Crossing

One alternative, Alternative 1, was considered a viable alternative to be further analyzed for the Gateway to the Americas Crossing. Alternatives 2 and 3 were not modeled. Refer to the Gateway to the Americas Bridge Traffic Analysis Report by Civil Engineering Consultants for complete information on the results of the simulation and analysis for the alternatives related to this crossing.

Alternative 1

Alternative 1 proposed to synchronize traffic signals from the POE north to Washington St. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated improvement to intersection delay along the Convent St. and Washington St. corridors with LOS improving at these intersections.
8.2.2 Juarez-Lincoln Crossing
Two alternatives, Alternative 1 and 4, were considered viable alternatives to be further analyzed for the Juarez-Lincoln Crossing. Alternatives 2, 3, 5, and 6 were not modeled. Refer to the Lincoln-Juarez Bridge Traffic Analysis Report by Civil Engineering Consultants for complete information on the results of the simulation and analysis for the alternatives related to this crossing.

Alternative 1
Alternative 1 proposed to synchronize traffic signals within a five-block area from the crossing. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated minor improvement to intersection delay with a LOS improvement.

Alternative 4
Alternative 4 proposed to improve intersection geometry by installing dual left-turn lanes at Santa Ursula Ave. and Matamoros St. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated significant improvement to intersection delay with LOS improving several levels.

8.2.3 Colombia Crossing
Two alternatives, Alternative 2 and 3, were considered viable alternatives to be further analyzed for the Colombia Crossing. Alternatives 1 and 4 were not modeled. Refer to the Colombia Solidarity Bridge Traffic Analysis Report by Civil Engineering Consultants for complete information on the results of the simulation and analysis for the alternatives related to this crossing.

Alternative 2
Alternative 2 proposed improvements for commercial traffic operations once they have exited the temporary BSIF. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated virtually no change in LOS.

Alternative 3
Alternative 3 proposed improvements for commercial traffic operations as they are entering the temporary BSIF. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated virtually no change in LOS.

8.2.4 World Trade Crossing
Two alternatives, Alternative 1 and 2, were considered viable alternatives to be further analyzed for the World Trade Crossing. Alternative 3 was not modeled. Refer to the World Trade Bridge Traffic Analysis Report by Civil Engineering Consultants for complete information on the results of the simulation and analysis for the alternatives related to this crossing.

Alternative 1
Alternative 1 proposed to improve traffic signal phasing and timing at the intersection of LP 20 and FM 1472/Mines Rd. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated improvement to intersection delay with LOS improving at the intersection.
Alternative 2
Alternative 2 proposed to improve traffic signal phasing and timing at the intersection of IH 35 and LP 20. A detailed analysis was performed and a simulation model was created for this alternative. The results of the simulation model indicated little improvement to intersection delay with virtually no change in LOS at the intersection. However, the study team anticipates that additional improvements to the interchange LOS will occur when the Loop 20 mainlanes are constructed and open to through traffic.
9.0 FUNDING OPPORTUNITIES

One of the expected outcomes of this study was the identification of funding opportunities available to help implement the improvements recommended by the study team. This chapter outlines the expected costs of projects recommended for the TxDOT Laredo District along with an overview of the various funding opportunities available to help fund those recommendations.

9.1 Alternative Estimated Costs

In order to assess the magnitude of the funding requirements proposed by this study, the study team compiled the estimated costs of all the viable alternatives contained therein. The total cost equaled $3,470,200. The costs of the alternatives for each of the crossings are shown in Table 13.

<table>
<thead>
<tr>
<th>Crossing</th>
<th># of Alternatives</th>
<th>Total Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway to the Americas Crossing</td>
<td>3</td>
<td>$676,400</td>
</tr>
<tr>
<td>Juarez-Lincoln Crossing</td>
<td>6</td>
<td>$802,000</td>
</tr>
<tr>
<td>Colombia Crossing</td>
<td>3</td>
<td>$475,400</td>
</tr>
<tr>
<td>World Trade Crossing</td>
<td>3</td>
<td>$122,300</td>
</tr>
<tr>
<td>Eagle Pass Crossing</td>
<td>2</td>
<td>$288,700</td>
</tr>
<tr>
<td>Camino Real Crossing</td>
<td>2</td>
<td>$545,600</td>
</tr>
<tr>
<td>Del Rio Crossing</td>
<td>3</td>
<td>$527,900</td>
</tr>
<tr>
<td>Lake Amistad Dam Crossing</td>
<td>2</td>
<td>$31,900</td>
</tr>
<tr>
<td>District Total</td>
<td>24</td>
<td>$3,470,200</td>
</tr>
</tbody>
</table>


9.2 Overview of Potential Funding Sources

9.2.1 SAFETEA-LU Highway Program

A review of the SAFETEA-LU Highway Program identified four funding categories that could potentially be used to fund the study alternatives presented in this report. These categories have eligibility restrictions or are allocated based on specific criteria that may make the funds no longer available or specific alternatives ineligible. For additional information on the SAFETEA-LU, refer to the Fact Sheets for Highway Provisions in the Safe, Accountable, Flexible, Efficient Transportation Equity Plan: A Legacy for Users (SAFETEA-LU), located in Appendix C.
Congestion Mitigation and Air Quality (CMAQ) Improvement Program
The CMAQ program provides funding for projects in air quality non-attainment and maintenance areas which reduce transportation related emissions. CMAQ funds are distributed based on a criteria that includes population and the severity of pollution in an area. Federal participation is 80% for most of the alternatives presented in the study and up to 100% for traffic signal projects. However, by statute, diesel retrofit projects take priority over roadway projects.

Coordinated Border Infrastructure (CBI) Program
The purpose of the CBI program is to improve the safe movement of motor vehicles at or across the border between the US and Mexico. A review of the eligibility criteria reveals that all study alternatives are eligible for this funding category at an 80% federal participation with selection being based on criteria that includes number of land ports of entry in the State, number of incoming personal vehicles and commercial trucks, and the weight of inbound cargo by commercial truck.

State Infrastructure Bank Program (SIB)
The SIB program gives States the ability to increase the efficiency of their investments and leverage allocated federal funds by attracting non-federal investment, public and private, to supplement the funding of roadway projects.

Surface Transportation Program (STP)
The STP provides flexible funding that may be used by States and localities for projects on any federal aid highway project. Federal participation is 80% for most of the alternatives presented in the study and up to 100% for certain type safety projects.

9.2.2 TxDOT 2007 Unified Transportation Program (UTP)
A review of the 2007 UTP identified nine funding categories that could potentially be used to fund the study alternatives presented in this report. These categories have eligibility restrictions or are allocated based on specific criteria that may make the funds no longer available or specific alternatives ineligible. For detailed information on the UTP, refer to the “2007 Unified Transportation Program (UTP) Statewide Mobility Program” located in Appendix C.

Category 1 – Preventative Maintenance and Rehabilitation
The purpose of this category is to provide funding for preventative maintenance and rehabilitation of the existing state highway system. Funds are allocated to the TxDOT districts annually for preserving and maintaining the roadway system. This program allows for non-capacity improvements (no additional lanes permitted) to roadways, such as intersection improvements.

Category 2 – Metropolitan Area Corridor projects
The purpose of this category is to provide funding for mobility and added capacity projects within a Transportation Management Area (TMA). TMAs are major metropolitan areas (areas with population greater than 200,000) within the state. These projects are recommended by the TxDOT districts and require concurrence from the local MPO. The roadway must be on the MPO’s Metropolitan Transportation Plan.
Category 3 – Urban Area (Non-TMA) Corridor Projects
The purpose of this category is to provide funding for mobility and added capacity projects that are not within a TMA. Non-TMAs are urban areas (areas with population greater than 50,000 and less than 200,000) within the state. These projects are recommended by the TxDOT districts and require concurrence from the local MPO. The roadway must be on the MPO’s Metropolitan Transportation Plan.

Category 5 – Congestion Mitigation and Air Quality Improvement
The purpose of this category is to provide funding for projects in air quality non-attainment and maintenance areas which reduce transportation related emissions. These projects are selected by the MPOs with assistance from TxDOT and the Texas Commission on Environmental Quality (TCEQ) and require concurrence from the US Environmental Protection Agency (EPA) and the Federal Highway Administration (FHWA).

Category 7 – Metropolitan Mobility/Rehabilitation
The purpose of this category is to provide funding for projects providing transportation needs within a TMA. Funds are allocated annually to the TMAs via the TxDOT districts for their use. These projects are selected by the MPOs with assistance from TxDOT. Only roadways with a functional classification greater than a local road or rural minor collector are eligible for this funding category.

Category 8 – Safety – Federal Highway Safety Improvement Program
The purpose of this category is to provide funding for on and off highway system safety related projects. All highway on and off the state system are eligible for this program. Projects are selected based on accident history

Category 8 – Safety – Federal High Risk Rural Roads
The purpose of this category is to provide funding for safety related construction and operational improvements on high risk rural roads. Only roadways with a functional classification greater than a local road or rural minor collector that are experiencing a high rate of accidents, as defined in the category, are eligible for this funding category.

Category 10 – Supplemental Transportation Projects CBI Program
This category is the State’s component of the federal program in the SAFETEA-LU Highway Program described above. The purpose of the CBI program is to improve the safe movement of motor vehicles at or across the border between the US and Mexico. A review of the eligibility criteria reveals that all study alternatives are eligible for this funding category at an 80% federal participation with selection being based on criteria that includes number of land ports of entry in the State, number of incoming personal vehicles and commercial trucks, and the weight of inbound cargo by commercial truck.

Category 11 – District Discretionary
The purpose of this category is to provide funding for transportation projects selected at the district engineer’s discretion. All roadways on the state highway system and off-system roadways with a functional classification greater than a local road or rural minor collector are eligible for this funding category. The acquisition of ROW is not eligible for this category of funding.
9.2.3 TxDOT District Maintenance Budget
As part of the legislative appropriation process, TxDOT is allocated funding for maintaining the state roadway inventory. Funds are subsequently allocated to the TxDOT districts for the maintenance and upkeep of the facilities in their respective districts.

According to the TxDOT’s Maintenance Management Manual, maintenance work can be categorized into three major categories: routine maintenance, preventative maintenance, and major maintenance. All three categories are applicable for the funding of study alternatives with the work performed by state maintenance forces or by contract.

Routine Maintenance
As the name implies, this category of work includes the day-to-day maintenance activities required to keep the roadway system. These activities may include the installation and/or replacement of specific roadway appurtenances, such as signs, markings, lighting, barriers, etc.

Preventative Maintenance
This category of work is focused towards the funding of maintenance activities that extend the service life of existing roadways, especially pavement. An example of activities in this category is pavement resurfacing.

Major Maintenance
This category of work is geared towards the funding of a deficiency in the roadway system, especially those that impact safety or protect private and public property. These activities may include full-depth pavement, constructing drainage channels, or upgrading or replacing existing traffic signals.

9.2.4 Municipal and County Annual Operating Budgets
As part of any city or county’s annual budget process, these government entities allocate funds to the different departments that compose their organization. These departments include traffic, maintenance, road and bridge, street, public works, etc.

The funds that these departments are allocated annually could potentially be spent on the types of improvements identified in this study. The availability and amount of funds from these sources will vary between jurisdictions.

9.2.5 General Services Administration (GSA)
The GSA is responsible for all maintenance, construction, and operational activities within the limits of the federal border facilities. As part of their responsibilities, GSA develops construction and operations plans for their facilities.

As part of their plans, the GSA could be approached by the state, city and/or county and asked to fund improvements to the roadway network outside of their facilities. This would be even more reasonable if the improvements that the GSA is approached to fund directly benefit their operation.

9.2.6 Border Crossing Owners and Operators
Of the eight border crossings in the TxDOT Laredo District, all are tolled facilities whose revenue directly correlates with the number of vehicles and pedestrians that use the crossing and the number that decide to use a different crossing. Moreover, both of these numbers are affected by recurring congestion.
The fact that crossing operators have a financial stake in the reduction of traffic congestion in the vicinity of their crossing lends itself for operators to be approached by the state, city and/or county and asked to fund improvements to the roadway network outside of their facilities.

In the case of private operators, funding could be set as a percentage of roadway improvement construction or a flat fee.

For crossing that are owned by municipalities, they could have the option of funding individual projects or establishing a permanent revenue stream for border crossing improvements by earmarking a percentage of crossing gate revenue going to a separate fund for this type of improvements.

### 9.3 Summary of Findings

A review of available federal, state, and municipalities as funding programs indicate that, of the multitude of programs available, few are applicable for the types of roadway improvements presented by this study. Moreover, of the few that are available, most will require detailed analysis in excess of that prepared by the scope of this study.

For example, the CBI program is uniquely tailored to fund projects with the same objectives as those of the projects in this study. However, with the SAFETEA-LU Highway Program ending in 2009, it is unlikely that funding will be available when the findings of this study are released. The availability of funding from a program of this nature will be up to SAFETEA-LU’s successor, provided it contains an extension of the CBI program.

As a result, the study team concluded that the primary mechanism for public funding for the short-term improvements shall be the maintenance budgets of the entities with jurisdiction over the project site, the use of the TxDOT District’s discretionary allocations, and incorporation of the alternatives to planned or on-going construction projects. These entities are better suited to assess the benefits to local conditions and costs of each alternative.

The other potential funding sources, GSA and border crossing owners, are long-term in nature. Based on the investment that these parties have on their facilities and the benefits that less congestion on roadways, leading to their facilities, can have on their overall operations, it seems logical that they would be receptive to dialogue on the subject. It is the study team’s conclusion that these funding ideas merit further consideration by TxDOT and the local jurisdictions.
10.0 IMPLEMENTATION

This chapter will expand on the information presented about individual alternatives detailed in Chapter 7.0 pertaining to implementation time criterion and construction cost estimates. This chapter will also expand on the funding sources information presented in Chapter 9.0 to describe potential maintenance and construction methods that are available for the development of the study alternatives.

Alternatives for the crossings in the TxDOT Laredo District are shown in Table 14, along with a brief description, estimated implementation time, and estimated construction cost. Alternatives in this study were developed in a manner that allows for some individual alternatives to be combined, thereby compounding the operational benefits. Reasonably combining alternatives can similarly benefit implementation by creating more appealing contracts due to larger scopes of work and engineering estimates.

**Table 14 – Study Alternatives**

<table>
<thead>
<tr>
<th>Crossing</th>
<th>Alternative #</th>
<th>General Description</th>
<th>Implementation Time</th>
<th>Estimated Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway to the Americas Crossing</td>
<td>1</td>
<td>Synchronize traffic signal lights from POE north to Washington St.</td>
<td>18 months</td>
<td>$265,800</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Install ITS in study area</td>
<td>36 months</td>
<td>$396,800</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Improve and add signage in downtown area</td>
<td>18 months</td>
<td>$13,800</td>
</tr>
<tr>
<td>Juarez-Lincoln Crossing</td>
<td>1</td>
<td>Synchronize traffic signals within five block area from bridge</td>
<td>18 months</td>
<td>$80,400</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Install ITS devices in give block area</td>
<td>36 months</td>
<td>$396,800</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Improve and add signage in downtown area</td>
<td>18 months</td>
<td>$3,000</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Dual left at Santa Ursula Ave. and Matamoros St.</td>
<td>24 months</td>
<td>$268,400</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Dual left at Victoria St. traveling eastbound to San Dario Ave.</td>
<td>24 months</td>
<td>$51,300</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Restriping and lane assignment signs at San Dario Ave. and Victoria St. at IH 35</td>
<td>12 months</td>
<td>$2,100</td>
</tr>
<tr>
<td>Colombia Crossing</td>
<td>1</td>
<td>Add traffic signal light at FM 1472 and FM 255</td>
<td>18 months</td>
<td>$296,700</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Improvements at DPS facility exit</td>
<td>18 months</td>
<td>$128,000</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Improvements at DPS facility entrance</td>
<td>18 months</td>
<td>$50,700</td>
</tr>
<tr>
<td>World Trade Crossing</td>
<td>1</td>
<td>Traffic signal phasing and timing improvements at LP 20 and FM 1472</td>
<td>18 months</td>
<td>$39,600</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Traffic signal phasing and timing improvements at IH 35 and LP 20</td>
<td>18 months</td>
<td>$79,200</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Improve and add signage</td>
<td>18 months</td>
<td>$3,500</td>
</tr>
<tr>
<td>Eagle Pass Crossing</td>
<td>1</td>
<td>Traffic signal phasing and timing improvements along E. Garrison St.</td>
<td>18 months</td>
<td>$98,900</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Install ITS devices on E. Garrison St.</td>
<td>24 months</td>
<td>$189,800</td>
</tr>
<tr>
<td>Camino Real Crossing</td>
<td>1</td>
<td>Traffic signal phasing and timing improvements on S. Monroe St.</td>
<td>18 months</td>
<td>$39,600</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Install ITS devices</td>
<td>24 months</td>
<td>$506,000</td>
</tr>
</tbody>
</table>
### Table 14

<table>
<thead>
<tr>
<th>Crossing</th>
<th>Alternative #</th>
<th>General Description</th>
<th>Implementation Time</th>
<th>Estimated Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Del Rio Crossing</td>
<td>1</td>
<td>Improve traffic signal phasing and timing along US 277S (Spur 239)</td>
<td>24 months</td>
<td>$264,900</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Install ITS devices along US 277S</td>
<td>24 months</td>
<td>$189,800</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Extend existing right-turn bay heading southbound, traveling west on Rio Grande Rd.</td>
<td>18 months</td>
<td>$73,200</td>
</tr>
<tr>
<td>Lake Amistad Dam Crossing</td>
<td>1</td>
<td>Add signage at US 90</td>
<td>12 months</td>
<td>$900</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Add flashing beacon at US 90 and Spur 349</td>
<td>18 months</td>
<td>$31,000</td>
</tr>
</tbody>
</table>


### 10.1 State of Texas (TxDOT) Maintenance Forces

The use of state maintenance forces is a method of implementing specific types of projects that are on the State’s roadway system. The criteria for identifying a compatible project are subjective and ultimately lie at the discretion of local TxDOT management. However, generally speaking, a good candidate project for this method of implementation is a low cost, short construction time project that does not require overly complicated construction methods. A good candidate project also requires little to no environmental documentation and no ROW acquisition. More importantly, the project can be both funded and scheduled within the constraints of the current fiscal year or the following year.

This method of implementation is particularly beneficial for implementing projects where safety issues have been identified, provided that the project meets the criteria mentioned above. Since TxDOT management can readily mobilize personnel to the project and there is no timely procurement process needed, resources can be quickly dispatched towards implementing the project, thereby resolving the safety issue.

A review of the study alternatives for the TxDOT Laredo District revealed several projects that were good candidates for this method of implementation. Among the projects on Table 14 that met the general criteria were:

- Juarez-Lincoln Crossing Alternative 6
- World Trade Crossing Alternative 3
- Lake Amistad Dam Crossing Alternative 1

For example, Lake Amistad Dam Crossing Alternative 1 proposed to provide additional guidance to the crossing by adding signs along US 90. This project met the general criteria listed above for using TxDOT maintenance personnel since they are equipped and trained to perform this type of work. Thus, utilizing TxDOT maintenance forces to perform this work was a good method of implementing this alternative.

### 10.2 City or Municipal In-house Projects

The use of city personnel is a method of implementing specific types of projects that are not on the State’s roadway system but located within the city limits of a municipality, with one notable exception. The criteria for identifying a compatible project are subjective and, ultimately, lie at the discretion of local city management. However, generally speaking, a good candidate construction...
project for this method of implementation is a low cost, short construction time project that does not require overly complicated construction methods. A good candidate project also requires little to no environmental documentation and no ROW acquisition. More importantly, the project can be both funded and scheduled within the constraints of the current fiscal year or the following year.

The use of city personnel is a method of implementing some traffic signal related projects regardless on whether they are on the State’s roadway system because typically most large cities operate and maintain traffic signals within their city limits. For these projects, the use of traffic department staff is a useful method of implementing projects to optimize and improve traffic signals.

These methods of implementation are particularly beneficial for implementing projects where safety issues have been identified, provided that the project meets the criteria mentioned above. Since city management can readily mobilize personnel to the project and there is no timely procurement process needed, resources can be quickly dispatched towards implementing the project, thereby resolving the safety issue.

A review of the study alternatives for the TxDOT Laredo District reveals several alternatives that were suitable candidates for this method of implementation. Among the projects on Table 14 that met the general criteria were:

- Gateway to the Americas Crossing Alternative 1
- Gateway to the Americas Crossing Alternative 3
- Juarez-Lincoln Crossing Alternative 1
- Juarez-Lincoln Crossing Alternative 3

For example, Gateway to the Americas Crossing Alternative 3 proposed to provide additional guidance to the crossing by adding signs in the downtown area. This project met the general criteria listed above for using city maintenance personnel since they are equipped and trained to perform this type of work. Thus, utilizing city maintenance forces to perform this work was a good method of implementing this alternative.

10.3 County Maintenance Forces

The use of county personnel is a method of implementing specific types of projects that are not on the State’s roadway system but lie within the jurisdiction of the county. The criteria for identifying a compatible project are subjective and ultimately lie at the discretion of county management. However, generally speaking, a good candidate project for this method of implementation is a low cost, short construction time project that does not require overly complicated construction methods. A good candidate project also requires little to no environmental documentation and no ROW acquisition. More importantly, the project can be both funded and scheduled within the constraints of the current fiscal year or the following year.

This method of implementation is particularly beneficial for implementing projects where safety issues have been identified, provided that the project meets the criteria mentioned above. Since county management can readily mobilize personnel to the project and there is no timely
procurement process needed, resources can be quickly dispatched towards implementing the project, thereby resolving the safety issue.

A review of the study alternatives for the TxDOT Laredo District did not reveal any alternatives that were suitable candidates for this method of implementation mechanism because all the alternatives identified were on the State’s roadway system or within the jurisdiction of a city.

10.4 State Construction Contract

The use of the state procurement system to secure a construction contractor is a readily utilized method of implementing many types of construction projects on the State’s roadway system. This method is flexible enough to accommodate any project regardless of cost or complexity, provided that funding is available for the project.

As mentioned in Chapter 9.0, Funding Opportunities, there is a variety of financing programs available, each with its own set of eligibility and documentation requirements. When selecting between funding options, it is essential that the impacts of the funding categories be weighed against the impacts to project implementation. For example, safety related funding sources typically require an accident analysis be performed as part of the justification requirements. Similarly, the use of federal funds can introduce additional requirements to the programming or construction of the project.

A review of the study alternatives for the TxDOT Laredo District reveals several projects that were good candidates for this method of implementation. Among the projects on Table 14 that met the general description were:

- Gateway to the Americas Crossing Alternative 2
- Juarez-Lincoln Crossing Alternative 2
- Juarez-Lincoln Crossing Alternative 4
- Juarez-Lincoln Crossing Alternative 5
- Colombia Crossing Alternative 1
- Colombia Crossing Alternative 2
- Colombia Crossing Alternative 3
- Eagle Pass Crossing Alternative 2
- Camino Real Crossing Alternative 2
- Camino Real Crossing Alternative 3
- Del Rio Crossing Alternative 2
- Del Rio Crossing Alternative 3
- Lake Amistad Dam Crossing Alternative 2
For example, Lake Amistad Dam Crossing Alternative 2 proposed to install a flashing beacon at the intersection at US 90 and Spur 349. A flashing beacon installation project would require the mobilization of crews and equipment typically associated with construction contractors that specialize in performing projects of this magnitude and complexity. Thus, utilizing the TxDOT letting process to select a contractor to perform this work would be a good method of implementing this alternative.

10.5 City or Municipal Construction Contract

The use of a city’s procurement system to secure a construction contractor is a readily utilized method of implementing many types of construction projects within a city’s jurisdiction. This method is flexible enough to accommodate any project regardless of cost or complexity, provided that funding is available for the project.

There is typically a variety of financing programs available within a city’s financial structure, each with its own set of eligibility and documentation requirements. When selecting between funding options, it is essential that the impacts of the funding categories be weighed against the impacts to project implementation. For example, safety related funding sources typically require an accident analysis be performed as part of the justification requirements. Similarly, the use of federal funds can introduce additional requirements to the programming or construction of the project.

A review of the study alternatives for the TxDOT Laredo District did not reveal any alternatives that were suitable candidates for this method of implementation.

10.6 County Construction Contract

The use of a county’s procurement system to secure a construction contractor is a readily utilized method of implementing many types of construction projects within a city’s jurisdiction. This method is flexible enough to accommodate any project regardless of cost or complexity, provided that funding is available for the project.

There is typically a variety of financing programs available within a county’s financial structure, each with its own set of eligibility and documentation requirements. When selecting between funding options, it is essential that the impacts of the funding categories be weighed against the impacts to project implementation. For example, safety related funding sources typically require an accident analysis be performed as part of the justification requirements. Similarly, the use of federal funds can introduce additional requirements to the programming or construction of the project.

A review of the study alternatives for the TxDOT Laredo District did not reveal any alternatives that were suitable candidates for this method of implementation because all the alternatives identified were on the State’s roadway system or within the jurisdiction of a city.

10.7 Professional Services Contracts

The use of the services procurement process to secure professional services is a method of implementing specific types of projects. In general, these projects are not construction projects but rather are projects to analyze and enhance the operations of existing roadways.
A review of the study alternatives for the TxDOT Laredo District reveals several projects that were good candidates for this method of implementation. Among the projects on Table 14 identified were:

- World Trade Crossing Alternative 1
- World Trade Crossing Alternative 2
- Eagle Pass Crossing Alternative 1
- Camino Real Crossing Alternative 1
- Del Rio Crossing Alternative 1

For example, Del Rio Crossing Alternative 1 proposed to synchronize traffic signals along US 277S. Implementing this alternative typically would require specialized personnel with experience in traffic engineering. The skill sets include traffic data collection, experience with signal timing optimization software and knowledge of traffic signal field equipment.

Utilizing the professional services process to secure the services of an engineering firm to perform the data collection, analysis and field work to re-time the traffic signals would be a good method of implementing this alternative.

**10.8 On-going Construction Projects**

The opportunity to utilize an on-going construction project offers significant benefits to the implementation of study alternatives since it eliminates all procurement process costs and delays, minimizes implementation time and gets a contractor on-site that is already familiar with the location. The criteria for identifying a compatible project are subjective and ultimately the decision to incorporate a change to an existing project will lie with local TxDOT management.

During the field data collection trips and on subsequent trips to the TxDOT Laredo District for RTWG or stakeholder meetings, the study team did not observe on-going construction projects that could potentially be modified to include the construction of one or more of the alternatives presented in this study.

**10.9 Planned Projects**

Incorporating study alternatives into projects in the area that are currently in the planning or design phase is another method of implementing study alternatives. The use of planned projects or projects under design as a vehicle to implement study alternatives provides the alternative with design staff, already familiar with the location, for completing the design, a source of funding and yields a cohesive design between all the improvements. This method also eliminates the duplication of procurement process costs (time and money).

As with using on-going contracts for implementing alternatives, the criteria for identifying a compatible project are subjective and ultimately the decision to incorporate a change to a proposed project will lie with local TxDOT management. However, the benefits from this method of implementing viable study alternatives merit the review of projects currently in the planning or design phase for such opportunities.
11.0 RECOMMENDATIONS

This chapter concludes the study by presenting the recommendations for each border crossing in the TxDOT Laredo District. The alternatives developed for the border crossings have gone through numerous phases in the analysis process. That process included data collection, initial alternatives development, the first RTWG meeting, traffic data collection, individual stakeholder meetings, constraint analysis, estimates, traffic modeling, screening analysis, a second RTWG meeting, and alternatives refinement.

11.1 Gateway to the Americas Crossing

RJRA presented three improvement alternatives for the Gateway to the Americas Crossing at the second RTWG meeting. The following is a list of the alternatives:

- **Alternative 1**: Synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Salinas Ave.

- **Alternative 2**: Install ITS devices for motorist information in the same study area.

- **Alternative 3**: Improve and add signage in the downtown area, primarily for disseminating lane assignments.

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 15 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>94%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>2</td>
<td>87%</td>
</tr>
</tbody>
</table>


RJRA recommends that each alternative presented for the Gateway to the Americas Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complement each other and are independent of or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking provided by the table above will provide TxDOT some guidance on the attendees' priorities.

RJRA understands the implementation of Alternatives 2 and 3 will require coordination with the City of Laredo since the alternatives involve city streets. The implementation of ITS devices will also require interagency coordination depending on the ultimate location of these devices.
Comments received from the work group attendees were all positive. In fact, one comment suggested combining of all three alternatives as one.

11.2 Juarez-Lincoln Crossing

RJRA presented six improvement alternatives for the Juarez-Lincoln Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Synchronize traffic signals within a five-block area from the crossing. Area begins at the bridge and extends east to San Eduardo Ave. and west to Santa Ursula Ave., and continues north to Washington St.

- Alternative 2: Install ITS devices for motorist information within this same five block area.

- Alternative 3: Improve and add signage in the downtown area, primarily for disseminating lane assignments.

- Alternative 4: Improve intersection geometry by installing dual left-turn lanes at Santa Ursula Ave. and Matamoros St.

- Alternative 5: Improve intersection geometry by installing dual left-turn lanes at Victoria St. traveling eastbound to San Dario Ave.

- Alternative 6: Restripe and add lane assignment signs at the intersection of San Dario Ave. and Victoria St., as San Dario Ave. splits to IH 35.

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 16 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.
Table 16 – Rank Results – Juarez-Lincoln Crossing

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>81%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>2</td>
<td>57%</td>
</tr>
<tr>
<td>Alternative 4</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>Alternative 5</td>
<td>5</td>
<td>71%</td>
</tr>
<tr>
<td>Alternative 6</td>
<td>6</td>
<td>85%</td>
</tr>
</tbody>
</table>


RJRA received mixed results in this survey. However, the information received in the comment cards gave RJRA an insight into the priorities and wishes of the work group meeting attendees. One comment suggested combining Alternatives 1 through 3. Another comment received agreed with the dual left-turn lanes concepts and suggested they would address congestion.

RJRA recommends that all the alternatives for the Juarez-Lincoln Crossing be implemented. However, RJRA understands funding and implementation constraints can delay any of these alternatives. Therefore, RJRA, with consideration to the comments from the RTWG #2 meeting, recommends combining the alternatives as follows and implementing them in the respective order. RJRA recommends Alternatives 1 through 3 be combined and implemented as one alternative. RJRA then recommends combining Alternatives 5 and 6 and implementing them together since they both involve improvements to the same intersection. Finally, RJRA recommends Alternative 4 to remain as one alternative and, if necessary, implemented last.

RJRA further recommends coordination with the City of Laredo regarding the implementation of alternatives to city streets.

11.3 Colombia Crossing

RJRA presented three improvement alternatives for the Colombia Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Add a traffic signal light at FM 1472 and FM 255 provided that it meets signal warrants
- Alternative 2*: Improvements once commercial traffic has exited the BSIF facility:
  - Striping improvements
  - Improve and add signage upon exiting the temporary BSIF facility
  - Increase acceleration lane for commercial trucks upon exiting the BSIF facility
  - Exit radius improvements
• Alternative 3*: Improvements to area as commercial traffic is entering the DPS facility
  o Add a designated right-turn lane upon entering the BSIF for commercial trucks
  o Improve and add signage, primarily for lane designation

Please note that Alternatives 2 and 3 are proposed improvements that will serve the temporary BSIF area until the permanent BSIF is open.

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 17 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>3</td>
<td>86%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>1</td>
<td>92%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>2</td>
<td>92%</td>
</tr>
</tbody>
</table>

The results of the ranking survey indicate that the work group attendees agreed with the study group.

RJRA recommends that Alternative 2 be implemented first. It is obvious the work group felt improvements are necessary to the exit of the BSIF facility. However, RJRA recommends that the schedule for the completion date of the permanent BSIF facility be confirmed before deciding to implement Alternative 2.

RJRA recommends that Alternative 3 be implemented second. However, RJRA recommends that the schedule for the completion date of the permanent BSIF facility be confirmed before deciding to implement Alternative 3.

RJRA recommends that Alternative 1 be implemented only if the traffic signal is warranted.

11.4 World Trade Crossing

RJRA presented three improvement alternatives for the World Trade Crossing at the second RTWG meeting. The following is a list of the alternatives:

• Alternative 1: Improve traffic signal phasing and timing at the intersection of LP 20 and FM 1472.
• Alternative 2: Improve traffic signal phasing and timing at the intersection of IH 35 and LP 20
Alternative 3: Improve and add signage in the study area

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 18 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>85%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>3</td>
<td>92%</td>
</tr>
</tbody>
</table>


RJRA recommends that each alternative presented for the World Trade Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complement each other and are independent of or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking in the table above will provide TxDOT some guidance on the attendees’ priorities.

11.5 Eagle Pass Crossing

RJRA presented two improvement alternatives for the Eagle Pass Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Improve traffic signal phasing and timing along E. Garrison St.
- Alternative 2: Install ITS devices for motorist information along E. Garrison St.

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 19 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>90%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>2</td>
<td>90%</td>
</tr>
</tbody>
</table>

RJRA recommends that each alternative presented for the Eagle Pass Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complement each other and are independent of or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking in the table above will provide TxDOT some guidance on the attendees’ priorities.

11.6 Camino Real Crossing

RJRA presented two improvement alternatives for the Camino Real Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Improve traffic signal phasing and timing along S. Monroe St., starting at Bliss St. and traveling away from the bridge.
- Alternative 2: Install ITS devices for motorist information.
  - At the intersection of S. Monroe St. and Bliss St.
  - Add railroad crossing gates in the study area, as train activity is anticipated to increase due to the addition of the large beer factory on the Mexican side of the border (plan to primarily ship goods via railroad).
- Alternative 3: Widen S. Monroe St. to arterial typical section.

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 20 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

### Table 20 – Rank Results – Camino Real Crossing

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>3</td>
<td>100%</td>
</tr>
</tbody>
</table>


RJRA recommends that Alternatives 1 and 2 presented for the Camino Real Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complement each other and are independent of or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking in the table above will provide TxDOT some guidance on the attendees’ priorities.

RJRA recommends that Alternative 3 not to be implemented in the short-term. RJRA recognizes this alternative has ROW and environmental issues. These issues could prevent the alternative
form being implemented or would essentially change the alternative into a long-term project. Comments received at the work group meeting confirm RJRA’s recommendations. The comments stated that the ROW width was limited and a 4f issue would be encountered if additional ROW was acquired.

11.7 Del Rio Crossing

RJRA presented three improvement alternatives for the Del Rio Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Improve traffic signal phasing and timing along US 277/Spur 239.
- Alternative 2: Install ITS devices for motorist information along US 277/Spur 239.
- Alternative 3: Extend the existing southbound right-turn bay for traffic traveling west onto Rio Grande Rd. (for easier access to the duty free shop located on this road).

For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 21 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>% Agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>2</td>
<td>91%</td>
</tr>
<tr>
<td>Alternative 3</td>
<td>3</td>
<td>80%</td>
</tr>
</tbody>
</table>


RJRA recommends that all the alternatives presented for the Del Rio Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complemented each other and are independent off or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking in the table above will provide TxDOT some guidance on the attendees’ priorities.

11.8 Lake Amistad Dam Crossing

RJRA presented two improvement alternatives for the Lake Amistad Dam Crossing at the second RTWG meeting. The following is a list of the alternatives:

- Alternative 1: Add signage at US 90.
- Alternative 2: Add a flashing beacon at US 90 and Spur 349.
For the crossings in the TxDOT Laredo District, RJRA ranked the alternatives then asked the second RTWG meeting attendees if they agreed with the ranking. The ranking was based on which alternative they would like to have implemented first. Below is Table 22 with a list of the alternatives, ranked as they were taken to the second RTWG meeting. RJRA used this information in formulating the recommendations. For more information concerning the second RTWG meeting, refer to the RTWG #2 Meeting Report.

**Table 22 – Rank Results – Lake Amistad Dam Crossing**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rank</th>
<th>%Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>2</td>
<td>100%</td>
</tr>
</tbody>
</table>


RJRA recommends that all the alternatives presented for the Lake Amistad Dam Crossing be combined and implemented as one. These alternatives can be implemented as one alternative because they all complemented each other and are independent off or will not compromise the implementation of the other. However, RJRA understands funding and implementation constraints can delay any of these alternatives. The ranking in the table above will provide TxDOT some guidance on the attendees’ priorities.

RJRA further recommends, based on comments received at the second RTWG meeting, to include safety lighting as part of Alternative 2.

**11.9 Next Steps**

The next steps in the project development process will be for TxDOT’s TPP Division to take these recommendations under advisement. Then, advise the TxDOT Laredo District and local entities involved of these recommendations. Funding will be allocated. The alternatives that can be easily implemented without environmental documentation or ROW acquisition should be considered as high priority. Alternatives that can be incorporated into construction projects already underway should also have high priority. Finally, the alternatives that will need further design, environmental documentation and ROW acquisition should be programmed into TxDOT’s STIP and the MPO’s Transportation Improvement Plan.
APPENDIX A – FIELD RECONNAISSANCE PHOTOS
APPENDIX B – INDIVIDUAL STAKEHOLDER MEETING DOCUMENTS
APPENDIX C – INFORMATION FROM LOCAL AGENCIES
APPENDIX D – TRAFFIC DATA COLLECTION
APPENDIX E – ESTIMATES
Bibliography – Laredo District


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StreetMap USA, ESRI, 2002.


Truck Transportation Through Border Ports of Entry: Analysis of Coordination Systems, Texas Transportation Institute, 2002.