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 executive summary documents the outcomes of that study for the TxDOT Laredo District.

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 also identified low cost (short-term) improvements that could be implemented within a five-year timeframe.

The following TxDOT Laredo District crossings were evaluated as part of the 26 Texas-Mexico international border crossings included in the study:

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

Field Reconnaissance

The study team performed field reconnaissance work at all 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 port of entry (POE). The study team took photos of these roadways and identified operational deficiencies in the study areas. This work also included identification of any constraints in the study areas, such as historical sites, commercial development, and residential constraints. Refer to Appendix A in the Volume II TxDOT Laredo District Study Report for a CD of all photos from these field reconnaissance trips.

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 document 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 within the system improvements, in this case, through low cost, short-term improvements that can be implemented within a five-year timeframe.

A Need and Purpose statement was created for all eight TxDOT Laredo District crossings. It evaluated the existing conditions in the study area of the crossings, previous plans and studies being conducted by agencies such as TxDOT Laredo District, local cities and counties, land use, existing and historic mobility, such as traffic growth rates, population growth, congestion, and safety issues. The study team found that 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. Refer to Volume II TxDOT Laredo District Study Report for all Need and Purpose documents created for the eight crossings.

Goals and Objectives

The study team evaluated the Need and Purpose documents 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 right of way (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 the proposed alternatives were evaluated and constitute the goals and objectives of the study. Refer to Volume II TxDOT Laredo Study Report for more specific information on the goals and objectives for each crossing.

Del Rio Crossing
The following three improvement alternatives are recommended:

- **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) (shown below)

Lake Amistad Dam Crossing
The following two improvement alternatives are recommended:

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

Traffic Data Collection
The study team collected traffic data at four of the eight international crossings in the TxDOT Laredo District. These included the Gateway to the Americas Crossing, Juarez-Lincoln Crossing, Colombia Crossing, and World Trade Crossing.

- **Average Daily Traffic (ADT) Volumes**
  The study team collected twenty-four hour traffic data and vehicle classification counts along key routes leading to the four aforementioned crossings. The ADT data collected served to evaluate existing traffic demand/conditions and to evaluate the anticipated traffic growth. The results of the analysis were used as part of an overall evaluation of proposed improvements to relieve traffic congestion.

- **Turning Movement Counts (TMC)**
  The study team collected TMC data during morning (7:00 AM - 9:00 AM), mid-day (11:00 AM - 1:00 PM), and afternoon (4:00 PM - 7:00 PM) peak periods at critical intersections within the study network of the four international border crossings.

- **Travel Time Runs (TTR)**
  TTR data was collected within the study corridor for each of the four crossings. Data gathered from the TTR helped 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.

Refer to Appendix D for complete sets of travel time data sheets and route maps in the Volume II TxDOT Laredo District Study Report.
Colombia Crossing

The following three improvement alternatives are recommended:

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

*Proposed improvements to serve the temporary BSIF area until the permanent BSIF is open.

World Trade Crossing

The following three improvement alternatives are recommended:

- Alternative 1: Improve traffic signal phasing and timing at the intersection of LP 20 and FM 1472 (shown right).
- 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.

Eagle Pass Crossing

The following two improvement alternatives are recommended:

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

Camino Real Crossing

The following two improvement alternatives are recommended:

- 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).

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 system (GIS) software. The maps were used during the alternative screening evaluation and at the RTWG Meeting #2 as reference material and information. Datasets for the constraints maps were collected from a variety of sources, such as the Texas Natural Resources Information System, MPO data resources, county central appraisal districts, and city planning departments. Some datasets were created by the study team referencing additional information from field reconnaissance, stakeholders, local agencies, and TxDOT staff. The figure to the left displays the constraints map developed for the Gateway to the Americas Crossing and Juarez-Lincoln Crossing study area. The various colors reflect land use categories. For example, solid red reflects commercial use, solid green reflects park land use, and blue reflects civic land use. Refer to Volume II TxDOT Laredo District Study Report for copies of all constraints maps developed by the study team for the eight crossings.

Initial Alternatives

The development of initial alternatives technically began while the study team conducted several reconnaissance visits to all the bridges in the TxDOT Laredo District. The study team made general observations of locations and documented traffic congestion and operational deficiencies. The study team also collected information from different local sources such as TxDOT and local bridge operators.

The study team proceeded to develop initial alternatives that would be presented at the first RTWG meeting. At the meeting, the study team presented the initial alternatives developed for each crossing and encouraged attendees to provide input on the initial list, as well as help develop additional alternatives. Refer to Chapter 6.0, Initial Alternatives, in the Volume II TxDOT Laredo District Study Report for a detailed list and maps of all the initial alternatives developed for the eight crossings.

Refined Alternatives

The comments from the first RTWG meeting provided the study team with sufficient information to develop additional alternatives for the crossings. 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. The resulting set of combined and additional alternatives was defined as the refined initial alternatives. Refer to Chapter 7.0, Refined Alternatives, in the Volume II TxDOT Laredo District Study Report for a detailed list and maps of these refined alternatives.

Initial Screening

The study team conducted an initial screening based on a fatal flaw analysis of the refined initial alternatives previously mentioned. A fatal flaw meant that the alternative would no longer move forward in the study process, and was based on criteria set forth in the scope of the project: short-term, low cost, within five miles of the crossing, and not located on GSA property. Short-term was defined as an alternative that could be constructed and completed within five years. The study team also took potential environmental impacts into account, as well as ROW acquisition. The study team assigned a total cost estimate threshold for both construction costs and ROW costs, in 2008 dollars, of less than one million dollars. Finally, any alternative beyond five miles of the crossing would not move forward in the study process. The no-build alternative, or do nothing option, would move forward as a viable option for each crossing throughout the study process. Refer to Chapter 7.0, Refined Alternatives, in the Volume II TxDOT Laredo District Study Report for more detailed information on the initial screening process and the alternatives eliminated based on the fatal flaw guidelines.
As part of the final screening exercise, the study team developed a screening matrix, evaluation criteria, defined the use of traffic modeling data in the matrix, devised a scoring system, and defined a process for paring down the list of alternatives for each of the eight crossings.

The screening matrix included criteria based on the Need and Purpose statement and the scope of the study. The criteria were subsequently categorized based on the Goals and Objectives of the study. The categories included mobility, safety, economy, environment, security, design, and cost effectiveness. Criteria for each category was developed to fit the conditions identified during the study process. Ratings for each initial alternative were based on whether the alternative had a positive, neutral, or negative affect on the individual criteria, and were qualitatively represented with a plus, zero, or minus, respectively. Some of the criteria within the mobility, economy, environment, and cost effectiveness categories were supplemented with quantitative measures.

The quantitative analysis consisted of developing the applicable units of measures, or measures of effectiveness (MOE), for these criteria using CORSIM and Synchro traffic software. Level of Service (LOS) was measured with a rating of A through F, with A being the best and F being the worst. Traffic delays were measured by time and seconds of delay, and queue lengths were measured in feet. Other quantitative measures included fuel economy in the economy category measured in miles per gallon, and air quality in the environment category using kilograms of carbon dioxide to measure emissions.

The cost effectiveness category also utilized quantitative MOEs, and included construction costs, ROW cost, implementation time, and total cost. Implementation time estimates were based on a timeline that included design, ROW acquisition, environmental documentation and clearance and actual construction time. The study team also factored in an inflation rate of 5% per year to the construction estimates. Refer to Appendix E of the Volume II TxDOT Laredo District Study Report for more detailed information on the identification of funding opportunities to help implement the improvements recommended by the study team, and information on methods available for the development of the study alternatives, respectively.

The following are the recommendations for each crossing in the TxDOT Laredo District.

**Gateway to the Americas Crossing**

- **Alternative 1:** Synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Santa Maria Ave.
- **Alternative 2:** Install ITS devices for motorist information in the same study area (shown below)
- **Alternative 3:** Improve and add signage in the downtown area, primarily for disseminating lane assignments

**Juarez-Lincoln Crossing**

- **Alternative 1:** Synchronize traffic signals from the POE north to Washington St. This area extends east to Flores Ave. and west to Santa Maria Ave.
- **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 assignments at the intersection of San Dario Ave. and Victoria St., as San Dario Ave. splits to IH 35 (shown right)