El Paso Regional Ports of Entry Operations Plan

Volume II – Technical Appendices
Project Summary Report

prepared for

Texas Department of Transportation

prepared by

Cambridge Systematics, Inc.

with

HNTB Corporation
KPMG, LLC
Harris Interactive Services Bureau
University of Texas El Paso

June 2011





volume II – technical appendices

El Paso Regional Ports of Entry Operations Plan

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date

June 2011

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A. Steering Committee Members and Stakeholders Consulted

A.1 Advisory Committee

- Steve Ortega, El Paso City Representative, El Paso MPO Policy Board Chair
- Walter Miller, Mayor Horizon City and member of El Paso MPO Policy Board
- Scott McLaughlin, Stagecoach Cartage and member of Camino Real Regional Mobility Authority Board

A.2 List of Stakeholders Consulted and Briefed

Federal/National Agencies

- Mexico Aduana
- Mexican Consulate
- U.S. Consulate General
- U.S. Customs and Border Protection
- U.S. General Services Administration
- U.S. International Boundary and Water Commission (IBWC)
- Secretariat of Communications and Transport (SCT)
- Foreign Trade Zone No. 68

State Agencies

- Chihuahua State Government
- New Mexico Border Authority
- New Mexico Department of Transportation (NMDOT)
- TxDOT El Paso District Office
- TxDOT International Relations Office

Regional Planning Agencies/Organizations

- Instituto Municipal de Investigación y Planeación (IMIP)
- El Paso MPO Transportation Policy Board

- Paso del Norte Group, Model Ports Committee
- Camino Real Regional Mobility Authority

Cities/Representatives/Local Elected Officials

- City of El Paso Committee on Border Relations
- El Paso County Judge Escobar
- El Paso City Council Members (individual briefings)
  - Emma Acosta
  - Susie Byrd
  - Mayor John Cook
  - Eddie Holguin Jr.
  - Ann Morgan Lilly
  - Beto O'Rourke
  - Steve Ortega
  - Carl Robinson
- El Paso City Council (plenary briefing)
- El Paso City Staff
- El Paso and Dona Ana County Commissioners
  - Commissioner Escobor
  - Commissioner Gandara
  - Commissioner Haggerty
  - Commissioner Lewis
  - Commissioner Perez
- El Paso Independent School Board President
- City of Juarez
- Horizon City Council
- Texas State Representatives and Senators
  - Rep. Elect Dee Margo
  - Rep. Pickett
  - Rep. Reyes
  - Rep. Chavez
  - Rep. Quintanilla
  - Rep. Marquez

  - Rep. Gonzalez
  - Senator Elect Rodriguez
  - Senator Shapleigh
  - Senator Udall's office
- Socorro City Manager
- Ysleta Independent School Board

Industry Representatives

- AMAC
- Delphi
- Downtown Management District/Central Business Association
- El Paso Regional Economic Development Corporation (REDCo)
- Foreign Trade Alliance
- Foreign Trade Association
- Greater El Paso Chamber of Commerce, Transportation and Infrastructure Committee
- Hispanic Chamber of Commerce
- Promofront
- Rotary Club of West El Paso
- Ryder
- Secure Origins
- Southwest Maquila Association
- Sunland Park Rotary Club
- Transmen Freight Services LLC

Others

- El Paso Times Editorial Board
- Neighborhood Coalition Summit
- Sun Metro
- Sunny 99.9
- Texas Transportation Institute

B. Public and Stakeholder Involvement Summaries

B.1 May 2010 Focus Group Summaries

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 3, 2010
8:00 am – 10:00 am
El Paso City Hall

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the business community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants believe that the region's ports of entry (POEs) are currently in "crisis mode" and this level of operation is unacceptable. As a whole, all bridges in the region are problematic in both directions. Key issues include:

   a. **Wait times** – Participants indicated that wait times for commercial and passenger vehicles can be three hours or more. Participants also indicated that the Bridge of the Americas (BOTA) POE is over-utilized. Commercial participants stressed the need to improve the predictability and reliability of travel times, as many of the region's industries rely on just-in-time manufacturing.

   a. **Understaffing** – Participants felt that understaffing of inspection personnel is one of the fundamental issues contributing to the long wait times at the POEs. The region is experiencing understaffing to a more severe degree than has been experienced in recent years. Participants noted that several factors, including officer recruitment, training, and retention, contribute to the sub-allocation of front line officers available to conduct the inspection work day after day. Participants believed that Customs

and Border Protection (CBP) officers are asked to work considerable amounts of overtime in hot and dangerous work conditions. Participants believed that this work environment contributes to significant staff turnover.

b. **Frequent traveler programs provide some benefits, but could be improved –** Over the past five years, the use of SENTRI lanes (available at Stanton and Zaragoza) has increased from 10 percent to approximately 16 percent of all crossings. While participants felt that the range of frequent traveler programs available in the region (i.e., SENTRI/DCL and FAST) have been useful, the travel time benefits are often small compared to the costs. Participants indicated that the SENTRI/DCL and FAST programs have not been integrated with the Customs-Trade Partnership Against Terrorism (C-TPAT) system and still require that every traveler is scanned every time. Commercial participants indicated that acquiring C-TPAT certification is a time consuming, data intensive, and expensive endeavor for businesses, yet the benefits are diminished by chokepoints in the FAST lanes (lack of access to the FAST lanes on the Mexico side requires trucks to wait in queue before even reaching the FAST lanes). In many cases, acquiring C-TPAT certification is viewed as a "cost of doing business" in the region (i.e., shippers will not do business with non-C-TPAT carriers), but the program often does not come with significant transportation benefits. The participants also indicated that pedestrian use of frequent travel programs is limited because of cost. They indicated it is underutilized because pedestrians are paying tolls in both directions.

c. **Mix of Commercial and Passenger Traffic on the Same Bridge –** The participants agreed that mixing commercial and passenger traffic at the same POE impedes operational efficiency. However, some participants indicated that providing mobility options at each bridge is more important. These participants suggested that each bridge should have infrastructure to accommodate both commercial and passenger vehicle traffic.

d. **Use of Technology** - Participants believed that the region's POEs are not fully utilizing the technological advancements that are currently available in the marketplace. The C-TPAT system is set up in a cargo environment to secure the supply chain, but these same capabilities have not expanded to include the people side as well. The San Diego, California and Blaine, Washington crossings were held up as good examples of how technology could be used at POEs.

e. **Limited hours of operation –** Santa Teresa's commercial cargo facilities operate from 8:00am to 8:00pm Monday through Friday (Saturdays 9:00am to 2:00pm). While the region's other commercial crossings also have limited hours of operation, participants indicated that companies would utilize Santa Teresa more if it were open longer. However, participants noted that the limited utilization of Santa Teresa prevents CBP from allocating enforcement staff which, in turn, limits the attractiveness of the crossing for commercial users. This dilemma contributes to underutilization at Santa Teresa.

f. **Health, Safety, and Security –** Participants were concerned about the environmental and health effects related to idling vehicles waiting in queue. Safety and security is

also a concern. Participants indicated that people are getting robbed while waiting to cross the border.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **CBP officer recruitment and retention –** As mentioned above, participants felt that CBP officer recruitment and retention continues to be a challenge. The agency has been bleeding staff to other federal agencies. Given the understaffing problem and the difficulty of recruiting and training new staff, officers are asked to work considerable amounts of overtime to get the work done.

b. **Land-locked ports –** Participants noted that physical constraints surrounding the ports prevent capacity expansions. This was a particular concern at BOTA, which has limited right-of-way that could be used for expansion. In addition, participants expressed concern about the impacts of CBP southbound inspections, as the region's bridges were not designed to accommodate southbound inspections. As a result, new southbound inspections within the existing footprint of the POEs increase the burden on already constrained POEs that cannot be expanded.

c. **Securing rail shipments –** Some participants noted that securing rail shipments is a challenge and the current system facilitates can facilitate smuggling. They want an efficient border crossing process in which a secure rail cargo box would receive clearance inspection in Mexico by U.S. CBP officials. The secure shipment would also be subject to ongoing inspections throughout transport. In addition to improved rail security, the region needs more infrastructure to support rail access. Participants noted that the rail potential at Santa Teresa is an asset for the POE as the area is sparsely developed.

d. **Government Coordination –** The participants stressed that coordination between the U.S. and Mexican governments are necessary to advance infrastructure projects and security improvements. They indicated that the Mexico government is moving forward on several infrastructure projects, including dedicated lanes and truck only lanes. However, the governments on both side of the border need to work together. One comment was made that several focus group participants have been working on this issue for 12 to 16 years, indicating that stakeholders are not the problem. Rather, the problem is the governments' lack of coordination and understaffing. Participants indicated that the region needs U.S. and Mexican inspectors on both side of border, but Mexico is one of the only countries that does not allow the U.S. to conduct preclearance in Mexico.

3. Where does investing in the region's ports of entry fit among other regional priorities?

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They indicated a need to look at the region as one economy - a metroplex. Most of the traffic crossing the border is regional, not from interior Mexico

going further north into the U.S. Therefore, any improvements to the POE wait times are likely to stay within the region and affect the bottom line of businesses in the region. Increasing jobs in the region can increase the tax base and this will have positive impact on quality of life.

From the perspective of dealing with realistic threats, the participants felt that priorities of the inspection agents often are misaligned. At present, they feel that there is more emphasis on not making a mistake than facilitating the movement of people and goods. Until transportation mobility is on equal par with safety and security, delay at the border will continue to choke the system. The participants indicated that businesses are turning away and moving elsewhere besides Canada and Mexico. Fixes on both sides of the border are necessary.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Resolve the understaffing problem –** The participants expressed frustration that the region is losing revenue now, indicating that an immediate fix would be to fully staff the bridges. They suggested that the National Guard could conduct secondary inspections in the short term while CBP trains additional staff.

b. **Create a FAST-only Port of Entry –** Participants were interested in designating one port of entry for the exclusive use of FAST participants would help to expedite the clearance of transborder shipments by C-TPAT approved carriers. This would help to create a security environment that would allow for greater speed and efficiency and improve reliability for just-in-time manufacturers, importers, and carriers.

c. **"Push back the border" for inspections –** Participants noted that rather than requiring that all southbound inspections occur within the existing footprint of the POE, push the inspection point into Mexico at the point of debarkation (point of unloading).

d. **Make inspection procedures more consistent and transparent –** Participants felt that improving the consistency and transparency of the inspection process may help to make inspectors more comfortable and address the understaffing issue. Requiring all CBP staff to be "generalists" (i.e. trained in both administrative and front line functions) exacerbates inefficiencies, as staff are more likely to overreact to a situation. Instead, allowing administrative staff to focus solely on permitting rather than front line issues, for example, would make more efficient use of available resources. The participants indicated that presently approximately two-thirds of bridge staff are administrative and the remaining one-third work the front line. However, participants would like to see these numbers reversed. They indicated that things work better when Washington

officials visit the region, therefore they know that the region's POEs can work more efficiently.

e. **Increase the number of dedicated travel lanes –** Participants noted that as participation in the SENTRI program continues to increase, additional DCL/SENTRI lanes are needed. Rather than funneling all SENTRI travelers through Zaragoza and Stanton, consider adding DCL lanes on the other bridges as well. Another suggestion was to designated a commercial FAST lanes from 6-9am, then open the lane for everyone the rest of the day. However, access to FAST lanes is important.

f. **Improve the efficiency of POE approaches –** Participants want to consider the construction of a connection out of BOTA to tie into Cesar Chavez west. Internal circulation around BOTA is so poor. At present, drivers leaving BOTA cannot go west. In addition, late night traffic on BOTA heading into Mexico can back up almost all the way to I-10 when CBP conducts southbound inspections. At Zaragoza, some inefficiencies on the approach could be improved.

g. **Add more bridges –** In the long-term, the participants anticipate that the El Paso region will need more border crossing locations to accommodate demand. They suggested that Tornillo is an option, but it is too far away.

h. **Privatize or use public-private partnerships to help acquire funding -** The Chamizal Treaty is an International Treaty to keep BOTA free, but there is a movement to privatize. At present, it is the only free bridge along the entire U.S.-Mexico border. The focus group participants also indicated that DCL was created after private sector pushing for 5 years. They commented that the private sector (foreign trade association) has been helping to fund DCL improvements, including paying $7 million for BOTA.

i. **Leverage technology for use in both directions –** Participants suggested development of a frequent traveler pass that would work for north and southbound travel on any bridge. They also encouraged the allowance of pre-clearance for customs on each side of the border. However, this would require coordination among public and private concessionaires and U.S. and Mexican governments.

j. **Establish consensus with CBP –** The federal government is one of the critical partners driving decisions. As a result, the participants recognized the importance of working closely with CBP to build consensus and support for the strategies discussed.

k. **Consider historic data and previous studies –** The participants encouraged the study team to research, understand, and build upon previous regional efforts. The challenges discussed throughout the focus group are not new. They have been studied numerous times by a handful of agencies. Use the previous studies to help inform strategies and recommendations.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 3, 2010
10:00 am – 12:00 pm
El Paso City Hall

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the business community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   The participants indicated that the border crossings are currently in "crisis mode," with problems in both directions. However, given the fiscal constraints under which the ports of entry (POEs) must operate, some respondents indicated that the POEs are working as good as can be expected. The following factors contribute to congestion at the border:

   a. **Merging and weaving of passenger and commercial vehicles** – Participants indicated that weaving trucks are a particular issue at the Bridge of the Americas (BOTA) POE. Participants described the merging and weaving at BOTA as "chaos."

   b. **Secondary inspections in primary inspection lanes** – Designated secondary inspection areas are designed to allow inspectors to conduct additional inquiries/searches without causing delays for other vehicles or pedestrians in the primary inspection lanes. Rather than using these areas consistently, however, the participants indicated that Customs and Border Protection (CBP) officers

often conduct secondary inspections in the primary lanes instead. Union resistance and inspection incentives were cited as two contributing factors.

c. **Understaffing –** Participants indicated that there are not enough CBP agents to man all of the available inspection lanes. They cited high stress levels, low pay, overtime demands, and exposure to health risks from idling vehicles as reasons for high employee turnover. Participants also cited the lack of response from Congress regarding the CBP Commissioner's request to add new staff as a key factor contributing to the problem. Once hired, it takes 12 to 18 months to train an agent.

d. **Wait time management and communication –** Participants mentioned that when CBP gets a hit in primary, they close the lane with a cone. However, no information is communicated to the back of the queue to indicate that the lane is closed. Management of wait times was also cited as a big issue. The participants indicated that reports on bridge wait times are not accurate or timely. There needs to be a uniform measurement of crossing times.

e. **Traffic control devices on approach –** Participants indicated that the stop signs at Stanton and 8th are an issue, as well as the traffic control at 6th and South El Paso Street. Participants asked whether these intersections could be signalized.

f. **Southbound inspections –** The bridges were not designed for southbound inspections. When southbound inspections are conducted, the participants described queues on BOTA that back up to I-10, creating mobility and safety issues.

In contrast to these congestion-causing conditions, the participants highlighted several favorable aspects of the Santa Teresa POE. The POE's rail potential, the new Camino Real Highway, and random inspections by x-ray make Santa Teresa a favorable alternative compared to the region's other POEs. Some participants indicated that their companies would use Santa Teresa all the time if its operating hours were extended. (currently Monday through Friday 8:00am to 8:00pm, Saturdays 9:00am to 2:00pm).

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Retention of CBP Staff –** As described above, the participants indicated that CBP has lost a lot of agents to other federal agencies that offer better working conditions and/or benefits. CBP will also require additional federal funding to add more staff.

b. **Implementation Lead Time –** The participants cited that nearly 150 studies on the region's POEs have been conducted by various agencies over the past 20 years. However, they indicated that studies are only as good as their implementation. Participants agreed that because dynamics shift so quickly, it is

tough for the various studies and recommendations to keep up. By the time an improvement is recommended or implemented, the conditions have changed.

c. **Urban Demand** - Unlike many other border crossing locations, the participants indicated that most of the loads crossing the border in the El Paso region stay in El Paso. In their view, this urban demand would limit the effectiveness of another suburban crossing in the region.

d. **Standards for Frequent Traveler Approvals –** Participants indicated that frequent traveler approvals for SENTRI/DCL are down 30 or 40 percent. The standards required for approval have escalated so high that it is very difficult for travelers to quality for the program. Participants suggested that the DCL and SENTRI lanes should be treated like the security lines at airports. If an inspection agent finds liquid in a passenger's carry on, it is taken and disposed of. However, they do not revoke the passenger's boarding pass. They suggested the same common sense should be applied to the frequent traveler passes (i.e. do not revoke the SENTRI/DCL pass if two oranges, for example, are found in a passenger vehicle).

e. **Urban Growth Patterns –** Participants indicated that most of the truck growth has been to the east because most shipments from El Paso travel east. However, they expect lots of growth in San Geronimo/Santa Teresa area as well. Participants questioned what the city should be doing to prepare for the growth, including the connection on I-10 via Art Craft Road, e.g., investigating the need for a bypass or other infrastructure investments to meet demand. Participants also suggested the need to look at Foxconn and its plans to locate electronics assembly operations in Chihuahua state and growth it will bring.

f. **Federal Policy –** Many participants agreed that Federal policy is more of a problem than the region's POE infrastructure. They suggested that the policies governing operations at the POEs should be clearer and reevaluated to support commerce. However, they indicated that when Washington officials comes to El Paso, everything operates much more smoothly.

3. Where does investing in the region's ports of entry fit among other regional priorities?

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. The participants recognized that there is no quality of life without economic development. However, the gridlock at the region's POEs are contributing to lost business. Participants indicated that there are vacant commercial buildings along Stanton and El Paso Streets in the heart of downtown because the lines at the border crossings are too long and people from Mexico are not coming across the border to shop. They explained that in the past, there were waiting lists filled with people wanting to lease these spaces and the rent per square foot was once comparable to Manhattan. The downtown vacancies have a ripple effect because they mean less city taxes.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Extend Hours and Staff on Existing Bridges –** Participants indicated that extended hours and more staff on existing bridges would provide a good short-term solution to improve the operations of the region's POEs. Participants suggested that off-duty customs agents could be hired as extra agents while new staff are trained. Participants also suggested employing retired people from industries that conduct background checks (i.e. schools) to carry out the administrative work so that more of the trained inspection agents are available to work the line.

b. **Apply Incentives/Lessen Disincentives –** Participants suggested that CBP should incentivize inspection agents for using secondary inspection areas more consistently and effectively (rather than conducting secondary inspections in primary). Also, participants explained that the current policy deters people from acknowledging a mistake (e.g., the accidental possession of an orange in the vehicle) because it opens them up to potential confiscation of their credentials. This disincentive translates to people not reporting more serious problems as well. For example, if a cartel has gotten to a company's employee and the employer turns over information, the employer's trucks are subject immediately to inspection. The participants suggested that incentives should be in place to reward people for acknowledging mistakes or informing CBP of security threats.

c. **Make Better Use of Existing Technology -** Participants suggested that effective use of Intelligent Transportation Systems (ITS) or dynamic message signs (DMS) on the bridges and approaches could help to reduce weaving issues and alert drivers of lane closures. Interoperable technology for license plate recognition and FAST/DCL tags that could be used all of the region's POEs was also suggested. At present, the region's POEs are not utilizing the technology that exists.

d. **Improve Interdiction through Intelligence –** Participants suggested that adding more agents from the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), particularly for southbound inspections, would boost intelligence capabilities. ATF is running southbound inspections because they have specially trained dogs searching for drugs, guns, and money. Participants also suggested that U.S. inspectors should be allowed on the Mexican side and Mexican inspectors allowed on the U.S. side. They stressed the importance of increasing the rate of interdiction through intelligence rather than stopping traffic.

e. **Add a New Crossing Point Between BOTA and Zaragoza –** Congestion on the Juarez side of the border is bad. Participants suggested that a new border crossing point somewhere between BOTA and Zaragoza would help to relieve

this congestion. Infrastructure in Juarez has been built to support a new crossing point.

f. **Add Tolls and DCL lanes to BOTA –** Participants suggested that a southbound toll on BOTA be considered along with a DCL lane on BOTA northbound. They suggested potentially moving the non-tolled crossing from BOTA to another crossing.

g. **Route all Oversize/Overweight Trucks through Santa Teresa –** In addition to routing all oversize/overweight trucks through Santa Teresa, participants suggested that distributing more truck traffic to Santa Teresa would help to make the whole system work better.

h. **Privatize the Bridges –** Participants pointed to the privatized bridges in Laredo, where they run twice as many trucks across their bridges and it works efficiently. They explained that a company would own the bridge and sell shares to businesses. Where the City of El Paso currently owns the bridges, the participants suggested that the company compensate the city for the lost revenue.

i. **Move Southbound Inspections Away from the Border –** Since the existing POEs were not designed for southbound inspections, the participants suggested that these inspection areas be conducted several miles into Mexico, away from the border. Jersey barriers or other traffic control devices could be used to keep the commercial vehicles secure before screening.

j. **Implement Contra-Flow Lanes –** Participants suggested the use of contra-flow lanes during peak periods to provide additional capacity in the peak direction.

k. **Provide Better Amenities on the Bridges –** Participants suggested that restrooms and water fountains be available on the bridges if people are required to wait for hours. They also suggested that there be a drop off/pick up area for pedestrians ("kiss and ride" concept).

l. **Consider Implementing the Freight Shuttle Concept –** Participants suggested the development of a demonstration freight shuttle project on the east side of El Paso.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 3, 2010
2:00 pm – 4:00 pm
Pavo Real Recreation Center

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the freight shipper/carrier community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants believe these are the key issues that are affecting the region's ports of entry (POE):

   a. **Congestion –** Participants are concerned about congestion at POEs. They feel that despite efforts to expedite throughput at the POEs, such as the Free and Secure Trade (FAST) program, crossing times continue to be longer than desired. Participants noted that even with multiple lanes at a crossing, each for different types of traffic (FAST, full trucks, empty trucks), these lanes merge into one for customs inspection. They also noted that many drivers dangerously weave between lanes to avoid long queues. Participants want to see new infrastructure built on both sides of the border as well as new border crossings. They are aware of the new primary and FAST lanes that have been built at the Zaragosa POE, however, only one of two FAST lanes are normally staffed.

b. **Security –** Participants noted that customs inspections are not standardized and depend on the subjectivity and mood of the inspection officer. They also noted that secondary inspections do not happen in the commercial environment.

c. **Uneven travel patterns –** Participants noted that the Bridge of the Americas (BOTA) has a more attractive border crossing fee compared to other crossings. They feel that BOTA will continue to be a attractive option as the other crossings at Zaragosa and Santa Teresa require additional travel time. Participants indicated that they want improved distribution of traffic across the bridges. They noted that accidents on BOTA result in traffic congestion in downtown El Paso. They are aware of the restriction of hazardous materials at BOTA while the Zaragosa crossing allows the passage of such materials.

d. **Regional growth –** Participants noted that growth in the area has been occurring at the eastern end of the metropolitan area. They have seen additional vehicles and pedestrians utilizing the Zaragosa POE.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of challenges, including:

a. Customs and Border Protection (CBP) Attrition – Participants note that staffing is a continuing issue at the POE. While CBP continues to hire people, attrition continues to be a problem. Staff are leaving CBP for other federal agencies. Not only is there a shortage of staff, the hiring process takes a long time to complete background checks and training.

b. Land-locked Crossing Points – Participants noted that the land-locked nature of the existing POEs limits the feasibility of expansion to accommodate growing demand.

c. Resistance to Tolling – Participants are aware that El Paso is the only southern border city with a free bridge, creating a unique situation for the City. They note that the commercial trucking community would strongly resist any proposal to toll BOTA. Tolls on BOTA would directly affect their bottom line. Companies would consider relocating if tolls become too large of an expense.

d. **Achieving regional consensus –** One potential strategy to improving POE operations in the region is to convert an existing mixed-traffic bridge to one that only serves commercial traffic. However, given the urban nature of the region's bridges, people would be impacted and inconvenienced regardless of which bridge is selected.

3. **Where does investing in the region's ports of entry fit among other regional priorities?**

The region faces many quality of life issues, all of which are important. However, the region for the most part does not understand the importance of trade to the economic vitality of the region.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Develop a commercial-only POE –** Participants are interested in a POE dedicated to commercial traffic. This may require the conversion of an existing bridge or the construction of a new facility. This can be complemented by the designation of truck-only routes that lead to and from the POE.

b. **Improve staffing incentives –** Participants suggested the formation of an incentive program to reward inspectors on their ability to make quality inspections and maintain traffic throughput at the POE. Participants also suggested that the CBP look a efficiency measures such as lean manufacturing to improve their programs and staffing.

c. **Invest in new infrastructure –** Participants are interested in a new loop road that connects the three POEs at Stanton, BOTA, and Zaragosa. They are also interested in a new crossing in the area between BOTA and Zaragoza. Ideally, this new crossing would use the latest technologies to process trusted travelers. The participants want this new bridge to directly connect the industrial areas of eastern Juarez to Border Highway on the U.S. side in order to bypass residential neighborhoods. They recognize that new infrastructure will require time, planning, and support on both sides of the border, therefore, they encourage securing land and citizen support sooner than later.

d. **Improve use of technology –** Aside from the construction of new infrastructure, participants want to see additional use of technology at existing POEs to expedite border crossing times.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 3, 2010
5:30 pm – 7:30 pm
Armijo Recreation Center

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

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- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of El Paso residents participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants identified the following key issues with the region's ports of entry (POE):

   a. **Congested crossings -** Participants are aware of congestion from high volumes of traffic at POEs in the region. They noted that this problem is worth addressing now, before the economy picks up and exacerbates congestion.

   b. **Efficient commuter lanes -** Participants indicated that current dedicated commuter lanes (DCL) are operating efficiently.

   c. **Inefficient customs processing –** Participants noted that not all lanes are utilized at POEs. They want to see staffing at all booths to expedite customs processing.

2. **What are the most critical challenges facing the cross-border transportation system?**

   Participants identified a number of regional challenges, including:

a. **Understaffing –** Participants want to see every available border crossing lane in operation. This will require additional staff.

b. **Connectivity to other roadways –** Participants felt that there are limited north/south access points to and from the Bridge of the Americas (BOTA). They are in support of more access points.

c. **Tolling –** Participants recognized that tolling is an option under consideration for the BOTA, however, there are mixed opinions on the effectiveness of its implementation. They are not convinced that tolling saves time for travelers. Participants suggested that better management of staffing is a simpler solution. They are also aware that tolling will face opposition from various groups in the community.

d. **Separation of traffic –** Participants suggested the separation of traffic into different groups to help expedite border crossings. One idea is to separate traffic based on license plates, one group with U.S. plates and the other with Mexican plates. Another idea is to separate commercial traffic from non-commercial traffic as the two types of traffic have different processing times. Commercial traffic could have a dedicated crossing that is absent of non-commercial traffic.

3. **Where does investing in the region's ports of entry fit among other regional priorities?**

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They indicated a need to look at the regional transportation system as a whole and how the ports of entry relate to the operations of important facilities, including Interstate 10. They recognize that existing infrastructure, specifically in area around Fort Bliss, does not support current and proposed development.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Investigate improvements to the loop –** Participants expressed a desire to improve the loop road in the area around the Paso del Norte bridge, where there is no direct connection between Cesar Chavez Highway and Paisano Drive. A direct connection would improve cross-border traffic access to the western areas of the El Paso metropolitan area.

b. **Separation of traffic –** As mentioned above, participants are interested in separate crossings for different types of traffic. They are interested in the impact of traffic separation on the regional transportation network.

c. **Develop a range of solutions –** Participants suggested developing a range of solutions, short-, mid-, and long-term, to address issues with the POEs. Short-

term solutions, such as staffing, would be addressed first, followed by more complex and expensive mid- to long-term solutions. This incremental approach can help improve the management of the POEs.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 5, 2010
9:00 am – 11:00 am
Hilos de Plata

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the freight shipper/carrier community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants identified the following key issues with the region's ports of entry (POE):

   a. **Heavy use of eastern POEs –** Participants identified the eastern POEs at Zaragosa as the preferred gateway for commercial vehicles. They felt the western crossing at Santa Teresa was less desirable as it is connected to an access road to Interstate 10 that operates at-grade with several signals and stop signs.

   b. **Need for additional capacity –** Participants felt that additional POEs will be needed to meet future demand. They also felt that improvements to existing bridges will be necessary. They recommended that any POE study should consider all POEs in the region as a system and not by individual crossings.

   c. **Need for more technology –** Participants suggested the implementation of additional technologies to help expedite border crossings. They felt that technology can lead to faster inspections and will increase the attractiveness of border crossings to all travelers.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Separation of traffic –** Participants felt that there should be a separation of commercial and non-commercial traffic at POEs. They suggested the implementation of separate truck lanes at bridges, the Bridge of the Americas (BOTA) in particular. They also suggested 24-hour or time-of-day based implementation of truck-only bridges. Participants feel that there is a need for an additional POE for commercial or non-commercial traffic in the eastern El Paso area near Yarbrough Drive or east of Zaragoza Road, however, this new POE would require additional infrastructure to provide connectivity to the existing transportation network.

b. **Implementation of technologies –**Participants feel that more technology can be implemented at POEs. They suggested that a combination of new technology with other systems management and capacity improvements at POEs will help alleviate border traffic congestion. They are interested in evaluating the use of technologies used at marine POEs and applying these technologies at El Paso POEs.

c. **Border security –** Participants recognize the need for increased security at the border, however, they also recognize the need to improve mobility in the region. They feel that a balance must be achieved between security and mobility concerns. Participants also noted that the staffing and management of POEs vary across the country, resulting in variations in border processing efficiency at different gateways. Participants feel that the U.S. Department of Homeland Security has the responsibility to ensure that there is consistency between different POEs across the country. Participants are also interested in evaluating the impacts and benefits of the Customs Trade Partnership against Terrorism (C-TPAT) program on shippers and carriers. They felt that the data collected as part of the C-TPAT program can help identify regional cross-border travel patterns.

d. **Staffing –** Participants noted that U.S. Customs and Border Protection (CBP) staffing is a challenge that must be overcome. They indicated that it is currently difficult to fully staff existing POEs and that this challenge will be present with the construction of a new POE.

e. **Tolling –** Participants suggested the implementation of innovative peak pricing or off-peak pricing schemes to address the challenge of reducing peak commercial travel. They are interested in exploring examples of viable pricing schemes based on the experience of other jurisdictions. They are also interested in learning about the travel time of commercial vehicles in the El Paso border region. The Texas Transportation Institute was suggested as a source of information for cross-border travel times.

f. **Long-haul trucking –** Participants are aware that Mexican carriers cannot conduct long-haul operations within the U.S. They also recognize that the majority of the POE crossings are conducted by Mexican carriers conducting drayage operations.

The participants are interested in exploring alternative freight distribution channels, such as "freight shuttles" that involve the use of rail to ship goods across the border. They also indicated that such a rail-based system may face challenges as supply chain operations in the El Paso region are predominantly truck-based.

g. **Stakeholders –** Participants want to ensure all major stakeholders in the region are contributing to a POE plan. They suggested getting the involvement of the maquiladora industry to identify implementable solutions and strategies. Participants feel that the involvement of private industry, along with the regional mobility authority and the state transportation department can help all parties understand and evaluate border operations and enact successful policy change.

3. Where does investing in the region's ports of entry fit among other regional priorities?

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They commented that El Paso and Juarez operate as a single metropolitan area; improvements to POEs can help expedite freight movements and attract business to the region. They also indicated that other infrastructure investments in the region's transportation system will be needed to drive regional economic growth. Participants stressed that Fort Bliss and the maquiladora industry are key regional economic drivers. They also stressed the need for POE investment to stay competitive with other Texas POEs.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Improved POE access –** Participants want to see improvements at POEs, primarily at BOTA, to address issues with traffic flow, access/egress, and idling.

b. **Improvements at the Santa Teresa POE –** Participants want to see increased use of the western POE at Santa Teresa with minimal impact to local roadways. This requires the construction of a grade-separated access roadway between the POE and Interstate 10 to facilitate faster travel times.

c. **Implementation of new technology –** Participants encourage the use of technology to improve throughput of cars and trucks at all POEs in the region.

d. **Construction of new POEs –** Participants want to plan for additional POEs in the long-term.

e. **Privatization –** Participants are interested in the possible privatization of some border crossing operations.

f. **Mix of solutions –** Participants suggested the development of a mix of short-, mid-, and long-term solutions to address systemwide POE issues.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 5, 2010
1:00 pm – 3:00 pm
Mission Valley Regional Command Center

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the freight shipper/carrier community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants believe that the key issues impacting the operation of the region's ports of entry (POE) include:

   a. **Crossing times –** Participants are dissatisfied with crossing times at the border. They are frustrated with the redundancies of inspections and the variation in the security standards that are being applied by different agencies. They have seen trucks waiting on private land on the Mexican side of the border and many of them queue on access roads that lead to a border crossing. Participants are interested in solutions to help reduce peak demand.

   b. **Regional travel patterns –** Participants specified that the eastern POEs receive a greater amount of traffic compared to the western POE at Santa Teresa despite quicker border processing times at the western POE.

   c. **Security –** Participants recognize that security inspections are needed, however, finding ways to tighten security while expediting traffic throughput is a delicate

process that involves many different agencies. They feel that the Automated Commercial Environment (ACE) program intended to expedite border crossings has been implemented slowly.

d. **Staffing –** Participants noted that the number of staff working at the crossings have been inconsistent. They prefer increasing staffing levels to expedite border traffic throughput, especially during peak hours.

e. **Rail -** Participants recognize there are several constraints on rail operations, including: time window for rail interchanges, city-imposed operating hours for rail, crew changing times, and other agency coordination issues. The participants have worked for years to mitigate these issues. Their efforts have led to the improvement of time restrictions in Juarez and better customer service by Customs and Border Protection (CBP). Construction of grade separated right-of-way for rail is underway in Juarez. Participants noted that secondary inspections of rail are rare because of the effectiveness of x-ray inspection equipment. They are concerned, however, about the competitiveness of the region's POEs against those at Eagle Pass, Laredo, and Brownsville.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Funding –** Participants want to keep economic activity moving in the region. They feel that a key component to maintain economic progress is to address the operational efficiency of POEs. Participants recognize there is a need to have cost-sharing between public and private sources to help fund POE improvements. There have been efforts between rail carriers and the local and state agencies to address rail connectivity.

b. **Economic vitality –** Participants want to see a link between border efficiency and regional economic vitality. They are concerned that the average person may not understand this link, making it difficult for the region to pass public funding initiatives to help pay for capital improvements. Participants are looking to businesses to help pay border tolls.

c. **Tolling –** Participants feel that tolling would be successful if it leads to improved efficiency at the POEs and also result in a reasonable return on investment. They feel that the revenue generated should directly fund POE enhancements to improve travel times and inspection times.

d. **Redundancies** – Participants feel there are many redundancies in the inspection process, with multiple federal agencies making multiple, yet similar, inspections. They want to remove these redundancies. Adoption of technology, such as weigh-in-motion, can help address this issue.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 6, 2010
6:00 pm – 8:00 pm
Sunland Park City Hall

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of Sunland Park residents participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants believe that the region's ports of entry (POEs) are close to "crisis mode" and that this level of operation is unacceptable. Key issues include:

   a. **Traffic imbalance –** Participants recognized a big imbalance in cross-border traffic, with the POEs at Laredo receiving significantly more traffic than the POEs in El Paso. They suggested the analysis of Mexican freight flows to determine how to redistribute traffic from heavily used crossings to underutilized crossings.

   b. **Border inefficiencies –** Participants indicated that there is a perception of inefficiency with regard to border crossing operations. This is attributed to inspections that are conducted at the crossings themselves and not at a secondary secure off-site location away from the border. The implementation of off-site inspection points could be complemented with secure corridors to the border and require the sealing of containers at the point of origin. The participants expressed a desire to have more non-commercial crossings and to designate specific crossings for commercial traffic. They suggested that these additional crossings are worth

considering after existing bridges are fully utilized. They also suggested the diversion of some freight movements on to rail.

c. **Understaffing –** Participants indicated that the POEs are understaffed. Additional staff is needed to handle the level of traffic at the border. Both vehicles and pedestrians have long wait times. Border staff currently work in 30 minute intervals to reduce exposure to exhaust fumes. Participants indicated a desire to increase the budget of the Customs and Border Protection in order to fully staff all border crossing booths.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Future economic growth –** Participants emphasized the importance of future economic growth of the region, particularly in northern Chihuahua state and the western and northern parts of the metropolitan El Paso area. They described existing facilities as being insufficient for handling existing conditions, much less future conditions.

b. **Regional growth –** Participants indicated that the eastern border crossings in the region are heavily utilized and that the western crossings have additional capacity. They are interested in diverting traffic to the western crossings, including expanding the hours of operation of the Santa Teresa crossing and building a new crossing in the vicinity of the Asarco plant. They also recognized that existing infrastructure and support services for shipping exists near the eastern crossings, making these crossings much more attractive than those in the west. Traffic counts are being collected by the New Mexico border authority; such counts may be valuable for analyzing long-term traffic growth.

c. **Border tolls –** Participants indicated their concern over tolling and that such implementation places a cost burden on the traveler. They also expressed that tolling may not work as border congestion continues to persist despite the existence of tolled crossings in the area. Designated commuter lanes (DCL) are not being used by infrequent travelers and are cost prohibitive to most people. Participants expressed an interest in studying the appetite for tolls in the region through the use of surveys, toll transaction data, and travel demand models.

d. **Technology –** Participants indicated that while technology has advanced in recent years, the use of these high-tech solutions at the border crossings has not been extensive. Participants would prefer the expanded use of technology where possible, however, they also indicated that some solutions do not require the use of advanced technology. Technology can help process frequent travelers quickly and provide inspectors more time to process infrequent travelers.

e. **Slow implementation –** Participants indicated that they have pressured Customs and Border Protection to increase investment at the border to help expedite processing times. They expressed their frustration that these investments have been

implemented at a slow rate and the region is losing businesses and money as a result.

3. **Where does investing in the region's ports of entry fit among other regional priorities?**

   Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They expressed their support of increasing investment in the POEs to enhance the business environment of the region. Improving border crossing times increase the attractiveness of U.S. businesses to Mexican travelers.

4. **What should be done to address these issues?**

   Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

   a. **Develop a progressive methodology –** Participants suggested a progressive methodology in developing solutions for the POEs. Such a methodology would consider simple short-term solutions, such as increasing staffing at the border, followed by a long-term solutions, such as new border crossings.

   b. **Increase manpower –** Participants expressed their support to increase staffing at the border crossings. They also expressed an interest in using performance measures to evaluate each border officer and their ability to promote throughput.

   c. **Increase use of technology –** Participants indicated their interest in expanded use of technology to help promote expedited border movements.

   d. **Increase stakeholder involvement –** Participants expressed their desire for increased communication between both U.S. and Mexican agencies given the nature of the crossings as a bi-national facility. New Mexico and Chihuahua officials need to be on the advisory committee to ensure regional balance in decision making. Participants also want increased involvement of local agencies to help bolster community support for border initiatives. They also want to ensure that there is transparent communication between all levels of government and citizens. Participants want Customs and Border Protection to understand the economic impact of efficient border crossings.

   e. **Improve efficiency of existing crossings –** Participants indicated that the western border crossing at Santa Teresa is underutilized and is a prime location for receiving additional or diverted border traffic. They expressed an interest in designated specific crossings for commercial traffic and others for non-commercial traffic. Relocating secondary inspections to secure sites away from the border is a solution worth considering. Another solution suggested by participants is the establishment of neutral territory on the border to allow families to meet without crossing into the other country.

3. **Where does investing in the region's ports of entry fit among other regional priorities?**

   Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. As described above, participants are interested in addressing funding, economic vitality, tolling, and redundancy issues. They feel that addressing each of them will provide benefits to the region.

4. **What should be done to address these issues?**

   Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

   a. **Improved bi-national coordination –** Participants want improved coordination of activities between American and Mexican agencies. They feel that there is adequate capacity to handle rail traffic at the POE, however, the efficiency of the system can be improved.

   b. **Involvement of customs brokers** – Participants want the input of customs brokers to identify segments of the supply chain process that needs to be fixed. Participants feel that the many security programs that are in place lead to instances where different security and inspection efforts overlap or override each other.

   c. **Tolling –** Participants want to expedite traffic throughput at the POEs. They are interested in exploring pricing solutions to help reduce bottlenecks and delays during peak travel periods.

   d. **Variety of solutions –** Participants understand that funding is limited, therefore, they are interested in developing short-, medium-, and long-term solutions to address POE issues. A variety of solutions enables agencies to address short-term issues with low-cost solutions and long-term issues with more expensive infrastructure projects.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

May 10, 2010
6:00 pm – 8:00 pm
Westside Regional Command Center

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of West El Paso residents participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants identified the following key operational issues at border crossings:

   a. **Existing traffic flow –** Participants noted that the Bridge of the Americas (BOTA) receives the highest amount of truck traffic among all the border crossings in the region. They indicated that the Santa Teresa crossing is underutilized and has the capacity to receive additional traffic from other crossings.

   b. **Truck services –** Participants indicated that truck services in Horizon City are preferred by commercial traffic over the somewhat limited services available at Santa Teresa. Attracting additional truck-related services (repairs, diesel, etc.) might help generate additional traffic to the Santa Teresa port of entry.

   c. **Secondary inspections –** Participants noted that regulations for what constitutes a primary and secondary inspection are not well defined. At present, it is a discretionary procedure with secondary inspection occasionally performed during

primary inspection. Separate secure areas for secondary inspections would help alleviate border congestion.

d. **Designated commuter lanes –** Participants are satisfied with the efficiency of designated commuter lanes (DCL) and would like to increase their use by creating an incentive-based program. DCL is currently a revenue-generating operation for the Mexican authorities while it is a security operation for the U.S.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Regional growth –** Participants noted that growth in Juarez is shifting westward and will impact the Santa Teresa crossing in the long-term.

b. **Mexican long-haul trucking –** Participants recognize that Mexican trucks currently are not permitted to operate in long haul functions in the United States. They would like to remove that restriction by implementing the NAFTA agreement and are interested in the resulting effect on border traffic congestion. There has not been the leadership in El Paso to take this on.

c. **Regulations and policy –** Participants indicated their interest in bi-national pre-inspection with U.S. and Mexican officers working in teams, similar to Operation Safe Commerce.

d. **Land constraints –** Participants felt that land in the Zaragosa area is constrained and cannot handle additional border crossings.

3. Where does investing in the region's ports of entry fit among other regional priorities?

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They indicated that the average resident in the region does not understand the importance of the border crossings. Few understand the issues with transportation at the border and how much the transportation industry contributes to the economy. Participants noted that transportation has not been a topic of discussion at neighborhood association meetings; however, this does not indicate that it is not an important issue.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Improve efficiency at border crossings –** Participants expressed frustration with the inefficiency of Customs and Border Protection (CBP). They suggested improving efficiency by increasing staffing at border crossings. They also

suggested increased use of technology, such as gamma ray x-ray inspection, to improve processing times.

b. **Extend hours –** Participants suggested extending the hours of operation for commercial vehicle processing. Extended hours can help spread commercial traffic over a larger portion of the day.

c. **Identify long-term capacity –** Participants recognized that developing a new port of entry would take time. They suggested studying demand-supply patterns for 2035. They also suggested the Santa Teresa border crossing as a facility that can alleviate future congestion at other crossings. Participants suggested acquiring right-of-way for new border crossings in anticipation of future demand.

d. Employ bi-national inspection teams – Participants suggested the implementation of a bi-national inspection facility at the Santa Teresa crossing as a pilot project. Such an inspection facility would include primary, secondary, tertiary, and fourth-level inspections. Bi-national inspection has not taken place, as common ground has not been found between both parties.

e. **Separating commercial and non-commercial traffic –** Participants noted that the existing arrangement of mixed commercial and non-commercial traffic flow at border crossings is inefficient. They suggested designating bridges for a specific type of traffic, commercial or non-commercial.

f. **Create additional designated crossing lanes -** Participants suggested increased implementation of DCLs at the border to process travelers (both pedestrians and vehicle passengers) with U.S. passports. Where DCL lanes are underutilized, a discount or incentive program can be used to encourage enrollment. Participants suggested allowing bus access to the DCL on the Stanton Street Bridge to help alleviate traffic on the Paso del Norte Bridge. Upon crossing the border, buses would be diverted to a secure location for U.S. Customs and Border Protection processing.

g. **Consider bridge tolling –** Participants recognized that the BOTA is the only bridge on the U.S.–Mexico border that does not charge a toll. They suggested that charging a toll may help distribute traffic across the other bridges in the region. They also recognized that charging a toll would require an amendment to the Chamizal Treaty, which stipulates that the BOTA operates as a toll-free facility. To help expedite toll-processing times for a newly tolled BOTA, designated lanes can be created to process pre-cleared traffic. Another suggestion is to toll the roadway on the approach to the bridge and not at the bridge itself.

h. **Consider one-way bridges –** Participants suggested converting BOTA into a southbound-only crossing while another bridge would be converted into a northbound-only facility.

i. **Look at public transit –** Participants suggested increasing the use of public transit. Improved transit connectivity may address the issues of congestion from car passenger drop-offs and limited parking availability at the border. Participants recommended constructing a secure parking lot in Juarez to encourage travelers to walk across the border and use transit in El Paso. Increased transit connectivity could help improve cross-town movements between central El Paso and Zaragosa.

j. **Identify project funding –** Participants suggested the involvement of the Camino Real Regional Mobility Authority (CRRMA). They suggested that ports of entry projects are packaged into bundles of 10-20 projects for CRRMA funding.

k. **Develop better origin-destination information –** Participants suggested the creation of a map to show the origins, destinations, and routes of truck traffic in relation to the 20-35 locations of industrial parks in Juarez.

El Paso Regional Ports of Entry Operations Plan
Focus Groups

June 2, 2010
9:00 am – 11:00 am
La Placita Conference Room, El Paso International Airport

Focus Group Discussion Summary

The purpose of the focus groups was to collect information on regional issues and priorities from a variety of perspectives. Following a brief introduction that provided an overview and key outcomes of the El Paso Regional Ports of Entry Operations Plan, the focus group attendees participated in a facilitated discussion centered on four broad themes:

- How well are the region's ports of entry currently operating?
- What are the most critical challenges facing the cross-border transportation system?
- Where does investing in the region's ports of entry fit among other regional priorities?
- What should be done to address these issues?

The information collected during this process will be used to help the study team identify, screen, and develop recommendations that address critical regional needs and issues. The following sections summarize the views and opinions of the freight shipper/customs broker community participating in this focus group.

1. **How well are the region's ports of entry operating now?**

   Participants identified the following key issues with the region's ports of entry (POEs):

   a. **Customs and Border Protection (CBP) staffing and management** – Participants agreed that CBP staffing is a fundamental issue affecting POE operations. Fully staffing the POEs and providing appropriate incentives to encourage both security and mobility objectives would help to make cross-border traffic flow better. The participants indicated that union issues may be difficult to resolve, however. If an agreement with the union can be reached, participants were optimistic that traffic would flow 100% better.

   b. **POE location** – Location of the POEs is an important consideration for many participants. POE selection depends on the locations of the maquila in Juarez, the warehouses in El Paso, and the approach infrastructure on both sides of the border, but particularly in Juarez. While the participants indicated that the Santa Teresa POE is pretty far out of the way, it does have its advantages if the central bridges are congested. The participants indicated that they do send some trucks through Santa

Teresa, but it usually is not practical for a fully-loaded trailer. They described that there has been growth to the west (Foxconn), but it does not compare to the infrastructure available for the maquilas is on the east side of the region.

c. **Hours of operation** - Participants mentioned that hours of operation are one of the primary factors influencing POE selection for commercial vehicles. They indicated that if the Bridge of the Americas (BOTA) was open longer, they would ship more through BOTA.

d. **BOTA approach conditions** - The participants explained that the approach to BOTA is problematic in the southbound direction due to high volumes of passenger traffic daily. There is also a lot of mixed traffic. Trucks back up to I-10 during southbound inspections and East Paisano Drive backs up as well. Participants attributed some of the problem to the street lights and weaving traffic on the approach and indicated that there is very little cooperation from the police department to control commercial and passenger vehicle traffic during peak hours.

e. **Frequent traveler programs –** The participants indicated that the C-TPAT/FAST lanes are working well, but there is still some room for improvement. For example, participants suggested that post-incident process improvements could be made to help keep traffic moving. After an incident, the whole supply chain, including the manufacturer, broker, importer, driver, etc., is subject to increased levels of security that increases congestion at the POEs. The participants indicated that the C-TPAT has expressed interested in developing review committees empowered to act as a direct communicator with the CBP Director's office to help resolve supply chain enforcement issues as they arise (rather than waiting weeks/months for resolution).

f. **Inspection processes –** The participants acknowledged that the inspection agencies and processes have been consolidated and improved over time, but it still is a hassle to get inspected by multiple agencies each time. The participants indicated that even if the Texas Department of Public Safety (DPS) stops doing safety inspections, a lot of the congestion has to do with national security inspection requirements with which CBP and Aduanas must comply.

2. What are the most critical challenges facing the cross-border transportation system?

Participants identified a number of regional challenges, including:

a. **Tolling and Congestion Pricing –** The participants recognized that implementing tolls and/or congestion pricing on the region's POEs would help to manage demand by pricing lanes throughout the day and spreading traffic over the system's bridges. However, the participants indicated that implementing tolls at BOTA would be "political suicide." The Chamizal Treaty is sacred for the city. Tolling would be cost-prohibitive for many of the businesses in the region.

b. **Industry is slow to respond to change –** Participants described a six-month pilot program at Ysleta that evaluated the demand for allowing 24-hour commercial vehicle operations. The pilot concluded that there was not enough demand to

support on-going 24-hour operations. However, the participants indicated that the timing of the pilot study was bad, pointing to the fact that overall demand was down due the national recession and seasonal (winter) cycle. Given that industries are slow to respond to changes and that seasonal changes affect demand, the participants suggested that the minimum length for a pilot study to evaluate the demand for 24-hour commercial operations should be one year or more. The participants also anticipate a two-year lag on the CBP side for the agency to recruit and train new agents in response to changing demand.

c. **Commercial-only POE –** The participants indicated that designating one of the ports of entry for commercial traffic only would require major reconfiguration of the infrastructure at the bridge. Participants also expressed concern that if all commercial traffic was restricted to one POE, protestors (which participants indicated is a common occurrence, primarily on the Mexico side) could conceivably block all cross-border commercial traffic at that point.

d. **Education and outreach –** The participants expressed a need to educate the public about the benefits of a new POE, including the potential benefits to residents of nearby neighborhoods. However, the participants acknowledged that mis-information from trusted sources is tough to overcome.

3. Where does investing in the region's ports of entry fit among other regional priorities?

Participants were asked to comment on the importance of cross-border mobility relative to other regional priorities. They commented that congestion levels affect the quality of life on both sides of the border. People in the region do not mind paying additional money to save time (SENTRI), but not everyone can afford it.

4. **What should be done to address these issues?**

Within the context of the issues and challenges described above, the participants were asked to suggest potential strategies to improve the operations of the region's POEs. The participants identified a number of strategies, including:

a. **Increase hours of operation for commercial traffic –**Participants suggested making at least one of the region's POEs open to commercial traffic 24-hours a day, six days per week (Monday – Saturday). Some participants would prefer the 24-hour commercial POE to be Ysleta (current commercial operations are 6am – midnight). Participants acknowledged that 24-hour operations would also require 24-hour staffing and that this may take time to implement.

b. **Reconfigure BOTA to accommodate in-bond traffic –** The participants described that at present, all in-bond commercial traffic must go through Ysleta (several hundred trucks on a daily basis). At Ysleta, if a commercial vehicle in the U.S. compound must return to Mexico, it can do so with within the footprint of the compound itself. The participants suggested that BOTA should be reconfigured to allow direct entry to Mexican customs from the U.S. compound

without having to use city streets. The participants indicated allowing in-bond traffic at BOTA would alleviate some of the burden at Ysleta.

c. **Separate commercial vehicles from passenger vehicles on POE approaches** - Participants noted that the existing arrangement of mixed commercial and non-commercial traffic flow at border crossings is inefficient.

d. **Increase the use of secondary inspection lanes –** The participants explained that CBP does not use the secondary inspection lanes efficiently. Very few cars go to secondary. They explained that for every primary inspector, there must be one or two inspectors waiting for them in primary.

e. **Start planning for a new POE now –** The participants agreed that it is likely that a new POE will be needed in the future to accommodate growing demand. Recognizing that it takes a very long time to plan and implement a new POE and the supporting infrastructure that is required, the participants also agreed that the region should start planning now. They suggested that a new POE on the east side would be a good idea because that is where the growth is. Providing a direct connection to the Border Highway would help to disperse traffic through the region without burdening the adjacent neighborhoods.

B.2 Public Opinion Survey Results

El Paso Regional Ports of Entry Operations Plan

Public Opinion Survey Results

Texas Department of Transportation

Draft Technical Memorandum

prepared for

Texas Department of Transportation

prepared by

Cambridge Systematics, Inc.

June 2010

draft technical memorandum

El Paso Regional Ports of Entry Operations Plan

Public Opinion Survey Results

prepared for

Texas Department of Transportation

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Cambridge Systematics, Inc.
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date

June 2010

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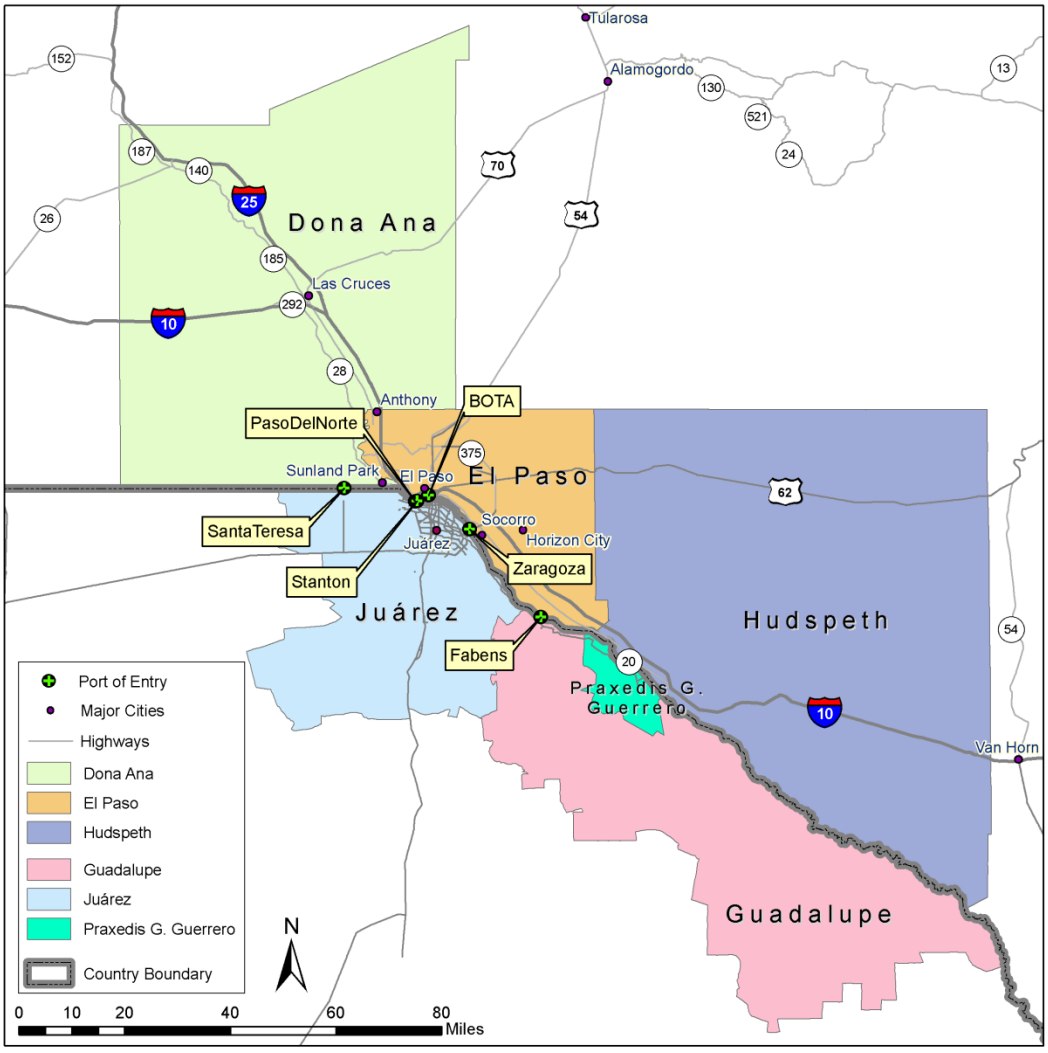
Executive Summary

The objective of the El Paso Regional Ports of Entry Operations Plan (Operations Plan) is to review all existing ports of entry within the El Paso region, analyze how they currently function, and develop recommendations to improve cross-border mobility. A critical component to developing the Operations Plan involves stakeholder outreach and public input. In April and May 2010, as part of a three-tiered public outreach process, the Operations Plan team conducted a public opinion survey within the El Paso-Las Cruces-Ciudad Juárez region (Figure ES.1) to understand public attitudes and perceptions concerning the region's border-crossing needs. The survey also measured support for a variety of strategies or solutions that could improve cross-border efficiency and mobility.

We collected 1,000 completed surveys, conducting the surveys by telephone (approximately 80 percent of respondents) and on-line (approximately 20 percent of respondents) in both English and Spanish. The mixture of telephone and on-line surveys allowed us to increase sample coverage and enhance regional representativeness. Approximately 40 percent of the respondents were from Texas (El Paso and Hudspeth Counties), 40 percent from Mexico (municipalities of Juárez, Práxedis G. Guerrero, and Guadalupe), and 20 percent from New Mexico (Dona Ana County). Of the 1,000 residents polled, approximately 3 out of 5 stated they had used at least one of the region's ports of entry in the last year.

The survey included questions related to the respondents' usage of the region's six ports of entry, perceptions of existing operations, the role and importance of cross-border mobility, and opinions on potential strategies and solutions that could mitigate regional impacts. Several common themes and conclusions emerged, summarized below.

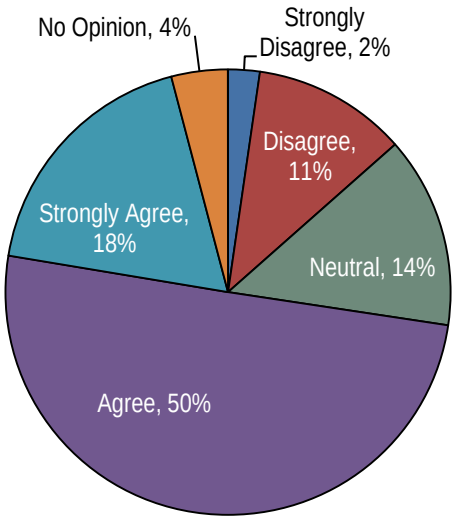
Figure ES.1 El Paso-Las Cruces-Ciudad Juárez Survey Area



Safety and Security Are Clear Priorities for the Region

Most respondents agree that safety and security are regional priorities and that improvements to port of entry efficiency should not come at the expense of national security (Figure ES.2). These views are generally consistent among port of entry users and non-users alike, throughout the region, and on both sides of the international border.

Figure ES.2 National Security Priorities – All Respondents
"Improving El Paso's port of entry efficiency should not come at the expense of national security"



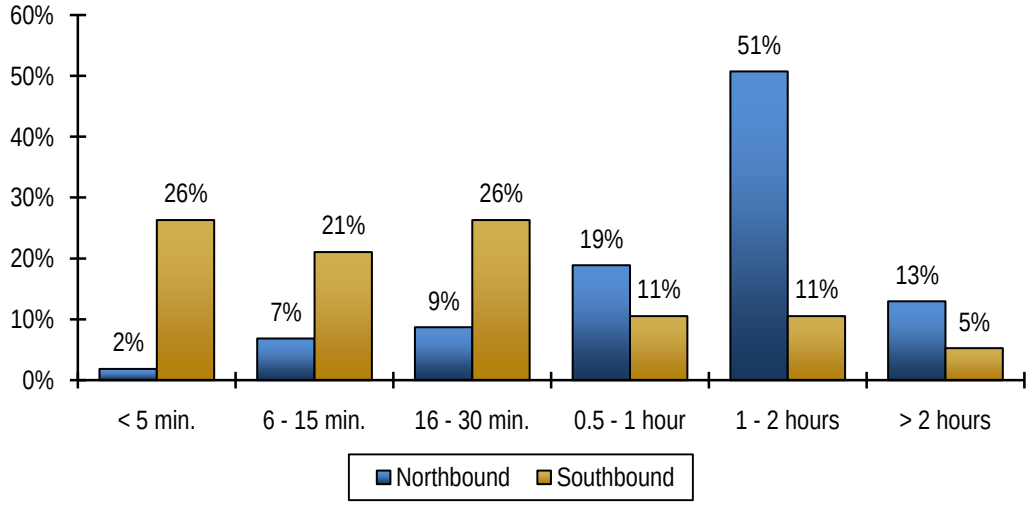
Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 1,001 regionwide responses.

The Ports of Entry Contribute to the Region's Economic Competitiveness, But Long Wait Times Are Affecting Travel Behavior

A majority of respondents believe that efficient ports of entry support the region's economic vitality. Approximately three-fourths (72 percent) of the respondents in Juárez and the neighboring Mexican municipalities use the region's ports of entry for the primary purpose of shopping/recreation in El Paso. For northbound trips, however, nearly two-thirds of respondents (63 percent) endured wait times in excess of one hour on average (Figure ES.3).

Figure ES.3 Average Reported Wait Times

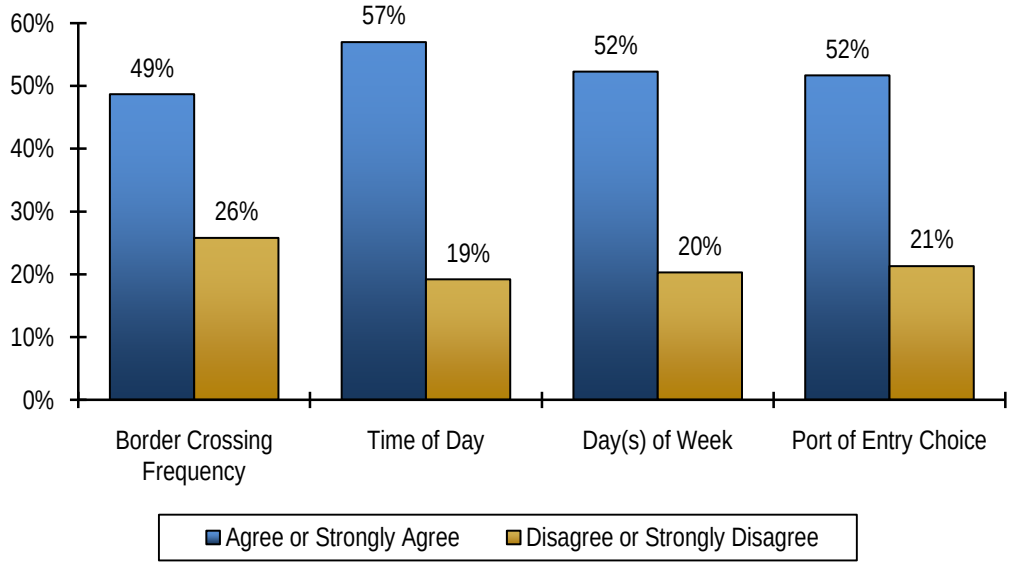
"On average, how long do you typically have to wait at the region's ports of entry?"



The survey revealed that wait times are affecting travel behavior for cross-border trips. For a majority of respondents, wait times influenced the time of day and day of the week they choose to cross the border, and the specific port of entry they choose to use (Figure ES.4). Wait times also influenced the frequency of cross-border trips for 49 percent of respondents. As wait times discourage people from making cross-border trips, the regional economy could suffer.

Figure ES.4 Impact of Wait Times on Travel Behavior

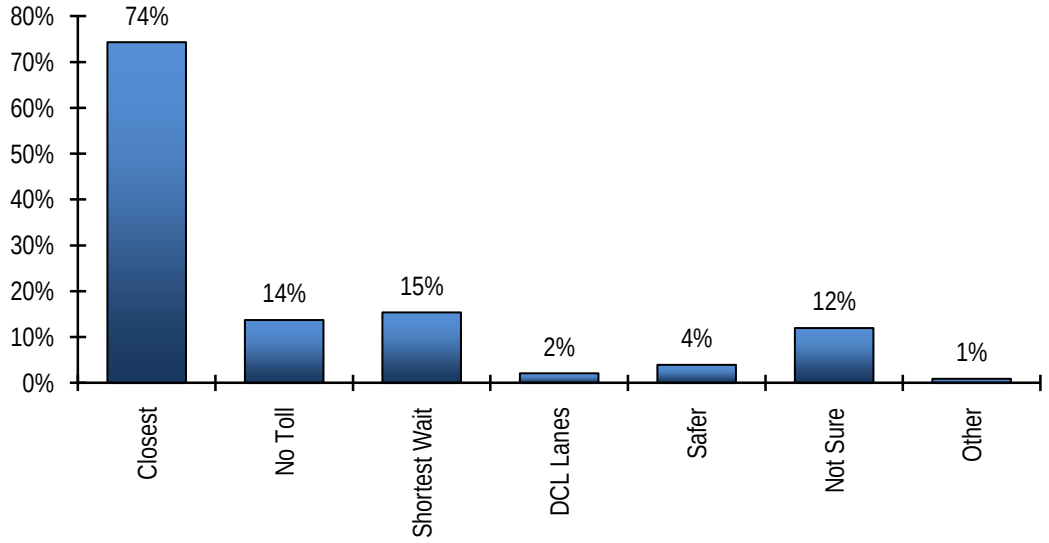
All Respondents



Proximity Has the Largest Influence on Port of Entry Selection

Of the respondents that used one or more of the region's ports of entries in the last year, the survey revealed that nearly three out of four use the port of entry that is closest to their starting or ending location. Proximity far outweighs toll prices, wait times, safety, frequent travel lanes, and other factors that influence port of entry selection (Figure ES.5). Even at the Bridge of the Americas (BOTA), where approximately 40 percent of respondents indicated they use BOTA because it is free, a higher percentage – over 60 percent of respondents – indicated that they choose BOTA because it is closest to their origin and/or destination.

Figure ES.5 Reasons Behind Primary Port of Entry Selection
North and Southbound Trips Combined



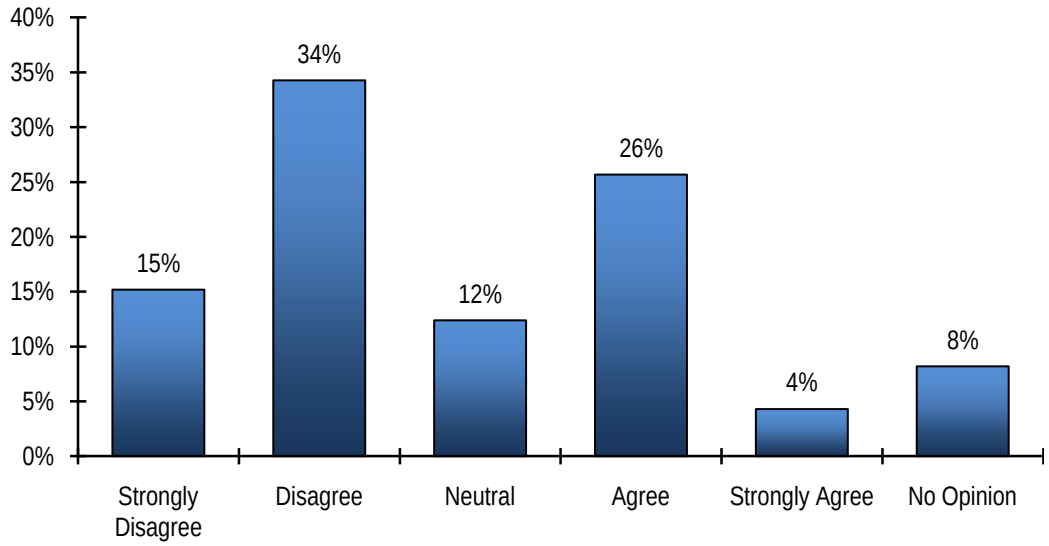
Note: Multiple responses accepted. DCL = dedicated commuter lanes.

Perceptions Regarding the Need for Additional Capacity at the Port of Entries Are Generally Divided within the Region

Physical infrastructure capacity and the number of inspection agents staffed at each port of entry affects the throughput and wait times of vehicles and pedestrians crossing the border each day. Overall, perceptions of existing capacity related to the number of border crossings and the number of agents and booths for inspection and processing are generally divided within the region. While many respondents are dissatisfied with existing capacity, a similar proportion is satisfied. Correspondingly, whereas nearly one-half (49 percent) of respondents find current wait times to be unacceptable, 30 percent consider them to be acceptable (Figure ES.6). Forty percent of respondents believe that some ports of entry in the region are underutilized (Santa Teresa being the most

commonly cited), while nearly one in four (23 percent) disagree that any crossings are underutilized. The levels of polarization are similar among U.S. and Mexican respondents, signaling a challenge ahead for adding border-crossing capacity in the form of new infrastructure.

Figure ES.6 Acceptability of Current Wait Times – All Respondents
"Current wait times are acceptable to me"

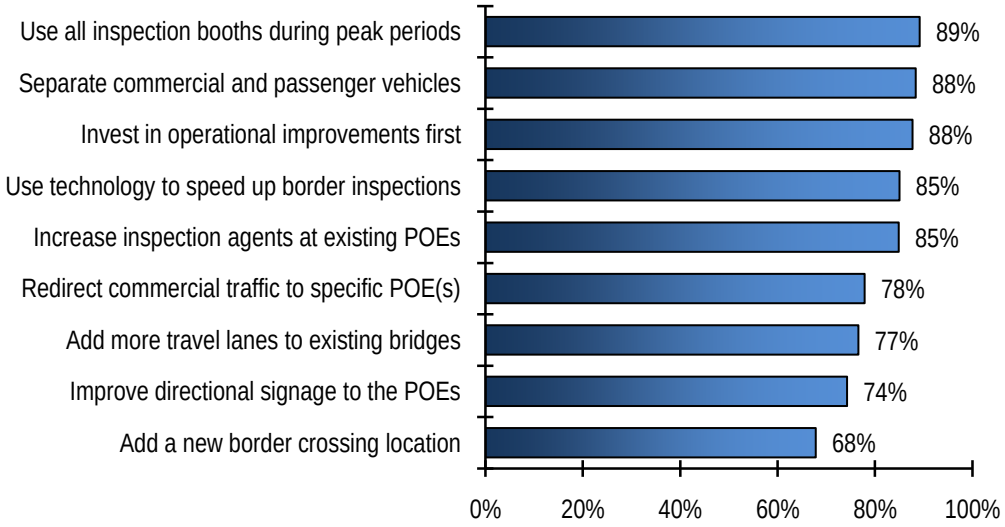


Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 1,001 regionwide responses.

Respondents Favor Investing in Operational Improvements First before Building a New Port of Entry

A large majority (88 percent) of respondents agree that the region should invest in operational improvements first to make existing ports of entry more efficient. A variety of operational improvement strategies are supported by a large majority of the population (Figure ES.7). The most popular strategy involves making use of all available inspection booths during peak periods, while strategies to implement technology to provide real-time traffic information or improve inspection capabilities are also popular. Among respondents from Juárez, 90 percent of residents favor moving commercial traffic to specific ports of entry.

Figure ES.7 Support for Operational Improvement Strategies
Respondents in Agreement or Strong Agreement

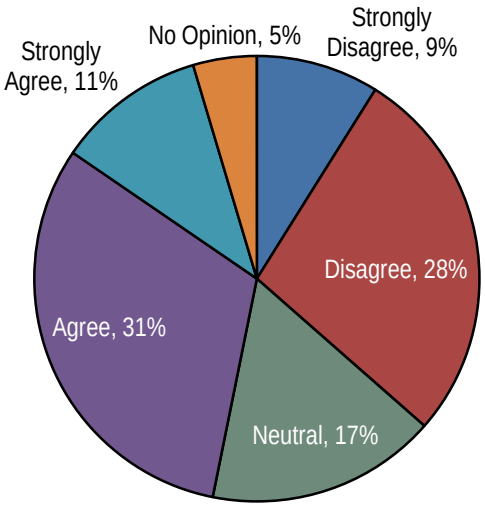


Note: Percentages are based on approximately 620 regionwide responses.

Tolling and Congestion Pricing Are the Least Popular Operational Strategy

The survey revealed that the least popular operational strategy among those offered was implementing tolls or congestion pricing on ports of entry that are currently free (Santa Teresa, BOTA, and Fabens-Caseta). Within the region, however, opinions about tolling are mixed. Whereas 42 percent of respondents agree that tolling would be an acceptable strategy, 36 percent disagree (Figure ES.8).

Figure ES.8 Implementation of Tolling or Congestion Pricing Strategies
"How would you rate your agreement/disagreement with a strategy to implement tolling/pricing strategies on bridges that are currently free?"

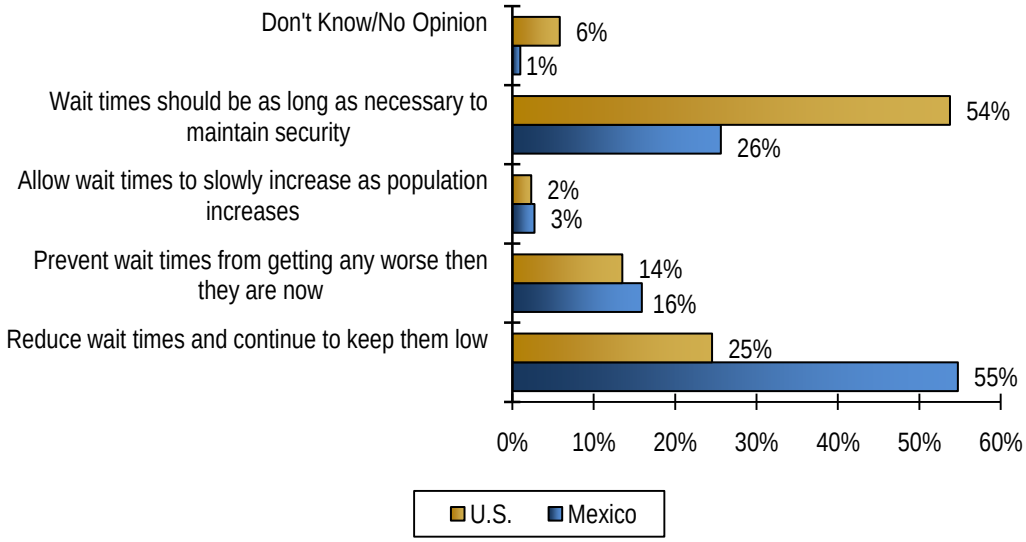


Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 628 regionwide responses.

Long-Term Operational Goals Are Divided along the International Border

When considering the long-term operational goal for the region's ports of entry, there are considerable differences in opinion among U.S. and Mexican respondents. A majority (54 percent) of U.S. residents indicated that wait times should be as long as they need to be to maintain national security and law enforcement, whereas 25 percent indicated that the region should reduce wait times and continue to keep them low (Figure ES.9). The Mexican respondents had the opposite view. Fifty-five percent of Mexican respondents would like to see wait times reduced and kept low even as the region's population grows. Comparatively, 26 percent of the Mexican respondents believe that national security needs should dictate wait times. Reconciling this division as the region's population is expected to more than double (to 4.5 million) by 2035 remains a considerable challenge.

Figure ES.9 Long-Term Goal for the Region's Ports of Entry
By Nationality



Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 1,001 regionwide responses.

1.0 Introduction

The overall purpose of the El Paso Regional Ports of Entry Operations Plan (Operations Plan) is to review all existing ports of entry within the El Paso region, analyze how they currently function, and develop recommendations to improve cross-border mobility in the region. A critical component of this effort is ensuring that all interested groups in the El Paso region, including both sides of the U.S.-Mexico border and southeastern New Mexico, are actively engaged in the planning, development, and implementation of the Operations Plan. A public opinion survey, the results of which are described in this technical memorandum, was one component of a three-tiered public outreach process. The objective of the public opinion survey was to understand public attitudes and perceptions concerning the region's border-crossing needs and the general types of strategies or solutions that could improve cross-border efficiency and mobility. Findings from the survey will be supplemented by targeted interviews with representatives from neighborhood groups, community business leaders, freight shippers and carriers, border agencies, and industry groups as well as a series of public meetings. Ultimately, the study team will use the findings from the public outreach process to inform the technical analysis of operations improvement alternatives.

1.1 POLL FORMAT

Contracting with Harris Interactive Service Bureau (HISB), the study team achieved a total sample size of just over 1,000 residents, completing the surveys by telephone (approximately 80 percent of respondents) and on-line (approximately 20 percent of respondents). The mixture of telephone and on-line surveys allowed the team to increase sample coverage and enhance regional representativeness. Respondents had to be at least 18 years old to participate and a current resident of one of six counties/municipalities in the El Paso region: El Paso and Hudspeth Counties in Texas, Dona Ana County in New Mexico, and the municipalities of Juárez, Práxedis G. Guerrero, and Guadalupe in Chihuahua, Mexico (Figure 1.1). The survey was available in both English and Spanish.

The survey began with several screening questions, followed by questions related to the respondent's usage of the region's ports of entry, perceptions of existing operations, the role and importance of the region's ports of entry, and opinions on potential strategies and solutions that could mitigate regional impacts. The survey closed with some respondent classification questions about the respondents and their households. The complete survey instrument is included in Appendix A.

1.2 RESPONDENT DEMOGRAPHICS

A total of 1,001 respondents were surveyed during April and May 2010. This pool consisted of 200 residents of New Mexico (20 percent of the total sample), 399 residents of Texas (40 percent of total), and 402 residents of Mexico (40 percent of total). Concurrently, 299 respondents were from El Paso County (30 percent of total), 275 were from the municipality of Juárez (28 percent of total), 200 respondents (20 percent) were from Dona Ana County in New Mexico, and the remaining 227 (22 percent) were from the remaining border counties/ municipalities southeast of El Paso.

Figure 1.1 Survey Area

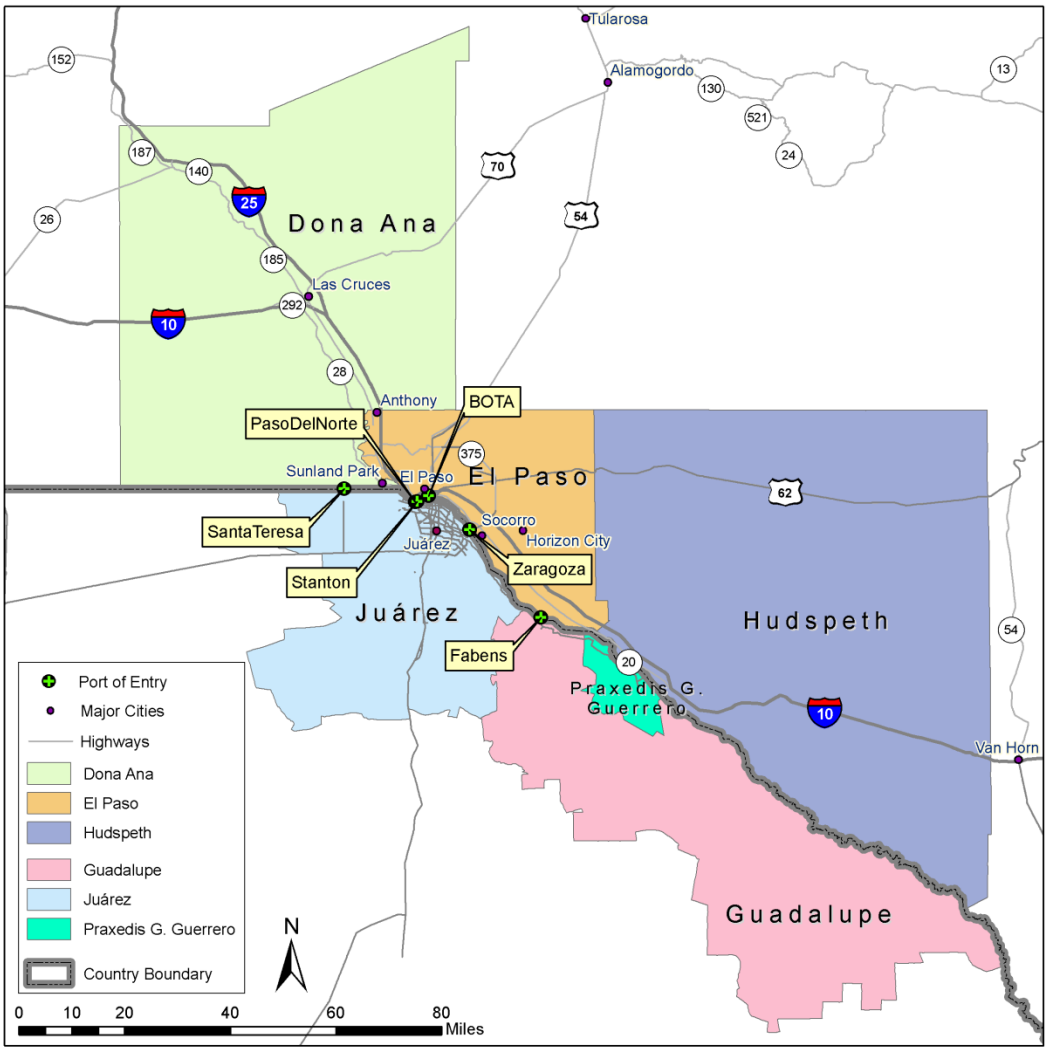
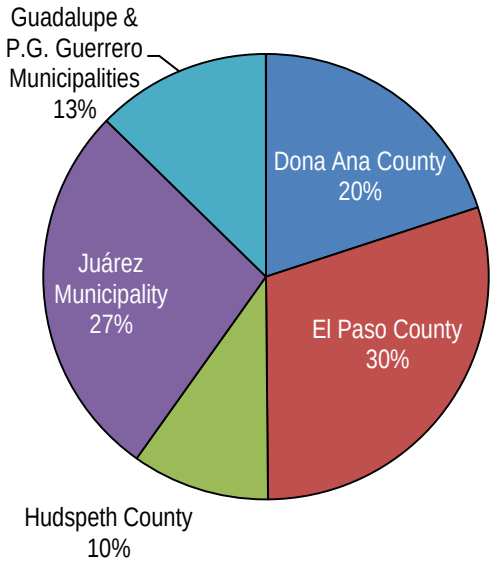


Figure 1.2 Geographic Distribution of Survey Respondents



1.3 REPORT ORGANIZATION

This report summarizes the results of the on-line and telephone surveys, organized as follows:

- **Section 2.0, Usage of the Region's Ports of Entry**, characterizes the northbound and southbound usage patterns of the region's six ports of entry, including trip frequency, trip purpose, and port of entry selection;
- **Section 3.0, Perceptions of Existing Operations**, summarizes levels of satisfaction with current wait times, system utilization, port of entry capacity, approach conditions, customer service, safety, and tolls;
- **Section 4.0, Role and Importance of the Region's Ports of Entry**, focuses on how the ports of entry affect mobility, the economy, and quality of life in the region;
- **Section 5.0, Regional Approach for Investing in the Region's Ports of Entry**, summarizes opinions on potential strategies and solutions that could mitigate the impact of the region's ports of entries; and
- **Section 6.0, Summary and Conclusions**, identifies common themes from the survey responses.

2.0 Usage of the Region's Ports of Entry

The first portion of the survey was dedicated to general usage questions related to the six ports of entry in the El Paso metropolitan area. These six ports of entry include:

- **Santa Teresa,** the westernmost port of entry located in New Mexico. With one lane in each direction, it provides access to the three common border-crossing modes, pedestrians, passenger vehicles, and commercial vehicles. There are no tolls, but there are restricted hours of operation.
- **Paso Del Norte** and the **Good Neighbor Bridge (Stanton Street),** which function in combination to provide border crossings in both directions. Paso Del Norte has four northbound lanes for pedestrians and passenger vehicles with one southbound lane for pedestrians only. Stanton Street has three southbound lanes for pedestrians and passenger vehicles and one northbound designated commuter lane (DCL). Both ports of entry charge tolls and are open 24 hours a day.
- **Bridge of the Americas** (BOTA), also called Cordova Bridge or the Free Bridge. It consists of two bridges with six lanes in each direction, two for commercial vehicles and four for passenger vehicles as well as pedestrians. There are no tolls and it is open 24 hours a day.
- **Ysleta-Zaragoza International Bridge** comprised of five northbound lanes and four southbound lanes, including two commercial lanes in each direction. It has pedestrian facilities, charges tolls, and is open 24 hours.
- **Fabens-Caseta**, the easternmost port of entry. It consists of one lane in each direction for passenger vehicles and allows pedestrian crossing. It is free of tolls, and has restricted hours of operation.

Table 2.1 provides a summary of the services at each port of entry from west to east.

Table 2.1 El Paso Region Port of Entry Facilities and Services

Port of Entry	Number of Lanes/ Direction	24-Hour Operations	Toll	Passenger Vehicles	Pedestrians	Commercial Vehicles
Santa Teresa	1 northbound			✓	✓	✓
	1 southbound			✓	✓	✓
Paso Del Norte	4 northbound	✓	$	✓	✓	
	1 pedestrians only	✓	$		✓	
Stanton Street	1 northbound (DCL only)			✓		
	3 southbound	✓	$	✓	✓	
Bridge of the Americas	6 northbound (2 commercial)	✓		✓	✓	✓
	6 southbound (2 commercial)	✓		✓	✓	✓
Ysleta-Zaragoza	5 northbound (2 commercial)	✓	$	✓	✓	✓
	4 southbound (2 commercial)	✓	$	✓	✓	✓
Fabens-Caseta	1 northbound			✓	✓	
	1 southbound			✓	✓	

Note: DCL = Dedicated Commuter Lane.

The first usage question in the survey asked, "In the last year, did you use one or more of the six ports of entry in the El Paso region?" If the response was "yes," the survey proceeded with questions concerning the usage of the various ports of entry, such as trip purpose, frequency, wait-time experience, and port of entry selection.

Of the 1,001 survey respondents, 61 percent stated they had used a port of entry within the last year (Table 2.2). Of these cross-border travelers, 13 percent were from Dona Ana County, 30 percent were from El Paso County, 8 percent were from Hudspeth County, 32 percent were from the municipality of Juárez, and 5 percent were from Guerrero or Guadalupe municipalities. The port of entry users were evenly split between the U.S. and Mexico.

Table 2.2 Residency of Port of Entry Users

County/Municipality	Number	Percent
Dona Ana	83	13%
El Paso	183	30%
Hudspeth	48	8%
U.S. Total	314	51%
Juárez	200	32%
Guadalupe and Praxedis G. Guerrero	102	17%
Mexico Total	302	49%
Grand Total	616	100%

2.1 NORTHBOUND TRIPS

The survey asked respondents how frequently they entered the United States (northbound) by passenger vehicle and walking or bicycling (see Tables 2.3 and 2.4). Of the 616 port of entry users, 53 percent said they take a passenger vehicle more than once per month. U.S. residents reported a lower rate of use per respondent with 45 percent crossing more than once per month, while residents of Mexico reported a rate of 61 percent crossing more than once per month. The municipalities of Guerrero and Guadalupe had the highest rate at 63 percent and El Paso had the highest in the U.S. with 50 percent crossing more than once per month.

Of the 616 port of entry users, 22 percent said they use pedestrian or bicycle facilities at a port of entry more than once per month. U.S. residents reported a slightly lower rate of use per respondent with 19 percent crossing more than once per month, compared to a rate of 24 percent among Mexican respondents. Juárez had the highest rate at 26 percent and Dona Ana had the highest in the U.S. with 23 percent crossing more than once per month.

Table 2.3 Northbound Passenger Vehicle Use – by County/Municipality
"In the last year, about how many times did you enter the United States through one of the six northbound ports of entry by passenger vehicle?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Never	18%	26%	15%	22%	17%	17%
Less than Once/Month	29%	35%	36%	33%	24%	21%
1-3 Times/Month	35%	26%	33%	37%	40%	35%
1-4 Times/Week	15%	12%	14%	6%	15%	24%
Daily/Almost Daily	3%	1%	2%	2%	4%	4%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 616 regionwide responses.

Table 2.4 Northbound Pedestrian Use – by County/Municipality
"In the last year, about how many times did you enter the United States through one of the six northbound ports of entry as a pedestrian?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Never	52%	52%	59%	76%	43%	47%
Less than Once/Month	25%	24%	21%	10%	31%	31%
1-3 Times/Month	17%	20%	17%	12%	18%	14%
1-4 Times/Week	5%	4%	3%	2%	7%	7%
Daily/Almost Daily	1%	0%	1%	0%	1%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 616 regionwide responses.

A follow-up question inquired about the purpose of these northbound trips (see Table 2.5). The primary reason given for U.S. residents, at a rate of 49 percent, was to return home, followed by 27 percent who were visiting family or friends. Mexican residents' primary purpose, at 72 percent, was for shopping or recreation, followed by 20 percent who were visiting family or friends.

Table 2.5 Primary Purpose of Northbound Trips – by County/Municipality

"What was the most frequent purpose of your northbound trips?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Commuting	3%	1%	3%	10%	3%	4%
School	1%	0%	0%	0%	2%	3%
Visiting Friends/Family	23%	37%	26%	17%	16%	23%
Shopping/Recreation	41%	7%	6%	14%	76%	67%
Returning Home	24%	46%	49%	50%	0%	2%
Other	6%	6%	13%	7%	3%	0%
Not Sure	1%	3%	2%	2%	1%	0%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 562 regionwide responses.

When asked which port of entry was used most often, U.S. residents reported similar usage of Paso Del Norte at 24 percent and Ysleta-Zaragoza at 23 percent (see Table 2.6). Closely following was BOTA at 17 percent. Mexican residents displayed a similar pattern with BOTA at 30 percent and Ysleta-Zaragoza at 29 percent, followed by Paso Del Norte at 24 percent. This pattern was supported in the peripheral counties as well with the exception of Dona Ana which used Santa Teresa more frequently than Ysleta-Zaragoza.

Table 2.6 Primary Port of Entry Selected for Northbound Trips – by County/ Municipality

"Which port of entry did you used most often for northbound trips?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Santa Teresa	6%	13%	5%	0%	3%	10%
Paso Del Norte	24%	46%	16%	12%	29%	19%
Stanton Street	4%	11%	4%	7%	1%	4%
Bridge of the Americas	24%	20%	22%	10%	28%	32%
Ysleta-Zaragoza	29%	4%	37%	26%	36%	21%
Fabens-Caseta	9%	3%	14%	26%	0%	14%
Not Sure	4%	3%	2%	19%	4%	0%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 562 regionwide responses.

Respondents were asked why they used their choice port of entry most often and a substantial portion, 73 percent, reported that it was the closest to their origin or destination (see Table 2.7). This reason was most significant for users of the Ysleta-Zaragoza port of entry (83 percent) and the Fabens-Caseta port of entry (84 percent). BOTA saw the highest rate of use (39 percent) for the reason of having no tolls. Santa Teresa had the highest rate (26 percent) for shortest wait times.

Several respondents provided several "other" reasons behind their northbound port of entry selection. Reasons included proximity to public transit, shopping, and/or medical facilities; availability of parking facilities near the port of entry; more open lanes; and better/friendlier customer service.

Table 2.7 Reasons Behind Primary Port of Entry Choice – Northbound
"Why did you choose to use this port of entry most often for northbound trips?"

Primary Port of Entry	It's Closest	No Toll	Shortest Wait Times	DCL Lanes	Safety	Not Sure	Other
Santa Teresa	58%	10%	26%	6%	6%	23%	3%
Paso Del Norte	75%	2%	19%	1%	4%	16%	0%
Stanton Street	48%	4%	17%	17%	0%	22%	4%
Bridge of the Americas	65%	39%	20%	1%	9%	13%	0%
Ysleta-Zaragoza	83%	1%	15%	4%	2%	9%	1%
Fabens-Caseta	84%	0%	16%	4%	0%	6%	2%
Total	73%	11%	18%	3%	4%	13%	1%

Note: Multiple responses accepted. Total percentages based on 562 respondents.

Respondents were also asked which ports of entry they use in addition to their primary port of entry for northbound trips (see Table 2.8). Ysleta-Zaragoza has the highest rate of secondary use with 30 percent overall, and Stanton Street has the lowest rate with 9 percent.

When looking at the overall distribution of port of entry selection (primary and secondary), 59 percent of the respondents that traveled northbound through a port of entry in the last year used Yselta-Zaragoza. Nearly half (49 percent) used BOTA and 46 percent used Paso Del Norte. Stanton Street, which allows northbound travel for SENTRI/DCL travelers only, had the lowest usage percentage.

Table 2.8 Alternate Ports of Entry for Northbound Trips

"Which other ports(s) of entry did you use for northbound trips?"

	Secondary Use	Primary and Secondary Use
Santa Teresa	19%	25%
Paso Del Norte	22%	46%
Stanton Street	6%	10%
Bridge of the Americas	25%	49%
Ysleta-Zaragoza	30%	59%
Fabens-Caseta	9%	18%
No other ports of entry used	27%	–

Note: Percentages based on 562 responses. Multiple responses accepted.

The final question for northbound travel was concerned with typical wait times when entering the United States (see Table 2.8). A majority of respondents (63 percent) recalled waiting more than one hour on average. A higher percentage of American respondents (17 percent) estimated wait times that exceeded two hours, compared to 7 percent of respondents from Mexico.

Table 2.9 Northbound Wait Times – by County/Municipality

"On average, how long do you typically have to wait at the region's ports of entry when entering the United States?"

	Total (%)	Nationality	
		United States	Mexico
Less than 5 Minutes	2%	3%	2%
6-15 Minutes	7%	12%	6%
16-30 Minutes	9%	9%	9%
31 Minutes-1 Hour	19%	19%	22%
1-2 Hours	50%	40%	53%
More than 2 Hours	13%	17%	7%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 562 regionwide responses.

2.2 SOUTHBOUND TRIPS

Returning to the question of how frequently respondents used one of the region's ports of entry, the same set of questions were asked concerning entry into Mexico (southbound) by passenger vehicle and walking or bicycling (see Tables 2.9 and 2.10). Of the 616 port of entry users, 47 percent said they take a passenger vehicle more than once per month. U.S. residents reported a lower rate of use per respondent with 38 percent crossing more than once per month, while residents of Mexico reported a rate of 57 percent crossing more than once per month. The municipalities of Guerrero and Guadalupe had the highest rate at 63 percent and El Paso and Dona Ana Counties had the highest in the U.S., both with 40 percent crossing more than once per month.

Of the 616 port of entry users, 19 percent said they use pedestrian or bicycle facilities at a port of entry more than once per month. U.S. residents reported a lower rate of use per respondent with 15 percent crossing more than once per month. Residents of Mexico reported a rate of 21 percent crossing more than once per month. Juárez and the combined municipalities of Guerrero and Guadalupe both had a rate of 21 percent, while El Paso and Dona Ana both had 20 percent crossing more than once per month.

Table 2.10 Southbound Passenger Vehicle Use – by County/Municipality
"In the last year, about how many times did you leave the United States through one of the six southbound ports of entry by passenger vehicle?"

		County/Municipality				
	Total (%)	Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Never	25%	24%	22%	39%	27%	20%
Less than Once/Month	28%	35%	37%	27%	22%	18%
1-3 Times/Month	31%	28%	27%	29%	36%	35%
1-4 Times/Week	13%	11%	12%	4%	12%	23%
Daily/Almost Daily	3%	1%	2%	2%	4%	5%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 616 regionwide responses.

Table 2.11 Southbound Pedestrian Use – by County/Municipality

"In the last year, about how many times did you leave the United States through one of the six southbound ports of entry as a pedestrian?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Never	61%	57%	63%	88%	57%	55%
Less than Once/Month	20%	23%	17%	6%	23%	25%
1-3 Times/Month	14%	18%	15%	6%	14%	16%
1-4 Times/Week	4%	1%	5%	0%	6%	4%
Daily/Almost Daily	0%	0%	0%	0%	1%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 616 regionwide responses.

A follow-up question inquired as to the purpose of these southbound trips (see Table 2.12). The primary reason given for U.S. residents, at a rate of 55 percent, was to visit friends and family, followed by 19 percent who cross for other reasons.[1] Mexican residents' primary purpose, at 76 percent, was returning home, followed by 14 percent who crossed southbound for shopping or recreation.

Table 2.12 Primary Purpose of Southbound Trips – by County/Municipality

"What was the most frequent purpose of your southbound trips?"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Commuting	4%	4%	5%	6%	2%	3%
School	0%	0%	0%	0%	1%	0%
Visiting Friends/Family	31%	54%	60%	52%	4%	7%
Shopping/Recreation	14%	17%	13%	18%	12%	17%
Returning Home	41%	3%	4%	3%	80%	73%
Other	9%	20%	17%	21%	0%	0%
Not Sure	1%	3%	1%	0%	2%	0%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 522 regionwide responses.

[1] The survey did not prompt for a specification of "other" trip purposes.

When asked which port of entry was used most often, U.S. residents evenly reported usage of Paso Del Norte at 21 percent, BOTA at 23 percent, and Ysleta-Zaragoza at 22 percent (see Table 2.13). Mexican residents most frequently choose BOTA at 44 percent, followed by Ysleta-Zaragoza at 25 percent. These two ports of entry were also the primary choices overall with 34 percent and 27 percent, respectively.

Table 2.13 Primary Port of Entry Selected for Southbound Trips – by County/ Municipality

"Which port of entry did you use most often for your southbound trips?"

		County/Municipality				
	Total (%)	Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Santa Teresa	5%	17%	4%	0%	2%	7%
Paso Del Norte	18%	37%	14%	12%	22%	8%
Stanton Street	5%	10%	5%	9%	3%	1%
Bridge of the Americas	34%	30%	26%	12%	37%	51%
Ysleta-Zaragoza	27%	0%	37%	30%	33%	17%
Fabens-Caseta	8%	0%	12%	27%	0%	14%
Not Sure	4%	7%	2%	9%	3%	2%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 522 regionwide responses.

Respondents were asked the reason for their primary southbound port of entry choice and three out of five (75 percent) reported that it was the closest to their origin or destination (see Table 2.14). This reason was most common for 90 percent of the users of the Ysleta-Zaragoza port of entry and 85 percent of the southbound travelers using Fabens-Caseta. BOTA saw the highest rate of use (42 percent) for the reason of having no tolls. Santa Teresa had the highest rate (33 percent) for shortest wait times.

Several respondents specified other reasons for selecting their preferred southbound port of entry. These reasons included the availability of parking to leave their car near the port of entry, easier access to buses, and better customer service.

Table 2.14 Reasons Behind Primary Port of Entry Choice – Southbound
"Why did you choose to use this port of entry most often for southbound trips?"

Primary Port of Entry	It's Closest	No Toll	Shortest Wait Times	DCL Lanes	Safety	Not Sure	Other
Santa Teresa	56%	4%	33%	0%	4%	26%	4%
Paso Del Norte	81%	5%	7%	0%	3%	16%	1%
Stanton Street	80%	0%	12%	0%	0%	16%	0%
Bridge of the Americas	61%	42%	18%	1%	7%	8%	1%
Ysleta-Zaragoza	90%	1%	6%	1%	4%	6%	0%
Fabens-Caseta	85%	5%	18%	0%	0%	10%	0%
Total	75%	16%	13%	1%	4%	11%	1%

Note: Multiple responses accepted. Total percentages are based on 522 regionwide responses.

Respondents were also asked which ports of entry they use as alternatives for southbound trips (see Table 2.15). Similar to the findings for the northbound direction of travel, Ysleta-Zaragoza has the highest rate of secondary use with 23 percent overall. Fabens-Caseta port of entry has the lowest rate with 4 percent.

When looking at the overall distribution of port of entry selection (primary and secondary together), about half of the cross-border travelers in the last year indicated that they used BOTA and/or Ysleta-Zaragoza. Stanton Street, charging a toll in the southbound direction, and Fabens-Caseta, allowing southbound travel for pedestrians only, both had the lowest southbound usage percentages.

The final question for southbound travel was concerned with typical wait times when entering Mexico (see Table 2.16). Clearly, wait times in the southbound direction are substantially shorter than northbound. Approximately one third of the respondents (34 percent) recall waiting less than five minutes on average. Seventy-nine percent of U.S. residents and 87 percent of Mexican residents rarely wait more than 30 minutes.

Table 2.15 Alternate Ports of Entry for Southbound Trips

"Which other ports of entry did you use for southbound trips?"

	Secondary Use	Primary and Secondary Use
Santa Teresa	8%	13%
Paso Del Norte	15%	33%
Stanton Street	7%	11%
Bridge of the Americas	15%	49%
Ysleta-Zaragoza	23%	50%
Fabens-Caseta	4%	11%
No other ports of entry used	44%	–

Note: Percentages based on 522 responses. Multiple responses accepted.

Table 2.16 Southbound Wait Times – by County/Municipality

"On average, how long do you typically have to wait at the region's ports of entry when entering Mexico?"

	Total (%)	Nationality	
		United States	Mexico
Less than 5 Minutes	34%	35%	32%
6-15 Minutes	31%	30%	35%
16-30 Minutes	17%	14%	20%
31 Minutes-1 Hour	8%	7%	8%
1-2 Hours	7%	9%	4%
More than 2 Hours	3%	5%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 522 regionwide responses.

2.3 FREQUENT TRAVELER PROGRAMS

The Secure Electronic Network for Travelers Rapid Inspection (SENTRI) frequent travel program provides faster Customs and Border Protection (CBP) processing for pre-approved, low-risk travelers. Applicants voluntarily undergo a thorough fingerprint and biographical background check and pay several required fees. Once approved, SENTRI users have access to specific dedicated commuter lanes (DCL) into the United States. A similar program, the Free and Secure Trade (FAST) program, is available for commercial drivers.

Respondents were asked whether they are familiar with the SENTRI program. Approximately one in four respondents (27 percent) is familiar with the program, and even fewer (3 percent) are actually enrolled in the program. Participation in the program was near equally split between U.S. and Mexican respondents. Half of the respondents enrolled in the program have annual household incomes less than $75,000 per year.

Table 2.17 Awareness of SENTRI Program

	Total (%)	Nationality	
		United States	Mexico
Percent familiar with the SENTRI program	27%	28%	25%
Percent enrolled in the SENTRI program	3%	2%	4%

Note: Percentages are based on 1,001 regionwide responses.

3.0 Perceptions of Existing Operations

This section describes satisfaction levels related to current operating conditions of the region's ports of entry facilities, including wait times, system utilization, port of entry capacity, approach conditions, customer service, safety, and toll rates.

3.1 WAIT TIMES

Overall, about half (49 percent) of the respondents indicated that current wait times at the region's ports of entry are unacceptable, compared to 30 percent who consider them to be acceptable (Table 3.1). Within the region and among user types, however, there are some differences in opinion. A higher percentage of residents from El Paso County (52 percent) and the three Chihuahua municipalities (Juárez at 61 percent and Guadalupe/Guerrero at 53 percent) find the current wait times to be unacceptable. Similarly, 60 percent of port of entry users (respondents who indicated they used one more port of entry in the last year) are dissatisfied with current wait times (Table 3.2).

Comparatively, residents of Dona Ana and Hudspeth Counties located on the periphery of the El Paso region were less likely to find the wait times unacceptable (40 percent and 25 percent, respectively) or more likely to not have an opinion either way. Non-users, respondents that have not used any of the region's ports of entry within the last year, had similar views. One in five non-users (20 percent) did not have an opinion either way, while 19 percent were neutral (neither satisfied nor dissatisfied) regarding current wait times.

As shown in Table 3.3, wait times at the ports of entry affect travel behavior for a majority of the respondents. For 57 percent of respondents, wait times influence the time of day they choose to cross the border, while approximately 52 percent use a specific port of entry due to wait times. Delays at the border also influence the day(s) of the week respondents choose to cross the border (52 percent) and the frequency of their cross-border trips (49 percent).

Table 3.1 Acceptability of Current Wait Times – by County/Municipality
"Current wait times are acceptable to me"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	15%	10%	17%	9%	13%	28%
Disagree	34%	31%	34%	16%	48%	25%
Neutral	12%	18%	14%	18%	6%	9%
Agree	26%	19%	22%	38%	27%	32%
Strongly Agree	4%	5%	3%	7%	4%	6%
No Opinion	8%	19%	9%	12%	1%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages based on 1,001 regionwide respondents.

Table 3.2 Acceptability of Current Wait Times – by User Type
"Current wait times are acceptable to me"

	Total (%)	POE User Type	
		Users	Non-Users
Strongly Disagree	15%	20%	8%
Disagree	34%	40%	25%
Neutral	12%	8%	19%
Agree	26%	27%	24%
Strongly Agree	4%	4%	5%
No Opinion	8%	1%	20%

Note: Percentages may not add to 100 percent due to rounding. Total percentages based on 1,001 regionwide respondents.

Table 3.3 Impact of Wait Times on Travel Behavior
All Respondents

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Opinion
Wait times influence the time of day I choose to cross the border.	2%	17%	13%	42%	15%	11%
Wait times influence the specific port of entry I choose to use.	3%	19%	16%	38%	14%	11%
Wait times influence the day(s) of the week I choose to cross the border.	4%	17%	15%	37%	15%	12%
Wait times influence how frequently I cross the border.	4%	22%	14%	35%	14%	11%

Note: Percentages may not add to 100 percent due to rounding. Total percentages based on 1,001 regionwide respondents.

Wait times affect a higher percentage of Mexican respondents than U.S. residents, as shown in Table 3.4. Seventy percent of Mexican respondents indicated that wait times influence the time of day they choose to cross the border, compared to 48 percent of U.S. respondents. The survey revealed similar trends for the impact of wait times on port of entry selection, day of the week for cross-border trips, and trip frequency.

Table 3.4 Impact of Wait Times on Travel Behavior – by Nationality
Percent saying "Agree" or "Strongly Agree"

	Total (%)	Nationality	
		United States	Mexico
Wait times influence the time of day I choose to cross the border.	57%	48%	70%
Wait times influence the specific port of entry I choose to use.	52%	46%	59%
Wait times influence the day(s) of the week I choose to cross the border.	52%	44%	65%
Wait times influence how frequently I cross the border.	49%	42%	59%

Note: Total percentages based on 1,001 regionwide respondents.

3.2 PORT OF ENTRY UTILIZATION

Forty percent of the respondents agreed or strongly agreed that some ports of entry in the El Paso region are underutilized (Table 3.5). As shown in Table 3.6, the Santa Teresa port of entry was identified by over two-thirds of these respondents (68 percent) as being underutilized, followed by Paso Del Norte (38 percent). The Stanton Street port of entry received the fewest votes (7 percent).

Table 3.5 Port of Entry Underutilization – by County/Municipality
"Some ports of entry in the El Paso region are underutilized"

		County/Municipality				
	Total (%)	Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	3%	2%	4%	1%	3%	9%
Disagree	20%	18%	18%	20%	27%	17%
Neutral	17%	20%	15%	21%	14%	24%
Agree	32%	29%	31%	29%	39%	31%
Strongly Agree	8%	7%	9%	6%	8%	9%
No Opinion	18%	26%	23%	23%	11%	9%

Note: Percentages may not add to 100 percent due to rounding. Total percentages based on 1,001 regionwide respondents.

Table 3.6 Port of Entry Underutilization
"Which ports of entry would you say are underutilized?"

Port of Entry	Total
Santa Teresa	68%
Paso Del Norte	38%
Ysleta-Zaragoza	27%
Bridge of the Americas	26%
Fabens-Caseta	21%
Stanton Street	7%

Note: Percentages are based on the 403 respondents who agreed or strongly agreed that some ports of entry in the El Paso region are underutilized. Multiple responses accepted.

3.3 CURRENT OPERATING CONDITIONS

The survey asked respondents to rate their level of satisfaction or dissatisfaction related to numerous operational aspects of the region's ports of entry. The following sections divide the survey results into three categories: 1) existing capacity; 2) port of entry approach conditions; and 3) customer service, safety, and tolls.

Existing Capacity

Several factors influence the capacity of the region's ports of entry, including the number of border-crossing locations, the number of CBP agents and booths available for inspection and processing, and the number of lanes for commercial vehicles, passenger vehicles, pedestrians, etc. Physical infrastructure capacity affects the maximum volume of passenger vehicles, pedestrians, and commercial vehicles that can cross the border each day.

Overall, perceptions of existing capacity are generally divided within the region. Whereas about 43 percent of the respondents are satisfied with the number of border-crossing locations in the region, about one in four (26 percent) are dissatisfied (Table 3.7). In terms of CBP staffing, 39 percent of respondents are satisfied with the number of agents available for inspection and processing, while 34 percent are dissatisfied. Respondents were also divided about the number of available inspection booths – approximately 34 percent are satisfied, while 37 percent are dissatisfied. While 44 percent of respondents are either neutral or had no opinion when it came to the number of dedicated truck lanes, about a third (34 percent) are satisfied and 23 percent are dissatisfied. Overall, the survey results point to a lack of consensus in the region regarding the need for additional port of entry capacity.

Table 3.7 Satisfaction with Existing Capacity
"How would you rate your satisfaction/dissatisfaction with the following port of entry operating conditions in the El Paso region?"

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	No Opinion
Number of border-crossing locations	6%	20%	20%	37%	6%	11%
Number of agents for inspection and processing	10%	24%	15%	36%	4%	11%
Number of booths for inspection and processing	9%	28%	18%	32%	2%	12%
Number of dedicated truck lanes	4%	19%	26%	32%	2%	18%

Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 620 regionwide responses.

Slightly more discernable trends are noticeable among users versus non-users of the region's ports of entry (Table 3.8). People that had used at least one border crossing in the last year were more likely to express dissatisfaction with the number of CBP agents (43 percent) and booths (48 percent) for inspection and processing than non-users (22 percent and 21 percent, respectively). Dissatisfaction rates are similar among U.S. and Mexican respondents, with a slightly higher percentage of Mexican respondents expressing dissatisfaction with existing port of entry capacity.

Table 3.8 Dissatisfaction with Existing Capacity – by Usage and Nationality
Percent saying "Dissatisfied" or "Very Dissatisfied"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Number of border-crossing locations	26%	31%	17%	24%	29%
Number of agents for inspection and processing	34%	43%	22%	33%	36%
Number of booths for inspection and processing	37%	48%	21%	34%	41%
Number of dedicated truck lanes	23%	26%	17%	22%	23%

Note: Total percentages are based on 620 regionwide responses.

Approach Conditions

Approaches, the roads leading up to the port of entry facilities, are affected by traffic signal operations, directional signage telling people where and how to access the ports of entry, and pre-trip information about delays at the border

crossings. Cumulatively, these factors contribute to congestion on the approach which impairs access to the ports of entry.

When asked about approach conditions in the region, 59 percent of respondents expressed satisfaction with traffic signal operations and the directional signage leading to the ports of entry (Table 3.9). Approximately two-thirds of cross-border travelers (users) find the approach signals and signage satisfactory (Table 3.10). Non-user satisfaction rates are lower because nearly one-quarter (23 percent) did not have an opinion either way.

Fewer respondents expressed satisfaction regarding pre-trip information about delays at the border crossings. Opinions among port of entry users are mixed with 40 percent dissatisfied and 37 percent satisfied. Over half of the non-users were neutral or expressed no opinion about pre-trip information capabilities.

Table 3.9 Satisfaction with Approach Conditions
"How would you rate your satisfaction/dissatisfaction with the following port of entry operating conditions in the El Paso region?"

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	No Opinion
Traffic signal operations leading up to the ports of entry	3%	9%	19%	54%	5%	10%
Directional signage leading up to the ports of entry	2%	10%	20%	53%	5%	10%
Pre-trip information about delays at border crossings	8%	24%	24%	31%	2%	12%
Congestion on the roads leading up to the ports of entry	14%	30%	20%	24%	2%	9%

Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 620 regionwide responses.

Congestion on the roads leading up to the ports of entry was a cause of concern for 44 percent of respondents on average. Dissatisfaction with congestions levels were slightly higher among port of entry users and Mexican respondents (Table 3.10).

Table 3.10 Satisfaction with Approach Conditions – by Usage and Nationality
Percent saying "Satisfied" or "Very Satisfied"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Traffic signal operations leading up to the ports of entry	59%	69%	44%	49%	74%
Directional signage leading up to the ports of entry	58%	66%	45%	52%	66%
Pre-trip information about delays at border crossings	33%	37%	27%	29%	37%
Congestion on the roads leading up to the ports of entry	27%	30%	22%	23%	33%

Note: Total percentages are based on 620 regionwide responses.

Customer Service, Safety, and Tolls

Respondents also rated their opinion on elements related to hours of operation, customer service, safety, and toll rates. Regarding hours of operation for passenger vehicles and pedestrians, nearly half of the respondents (48 percent) expressed satisfaction compared to 20 percent dissatisfied. Fewer respondents had opinions about commercial vehicle operating hours. As shown in Table 3.12, a satisfaction rate near 30 percent was consistent among users and non-users and among U.S. and Mexican respondents with respect to commercial hours of operation.

Table 3.11 Satisfaction with Customer Service, Safety, and Tolls
"How would you rate your satisfaction/dissatisfaction with the following port of entry operating conditions in the El Paso region?"

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	No Opinion
Hours of operation for passenger vehicles and pedestrians	4%	16%	22%	44%	4%	11%
Pedestrian safety along the bridge(s)	4%	16%	17%	43%	8%	11%
Customer service at the ports of entry	6%	14%	20%	42%	6%	12%
Toll rates	7%	22%	23%	31%	3%	14%
Hours of operation for commercial vehicles	4%	14%	32%	27%	2%	21%

Note: Percentages may not add to 100 percent due to rounding. Percentages are based on 620 regionwide responses.

Over half of the respondents (51 percent) are satisfied with pedestrian safety compared to one in five dissatisfied (20 percent). Respondents on the Mexican side of the border were generally more satisfied with pedestrian safety (63 percent) than American respondents (44 percent).

Opinions about customer service are generally favorable. As shown in Table 3.12, over half of the port of entry users find customer service to be satisfactory. Respondents from Mexico also tend to have a more favorable view of customer service.

There is no consensus throughout the region related to tolling. Opinions about toll rates are split rather evenly among people satisfied with existing toll rates (34 percent on average) and dissatisfied (29 percent on average). Over half of the non-users (54 percent) are either neutral or without an opinion about toll rates, while the opinions of port of entry users are more polarized.

Table 3.12 Satisfaction with Tolls, Customer Service, and Safety – by Usage and Nationality
Percent saying "Satisfied" or "Very Satisfied"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Hours of operation for passenger vehicles and pedestrians	47%	52%	40%	43%	54%
Pedestrian safety along the bridge(s)	51%	59%	39%	44%	63%
Customer service at the ports of entry	48%	53%	40%	44%	53%
Toll rates	34%	35%	33%	32%	38%
Hours of operation for commercial vehicles	29%	30%	28%	26%	35%

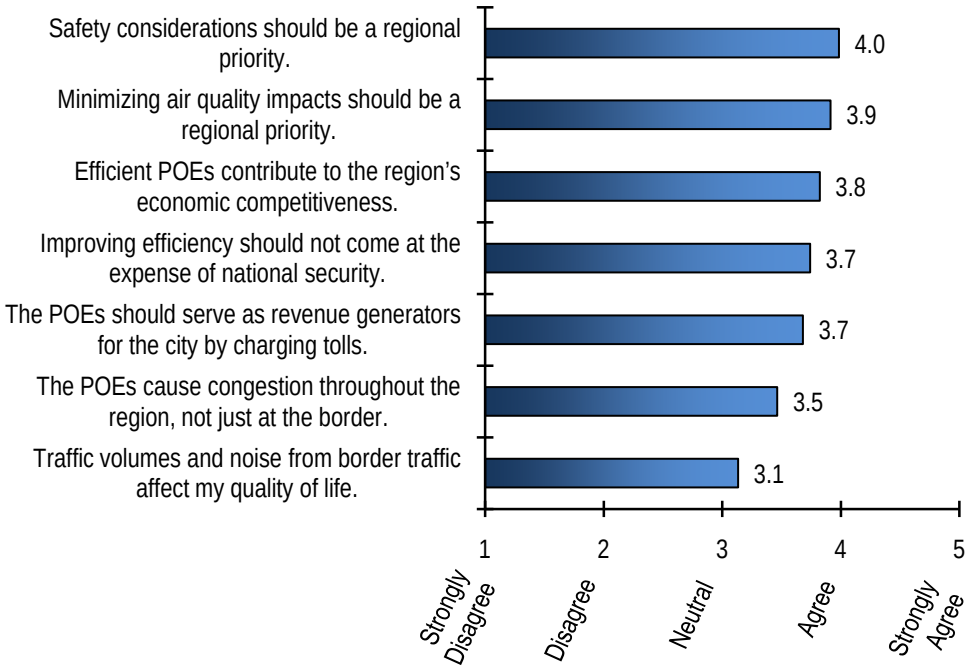
Note: Percentages are based on 620 regionwide responses.

4.0 Role and Importance of the Region's Ports of Entry

This section focuses on how the ports of entry affect mobility, the economy, and quality of life in the region. Collecting the opinions of the region's residents related to the role and importance of the ports of entry provides context for how cross-border mobility investments would fit among other regional priorities.

The survey asked respondents to rate their agreement/disagreement (based on a five-point scale) with several statements about the role and importance of the region's ports of entry related to safety and security, air quality, economic competitiveness, toll revenues, and congestion. Figure 4.1 lists the average agreement ratings for statements describing the role of the region's border-crossing facilities.

Figure 4.1 Role and Importance of the Region's Port of Entry
Average Rating



4.1 SAFETY AND SECURITY

Overall, 80 percent of the respondents agreed or strongly agreed that safety should be a regional priority, and these views were generally consistent among users and non-users alike (Table 4.1). A clear consensus on the importance of safety, such as separating passenger vehicles from commercial vehicles, also transcends the international border.

Table 4.1 Safety as a Regional Priority – by User Type and Nationality
"Safety considerations, such as separating passenger vehicles from commercial vehicles, should be a regional priority"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Strongly Disagree	1%	1%	1%	1%	1%
Disagree	5%	5%	5%	6%	4%
Neutral	10%	10%	11%	11%	10%
Agree	59%	60%	57%	58%	60%
Strongly Agree	21%	21%	22%	20%	24%
No Opinion	3%	2%	5%	5%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

When respondents were asked to evaluate the tradeoffs between border-crossing efficiency and national security, approximately two-thirds (69 percent) indicated that port of entry efficiency should not come at the expense of national security (Table 4.2). Among the residents of the Mexico municipalities, 77 percent agreed that national security should supersede efficiency, compared to 64 percent of U.S. residents.

4.2 AIR QUALITY

Closely following safety, about three out of four respondents (75 percent) cited the importance of minimizing air quality impacts from delays at the border crossings. As shown in Table 4.3, sentiments about the importance of air quality are highest in El Paso County and the Chihuahua municipalities, where about 80 percent of the respondents agreed or strongly agreed that air quality should be a regional priority. Located further away from the port of entry locations, a slightly lower percentage of respondents in Dona Ana and Hudspeth Counties (67 percent and 65 percent, respectively) agreed with the importance of minimizing air quality impacts.

Table 4.2 National Security Priorities – by User Type and Nationality
"Improving El Paso's port of entry efficiency should not come at the expense of national security"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Strongly Disagree	2%	1%	4%	3%	1%
Disagree	11%	12%	10%	14%	7%
Neutral	14%	12%	18%	14%	14%
Agree	50%	54%	44%	44%	59%
Strongly Agree	18%	17%	20%	19%	18%
No Opinion	4%	3%	5%	6%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

Table 4.3 Air Quality as a Regional Priority by County/Municipality
"Minimizing air quality impacts from delays at the ports of entry should be a regional priority"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	1%	1%	2%	0%	1%	1%
Disagree	9%	9%	7%	12%	11%	9%
Neutral	12%	18%	10%	19%	8%	9%
Agree	50%	44%	52%	55%	54%	42%
Strongly Agree	25%	23%	24%	10%	26%	39%
No Opinion	3%	6%	4%	4%	1%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

4.3 ECONOMIC COMPETITIVENESS

While 72 percent of respondents agreed or strongly agreed that efficient ports of entry contribute to the region's economic competitiveness, views varied within the region (Table 4.4). In the Mexico municipalities of Juárez, Guadalupe, and Praxedis G. Guerrero, 80 percent of respondents recognized a link between cross-border mobility and economic competitiveness. Comparatively, about 60 percent of respondents in Dona Ana and Hudspeth Counties agreed. Despite the regional variability, the majority of the respondents view operational efficiency at the ports of entry to be a contributing factor to the region's economic vitality.

Table 4.4 Contribution to Economic Competitiveness – by County/ Municipality
"Efficient ports of entry contribute to the region's economic competitiveness"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	1%	2%	2%	1%	0%	2%
Disagree	7%	6%	5%	10%	9%	2%
Neutral	16%	22%	16%	25%	8%	17%
Agree	55%	49%	55%	54%	66%	44%
Strongly Agree	16%	14%	16%	6%	13%	35%
No Opinion	4%	8%	6%	4%	2%	0%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

4.4 TOLL REVENUES

When asked whether tolls at the ports of entry should serve as revenue generators for the city, four out of five Mexican respondents (80 percent) agreed or strongly agreed (Table 4.5). In comparison, slightly over half of the U.S. respondents (56 percent) agreed. A higher percentage of border crossing users (73 percent), the travelers ultimately responsible for paying the fees, agreed the tolls should support city revenues compared to 54 percent of non-users.

Table 4.5 Tolling Revenues – by User Type and Nationality
"The ports of entry should serve as revenue generators for the city by charging tolls"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Strongly Disagree	2%	2%	3%	3%	1%
Disagree	12%	10%	15%	14%	8%
Neutral	16%	13%	21%	20%	9%
Agree	50%	54%	44%	45%	57%
Strongly Agree	16%	19%	10%	10%	24%
No Opinion	5%	3%	7%	7%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

4.5 CONGESTION AND QUALITY OF LIFE

Perceptions of congestion – and the role that the ports of entry play in contributing to the region's congestion – vary within the counties and municipalities surveyed. A higher percentage of respondents from El Paso and Juárez (61 percent and 62 percent, respectively) agreed or strongly agreed that the ports of entry contribute to mobility problems throughout the region, not just at the border (Table 4.6). Comparatively, respondents from the peripheral counties/municipalities (Dona Ana, Hudspeth, Guadalupe, and Praxedis G. Guerrero) were less likely to attribute congestion to the ports of entry and more likely to be neutral or have no opinion either way. This trend would indicate that congestion is worse in the immediate vicinity of the ports of entry themselves, with less effect as one travels further east or west along Interstate 10.

Overall, perceptions of quality of life impacts from cross-border traffic volumes and noise were near evenly split. While a third of the respondents (33 percent) indicated that border traffic does not affect the quality of life in their community, 41 percent agreed or strongly agreed that it does (Table 4.7). The survey indicated that quality of life impacts are more prominent among Mexico residents, however. Over half (53 percent) of the Mexican respondents, compared to 34 percent of the American respondents, indicated that the border crossings affect the quality of life in their neighborhood or community.

Table 4.6 Regional Congestion – by County/Municipality
"The ports of entry contribute to congestion and mobility problems throughout the region, not just at the border"

		County/Municipality				
	Total (%)	Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	2%	3%	2%	1%	2%	5%
Disagree	19%	22%	16%	18%	22%	17%
Neutral	18%	23%	16%	21%	13%	23%
Agree	45%	36%	47%	43%	53%	38%
Strongly Agree	12%	10%	14%	8%	9%	17%
No Opinion	4%	8%	5%	9%	1%	2%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

Table 4.7 Effect on Quality of Life – by County/Municipality

"Things like traffic volumes and noise from border traffic affect the quality of life in my neighborhood or community"

	Total (%)	County/Municipality				
		Dona Ana	El Paso	Hudspeth	Juárez	Guadalupe/ P.G. Guerrero
Strongly Disagree	4%	7%	5%	4%	2%	3%
Disagree	28%	32%	30%	36%	26%	19%
Neutral	20%	20%	20%	20%	19%	22%
Agree	33%	24%	29%	30%	43%	39%
Strongly Agree	8%	4%	8%	3%	10%	13%
No Opinion	6%	14%	8%	7%	0%	3%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

5.0 Regional Approach for Investing in the Region's Ports of Entry

The last section of the survey asked respondents for their opinions on potential strategies and solutions that could mitigate the impact of the region's ports of entry. These strategies ranged from:

- Using all available inspection booths during peak travel periods;
- Increasing the number of inspection booths or CBP agents at existing ports of entry;
- Utilizing intelligent transportation systems (ITS) to communicate real-time traffic information and direct traffic;
- Utilizing technology applications (such as fingerprint identification) to expedite border inspections and processing;
- Implementing tolling/congestion pricing strategies on bridges that are currently free (Santa Teresa, BOTA, and Fabens-Caseta);
- Making signalization or signage improvements along port of entry access routes;
- Restricting commercial traffic to certain operating hours or crossings; and
- Adding a new border-crossing location.

The survey responses help to gauge the attractiveness of various operational strategies.

The survey concluded with a question related to the long-term operational goal for the region's ports of entry. Ultimately, this information will assist the study team in developing immediate, short-term, mid-term, and long-term recommendations to improve cross-border mobility in the region that are consistent with local needs and issues.

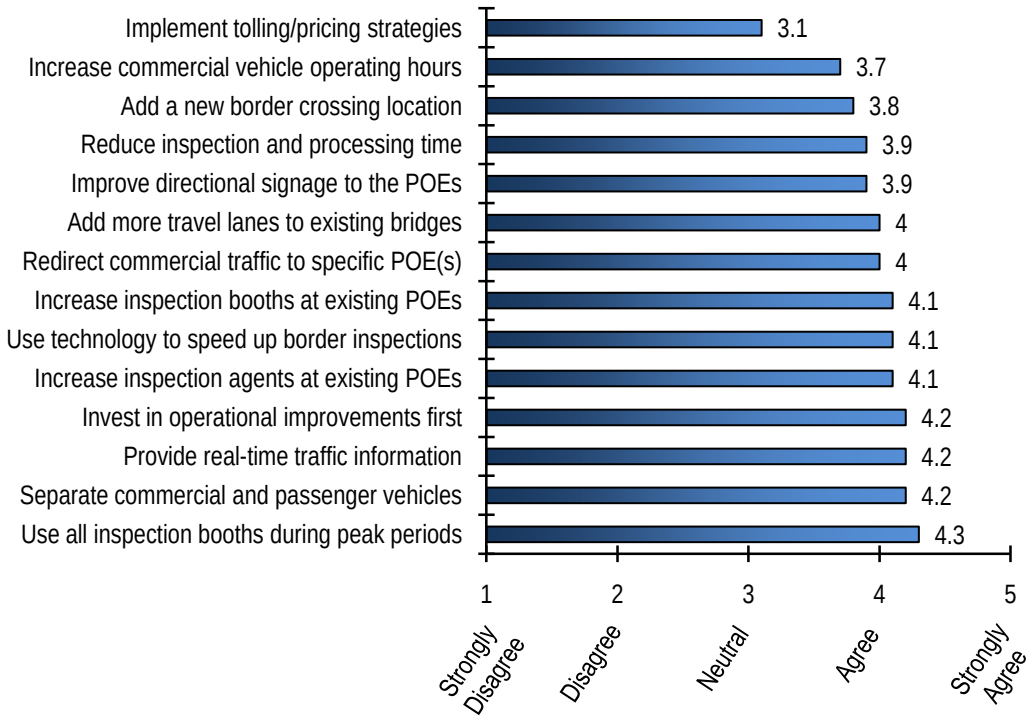
5.1 Operational Improvement Strategies

The survey asked respondents to rate their agreement or disagreement with various strategies for improving operations at the El Paso region ports of entry. Overall, most of the listed strategies were agreeable to a majority of the respondents, with the exception of the implementation of tolling/pricing strategies on bridges that are currently free (discussed in more detail later in this section).

Inspection Capacity

Using a rating scale from one to five as shown in Figure 5.1, the use of all available inspection booths during the busiest times of the day received the highest average rating. At present, many of the inspection booths remain closed even during peak periods due to staffing and funding limitations. Nearly 9 out of 10 respondents (89 percent) agreed or strongly agreed that all inspection booths should be used during peak periods to increase capacity and reduce wait times (Table 5.1). Over 80 percent of respondents also agreed with similar strategies related to increasing the number of CBP agents and inspection booths at existing ports of entry.

Figure 5.1 Average Rating by Improvement Strategy on a Five-Point Scale



While a majority of respondents (72 percent) agreed with reducing the time it takes to inspect and process each vehicle or pedestrian, this strategy received one of the lowest average ratings (3.9 on a 5-point scale). Streamlining the inspection process would help to increase throughput, but efficiency gains should not come at the expense of safety and security. While almost 90 percent of Mexican respondents agreed or strongly agreed with reducing inspection times, just over 60 percent of U.S. respondents agreed.

Table 5.1 Operational Improvement Strategies
"How would you rate your agreement/disagreement with the following strategies for improving operations at the El Paso region ports of entry?"

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Agree	No Opinion
Use all inspection booths during peak periods	3%	5%	89%	3%
Separate commercial and passenger vehicles	3%	6%	88%	3%
Invest in operational improvements first	2%	7%	88%	3%
Provide real-time traffic information	3%	9%	85%	4%
Use technology to speed up border inspections	5%	7%	85%	3%
Increase inspection agents at existing POEs	4%	9%	85%	3%
Increase inspection booths at existing POEs	6%	9%	81%	4%
Redirect commercial traffic to specific POE(s)	5%	12%	78%	5%
Add more travel lanes to existing bridges	7%	12%	77%	4%
Improve directional signage to the POEs	4%	17%	74%	4%
Reduce inspection and processing time	14%	10%	72%	4%
Add a new border-crossing location	14%	14%	68%	4%
Increase commercial vehicle operating hours	10%	18%	63%	9%
Implement tolling/pricing strategies	36%	17%	42%	5%

Note: Percentages may not add to 100 percent due to rounding. Percentages are based on approximately 620 regionwide responses.

Commercial Vehicles

Separating commercial vehicles from passenger vehicles received the second highest rating (4.2) among the operational strategies listed in the survey. Overall, 88 percent of respondents agreed or strongly agreed with the strategy to designate truck only lanes (Table 5.1). The strategy to redirect commercial traffic to specific ports of entry received a slightly lower rating (4.0), although 78 percent of all respondents agreed with the strategy. Residents of El Paso County and the Chihuahua municipalities were more likely to favor restricting commercial traffic to certain crossings than residents of Dona Ana and Hudspeth Counties. In Juárez, 90 percent of respondents favored moving commercial traffic to specific ports of entry.

Less popular throughout the region was the strategy to increase the operating hours for commercial vehicles. At present, commercial vehicle operating hours are restricted at the three commercial ports of entry according to the following schedules:

- **Santa Teresa –** Monday through Friday, 8:00 a.m. to 8:00 p.m. and Saturday 9:00 a.m. to 2:00 p.m.;
- **Bridge of the Americas –** Monday through Friday, 6:00 a.m. to 6:00 p.m. and Saturday 6:00 a.m. to 2:00 p.m.; and
- **Ysleta-Zaragoza –** Monday through Friday, 6:00 a.m. to midnight.

While 63 percent of the respondents agreed with the strategy to increase operating hours for commercial vehicles, over one in four (27 percent) were neutral or did not have an opinion either way. Respondents in the peripheral counties and municipalities (Dona Ana, Hudspeth, Guadalupe, and Praxedis G. Guerero) were more likely to be indifferent/neutral on the issue. However, residents of Juárez were highly supportive of lengthening commercial operating hours. Approximately 79 percent of Juárez residents supported this strategy compared to 56 percent in El Paso County.

Operational Improvements versus New Border Crossing

A large majority, 88 percent, agreed that the region should invest in operational improvements first to make existing ports of entry more efficient. Nearly all of the Mexico respondents (96 percent) agreed or strongly agreed with the implementation of operational improvements, while 82 percent of respondents on the U.S. side of the border agreed.

Views about adding a new port of entry are divided across the U.S.-Mexico border. Whereas 87 percent of Mexican respondents favor the construction of a new port of entry, approximately 56 percent of U.S. respondents agree or strongly agree (Table 5.2). Users of the ports of entry (regardless of nationality) are also more likely to favor a new border-crossing location (80 percent in favor), compared to respondents who have not used a port of entry within the last year (49 percent in favor).

Somewhat more favorable than constructing a new port of entry is adding additional travel lanes to existing bridges. At many of the ports of entry, however, physical land constraints limit the opportunity for expansion. Despite this constraint, about three out of four respondents (77 percent) support the addition of travel lanes to existing ports of entry.

Table 5.2 New Border-Crossing Location – by User Type and Nationality
"Add a new border-crossing location"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Strongly Disagree	4%	0%	9%	6%	0%
Disagree	10%	7%	14%	14%	3%
Neutral	14%	10%	20%	17%	10%
Agree	45%	50%	37%	39%	55%
Strongly Agree	23%	30%	12%	18%	32%
No Opinion	4%	2%	8%	6%	0%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 628 regionwide responses.

Use of Technology

The development and deployment of technology was a popular strategy for improving operational efficiency at the ports of entry. Overall, 85 percent of respondents agreed or strongly agreed with technology applications such as fingerprint identification to speed up border inspections and ITS to provide real-time traffic information about wait times at the ports of entry. Technology strategy ratings were generally consistent among users and non-users as well as U.S. and Mexico respondents.

Tolling and Congestion Pricing

The least popular operational strategy was implementing tolling or congestion pricing on bridges that are currently free. At present, Santa Teresa, BOTA, and Fabens-Caseta are the only three bridges in the region that do not charge a toll. BOTA is protected from tolls by way of the Chamizal Treaty which stipulates that it operate as a toll-free facility. Therefore, implementing a toll or congestion pricing on BOTA would require an amendment to the treaty.

Opinions about tolling in the region are mixed. About 42 percent of respondents agree that tolling would be an acceptable strategy, while 36 percent disagree (Table 5.3). Users of the ports of entry, the people that would ultimately have to pay the tolls if they were implemented, were less likely to be in favor of tolling; however, opinions among port of entry users are still largely mixed. Approximately 45 percent of cross-border travelers disagree with the use of tolls on bridges that are currently free, while 40 percent believe tolling could be an effective strategy. A higher percentage of Mexican respondents (44 percent) are against tolling as compared to American respondents (32 percent not in favor of tolling).

Table 5.3 Tolling and Congestion Pricing – by User Type and Nationality
"Implement tolling/pricing strategies on bridges that are currently free"

	Total (%)	Usage		Nationality	
		User	Non-User	United States	Mexico
Strongly Disagree	9%	12%	5%	8%	10%
Disagree	28%	33%	19%	24%	33%
Neutral	17%	13%	22%	19%	14%
Agree	31%	30%	34%	31%	31%
Strongly Agree	11%	10%	12%	11%	10%
No Opinion	5%	2%	8%	7%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 628 regionwide responses.

Additional Strategies

The respondents were given the opportunity to suggest additional operational improvement strategies other than those listed in the survey. About one-third of the respondents provided a response. While many of the responses echoed themes described above (using all available inspection booths during peak periods, increasing the number of inspection agents, adding a new border-crossing location, etc.), several other common themes emerged:

- **Improve customer service –** Forty-four respondents (approximately 4 percent of the sample) suggested that improvements are needed in the way inspection agents treat people crossing the border. These respondents noted a lack of respect, courtesy, fairness, and consistency from the inspection agents.
- **Impose stricter security regulations –** Approximately 36 respondents (4 percent of the total sample) suggested that security checks should be more thorough to prevent the passage of criminals, drugs, and weapons. Some of these respondents also stressed the importance of inspecting all southbound travelers as well.
- **Make better use of secondary inspection facilities –** Twenty-five respondents (2 percent of the sample) urged inspection agents to move vehicles that require longer than average inspection times out of the primary lanes and over to a secondary inspection location. Making better use of secondary inspection facilities would help to reduce delay for the other vehicles in queue.
- **Provide priority access lanes for specific populations –** Several respondents suggested that providing separate lanes for specific traveler types would help to increase efficiency. Among the responses, special inspection lanes were suggested for citizens (similar to the practice at airports), senior citizens and

people traveling with young children, emergency response vehicles, travelers without luggage, single-occupancy vehicles, students, and pre-cleared/low-risk travelers. While cross-border travelers can be categorized in numerous ways, the intent of this strategy would be to segregate like-travelers to improve efficiency.

- **Protect the safety of travelers on the bridges –** Several respondents expressed concern about the safety of the traveling public on the bridges. Respondents referenced fights that break out in line as people wait to cross and other criminal activities.
- **Establish inspection standards –** Establishing a standard inspection time for all agents was recommended by several respondents. This would help to cut down on people switching lanes to move out of a "slow" lane. Respondents suggested that the inspection process should be less subjective and more prescribed by a standard inspection checklist.
- **Increase participation in frequent traveler programs –** Pre-screening people before they get to the bridge through a frequent traveler application process would help to speed inspections of approved participants.
- **Reduce toll rates during off-peak periods –** Several respondents indicated that the tolls are cost-prohibitive for some travelers. Respondents suggested reducing the tolls during off-peak periods or otherwise reducing the fees so that more low-income people can have access.
- **Close the border –** A handful of respondents, less than 1 percent, suggested that all of the ports of entry should be closed. These respondents expressed concern about the violence in Juárez.

5.2 LONG-TERM OPERATIONAL GOAL

The combined population of the El Paso-Las Cruces-Cuidad Juárez region is expected to grow by 114 percent to 4.5 million people by 2035. Given this population growth and knowing how the region's ports of entry are operating now, the survey asked respondents to identify a reasonable long-term goal for port of entry operations. As shown in Table 5.4, there are considerable differences in opinion among U.S. and Mexico residents. A majority (54 percent) of U.S. residents indicated that wait times should be as long as they need to be to maintain national security and law enforcement, whereas 25 percent indicated that the region should reduce wait times and continue to keep them low. The Mexican respondents had the opposite view. Fifty-five percent of Mexican respondents would like to see wait times reduced and kept low even as the region's population grows. Comparatively, 26 percent of the Mexican respondents believe that national security needs should dictate wait times.

Table 5.4 Long-Term Goal for the Region's Ports of Entry
By Nationality

	Total (%)	Nationality	
		United States	Mexico
Reduce wait times and continue to keep them low	37%	25%	55%
Prevent wait times from getting any worse than they are now	14%	14%	16%
Allow wait times to slowly increase as population increases	2%	2%	3%
Wait times should be as long as they need to be to maintain national security and law enforcement	42%	54%	26%
Don't Know/No Opinion	4%	6%	1%

Note: Percentages may not add to 100 percent due to rounding. Total percentages are based on 1,001 regionwide responses.

6.0 Summary and Conclusions

Understanding public attitudes about the condition and performance of the existing border crossings and the general types of strategies or solutions that could mitigate these issues is a critical component to developing operations improvement alternatives. Ultimately, the goal of the El Paso Regional Ports of Entry Operations Plan is to achieve regional consensus on implementable strategies to enhance mobility, economic competitiveness, and regional quality of life.

The survey results reveal the opinions and priorities of the residents in the El Paso-Las Cruces-Cuidad Juárez region. Several common themes and conclusions emerged.

Safety and security are clear priorities for the region.

Most respondents agree that safety and security are regional priorities and that improvements to port of entry efficiency should not come at the expense of national security. These views are generally consistent among port of entry users and non-users alike, throughout the region, and on both sides of the international border.

The ports of entry contribute to the region's economic competitiveness, but long wait times are affecting travel behavior.

A majority of respondents believe that efficient ports of entry support the region's economic vitality. Approximately three-fourths (72 percent) of the respondents in Juárez and the neighboring Mexican municipalities use the region's ports of entry for the primary purpose of shopping/recreation in El Paso. In 2009, over 31,000 passenger cars, 1,900 trucks, and 21,000 pedestrians used these crossings each day, contributing over $1 billion to the regional economy and supporting tens of thousands of jobs.[2]

However, the survey revealed that wait times are affecting travel behavior for cross-border trips. For northbound trips, nearly two-thirds of respondents (63 percent) endured wait times in excess of one hour on average. For a majority of respondents, wait times influenced the time of day and day of the week they choose to cross the border, the specific port of entry they choose to use, and the frequency of their cross-border trips. As wait times discourage people from making cross-border trips, the regional economy suffers.

[2] University of Texas El Paso.

Proximity has the largest influence on port of entry selection.

Of the respondents that used one or more of the region's ports of entries in the last year, the survey revealed that nearly three out of four use the port of entry that is closest to their starting or ending location. Proximity far outweighs toll prices, wait times, safety, frequent travel lanes, and other factors that influence port of entry selection. Even at BOTA, where approximately 40 percent of respondents indicated they use BOTA because it is free, a higher percentage – over 60 percent of respondents – indicated that they choose BOTA because it is closest to their origin and/or destination.

Perceptions regarding the need for additional capacity at the port of entries are generally divided within the region

Physical infrastructure capacity and the number of inspection agents staffed at each port of entry affects the throughput and wait times of vehicles and pedestrians crossing the border each day. Overall, perceptions of existing capacity related to the number of border crossings and the number of agents and booths for inspection and processing are generally divided within the region. While many respondents are dissatisfied with existing capacity, a similar proportion is satisfied. Correspondingly, whereas nearly one-half (49 percent) of respondents find current wait times to be unacceptable, 30 percent consider them to be acceptable. Forty percent of respondents believe that some ports of entry in the region are underutilized (Santa Teresa being the most commonly cited), while nearly one in four (23 percent) disagree that any crossings are underutilized. The levels of polarization are similar among U.S. and Mexican respondents, signaling a challenge ahead for adding border-crossing capacity in the form of new infrastructure.

Respondents favor investing in operational improvements first before building a new port of entry.

A large majority (88 percent) of respondents agree that the region should invest in operational improvements first to make existing ports of entry more efficient. A variety of operational improvement strategies are supported by a large majority of the population. The most popular strategy involves making use of all available inspection booths during peak periods, while strategies to implement technology to provide real-time traffic information or improve inspection capabilities were also popular. Among respondents from Juárez, 90 percent of residents favor moving commercial traffic to specific ports of entry.

However, tolling and congestion pricing are the least popular.

Clearly, the least popular operational strategy among those offered in the survey was implementing tolls or congestion pricing on ports of entry that are currently free (Santa Teresa, BOTA, and Fabens-Caseta). Within the region, however,

opinions about tolling are mixed. Whereas 42 percent of respondents agree that tolling would be an acceptable strategy, 36 percent disagree.

Long-term operational goals are divided along the international border.

When considering the long-term operational goal for the region's ports of entry, there are considerable differences in opinion among U.S. and Mexican respondents. A majority (54 percent) of U.S. residents indicated that wait times should be as long as they need to be to maintain national security and law enforcement, whereas 25 percent indicated that the region should reduce wait times and continue to keep them low. The Mexican respondents had the opposite view. Fifty-five percent of Mexican respondents would like to see wait times reduced and kept low even as the region's population grows. Comparatively, 26 percent of the Mexican respondents believe that national security needs should dictate wait times. Reconciling this division as the region's population is expected to more than double (to 4.5 million) by 2035 remains a considerable challenge.

Public Opinion Survey Results Instrument

A. Public Opinion Survey Instrument

A.1 Introduction

The overall purpose of the El Paso Regional Ports of Entry Operations Plan is to review all existing ports of entry within the El Paso region, analyze how they currently function, and develop recommendations to improve cross-border mobility in the region. The objective of the public opinion survey is to understand public attitudes and perceptions concerning the region's border-crossing needs. We will use the findings from the survey to structure our Focus Group discussion topics as well as inform the technical analysis of operations improvement alternatives.

Contracting with Harris Interactive Service Bureau (HISB), we will target a total sample size of 1,000 residents, completing the surveys by telephone (approximately 80 percent of respondents) and on-line (approximately 20 percent of respondents). The mixture of telephone and on-line surveys will allow us to increase our sample coverage and enhance regional representativeness. Respondents must be at least 18 years old to participate and must be a current resident of one of six counties/municipalities in the El Paso region: El Paso and Hudspeth Counties in Texas, Dona Ana County in New Mexico, and the municipalities of Juárez, Práxedis G. Guerrero, and Guadalupe in Chihuahua, Mexico. The survey will be available in both English and Spanish.

The following survey instrument outlines the questions that HISB will use to program and implement the telephone/on-line survey. The survey will begin with several screening questions, followed by questions related to the respondent's usage of the region's ports of entry, perceptions of existing operations, the role and importance of the region's ports of entry, and opinions on potential strategies and solutions that could mitigate regional impacts. The survey will close with some respondent classification questions about the respondents and their households.

A.2 Survey Introduction Text

The opening title will read, "**Planning for the future of the El Paso region's ports of entry**." The following introductory text will precede the survey:

> "The Texas Department of Transportation (TxDOT) has recently begun a study to evaluate ways to make the six ports of entry in the El Paso region work better, both now and in the future. The study team wants to hear your opinions on the key issues concerning the ports of entry in the El Paso

region (from Santa Teresa, New Mexico to Tornillo/Guadalupe) and the types of solutions that could best address your needs or concerns. Your input will be critical in helping TxDOT analyze how the ports of entry currently function and develop recommendations to improve border crossings in the region."

A.3 Sample Screening

While brief, the first section of the survey will be used to confirm that the respondent qualifies for the survey. Screening question elements will include:

- Respondent's birth year or confirmation that they are at least 18 years of age;
- Respondent's primary residence state (Texas, New Mexico, or Chihuahua) and zip code (U.S)/postal code (Mexico); and
- Potential conflict of interest question asking whether the respondent or anyone in their household works for a public agency that is involved with border regulation or enforcement or providing, planning, or designing transportation services in the region.

A.4 Usage of the Region's Ports of Entry

The 15 questions in this section ask how often you use the region's six ports of entry (listed in Table A.1) as well as what motivates you to make your border-crossing choices.

Table A.1 El Paso Region Port of Entry Facilities and Services

Port of Entry	Number of Lanes/Direction	24-Hour Operations	Toll	Passenger Vehicles	Pedestrians	Commercial Vehicles
Santa Teresa	1 northbound			✓	✓	✓
	1 southbound			✓	✓	✓
Paso Del Norte	4 northbound	✓	$	✓	✓	
	1 southbound (pedestrians only)	✓	$		✓	
Stanton Street	1 northbound (DCL only)			✓		
	3 southbound	✓	$	✓	✓	
Bridge of the Americas	4 northbound	✓		✓	✓	✓
	4 southbound	✓		✓	✓	✓
Ysleta-Zaragoza	3 northbound	✓	$	✓	✓	✓
	3 southbound	✓		✓	✓	✓
Fabens-Caseta	2 northbound			✓	✓	
	1 southbound (pedestrians only)				✓	

Note: DCL = Dedicated Commuter Lane.

1. In the last year, did you use one or more of the six ports of entry in the El Paso region? The six ports of entry we are referring to include Santa Teresa (New Mexico), Paso Del Norte, Stanton Street, Bridge of the Americas (BOTA), Ysleta-Zaragoza, and Fabens-Caseta.

	Select one
a. Yes	O
b. No	O

If you answered "No," please skip to Question 14.

Northbound Trips

2. In the last year, about how many times did you **enter** the United States through one of the six northbound ports of entry in the El Paso/Juárez region by:

	Never	Less than Once a Month	1–3 Times a Month	1–4 Times a Week	Daily/ Almost Daily
a. Passenger Vehicle	O	O	O	O	O
b. Pedestrian/Bike	O	O	O	O	O

3. What was the most frequent purpose of these **northbound** trips (entering the U.S.)? (Select one)

	Select one
a. Commuting to work or attending work-related meetings	O
b. Attending school	O
c. Visiting friends/relatives	O
d. Shopping/recreation	O
e. Returning home	O
f. Other	O
g. Not sure	O

4. Which port of entry (POE) did you use **most often** for these northbound trips (entering the U.S.)? (Select one)

	Select one
a. Santa Teresa POE	O
b. Paso Del Norte POE (no northbound commercial vehicles)	O
c. Stanton Street POE (northbound dedicated commuter lane [DCL] only)	O
d. Bridge of the Americas POE	O
e. Ysleta-Zaragoza POE	O
f. Fabens-Caseta POE (no northbound commercial vehicles)	O
g. Not sure	O

5. Why did you choose to use this port of entry most often for northbound trips (entering the U.S.)? (Select all that apply)

	Select all that apply
a. It's closest to where I'm going to/starting from	O
b. I don't have to pay a toll	O
c. It has the shortest wait times	O
d. I use the DCL or FAST lanes	O
e. I feel safer on this bridge	O
f. Not sure	O
g. Other (prompt for add-in response)	O

If other, please specify:_____

6. Which other port(s) of entry (POE) did you use for **northbound** trips (entering the U.S.)? (Select all that apply)

	Select all that apply
a. Santa Teresa POE	O
b. Paso Del Norte POE (no northbound commercial vehicles)	O
c. Stanton Street POE (northbound dedicated commuter lane [DCL] only)	O
d. Bridge of the Americas POE	O
e. Ysleta-Zaragoza POE	O
f. Fabens-Caseta POE (no northbound commercial vehicles)	O
g. I did not use any other ports of entry	O

7. On average, how long do you typically have to wait at the region's ports of entry when **entering the U.S.** (traveling northbound**)**?

	Select one
a. Less than 5 minutes	O
b. 6-15 minutes	O
c. 16-30 minutes	O
d. 31 minutes-1 hour	O
e. 1-2 hours	O
f. More than 2 hours	O

Southbound Trips

8. In the last year, about how many times did you **leave** the United States through one of the six southbound ports of entry in the El Paso/Juárez region by:

	Never	Less than Once a Month	1–3 Times a Month	1–4 Times a Week	Daily/ Almost Daily
a. Passenger Vehicle	O	O	O	O	O
b. Pedestrian/Bike	O	O	O	O	O

9. What was the most frequent purpose of these **southbound** trips (leaving the U.S)? (Select one)

	Select one
a. Commuting to work or attending work-related meetings	O
b. Attending school	O
c. Visiting friends/relatives	O
d. Shopping/recreation	O
e. Returning home	O
f. Other	O
g. Not sure	O

10. Which port of entry (POE) did you use **most often** for these southbound trips (leaving the U.S)? (Select one)

	Select one
a. Santa Teresa POE	O
b. Paso Del Norte POE (pedestrians only)	O
c. Stanton Street POE (no southbound commercial vehicles)	O
d. Bridge of the Americas POE	O
e. Ysleta-Zaragoza POE	O
f. Fabens-Caseta POE (pedestrians only)	O
g. Not sure	O

11. Why did you choose to use this port of entry most often for southbound trips (leaving the U.S.)? (Select all that apply)

	Select all that apply
a. It's closest to where I'm going to/starting from	O
b. I don't have to pay a toll	O
c. It has the shortest wait times	O
d. I use the DCL or FAST lanes	O
e. I feel safer on this bridge	O
f. Not sure	O
g. Other (prompt for add-in response)	O

If other, please specify:_____

12. Which other port(s) of entry (POE) did you use for **southbound** trips (leaving the U.S.)? (Select all that apply)

	Select all that apply
a. Santa Teresa POE	O
b. Paso Del Norte POE (pedestrians only)	O
c. Stanton Street POE (no southbound commercial vehicles)	O
d. Bridge of the Americas POE	O
e. Ysleta-Zaragoza POE	O
f. Fabens-Caseta POE (pedestrians only)	O
g. I did not use any other ports of entry	O

13. On average, how long do you typically have to wait at the region's ports of entry when **entering Mexico** (southbound trips)?

	Select one
a. Less than 5 minutes	O
b. 6-15 minutes	O
c. 16-30 minutes	O
d. 31 minutes-1 hour	O
e. 1-2 hours	O
f. More than 2 hours	O

General Usage Questions

14. Are you familiar with the Secure Electronic Network for Travelers Rapid Inspection (SENTRI) program, the program that provides faster Customs and Border Protection (CBP) processing for pre-approved, low-risk travelers?

	Select one
a. Yes	O
b. No	O

15. {if Q14 = "Yes"} Are you enrolled in the Secure Electronic Network for Traveler' Rapid Inspection (SENTRI) program and eligible to use the Dedicated Commuter Lane?

	Select one
a. Yes	O
b. No	O

A.5 Perceptions of Existing Operations

This section asks about your level of satisfaction with the region's port of entry facilities. In this section, we are asking about both northbound and southbound ports of entry combined.

16. How would you rate your agreement or disagreement with the following statements about current wait times at the region's ports of entry?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable/ No Opinion
a. Wait times influence how frequently I cross the border.	O	O	O	O	O	O
b. Wait times influence the time of day I choose to cross the border.	O	O	O	O	O	O
c. Wait times influence the day(s) of the week I choose to cross the border.	O	O	O	O	O	O
d. Wait times influence the specific port of entry I choose to use.	O	O	O	O	O	O
e. Current wait times are acceptable to me.	O	O	O	O	O	O
f. Some ports of entry in the El Paso region are underutilized.	O	O	O	O	O	O

17. {if Q16f = "Agree" or "Strongly Agree"} Which ports of entry (POE) in the region would you say are underutilized?

	Select all that apply
a. Santa Teresa POE	O
b. Paso Del Norte POE	O
c. Stanton Street POE	O
d. Bridge of the Americas POE	O
e. Ysleta-Zaragoza POE	O
f. Fabens-Caseta POE	O

18. How would you rate your satisfaction or dissatisfaction with the following port of entry operating conditions in the El Paso region?

Random Group A:

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied	Not Applicable/ No Opinion
a. Number of booths for inspection and processing.	O	O	O	O	O	O
b. Pre-trip information about delays at border crossings	O	O	O	O	O	O
c. Directional signage leading up to the ports of entry	O	O	O	O	O	O
d. Traffic signal operations leading up to the ports of entry	O	O	O	O	O	O
e. Hours of operation for passenger vehicles and pedestrians	O	O	O	O	O	O
f. Number of dedicated truck lanes	O	O	O	O	O	O
g. Customer service at the ports of entry	O	O	O	O	O	O

Random Group B:

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied	Not Applicable/ No Opinion
a. Number of agents for inspection and processing.	O	O	O	O	O	O
b. Toll rates	O	O	O	O	O	O
c. Number of border-crossing locations	O	O	O	O	O	O
d. Pedestrian safety along the bridge(s)	O	O	O	O	O	O
e. Congestion on the roads leading up to the ports of entry	O	O	O	O	O	O
f. Hours of operation for passenger vehicles and pedestrians	O	O	O	O	O	O
g. Hours of operation for commercial vehicles	O	O	O	O	O	O

A.6 Role and Importance of the Region's Ports of Entry

This section focuses on how the ports of entry affect mobility, the economy, and quality of life in the region.

19. How would you rate your agreement or disagreement with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable/ No Opinion
a. Efficient ports of entry contribute to the region's economic competitiveness.	O	O	O	O	O	O
b. Improving El Paso's port of entry efficiency should not come at the expense of national security.	O	O	O	O	O	O
c. The ports of entry contribute to congestion and mobility problems throughout the region, not just at the border.	O	O	O	O	O	O
d. The ports of entry should serve as revenue generators for the city by charging tolls.	O	O	O	O	O	O
e. Minimizing air quality impacts from delays at the ports of entry should be a regional priority.	O	O	O	O	O	O
f. Safety considerations, such as separating passenger vehicles from commercial vehicles, should be a regional priority.	O	O	O	O	O	O
g. Things like traffic volumes and noise from border traffic affect the quality of life in my neighborhood or community.	O	O	O	O	O	O

A.7 Regional Approach for Investing in Ports of Entry

This last section asks for your opinion on potential strategies and solutions that could mitigate the impact of the region's ports of entry.

20. How would you rate your agreement or disagreement with the following strategies for improving operations at the El Paso region ports of entry?

Random Group A

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable/ No Opinion
a. Implement tolling/pricing strategies on bridges that are currently free.	O	O	O	O	O	O
b. Develop technology (such as fingerprint identification) to speed up border inspections and processing.	O	O	O	O	O	O
c. Use all available inspection booths during the busiest times of the day.	O	O	O	O	O	O
d. Increase the number of inspection agents at existing ports of entry.	O	O	O	O	O	O
e. Add more travel lanes to existing bridges.	O	O	O	O	O	O
f. Add a new border-crossing location.	O	O	O	O	O	O
g. Increase the operating hours for commercial vehicles.	O	O	O	O	O	O

Random Group B

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable/ No Opinion
a. Install "smart" transportation technology to provide real-time traffic information, such as wait times at the ports of entry.	O	O	O	O	O	O
b. Invest in operational improvements first to make existing ports of entry more efficient.	O	O	O	O	O	O
c. Increase the number of inspection booths at existing ports of entry.	O	O	O	O	O	O
d. Reduce the time it takes to inspect and process each vehicle or pedestrian	O	O	O	O	O	O
e. Improve the signage directing vehicles to port of entry facilities.	O	O	O	O	O	O
f. Separate commercial vehicles from passenger vehicles (truck only lanes).	O	O	O	O	O	O
g. Redirect commercial traffic to specific ports of entry.	O	O	O	O	O	O

21. Are there any other strategies you would suggest for improving operations at the El Paso region ports of entry?

	Select one
Yes	O
No	O

If yes, please specify:_____

22. The combined population of the El Paso-Las Cruces-Cuidad Juárez region is expected to grow by 114 percent to 4.5 million people by 2035. Given this population growth, a reasonable long-term goal for the region's ports of entry compared to the current condition would be to:

	Select one
a. Reduce wait times and continue to keep them low	O
b. Prevent wait times from getting any worse than they are now	O
c. Allow wait times to slowly increase as population increases	O
d. Wait times should be as long as they need to be to maintain national security and law enforcement	O
e. Don't know/No Opinion	O

A.8 Respondent Classification Questions

The end of the survey will include a small number of questions about the respondents and their households. The following questions will be used for classification purposes and market segmentation:

- Including yourself, how many people live in your household?
- How many registered vehicles (including cars, pick-up trucks, sport utility vehicles, vans, and motorcycles) are owned by you or those in your household (and kept at home address)?
- In total, how many years have you lived in the El Paso region?
- What is your current job status?
- {selecting from a list of categories} What is your total annual household income before taxes?

B.3 Meeting Schedule Summary

Table B.3.1 Stakeholder Meetings by Entity

Stakeholder/Agency	Dates	Attendees
Annual Neighborhood Coalition Summit	8/7/2010	
Border to Border Conference	11/17/2010	
Camino Real Regional Mobility Authority	5/11/2011	CRRMA Board Briefing
	4/20/2011	Raymond Telles
Chihuahua State Government		
Chihuahua State Transportation Officials	2/25/2011	
City of El Paso Traffic Division and Street Department	6/22/2010	Ted Marquez, Daryl Cole
City of Juárez		
City Representative Beto O'Rourke	4/18/2011	Representative Beto O'Rourke
	11/4/2010	Representative Beto O'Rourke
City Representative Carl Robinson	4/18/2011	Representative Carl Robinson
	11/4/2010	Representative Carl Robinson
City Representative Eddie Holguin Jr.	4/19/2011	
City Representative Emma Acosta	11/4/2010	Representative Emma Acosta
City Representative Steve Ortega	4/11/2011	Representative Steve Ortega
City Representative Susie Byrd	4/18/2011	Representative Susie Byrd
	11/4/2010	Representative Susie Byrd
Commissioner Gandara and Commissioner Perez	4/20/2011	Commissioner Gandara and Commissioner Perez
Commissioner Haggarty	4/19/2011	Commissioner Daniel Haggarty
Commissioner Sergio Lewis	4/19/2011	Commissioner Sergio Lewis
Committee on Border Relations	4/19/2011	(see sign-in sheet/member committee list)
	11/4/2010	(see sign-in sheet/member committee list)

Stakeholder/Agency	Dates	Attendees
Congressman Reyes	4/20/2011	Karl McElhaney
	4/11/2011	Congressman Reyes, Karl McElhaney, Salvador Payan
County Judge Escobar	4/19/2011	Veronica Escobar
Customs and Border Protection	5/12/2011	Ana Hinojosa, Hector Mancha, Barry Miller, John Meza, Francis Brown
	4/20/2011	Ana Hinojosa, Francis Brown, Barry Miller, John Meza
	11/16/2010	Ana Hinojosa, Offier Rivas, Officer Aveta
	10/29/2010	Ben Rohrbaugh
El Paso City Council	5/31/2011	City Council Meeting – Adoption of Operations Plan
	5/10/2011	City Council Meeting
	11/9/2010	City Council Meeting
El Paso City Manager	3/30/2011	Joyce Wilson (in combination with Advisory Committee)
El Paso MPO	5/6/2011	Transportation Policy Board Briefing
	3/30/2011	Roy Gilyard
	11/5/2010	Transportation Policy Board Briefing
	4/1/2010	
	2/24/2010	IBS Task Force
	1/21/2010	
El Paso Times Editorial Board	5/5/2010	
Foreign Trade Zone No. 68	6/2/2010	Joe Quinonez
General Services Administration (GSA)	4/19/2011	Jack Garten
Greater El Paso Chamber of Commerce	5/18/2011	
	10/6/2010	
	5/3/2010	Richard Dayoub (Focus Group)
Hispanic Chamber		

Stakeholder/Agency	Dates	Attendees
Horizon City Council	11/9/2010	
U.S. International Boundary and Water Commission (IBWC)	3/3/2011	Beto Arenas, Duane Price, Willy Martinez, Cheryl Franklin
Instituto Municipal de Investigación y Planeación (IMIP)	4/19/2011	Nicholas Lopez
Joint Working Committee (JWC)	9/21/2010	
Mayor Cook	4/20/2011	Mayor John Cook (in combination with Maquila and Congressman Reyes meeting)
	4/11/2011	Mayor John Cook (in combination with Congressman Reyes meeting)
	3/30/2011	Mayor John Cook (in combination with Advisory Committee)
	11/4/2010	Mayor John Cook
Mexican Aduana	11/4/2010	Fabian Gonzalez, Daniel Marin
Mexican Consulate	4/21/2011	Guillermo Reyes, Jimena Cortes
	6/1/2010	Roberto Rodriquez Hernandez, Jimena Cortes
New Mexico Border Authority	4/20/2011	Jim Creek
	3/1/10	Jim Creek
New Mexico Department of Transportation (NMDOT)	4/20/2011	Gabriela C. Apodaca, Jolene Herrera
Paso del Norte Group (PDN)	4/18/2011	Mary Lou Camarena
	12/15/2010	Mary Lou Camarena
	11/4/2010	PDN Model Port Working Group
	10/7/2010	
	6/1/2010	
	5/10/2010	David Buchmueller, Lisa Colquitt-Munoz
Promofront	11/4/2010	
	6/1/2010	

Stakeholder/Agency	Dates	Attendees
El Paso Regional Economic Development Corporation (REDCo)	6/24/2010	Manual Ochoa with Maquila reps: Jorge Pedroza Serrano, Ivan Ramos, Manuel Sotelo Suarez, etc.
	6/1/2010	Bob Cook
Servicio de Administracion Tributaria (SAT)		Jane/Said – Mexico City
Secretariat of Communications and Transport (SCT)		Jane/Said – Mexico City
Secure Origins	5/12/2011	
	11/4/2010	
Senator Udall (NM)	5/12/2011	Anna Apodaca
Socorro City Manager	6/1/2010	Manny Soto
Southwest Maquila Association, Foreign Trade Association, AMAC Logistics	4/20/2011	Laird Carmichael, Veronica Callaghan, Stephanie Caviness, Kathleen Neal
	4/18/2011	see sign-in sheet
Secretaria de Relaciones Exteriores (SRE)		Jane/Said – Mexico City
State Representative Chente Quintanilla	5/4/2011	
	2/10/2010	
State Representative Dee Margo	12/7/2010	
State Representative Marisa Marquez	3/3/2010	
State Representative Naomi Gonzalez	5/4/2011	
	6/2/2010	
State Representative Norma Chavez	2/24/2010	
	2/4/2010	
State Representative Pickett	1/27/2010	
	2/11/2010	
	4/26/2011	

Stakeholder/Agency	Dates	Attendees
State Senator Eliot Shapleigh	3/3/2010	
	6/21/2010	
State Senator Jose Rodriguez	12/6/2010	
Sun Metro	5/3/2010	Jay Banasiak (Focus Group)
Sunland Park Rotary Club	11/8/2010	
Sunny 99.9	8/5/2010	
TxDOT El Paso District	4/21/2011	Gus Sanchez, Tim Twomey, David Head, Leo Betancourt, Efrain Esparza, Ray Dovalina, Chuck Berry, Ricardo Romero
	3/30/2011	Chuck Berry
U.S. Consulate	5/5/2011	Deborah Grout
Yselta Independent School District	4/18/2011	Marty Reyes
	11/4/2010	Marty Reyes
	11/10/2010	YISD Board Meeting

Table B.3.2 Public Meetings

Public Meeting/ Focus Group	Date	Time	Location
Business Focus Group	5/3/2010	8:00 a.m.-10:00 a.m.	El Paso City Hall
Business Focus Group	5/3/2010	10:00 a.m.-12:00p.m.	El Paso City Hall
Shipper/Carrier/Receiver Focus Group	5/3/2010	2:00-4:00 p.m.	Pavo Real Recreation Center, 9301 Alameda., Lower Valley
Public Focus Group	5/3/2010	5:30-7:30 p.m.	Armijo Recreation Center, 710 Seventh., South El Paso
Public Focus Group	5/4/2010	6:00-8:00 p.m.	Rio Valle Woman's Club, 521 Mike Maros., Fabens,
Shipper/Carrier/Receiver Focus Group	5/5/2010	9:00-11:00 a.m.	Hilos de Plata, 4451 Delta., Central El Paso
Shipper/Carrier/Receiver Focus Group	5/5/2010	1:00-3:00 p.m.	Mission Valley Regional Command Center, 9011 Escobar., Lower Valley
Public Meeting	5/6/2010	6:00-8:00 p.m.	Sunland Park City Hall Council Chambers, 1000 McNutt., NM
Public Meeting	5/10/2010	6:00-8:00 p.m.	Westside Regional Command Center, 4801 Osbourne.,
Public Meeting	6/16/2010	6:30-8:30 p.m.	Rio Valley Woman's Club
Public Meeting	6/17/2010	6:30-8:30 p.m.	Santa Teresa High School, 100 Airport Rd NM
Public Meeting	6/21/2010	6:30-8:30 p.m.	Bowie High School, 801 San Marcial, Central
Public Meeting	6/22/2010	6:30-8:30 p.m.	South El Paso Senior Center, 600 S. Ochoa, South El Paso
Public Meeting	6/23/2010	6:30-8:30 p.m.	Riverside High School, 301 Midway, Lower Valley
Public Meeting	6/24/2010	6:30-8:30 p.m.	Socorro High School, 10150 Alameda, Lower Valley
Public Meeting	5/9/2011	6:30-8:30 p.m.	Texas Department of Transportation, 13301 Gateway Boulevard West
Public Meeting	5/10/2011	10:00 a.m.-12:00 p.m.	Pat O'Rourke Recreation Center, 901 N. Virginia
Public Meeting	5/10/2011	6:30-8:30 p.m.	Sunland Park City Hall council chambers, 1000 McNutt., NM
Public Meeting	5/11/2011	6:30-8:30 p.m.	Northeast Regional Command Center, 9600 Dyer St
Public Meeting	5/12/2011	6:30-8:30 p.m.	Westside Regional Command Center, 4801 Osbourne
Public Meeting	5/18/2011	6:30-8:30 p.m.	Riverside High School, 301 Midway, Lower Valley
Public Meeting	5/19/2011	6:30-8:30 p.m.	Bowie High School, 801 San Marcial, Central

B.4 Press and News Releases

Dedicated to Outstanding Customer Service for a Better Community

S E R V I C E S O L U T I O N S S U C C E S S

April 1, 2010

International Bridges Department
For Immediate Release
Contact: Tammy Fonce-Olivas at 915.621.6754 or 915.873.1974

CITY OF EL PASO, TXDOT EMBARK IN OPERATIONS PLAN FOR PORTS OF ENTRY

El Paso, Texas – The City of El Paso and the Texas Department of Transportation (TxDOT) are undertaking a new effort called the Regional Ports of Entry Operations Plan, the City of El Paso International Bridges Department announced today.

The Regional Ports of Entry Operations Plan focuses on how to best utilize existing border crossings in the El Paso-Juárez metropolitan area – from Santa Teresa, New Mexico to Tornillo/Guadalupe – in an effort to facilitate international travel and trade.

The City of El Paso teamed up with TxDOT on this new effort after suspending a study of a new border crossing within the El Paso city limits.
The Regional Ports of Entry Operations Plan will explore the impacts and benefits of a variety of potential operational improvement strategies, such as:

- Expanding or restricting the use of FAST or SENTRI lanes;
- Implementing congestion pricing at some crossings (i.e., charging higher tolls at peak traffic hours);

- Making traffic flow changes, such as restricting some ports to commercial traffic only or making some two-way bridges one-way.

The transportation, economic, and environmental implications of these and other strategies will be assessed, and immediate, short, medium, and long-term recommendations, including finance plans, will be summarized within a regional implementation plan.

The development of the Regional Ports of Entry Operations Plan will include extensive public involvement and outreach to ensure that all interested groups in the El Paso area actively engaged in the planning, development, and implementation of the Plan. Public involvement and outreach activities will start this spring and the plan should be completed within twelve months.

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Texas Department of Transportation

news

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(915) 790-4341 FAX (915) 790-4259

TxDOT's five goals: reduce congestion • enhance safety • expand economic opportunity • improve air quality • increase the value of transportation assets.

MEDIA ADVISORY
April 29, 2010

PUBLIC INVOLVMENT ACTIVITIES UNDERWAY TO SUPPORT REGIONAL PORT OF ENTRY OPERATIONS PLAN

El Paso, Texas – The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has initiated a series of public involvement and outreach activities to guide the development of the Regional Ports of Entry Operations Plan, TxDOT announced today.

The Regional Ports of Entry Operations Plan focuses on how to best utilize existing border crossings in the El Paso-Juárez metropolitan area – from Santa Teresa, New Mexico to Tornillo/Guadalupe – in an effort to facilitate international travel and trade. The public involvement and outreach activities are designed to ensure that all interested groups in the El Paso region are actively engaged in the planning, development, and implementation of the Plan.

In early April, a random survey of residents in the El Paso-Juárez region was launched. These surveys are designed to understand public attitudes and perceptions about the region's border crossing needs. In early May, the project study team will conduct targeted interviews with representatives from neighborhood groups, community business leaders, freight shippers and carriers, border agencies, and industry groups. These meetings will be held on May 3, 4, 5, 6 and 10 at various locations throughout the region, including Downtown, the Lower Valley, South, East, and West El Paso, Fabens, and Sunland Park, NM. Additional public meetings will be held in June.

Participants in these activities will be asked to provide input on the most critical needs and issues facing the region's ports of entry and to identify potential solutions to address neighborhood and regional border mobility issues. The project team will also use the results of the public outreach activities to assess the transportation, economic, and environmental implications of potential operational improvement strategies.

To receive additional information on how to participate in these activities, including dates and locations of public meetings, please visit www.elpasoborderplan.org, email questions to elpasoborderplan@camsys.com, or call Jim Brogan at (512) 691-8502.

# # #

noticias

Departamento de Transporte de Texas

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TxDOT's five goals: reduce congestion ▪ enhance safety ▪ expand economic opportunity ▪ improve air quality ▪ increase the value of transportation assets.

Comunicado de Prensa
29 de abril 2010

ACTIVIDADES DE PARTICIPACIÓN PÚBLICA EN MARCHA EN APOYO AL PLAN OPERACIONAL DE LOS PUERTOS DE ENTRADA

El Paso, Texas - El Departamento de Transporte de Texas (TxDOT), en cooperación con la Ciudad de El Paso, ha iniciado una serie de actividades de participación pública y de divulgación para orientar el desarrollo del Plan Operacional de los Puertos de Entrada de la Región, TxDOT ha anunciado hoy.

El Plan Operacional de los Puertos de Entrada se centra en cómo utilizar mejor los cruces fronterizos existentes en el área metropolitana de El Paso-Juárez - desde Santa Teresa, Nuevo México a Tornillo / Guadalupe - en un esfuerzo para facilitar los viajes y el comercio internacional. La participación pública y actividades de divulgación están diseñadas a garantizar que todos los grupos interesados en la región de El Paso participan activamente en la planificación, desarrollo e implementación del Plan.

A principios de abril, una encuesta al azar de los residentes de la región de El Paso-Juárez se puso en marcha. Estas encuestas están diseñadas para entender las actitudes y percepciones del público sobre las necesidades de los cruces fronterizos en la región. A principios de mayo, el equipo de estudio del proyecto llevará a cabo entrevistas específicas en los representantes de grupos de vecindad, las empresas líderes de la comunidad, los transportistas de carga y consignadores, agencias fronterizas, y grupos de la industria. Estas reuniones se llevarán a cabo el 3, 4, 5, 6 y 10 de mayo en varias localidades de la región, incluyendo el centro, el Valle Bajo, Sur, Este y Oeste de El Paso, Fabens, y Sunland Park, Nuevo México. En junio se llevarán a cabo sesiones públicas adicionales.

Los participantes de estas actividades se les pedirá que proporcionen sugerencias sobre las necesidades y los problemas más críticos que enfrentan los puertos de entrada de la región y para identificar las posibles soluciones para hacer frente a los problemas de movilidad fronteriza a nivel comunitario y regional. El equipo del proyecto también utilizará los resultados de las actividades de divulgación para evaluar las repercusiones al transporte, económicas y ambientales de las posibles estrategias de mejora operativa.

Para recibir información adicional sobre cómo participar en estas actividades, incluyendo las fechas y lugares de las sesiones públicas, por favor visite www.elpasoborderplan.org, envíe su pregunta por correo electrónico a elpasoborderplan@camsys.com , o llame a Jim Brogan al (512) 691-8502.

# # #

Texas Department of Transportation

news

El Paso District
13301 Gateway West
El Paso, Texas 79928-5410
(915) 790-4341 FAX (915) 790-4259

TxDOT's five goals: reduce congestion • enhance safety • expand economic opportunity • improve air quality • increase the value of transportation assets.

FOR IMMEDIATE RELEASE
June 3, 2009

PUBLIC MEETINGS SCHEDULED FOR REGIONAL PORTS OF ENTRY OPERATIONS PLAN

El Paso, Texas – The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has scheduled six public meetings to discuss issues and potential operational improvements for the six ports of entry in the El Paso-Juárez metropolitan area. The public meetings are designed to identify and address public issues and to solicit ideas about short, medium and long-term improvements to cross-border mobility in the region.

In 2009, the City of El Paso requested assistance from TxDOT in developing the Regional Ports of Entry Operations Plan. The Regional Ports of Entry Operations Plan will contemplate how to best operate existing border crossings from Santa Teresa, New Mexico to Tornillo/Guadalupe to better facilitate international travel and trade.

The scheduled meetings are part of a series of public involvement and outreach activities to guide the plan's development. Public outreach was launched in April with a random survey of area residents. In May, the study team conducted targeted interviews with representatives from neighborhood groups, community business leaders, freight shippers and carriers, border agencies, and industry groups. The purpose of the upcoming public meetings is to hear from others who are interested in the future of the region's ports of entry. Attendees are encouraged to recommend solutions that may address the needs of their neighborhood and suggest policy changes that could improve mobility and enhance economic competitiveness within the region.

Beginning June 16, the evening meetings will be held at various locations throughout the region:

June 16
6:30 p.m. to 8:30 p.m.
Rio Valle Woman's Club
521 Mike Maros, Fabens, TX

June 17
6:30 p.m. to 8:30 p.m.
Santa Teresa High School
100 Airport Road, Santa Teresa, NM

June 21
6:30 p.m. to 8:30 p.m.
Bowie High School
801 San Marcial, Central El Paso

June 22
6:30 p.m. to 8:30 p.m.
South El Paso Senior Center
600 S. Ochoa, South El Paso

June 23
6:30 p.m. to 8:30 p.m.
Riverside High School
301 Midway, Lower Valley El Paso

June 24
6:30 p.m. to 8:30 p.m.
Socorro High School
10150 Alameda, Lower Valley El Paso

The meetings will begin at 6:30 p.m. with information stations and staff available to discuss public concerns and ideas. A brief overview of the planning work underway will be presented at 7:00 p.m., after which participants will be invited to return to the information stations for further discussion with knowledgeable staff.

To receive additional information on these public meetings and other ways to get involved in the operations plan, please visit:
www.elpasoborderplan.org, email questions to elpasoborderplan@camsys.com, or call Jim Brogan at (512) 691-8502, or Blanca M. Del Valle, TxDOT Public Information Officer, at (915) 790-4341.

Departamento de Transporte de Texas

noticias

El Paso District
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COMUNICADO
3 de junio 2010

REUNIONES ABIERTAS AL PÚBLICO PARA EL PLAN OPERACIONAL DE LOS PUERTOS DE ENTRADA DE LA REGIÓN PROGRAMADAS

El Paso, Texas –El Departamento de Transporte de Texas (TxDOT), en cooperación con la Ciudad de El Paso, ha programado seis reuniones abiertas al público para discutir los problemas y posibles soluciones operacionales para los seis puertos de entrada en el área metropolitana de El Paso-Juárez. El Plan Operacional de los Puertos de Entrada de la Región se centra en cómo mejor utilizar los cruces fronterizos existentes desde Santa Teresa, Nuevo México a Tornillo/Guadalupe para facilitar los viajes y el comercio internacional. Las reuniones públicas se han diseñado para identificar y abordar los asuntos públicos y para solicitar ideas sobre mejoras operacionales a corto, mediano y largo plazo para optimizar la movilidad transfronteriza en la región.

Estas reuniones se celebran como parte de una serie de actividades de participación ciudadana y de divulgación para orientar sobre el proceso de desarrollo del Plan Operacional de los Puertos de Entrada de la Región. La campaña de difusión pública se puso en marcha en abril con una encuesta al azar de los residentes en la zona. En mayo, el equipo de estudio realizó entrevistas con representantes de grupos de vecinos, las empresas líderes de la comunidad, los transportistas de carga y consignadores, agencias fronterizas, y grupos de la industria. El objetivo de las próximas sesiones públicas es escuchar a otros que están interesados en el futuro de los puertos de entrada de la región. Los que participen de estas reuniones se les anima a recomendar soluciones que potencialmente podrían atender las necesidades de su comunidad, y sugerir cambios de política que podrían potencialmente mejorar la movilidad y expandir la competitividad económica de la región.

A partir del 16 de junio, las reuniones abiertas al público se llevarán a cabo por la noche en varias localidades de la región:

16 de junio
6:30 p.m. a 8:30 p.m.
Club de Mujeres de Rio Valle
521 Mike Maros, Fabens, Texas

17 de junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Santa Teresa
100 Airport Road, Santa Teresa, Nuevo Mexicc

22 de junio
6:30 p.m. a 8:30 p.m.
Centro de la Tercera Edad South El Paso
600 S. Ochoa, South El Paso

23 de junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Riverside
301 Midway, Lower Valley El Paso

21 de junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Bowie
801 San Marcial, Central El Paso

24 de junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Socorro
10150 Alameda, Lower Valley El Paso

Las reuniones comenzarán a las 6:30 p.m. con estaciones de información y personal disponible para discutir sus preocupaciones e ideas. Una visión general del trabajo de planificación que se está llevando a cabo será presentado a las 7 p.m., luego los participantes serán invitados a regresar a las estaciones de información para discutir más a fondo el plan con el personal experto en el desarrollo del plan.

Para recibir información adicional sobre estas reuniones públicas y otras maneras de involucrarse en el plan operacional, por favor visite www.elpasoborderplan.org, envié su pregunta por correo electrónico a elpasoborderplan@camsys.com, o llame a Jim Brogan al (512) 691-8502 o a Blanca Del Valle, Director de Relaciones Publicas para TxDOT al (915) 790-4341.

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Texas Department of Transportation

news

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MEDIA ADVISORY
June 22, 2010

SURVEY RESULTS SHOW STRONG SUPPORT FOR OPERATIONAL IMPROVEMENTS TO BORDER CROSSINGS

El Paso, Texas – The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has released the initial findings from a public opinion poll conducted as part of the Regional Ports of Entry Operations Plan. The poll, conducted by Harris Interactive Service Bureau, surveyed 1,000 U.S. and Mexican residents in the El Paso/Juarez region about their perceptions of existing border crossing operations and opinions on potential strategies and solutions that could be employed to make the existing system of crossings work more effectively.

Approximately 60 percent of border crossing users (respondents that crossed the border at least once in the last year) indicated that current wait times are unacceptable and a vast majority (88 percent) of total respondents agree that the region should invest in operational improvements to make the existing border crossings more efficient. Popular operational improvement ideas include making use of all available inspection booths during peak travel periods, using advanced technology to provide real-time traffic information, and separating passenger and commercial vehicles at some or all of the region's border crossings. Opinions about implementing or modifying tolls at the region's crossings were mixed: 42 percent of respondents agree that tolling is an acceptable strategy to improve efficiency, while 36 percent disagree (22 percent were neutral or had no opinion).

At the request of the City of El Paso, the transportation, economic, and environmental benefits and impacts of these and other strategies will be evaluated by TxDOT over the next several months. TxDOT and the city scheduled a series of six public meetings, inviting residents to recommend additional solutions to include in this analysis. Two remaining meetings are scheduled at the following locations:

June 23	**June 24**
6:30 p.m. to 8:30 p.m.	6:30 p.m. to 8:30 p.m.
Riverside High School	Socorro High School
301 Midway, Lower Valley El Paso	10150 Alameda, Lower Valley El Paso

The meetings will begin at 6:30 p.m., with information stations and staff available to discuss public concerns and ideas. A brief overview of the planning work underway will be presented at 7:00 p.m., after which participants will be invited to return to the information stations for further discussion with knowledgeable staff. TxDOT will also conduct a second round of public meetings this fall to review initial findings and recommendations from the technical analysis completed this summer.

To receive additional information on these public meetings and other ways to get involved in the operations plan, please visit www.elpasoborderplan.org, email questions to elpasoborderplan@camsys.com, or call Blanca Del Valle, Public Information Officer for TxDOT at (915) 790-4200.

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Texas Department of Transportation

news

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MEDIA ADVISORY
November 3, 2010

REGIONAL PORTS OF ENTRY OPERATIONS PLAN
FALL 2010 UPDATE

El Paso, Texas – The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has developed an initial set of potential solutions to address concerns at the region's ports of entry. These potential solutions were identified through a series of public and stakeholder outreach activities conducted in the spring and summer of 2010 and include:

- Operational strategies that could improve how the existing crossings are utilized (such as implementing new technology applications that alert drivers of lane closures and crossing times);
- Policy changes that could address how existing crossings are managed (such as allocating additional staff to the ports of entry or extending commercial vehicle operating hours); and
- Projects that could enhance the physical condition or capacity of existing crossings (such as adding or improving turning lanes or adding additional inspection lanes).

TxDOT and the City will be evaluating the transportation, economic, security, and environmental impacts and benefits of these potential solutions prior to making any recommendations in the Operations Plan - just because a potential solution is selected for testing does not mean that it will be recommended for implementation.

Prior to finalizing the list of potential solutions and testing their effectiveness, TxDOT and the City are seeking public input to ensure that the initial list is complete, accurate, and reflective of stakeholder and community needs. Both TxDOT and the City encourage all interested parties in the region to visit the project website www.elpasoborderplan.org, review the list of potential solutions selected for testing, and provide them with your comments (using the contact information below) by November 12, 2010.

Once the evaluation of transportation, economic, security, and environmental impacts and benefits is complete, TxDOT and the City will present preliminary recommendations to key stakeholders and the general public for review and feedback in another series of public meetings. It is anticipated that this additional outreach will occur in early 2011.

To receive additional information about the Operations Plan or provide additional comments, visit www.elpasoborderplan.org; email questions to elpasoborderplan@camsys.com; or call Jim Brogan at (512) 691-8502.

# # #

Texas Department of Transportation

news

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(915) 790-4341 FAX (915) 790-4259

MEDIA ADVISORY
February 10, 2011

WINNERS ANNOUNCED FOR REGIONAL PORT OF ENTRY OPERATIONS PLAN COLORING CONTEST

El Paso – The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has sponsored a coloring contest to support the ongoing Regional Ports of Entry Operations (POE) Plan.

The coloring contest, called **Connecting People: The Bridges of El Paso,** was open to all El Paso students (from Kindergarten to 5th Grade) during fall 2010. Over 200 entries were received. Winning artwork will be used on posters to announce the El Paso Regional POE Operations Plan's next round of public meetings. Posters will be displayed on the bridges, in public offices and storefronts, on the international bridges website and possibly in print media, such as the El Paso Times and El Diario.

Three first place winners were selected from three categories by age: K-1, 2-3, 4-5. The winning students are:

Kindergarten & 1st grade Category: **Ashley Marie Ignacio** / Glen Cove Elementary

2nd & 3rd grade Category: **Emily Shukitt** / Eastwood Knolls Elementary

4th & 5th grade Category: **Caylee Davis** / Tierra Del Sol Elementary

Honorable Mention: **Brianna Diaz-Callahan** / Barron Elementary (5th Grade)

Mark Tomlinson, TxDOT Director for the El Paso POE Plan will fly in from Austin to present the first place winners with framed certificates signed by the five-member Texas Transportation Commission, plus present them with small gift bags on Wednesday, **February 16** at **6 p.m.** in the Ysleta Room at the Ysleta Independent School District's Regional Office (9600 Sims Dr.).

El Paso District Engineer, Chuck Berry, will present Brianna Diaz-Callahan her certificate on Friday, **February 18** at **10:45 a.m.** at Barron Elementary School (11155 Whitey Ford St.).

The Regional Ports of Entry Operations Plan is focusing on how to best utilize existing border crossings in the El Paso-Juárez metropolitan area – from Santa Teresa, New Mexico to Tornillo/Guadalupe – in an effort to facilitate international travel and trade. To receive additional information about the Operations Plan, visit www.elpasoborderplan.org; email questions to elpasoborderplan@camsys.com; or call Jim Brogan at (512) 691-8502.

# # #

For more information, contact Blanca M. Del Valle, Public Information Officer, at (915) 790-4341.

El Paso Regional Ports of Entry Operations Plan

Public Meetings

May 9, 2011
6:30 p.m. to 8:30 p.m.
Texas Department of Transportation
13301 Gateway Boulevard West

May 10, 2011
10:00 a.m. to 12:00 p.m.
Pat O'Rourke Recreation Center
901 N. Virginia

May 10, 2011
6:30 p.m. to 8:30 p.m.
Sunland Park City Hall
1000 McNutt Rd., Sunland Park, NM

May 11, 2011
6:30 p.m. to 8:30 p.m.
Northeast Regional Command Center
9600 Dyer Street

May 12, 2011
6:30 p.m. to 8:30 p.m.
Westside Regional Command Center
4801 Osborne Drive

May 18, 2011
6:30 p.m. to 8:30 p.m.
Riverside High School
301 Midway Drive

May 19, 2011
6:30 p.m. to 8:30 p.m.
Bowie High School
801 South San Marcial

El Paso Times
elpasotimes.com

We want to hear from you.

Texas Department of Transportation
(915) 790-4200
www.elpasoborderplan.org
elpasoborderplan@camsys.com

El Paso Border Plan
c/o Camoridge Systematics, Inc.
9015 Mountain Ridge Drive, Suite 210
Austin, TX 78759

Plan Operacional de los Puertos de Entrada de la Región de El Paso

Reuniones Públicas

9 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Texas Department of Transportation
13301 Gateway Boulevard West

10 de mayo, 2011
10:00 a.m. a 12:00 p.m.
Pat O'Rourke Recreation Center
901 N. Virginia

10 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Sunland Park City Hall
1000 McNutt Rd., Sunland Park, NM

11 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Northeast Regional Command Center
9600 Dyer Street

12 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Westside Regional Command Center
4801 Osborne Drive

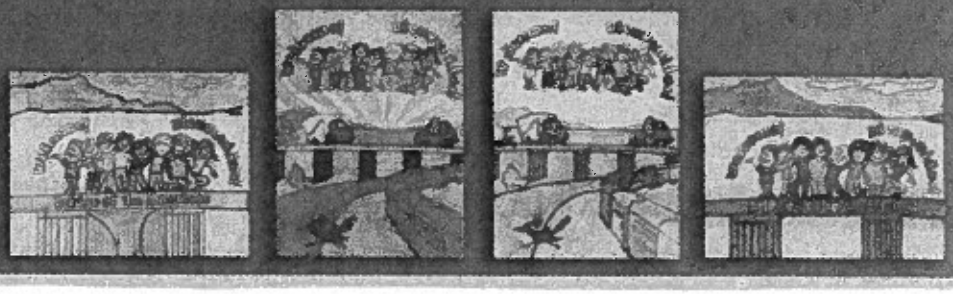
18 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Riverside High School
301 Midway Drive

19 de mayo, 2011
6:30 p.m. a 8:30 p.m.
Bowie High School
801 South San Marcial

Queremos saber su opinión.

Texas Department of Transportation
(915) 790-4200
www.elpasoborderplan.org
elpasoborderplan@camsys.com

Plan de la Frontera de El Paso
c/o Cambridge Systematics, Inc.
8015 Mountain Ridge Drive, Suite 210
Austin, TX 78759



Your guide to today, tomorrow and beyond

Today's events

Meetings

▶ **City Rep. Steve Ortega** will have a community meeting at 7:30 a.m. today at Village Inn, 2275 Trawood. Guest speakers: Chris Lopez, editor of the El Paso Times; and Javier Chacon, El Paso County elections administrator. El Paso County Commissioner Anna Perez of Precinct 1 will also be present to provide updates on county issues.

▶ **The Texas Department of Transportation** will meet about the El Paso regional ports of entry from 6:30 to 8:30 p.m. today at 13301 Gateway West. Or visit www.lpasoborderpan.org.

▶ **Recovery Int'l,** a self-help support group dealing with depression, fears, panic attacks, anxiety and bipolar illness, will meet at 7 p.m. today at St. Andrews Presbyterian Church, 2155 Wedgewood. 592-2935 or 591-2342.

r guide to today, tomorrow and be

Today's events

Meetings

▶ **North East Business Alliance** will meet from 7:45 to 9 a.m. today at La Dona Cafe, 5255 Trans Mountain. Guest speaker: Marie Moore, Academie Ste. Cecile International School. 588-7283 or email: tonyneba@gmail.com.

▶ **Texas Department of Transportation** will meet about the El Paso regonal ports of entry from 10 a.m. to noon today at the Pat O'Rourke Recreation Center, 901 N. Virginia; or from 6:30 to 8:30 p.m. today at Sunland Park City Hall, 1000 McNutt, Sunland Park. Visit www.elpasoborderplan.org.

▶ **El Paso Society for Human Resource Management** will have its monthly meeting from 11:30 a.m. to 1 p.m. today at the DoubleTree Hotel, 17th floor, 600 N. El Paso St. Guest speaker: Greg Martin, area business banking manager who will talk about fraud prevention, detection and prosecution. $15 for members, $20 for guests. www.epshrm.org.

▶ **Kiwanis Club** will meet at noon today at the Holiday Inn, 900 Sunland Park Drive. Guest speaker: Eliot Shapleigh. Lunch is optional, $10. 252-5921.

▶ **Cielo Vista Neighborhood Association** will meet at 6 p.m. today at the Jose Cisneros Branch Library. Guest speaker: Fred Lopez of the city Economic Development and Planning Department. 204-7980 or 443-1729.

▶ **Get Out of Debt:** Ready to start your own savings challenge? Attend this workshop for tips to help you get started from 6 to 7:30 p.m. today at the GECU Ysleta Branch, 8936 Alameda. Registration:gecu-ep.org and click on "Upcoming Seminars & Events — Get Out of Debt."

El Paso Regional Ports of Entry Operations Plan

Public Meetings

Texas Department of Transportation

June 16
6:30 p.m. to 8:30 p.m.
Rio Valle Woman's Club
521 Mike Maros, Fabens, Texas

June 17
6:30 p.m. to 8:30 p.m.
Santa Teresa High School
100 Airport Road, Santa Teresa, New Mexico

June 21
6:30 p.m. to 8:30 p.m.
Bowie High School
801 San Marcial, Central El Paso

June 22
6:30 p.m. to 8:30 p.m.
South El Paso Senior Center
600 S. Ochoa, South El Paso

June 23
6:30 p.m. to 8:30 p.m.
Riverside High School
301 Midway, Lower Valley El Paso

June 24
6:30 p.m. to 8:30 p.m.
Socorro High School
10150 Alameda, Lower Valley El Paso

We want to hear from you.

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www.elpasoborderplan.org
elpasoborderplan@camsys.com

El Paso Border Plan
c/o Cambridge Systematics, Inc.
9015 Mountain Ridge Drive, Suite 210
Austin, TX 78759

Plan Operacional de los Puertos de Entrada de la Región de El Paso

Reuniones Abiertas al Público

Texas Department of Transportation

16 de Junio
6:30 p.m. a 8:30 p.m.
Club de Mujeres de Rio Valle
521 Mike Maros, Fabens, Texas

17 de Junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Santa Teresa
100 Airport Road, Santa Teresa, Nuevo Mexico

21 de Junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Bowie
801 San Marcial, Central El Paso

22 de Junio
6:30 p.m. a 8:30 p.m.
Centro de la Tercera Edad South El Paso
600 S. Ochoa, South El Paso

23 de Junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Riverside
301 Midway, Lower Valley El Paso

24 de Junio
6:30 p.m. a 8:30 p.m.
Escuela Superior Socorro
10150 Alameda, Lower Valley El Paso

Queremos saber su opinión.

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Plan de la Frontera de El Paso
c/o Cambridge Systematics, Inc.
9015 Mountain Ridge Drive, Suite 210
Austin, TX 78759

[redacted]

Calendar

Today's events

El Paso Times
Monday, June 21, 2010

▶ **The Border Crossing Operations Plan will have a public meeting** from 6:30 to 8:30 p.m. today at Bowie High School, 801 S. San Marcial. The meeting is intended to identify and discuss public issues and to solicit ideas about short-, medium- and long-term improvements to cross-border mobility in the region. www.elpasoborderplan.org.

El Paso Times
Tuesday, June 22, 2010

▶ **The Border Crossing Operations Plan** will have a public meeting from 6:30 to 8:30 p.m. today at the El Paso Senior Center, 600 S. Ochoa. The meeting is intended to identify and discuss public issues and to solicit ideas about short-, medium- and long-term improvements to cross-border mobility in the region. www.elpasoborderplan.org.

El Paso Times
Wednesday, June 23, 2010

▶ **The Border Crossing Operations Plan** will have a public meeting from 6:30 to 8:30 p.m. today at Riverside High School, 301 Midway . The meeting is intended to identify and discuss public issues and to solicit ideas about short-, medium- and long-term improvements to cross-border mobility. www.elpasoborderplan.org.

El Paso Times
Thursday, June 24, 2010

▶ **The Border Crossing Operations Plan** will have a public meeting from 6:30 to 8:30 p.m. today Socorro High School, 10150 Alameda.The meeting is intended to identify and discuss public issues and to solicit ideas about short-, medium- and long-term improvements to cross-border mobility. www.elpasoborderplan.org.

MARK LAMBIE / EL PASO TIMES

Port of entry **Allison Pasternak** takes public comment from Jack Nelson, left, and Robert Peña during a meeting Wednesday at Riverside High School to discuss plans for an additional port of entry in the El Paso area.

border CROSSING

Border Crossing Users Said Wait Times are Unacceptable

The Texas Department of Transportation (TxDOT), in cooperation with the City of El Paso, has released the initial findings from a public opinion poll conducted as part of the Regional Ports of Entry Operations Plan.

The poll, conducted by Harris Interactive Service Bureau, surveyed 1,000 U.S. and Mexican residents in the El Paso/Juarez region about their perceptions of existing border crossing operations and opinions on potential strategies and solutions that could be employed to make the existing system of crossings work more effectively.

Approximately 60 percent of border crossing users (respondents that crossed the border at least once in the last year) indicated that current wait times are unacceptable and a vast majority (88 percent) of total respondents agreed that the region should invest in operational improvements to make the existing border crossings more efficient.

Popular operational improvement ideas include making use of all available inspection booths during peak travel periods, using advanced technology to provide real-time traffic information, and separating passenger and commercial vehicles at some or all of the region's border crossings.

Opinions about implementing or modifying tolls at the region's crossings were mixed: 42 percent of respondents agree that tolling is an acceptable strategy to improve efficiency, while 36 percent disagree (22 percent were neutral or had no opinion).

At the request of the City of El Paso, the transportation, economic, and environmental benefits and impacts of these and other strategies will be evaluated by TxDOT over the next several months. TxDOT and the city scheduled a series of six public meetings, inviting residents to recommend additional solutions to include in this analysis.

B.5 Project Factsheets/Newsletters

El Paso Regional Ports of Entry Operations Plan

The Texas Department of Transportation (TxDOT) has recently begun a *Regional Ports of Entry Operations Plan* that will:

- Review and assess the operations at all existing ports of entry within the El Paso region (from Santa Teresa, New Mexico to Tornillo/Guadalupe), analyze how they currently function, and develop recommendations to improve cross-border mobility in the region;
- Identify operational improvement strategies, such as the use of technology to reduce border inspection and processing times, charging higher tolls or increasing staff levels at peak traffic hours, or restricting some ports to commercial traffic only;
- Estimate the transportation, economic, and environmental impacts and benefits of potential operational improvement strategies; and
- Develop plan to help the region finance and implement operational, infrastructure, and institutional recommendations.

A key element of the study is extensive public involvement and outreach to ensure that all interested groups in the El Paso region are actively engaged in the planning, development, and implementation of the Operations Plan. Your input will be critical in helping TxDOT identify, evaluate, and recommend strategies to improve regional port of entry operations. TxDOT's consultant, Cambridge Systematics, Inc., will be conducting a series of focus groups with members of the local business community, manufacturers, freight shippers and carriers, and neighborhood residents to identify key issues concerning the ports of entry in the El Paso region and the types of solutions that could best address concerns.

You are receiving this announcement because you will be contacted by project staff in the coming weeks to request your participation in one of the upcoming focus groups. We cannot emphasize enough the importance of your participation in this study and encourage you to address any questions or comments to:

E-Mail: elpasoborderplan@camsys.com

Phone: Jim Brogan, Project Manager
(512) 691-8502

Write to: El Paso Border Plan
c/o Cambridge Systematics, Inc.
9015 Mountain Ridge Drive, Suite 210
Austin, TX 78759

Texas Department of Transportation

El Paso Regional Ports of Entry Operations Plan
Fall 2010 Update

The Texas Department of Transportation (TxDOT) is continuing to make progress on the *Regional Ports of Entry Operations Plan* that will review all existing ports of entry within the El Paso region, analyze how the ports currently function, and develop recommendations to improve cross-border mobility in the region. The following is an update of our recent activities:

- **Model Development –** We are developing a simulation model using available regional transportation and socioeconomic data that will allow us to evaluate alternative solution scenarios and test their ability to improve port of entry operations.
- **Scenario Development and Guiding Principles –** Before the alternative scenarios can be tested, the comprehensive set of projects, strategies, and initiatives that make up the scenarios must be screened for inclusion. To steer the scenario development process, we have defined "Guiding Principles" to help us ensure that the final set of solution scenarios address the most important issues identified by regional stakeholders and interest groups. As Guiding Principles for the Operations Plan, a scenario must:
  - Comprise logical groupings of operational, infrastructure, and policy-level solutions, leveraging technology where feasible;
  - Include a mix of immediate, short-, mid-, and long-term solutions;
  - Be realistic, implementable, and cost effective;
  - Facilitate trade and reduce the cost of doing business;
  - Reduce crossing times and alleviate bottlenecks without sacrificing security and enforcement;
  - Optimize the use of existing infrastructure;
  - Provide economic, environmental, and quality-of-life benefits on a regional scale; and
  - Minimize impacts to the health, safety, function, and character of surrounding neighborhoods.
- **Commodity Flow and Socioeconomic Profile (*coming soon!*) –** Intended to provide readers with an understanding of how freight trends and issues in the El Paso region impact port of entry operations, this background document summarizes demographic and economic trends as well as the operational characteristics of cross-border freight movements.

A key element of the study continues to be extensive public involvement and outreach. We are currently scheduling interim status briefings during October and November 2010 to update interested stakeholders on the study and answer any questions. We anticipate having preliminary findings to report in early 2011. We welcome your input and invite you to address any questions or comments to**:**

Website: www.elpasoborderplan.org

E-Mail: elpasoborderplan@camsys.com

Phone: Jim Brogan, Project Manager
(512) 691-8502

Texas Department of Transportation

El Paso Regional Ports of Entry Operations Plan

Winter 2011 Update

The Texas Department of Transportation (TxDOT), in coordination with the City of El Paso, is continuing to make progress on the *Regional Ports of Entry Operations Plan*, an effort to improve cross-border mobility in the region through operational improvements to the existing crossings. The following is an update of our recent activities:

- **Operational Models** – We have developed models that will help us evaluate the potential impact of different projects, strategies, and initiatives on the cross-border transportation system. These models help us to evaluate how the ports of entry function individually and as a system - both now and in the future.
- **Testing of Potential Strategies** – We are using these models to test a number of ideas to make the existing system of border crossings work better. These ideas were generated through discussions with the public and stakeholders throughout 2010. Options we are evaluating include:
  - **Operational strategies** that could improve how the existing crossings are utilized (such as modifying existing toll rates, proposing new tolls, or implementing new technology applications that alert drivers of lane closures and crossing times);
  - **Policy and management changes** that could address how existing crossings are managed (such as allocating additional staff to the ports of entry or extending hours of operation); and
  - **Infrastructure Projects** that could enhance the flow of traffic over existing crossings (such as adding or improving turning lanes or adding additional inspection lanes).

  A complete list of the scenarios we are testing is available on our project website (http://www.elpasoborderplan.org). Over the next month, we will be evaluating the transportation, economic, security, and environmental impacts and benefits of these potential solutions prior to making any recommendations in the Operations Plan - just because a potential solution is being tested does not mean that it will be recommended for implementation.

A key element of the study continues to be extensive public involvement and outreach. Once our testing process is complete, we will present preliminary recommendations to key stakeholders and the general public for review and feedback in another series of public meetings to be held in late March/early April – look to our website for specific dates, times, and additional information. In the meantime, we welcome your input and invite you to address any questions or comments to**:**

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Phone: Jim Brogan, Project Manager
(512) 691-8502

Texas Department of Transportation

El Paso Regional Ports of Entry Operations Plan
April 2011 Update

The Texas Department of Transportation (TxDOT), in coordination with the City of El Paso, is continuing to make progress on the *Regional Ports of Entry Operations Plan*, an effort to improve cross-border mobility through operational improvements to the region's six existing or planned international crossings (from Santa Teresa, NM to the planned Tornillo/Guadalupe port of entry). Over the last several months, we have been evaluating 22 individual operational improvement scenarios to determine whether or not they might improve wait times at the crossings and enhance overall mobility in the region. These potential strategies include:

- **Staffing and Management Enhancements**, e.g., allocating additional inspection staff or extending hours of operation at one or more crossings;
- **Pricing Strategies**, e.g., modifying existing toll rates or proposing new tolls;
- **Technology Improvements**, e.g., implementing wait time/queue monitoring technology and traveler information systems; and
- **Traffic Engineering/Infrastructure Improvements**, e.g., expanding the number of designated commuter lanes and FAST lanes, improving approach lanes, or changing the operational focus of one or more crossings to handle specific types of traffic (commercial or passenger).

A complete list of the scenarios we tested is available on our project website (http://www.elpasoborderplan.org).

Our initial tests of these scenarios show that **increased staffing, expanded hours of operation, improved technology, and some traffic engineering and infrastructure scenarios show the most promise** for reducing delay at the border. We currently are refining these results by combining elements of the most promising solutions to see what additional benefits can be achieved. Other scenarios we tested, particularly the pricing strategies, do not show as much promise for reducing delay and are not emerging as leading candidates for implementation.

Once our testing process is complete, we will present preliminary recommendations to regional stakeholders and the general public for review and feedback in another series of public meetings to be held in late April and early May – look to our website for specific dates, times, and additional information. We will incorporate feedback from this outreach process within a *Regional Ports of Entry Master Operations Plan* that will outline final recommendations that will ultimately be considered for implementation by TxDOT, the City of El Paso, and its regional, national, and international partners. In the meantime, we welcome your input and invite you to address any questions or comments to**:**

Website:	www.elpasoborderplan.org
E-Mail:	elpasoborderplan@camsys.com
Phone:	Jim Brogan, Project Manager (512) 691-8502

Texas Department of Transportation

El Paso Regional Ports of Entry Operations Plan
May 2011 Update

The *Regional Ports of Entry Operations Plan*, an effort to improve cross-border mobility through operational improvements to the El Paso/Juarez region's six existing or planned international crossings (from Santa Teresa, NM to the planned Tornillo/Guadalupe port of entry), is nearing completion. The project team is finalizing its technical analysis and has begun to develop conclusions and recommendations.

Our preliminary results show that the volume of passenger and commercial vehicles crossing the border- both north and southbound- is already straining the efficiency of the existing ports of entry. As a result, some of the region's crossings are already at or near their "operational capacity," with wait times at some crossings averaging 60 minutes for commercial vehicles and two hours for passenger vehicles on most days. On busy days, wait times can be even longer. Regional growth projections indicate that by 2035- and in some cases earlier- all of the region's existing crossings will suffer from these unacceptable wait times if no operational improvements are made. Our team has identified a number of operational, policy, and engineering strategies to address these concerns that we'll share with the region over the next several weeks. While these improvements alone will not completely solve all the performance issues at the ports of entry, they will help to maximize the capacity that does exist within the system.

Before we finalize our recommendations, however, we want to hear from you- your thoughts on our initial findings, your reactions to our preliminary recommendations and how they should be implemented, and your guidance about what the region should do next. Please join us at one of the following public meetings in the next several weeks:

Monday, May 9th
6:30 p.m. to 8:30 p.m.
TxDOT District Office
13301 Gateway Blvd W, El Paso

Tuesday, May 10th,
10:00 a.m. to 12:00 p.m.
Pat O'Rourke Recreation Ctr
901 N. Virginia, El Paso

Tuesday, May 10th
6:30 p.m. to 8:30 p.m.
Sunland Park City Hall
1000 McNutt Sunland Park, NM

Wednesday, May 11th
6:30 p.m. to 8:30 p.m.
Northeast Regional Command Center
9600 Dyer St., El Paso

Thursday, May 12th
6:30 p.m. to 8:30 p.m.
Westside Regional Command Center
4801 Osborne Dr., El Paso

Wednesday, May 18th
6:30 p.m. to 8:30 p.m.
Riverside High School
301 Midway Dr., El Paso

Thursday, May 19th,
6:30 p.m. to 8:30 p.m.
Bowie High School
801 South San Marcial, El Paso

In the meantime, we welcome your input and invite you to address any questions or comments to**:**

Website: www.elpasoborderplan.org

E-Mail: elpasoborderplan@camsys.com

Phone: Jim Brogan, Project Manager
(512) 691-8502

Texas Department of Transportation

B.6 Coloring Contest Winners

Connecting People: Bridges of El Paso Coloring Contest

Please complete and attach to entry.

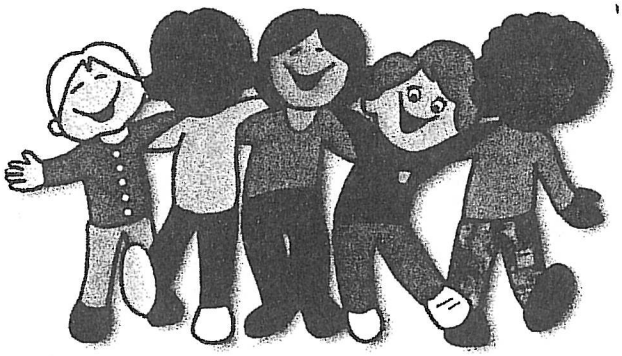
Name: Caylee Davis

Age: 9

Grade: 4th

School: Tierra Del Sol

Teacher: Sally Davis, Fine Arts



Entries must be received by Thursday, November 18, 2010.

HNTB
7500 Viscount Blvd., Suite 100
El Paso, TX 79925
(915) 887-0875

WINNER

Texas Department of Transportation


Welcome!
Bienvenidos!
Bridge of the Americas
Caylee Davis - Tierra Del

Connecting People: Bridges of El Paso coloring contest

Please complete and attach to entry.

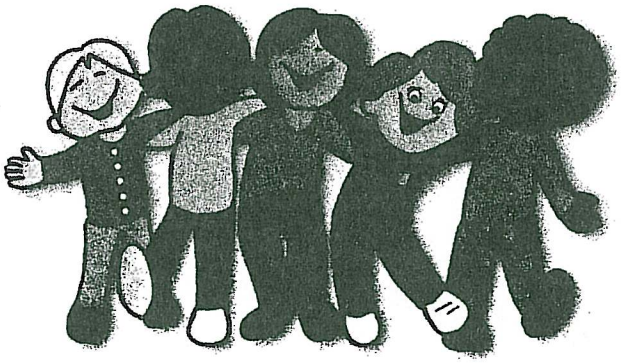
Name: Emily Shakit

Age: 7

Grade: 2nd

School: Eastwood Knolls School

Teacher: Mrs. Jane R. Webster



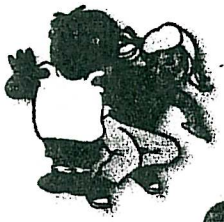
Entries must be received by Thursday, November 18, 2010.

HNTB
7500 Viscount Blvd., Suite 100
El Paso, TX 79925
(915) 887-0875

WINNER

Texas Department of Transportation

Emily Shuckitt - Eastwood Knolls



Connecting People: Bridges of El Paso Coloring Contest

Please complete and attach to entry.

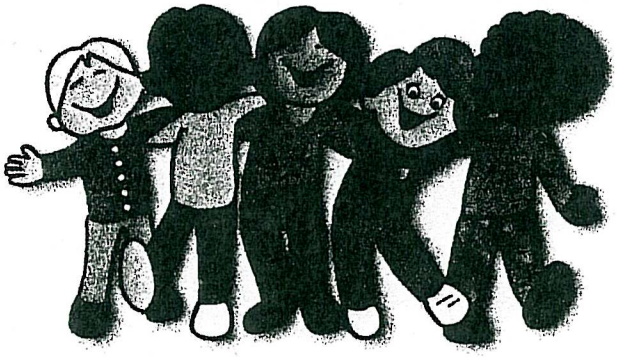
Name: Ashley

Age: 6

Grade: 1st

School: Glen Cove Elementary, YISD

Teacher: Mary Anne Gilbert, Fine Arts



Entries must be received by Thursday, November 18, 2010.

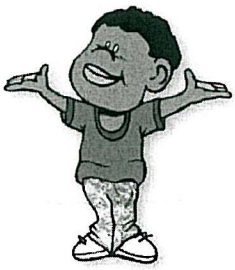
HNTB
7500 Viscount Blvd., Suite 100
El Paso, TX 79925
(915) 887-0875

Texas Department of Transportation

Winner

Welcome!
Bridge of the Americas
¡Bienvenidos!

Connecting People: Bridges of El Paso Coloring Contest



Please complete and attach to entry.

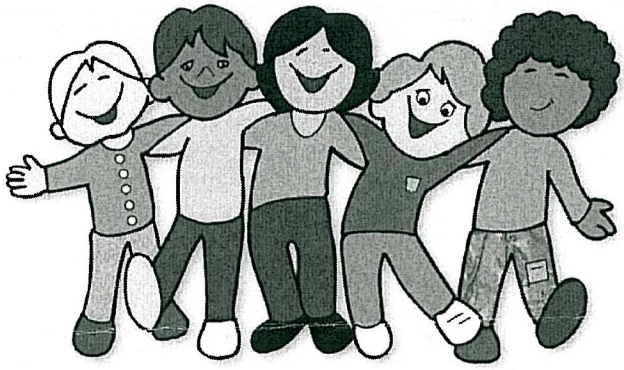
Name: Brianna Diaz- Callahan

Age: 10

Grade: 5th

School: Barron

Teacher: Ms Sutherland

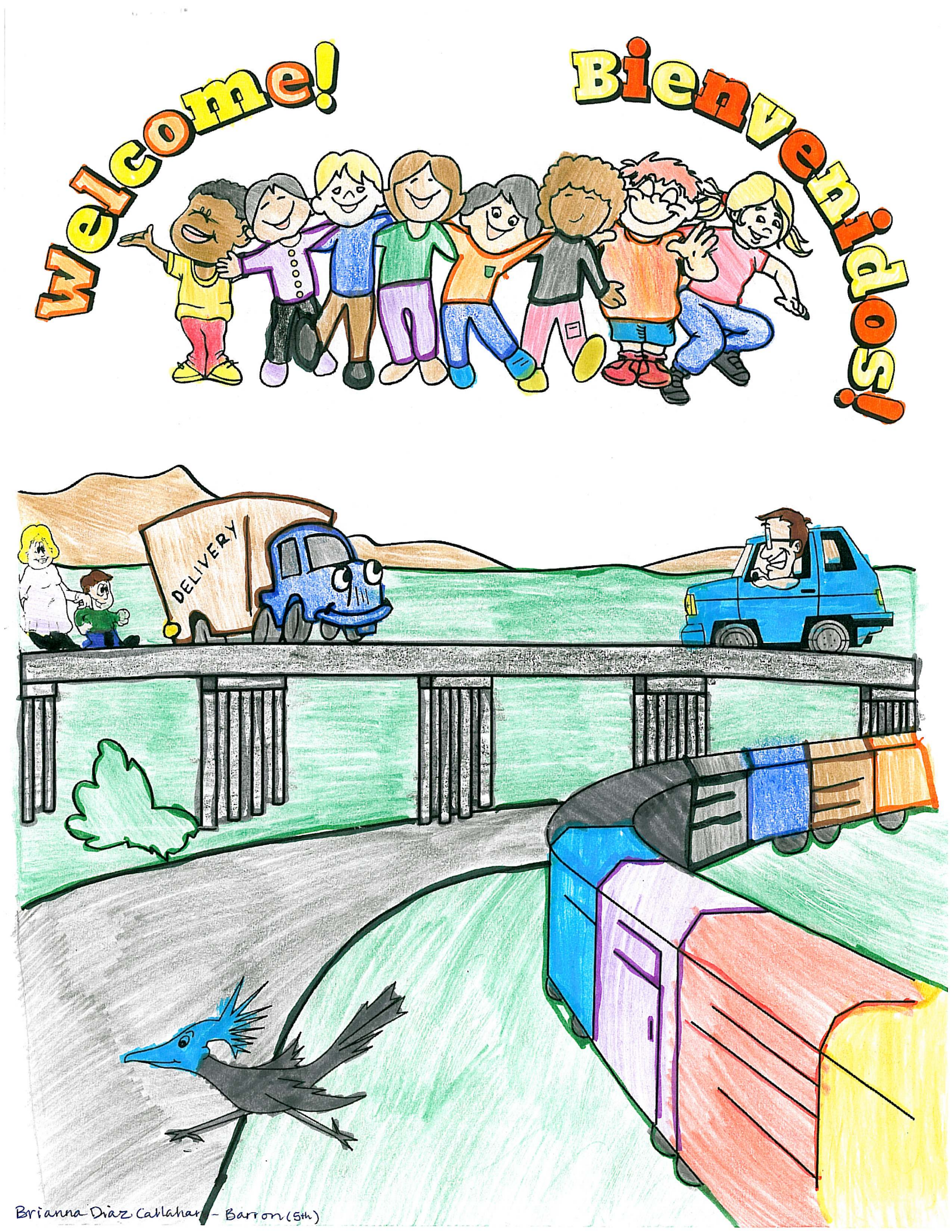


Entries must be received by Thursday, November 18, 2010.

HNTB
7500 Viscount Blvd., Suite 100
El Paso, TX 79925
(915) 887-0875

Texas Department of Transportation

HONORABLE MENTION



Brianna Diaz Callahan - Barron (5th)

C. Infrastructure Profile Summary

This Appendix provides profiles of the region's six existing crossings, focusing specifically on the number of existing inspection booths, hours of operation, toll rates, current travel volumes, staffing levels, and future plans for expansion. This info was used to support our model development efforts and shape the Operations Plan recommendations.

C.1 Santa Teresa Bridge Profile

Photo: http://www.elpasoborderplan.org.

Table C.1 Summary of Bridge Characteristics
Santa Teresa Bridge

	Northbound	Southbound
Hours of Operation	Passenger: 6 a.m. to 12 a.m. Commercial: 8 a.m. to 8 p.m. M-F 9 a.m. to 2 p.m. Sat	Passenger: Commercial: 8 a.m. to 8 p.m.
Structure(s)	–	
Length	N/A	
Toll	Free	
Type and Number of NB Booths Available	POV (2), Commercial (1), FAST (1)	
2010 Total Count	3,000 (two-way, all vehicles)	
2010 Percent Trucks (of counts)	17%	
2010 Peak Delay	33 min. (POV), 7 min. (Commercial), 2 min. (FAST)	

Travel Demand

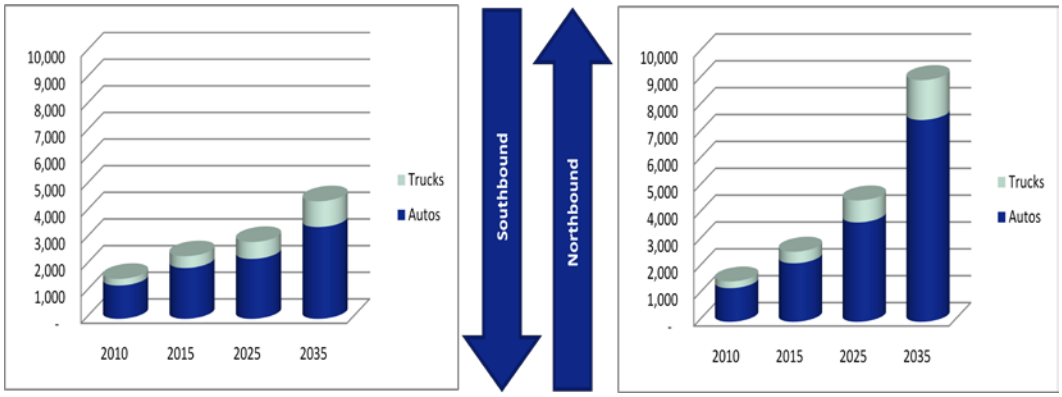
As indicated in Table C.2 below, the Santa Teresa POE included approximately 1,500 vehicles per direction in 2010. However, travel demand forecasts indicate that northbound trips are forecasted to be approximately double of those southbound trips in 2025 and beyond (see Figure C.1). Although the Santa Teresa POE is fifth in northbound traffic volumes among the six POEs, the Santa Teresa POE will experience the most growth in trips between 2010 and 2035, at approximately six times the trips in 2010.

Table C.2 Santa Teresa POE Traffic Counts and Forecasts

		Adjusted		
Vehicle Type	2010 Count	2015	2025	2035
		Autos		
NB	1,250	2,178	3,700	7,512
SB	1,250	1,910	2,248	3,444
Total	2,500	4,088	5,948	10,956
		Trucks		
NB	250	431	815	1,83
SB	250	441	636	970
Total	500	872	1,451	2,453
		All Vehicles		
NB	1,500	2,609	4,515	8,995
SB	1,500	2,351	2,884	4,414
Total	3,000	4,960	7,399	13,409

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

Figure C.1 Santa Teresa POE Trips by Directions and Mode

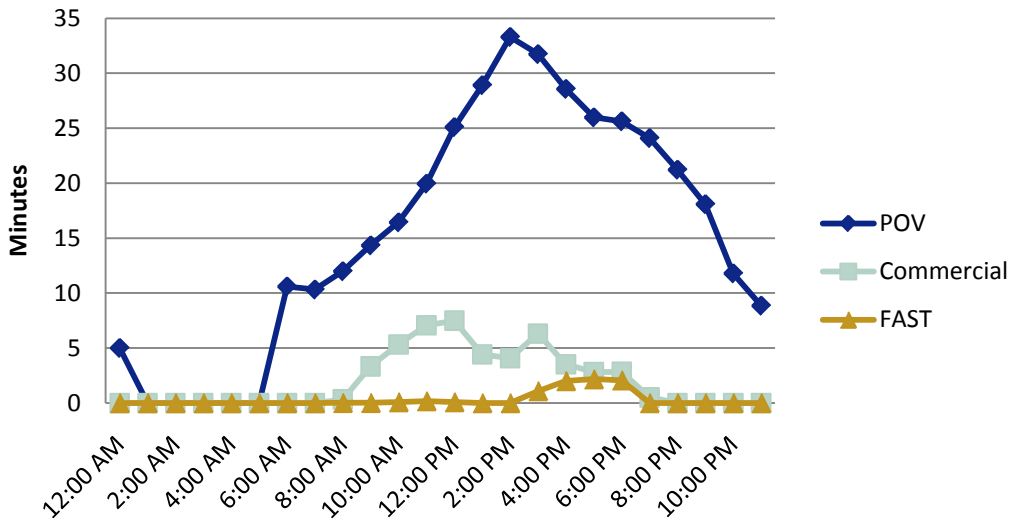


Traffic Delays

As illustrated in Figure C.2, most of the delay that occurred in 2010 was in the POV lanes and peaked at 33 minutes at approximately 2:00 p.m. Relative to

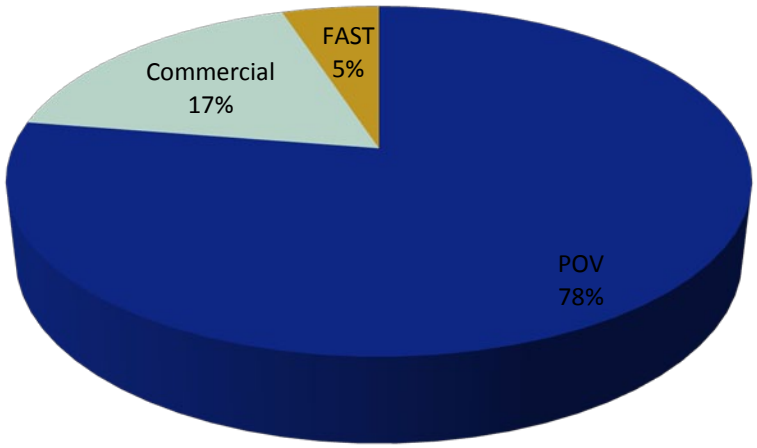
commuter traffic, on average, 10- to 15-minute delays occurred in the mornings (7:00-9:00 a.m.) and 25-minute delays occurred in the evenings (5:00-7:00 p.m.).

Figure C.2 Santa Teresa POE Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Figure C.3 Santa Teresa POE Share of 2010 Peak Delay by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Planned Transportation Improvements

In July 2010, the Santa Teresa POE received $10 million in American Recovery and Reinvestment Act (ARRA) funds. The funds will provide several improvements, including but not limited to expanding passenger vehicle lanes from two to five lanes, expanding commercial inspection lanes from two to three lanes, expanding passenger and commercial vehicle queuing, constructing a pedestrian sidewalk, and expanding pedestrian inspection areas.

C.2 Good Neighbor (Stanton Street) Bridge Profile

Photo: http://www.elpasoborderplan.org.

Table C.3 Summary of Bridge Characteristics
Good Neighbor (Stanton Street) Bridge

	Northbound	Southbound
Hours of Operation	6 a.m. to 12 a.m. M-F 10 a.m. to 12 a.m. Sat and Sun	24 hours per day
Structure(s)	Three-lane bridge primarily for southbound noncommercial traffic; dedicated northbound commuter lane	
Length	880 feet	
Toll	Noncommercial southbound access only; $2.50 vehicle, $0.50 pedestrian	
Type and Number of NB Booths Available	SENTRI (3)	
2010 Total Count	4,400 (two-way, all vehicles)	
2010 Percent Trucks (of counts)	0%	
2010 Peak Delay	Negligible	

Travel Demand

As indicated in Table C.4 below, the Good Neighbor (Stanton Street) Bridge POE included approximately 3,500 to 4,400 vehicles per direction in 2010. However, travel demand forecasts indicate that southbound trips are forecasted to be the

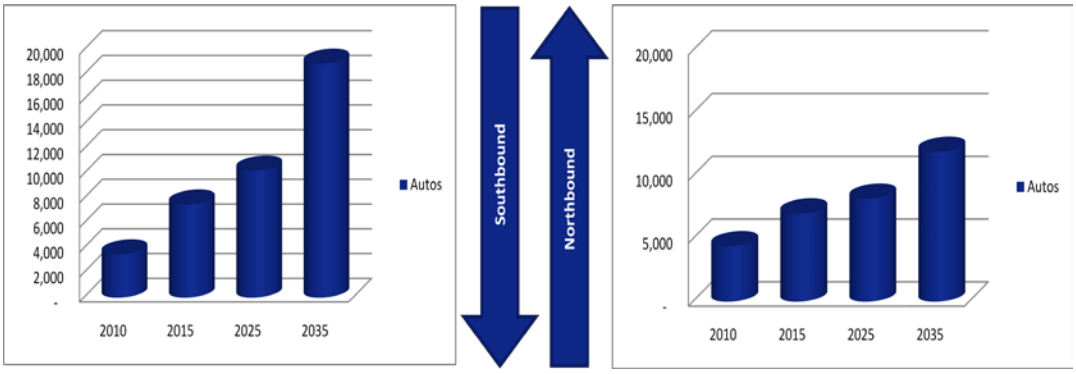
predominant movement in 2035 (see Figure C.4) as a result of only SENTRI lanes being provided in the northbound direction. There are no trucks in the base or future years at the Stanton Street POE as currently, only noncommercial access is provided.

Table C.4 Stanton Street POE Traffic Counts and Forecasts

		Adjusted		
Direction	2010 Count	2015	2025	2035
		Autos		
NB	4,400	7,009	8,188	11,924
SB	3,500	7,522	10,265	18,894
Total	7,900	14,531	18,453	30,818
		Trucks		
NB	–	–	–	–
SB	–	–	–	–
Total	–	–	–	–
		All Vehicles		
NB	4,400	7,009	8,188	11,924
SB	3,500	7,522	10,265	18,894
Total	7,900	14,531	18,453	30,818

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

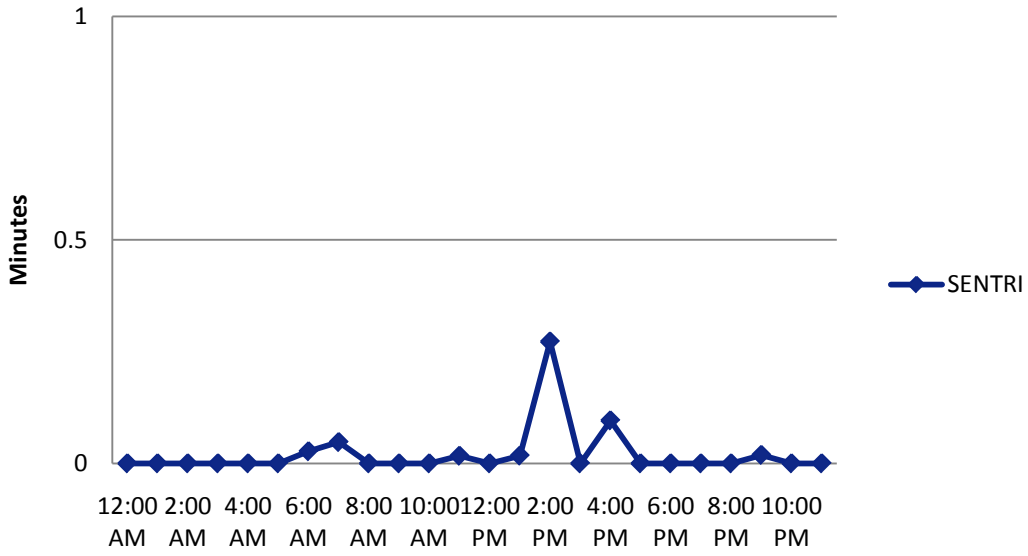
Figure C.4 Stanton Street POE Trips by Directions and Mode



Traffic Delays

As illustrated in Figure C.5, peak delay in 2010 was less than one minute for SENTRI lanes in the northbound direction. Delay data was not provided for the POV trips in the southbound direction.

Figure C.5 Stanton Street POE Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

C.3 Paso del Norte (PDN) Bridge Profile

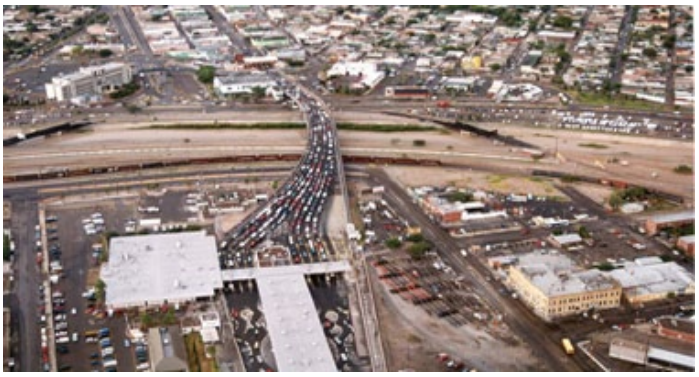


Photo: http://www.elpasoborderplan.org.

Table C.5 Summary of Bridge Characteristics
Paso del Norte Bridge

Hours of Operation	24 hours per day
Structure(s)	Four-lane bridge primarily for northbound noncommercial traffic; 1 southbound toll booth for pedestrians
Length	982 feet
Toll	$2.25 vehicle, $0.50 pedestrians
Type and Number of NB Booths Available	POV (11)

2010 Total Count	6,500 (two-way, all vehicles)
2010 Percent Trucks (of counts)	0%
2010 Peak Delay	41 min. (POV)

Travel Demand

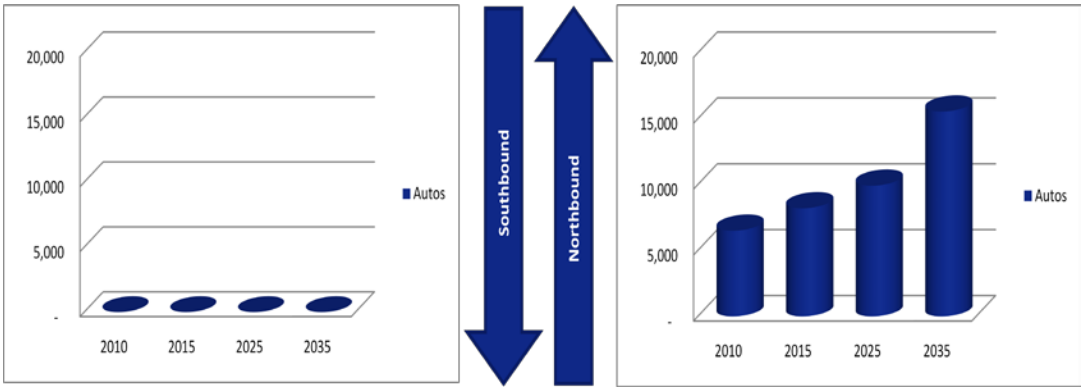
As indicated in Table C.6, the Paso Del Norte POE included approximately 6,500 autos in 2010 in the northbound direction. Only northbound access is provided at this POE, as illustrated in Figure C.6. Trips are expected to more than double between 2010 and 2035.

Table C.6 Paso Del Norte POE Traffic Counts and Forecasts

		Adjusted		
Direction	2010 Count	2015	2025	2035
		Autos		
NB	6,500	8,205	9,923	15,549
SB	–	–	–	–
Total	6,500	8,205	9,923	15,549
		Trucks		
NB	–	–	–	–
SB	–	–	–	–
Total	–	–	–	–
		All Vehicles		
NB	4,400	7,009	8,188	11,924
SB	3,500	7,522	10,265	18,894
Total	6,500	8,205	9,923	15,549

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

Figure C.6 Paso Del Norte POE Trips by Directions and Mode

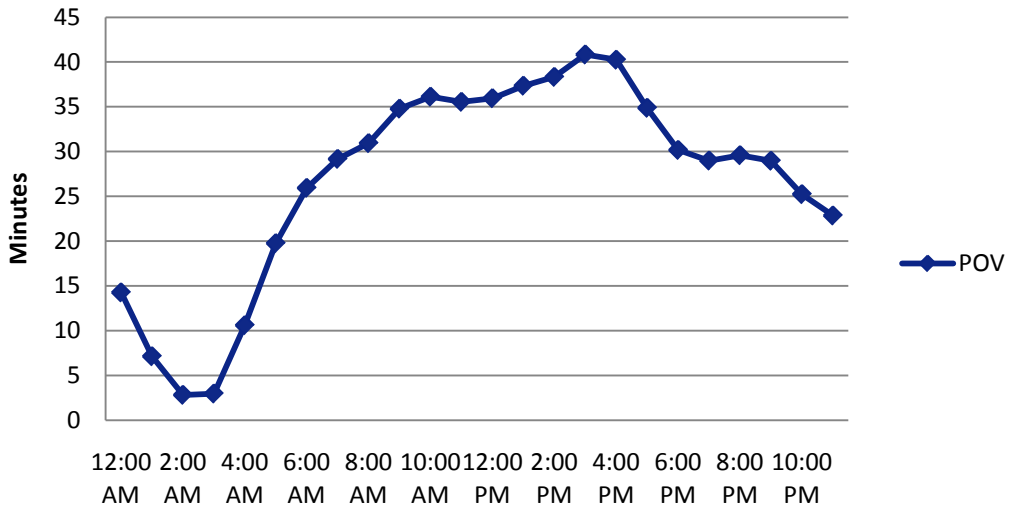


Traffic Delays

As illustrated in Figure C.7, only POV lanes are included in the northbound direction at the Paso Del Norte POE. Peak delays in 2010 ranged from less than 5

minutes to approximately 40 minutes. This POE is open 24/7 with peak delays during typical business hours.

Figure C.7 Paso Del Norte POE Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Planned Transportation Improvements

Approximately 14,000 to 16,000 pedestrians cross the Paso Del Norte Bridge per day with average wait times of 30 to 45 minutes with peak wait times upwards of 80 minutes (El Paso Times, December 3, 2010). In order to reduce wait times, pedestrian improvements are being made that will include pedestrian entering through three revolver doors with 52-inch televisions directing pedestrians to different lines. While in line, radio frequency scanners will be available to scan border-crossing cards prior to inspection. Construction began in December 2010 and is expected to last eight months (until summer 2011). Construction will take place late at night to reduce the impact to travelers.

C.4 Bridge of the Americas (BOTA) Profile

Photo: http://www.elpasoborderplan.org.

Table C.7 Summary of Bridge Characteristics
Bridge of the Americas (BOTA)

	Northbound		Southbound	
Hours of Operation	Passenger:	24 hours per day	Passenger:	24 hours per day
	Commercial:	8 a.m. to 6 p.m. M-F 6 a.m. to 2 p.m. Sat	Commercial:	8 a.m. to 8 p.m. cargo 8 a.m. to 11p.m. empties
Structure(s)	4 structures: Two two-lane commercial and two four-lane noncommercial			
Length	506 feet			
Toll	Free			
Type and Number of NB Booths Available	POV (14), Commercial (4), FAST (2)			
2010 Total Count	28,400 (two-way, all vehicles)			
2010 Percent Trucks (of counts)	10%			
2010 Peak Delay	40 min. (POV), 26 min. (Commercial), 14 min. (FAST)			

Travel Demand

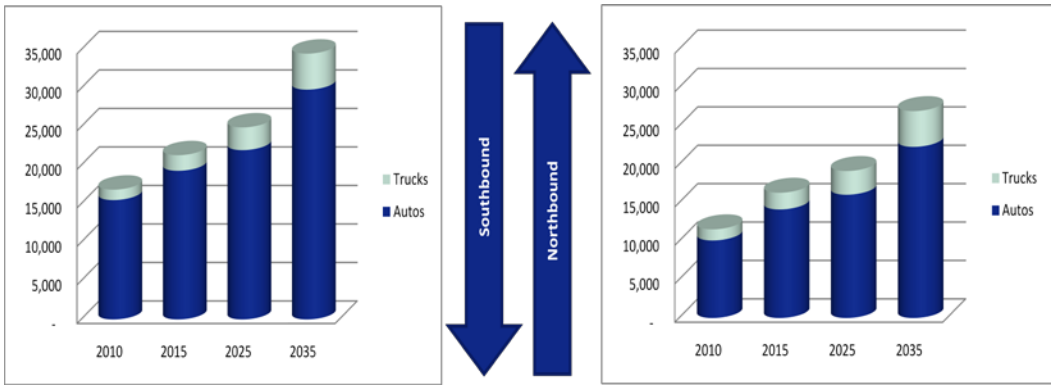
The BOTA POE has the highest northbound traffic volumes among the six POEs. As indicated in Table C.8 below, the BOTA POE included approximately 11,550 trips in 2010 in the northbound direction (28,400 total two-way). Southbound trips are expected to increase quicker than northbound trips, as illustrated in Figure C.8. Trips are expected to more than double between 2010 and 2035.

Table C.8 BOTA POE Traffic Counts and Forecasts

Direction	2010 Count	Adjusted 2015	Adjusted 2025	Adjusted 2035
		Autos		
NB	10,100	14,140	16,058	22,293
SB	15,500	19,299	21,985	29,838
Total	25,600	33,439	38,043	52,131
		Trucks		
NB	1,450	2,180	3,086	4,654
SB	1,350	2,026	2,951	4,671
Total	2,800	4,206	6,037	9,325
		All Vehicles		
NB	11,550	16,320	19,144	26,947
SB	16,850	21,325	24,936	34,509
Total	28,400	37,645	44,080	61,456

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

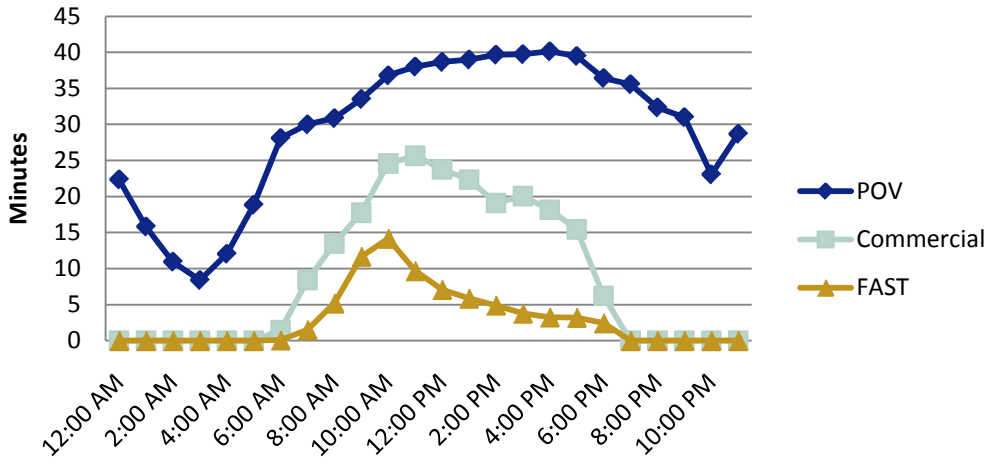
Figure C.8 BOTA POE Trips by Directions and Mode



Traffic Delays

As illustrated in Figure 12, POV, Commercial, and FAST lanes are included in the northbound direction at the BOTA POE. Peak delays in 2010 for Commercial and FAST lanes occurred during the late morning or midday, whereas peak delays for the POV lanes occurred steadily between 8 a.m. and 9 p.m. This difference in delays is explained by the fact that commercial and FAST lanes are only open from 6 a.m. to 6 p.m. Monday through Friday, and 6 a.m. to 2:00 p.m. Saturday, whereas POV lanes are open 24/7. All three lane types included 2010 peak delays below 45 minutes, with commercial lanes peaking at approximately 25 minutes, FAST lanes peaking at almost 15 minutes, and POV lanes peaking at approximately 40 minutes of delay.

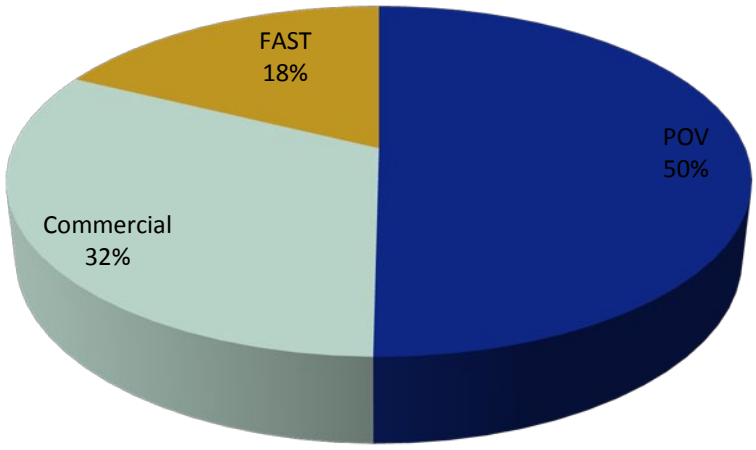
Figure C.9 BOTA POE Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Although 13 percent of total northbound trips were attributed to trucks in 2010, 32 percent of the 2010 peak delay occurred in Commercial lanes and another 18 percent in FAST lanes (see Figure C.10). This results in half the delay attributed to trucks in 2010, indicating that the truck delay is not proportionate to the truck trips. As a result, scenarios to be evaluated at the BOTA POE should include measures to reduce truck delays in Commercial and FAST lanes. One of the scenarios to be evaluated at the BOTA POE will be extending the commercial vehicle hours of operation.

Figure C.10 POE Share of 2010 Peak Delay by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

C.5 Ysleta Port (Zaragoza Bridge) Profile

Photo: www.elpasoborderplan.org.

Table C.9 Summary of Bridge Characteristics
Ysleta Port (Zaragoza Bridge)

	Northbound	Southbound
Hours of Operation	Passenger: 24 hours per day Commercial: 6 a.m. to 12 a.m. M-F 8 a.m. to 4 p.m. Sat	Passenger: 24 hours per day Commercial: 6 a.m. to 11 p.m.
Structure(s)	Two structures; four-lane commercial bridge and five-lane noncommercial bridge	
Length	804 feet	
Toll	Fare for all southbound and northbound traffic; POV $3.50, Commercial vehicle $3.50 per axle, Pedestrians $0.50	
Type and Number of NB Booths Available	POV (10), Commercial (6), FAST (2), SENTRI (2)	
2010 Total Count	17,200 (two-way, all vehicles)	
2010 Percent Trucks (of counts)	15%	
2010 Peak Delay	41 min. (POV), 12 min. (Commercial), 8 min. (FAST), <1 min. (SENTRI)	

Travel Demand

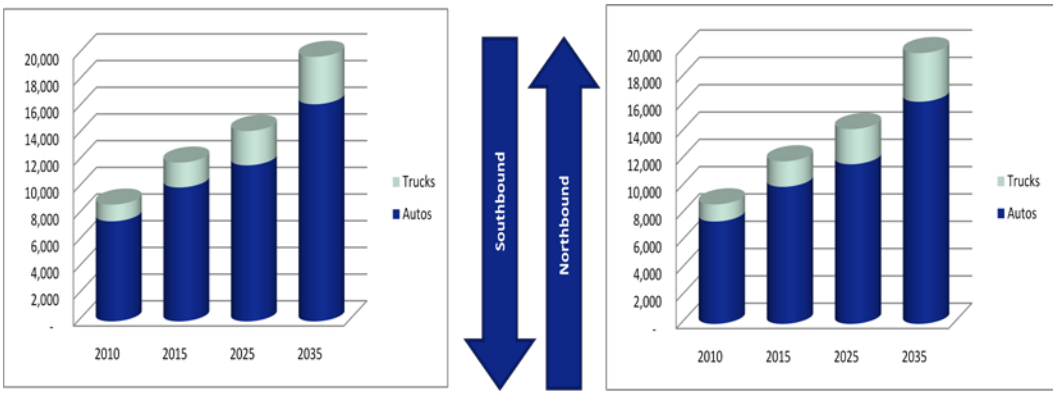
As indicated in Table C.10, approximately 17,200 vehicles per day currently cross the border at the Zaragoza Bridge. The Zaragoza POE has the second highest northbound traffic volumes among the six POEs and is expected to more than double the number of trips between 2010 and 2035. As illustrated in Figure C.11, southbound and northbound trips are expected to grow at a similar pace between 2010 and 2035.

Table C.10 Zaragoza POE Traffic Counts and Forecasts

Direction	2010 Count	Adjusted 2015	Adjusted 2025	Adjusted 2035
		Autos		
NB	7,200	9,155	10,485	13,987
SB	7,500	10,039	11,696	16,271
Total	14,700	19,194	22,181	30,258
		Trucks		
NB	1,250	1,873	2,499	3,480
SB	1,250	1,862	2,571	3,556
Total	2,500	3,735	5,070	7,036
		All Vehicles		
NB	8,450	11,028	12,984	17,467
SB	8,750	11,901	14,267	19,827
Total	17,200	22,929	27,251	37,294

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

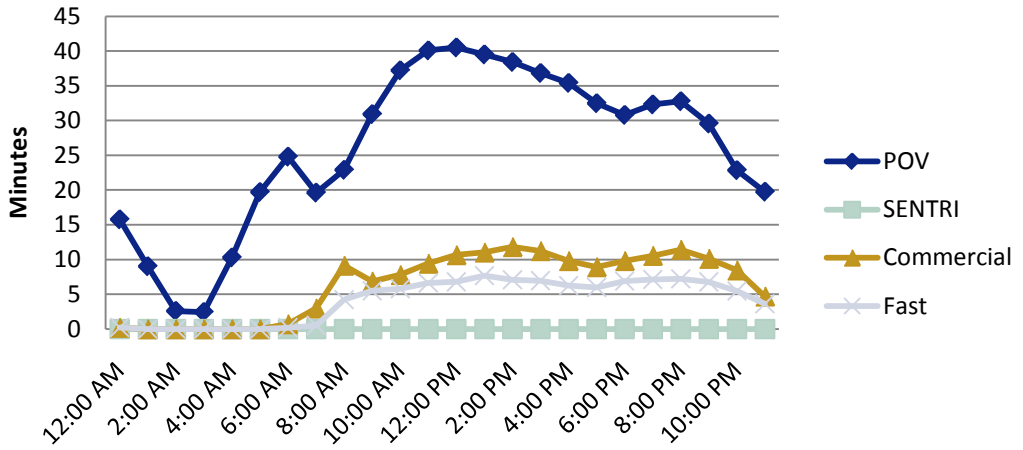
Figure C.11 Zaragoza POE Trips by Directions and Mode



Traffic Delays

As illustrated in Figure C.12, all four lane types (POV, SENTRI, Commercial, and FAST lanes) are included in the northbound direction at the Zaragoza POE. Peak delays in 2010 for FAST lanes were less than one minute. However, POV lanes peaked at just over 40 minutes, with Commercial and FAST lanes peaking at 12 and 8 minutes, respectively. Commercial and FAST lanes had a relatively consistent delay throughout the commercial vehicle hours of operation, whereas POV lanes peaked between 9 a.m. and 9 p.m. with at least a 30-minute delay.

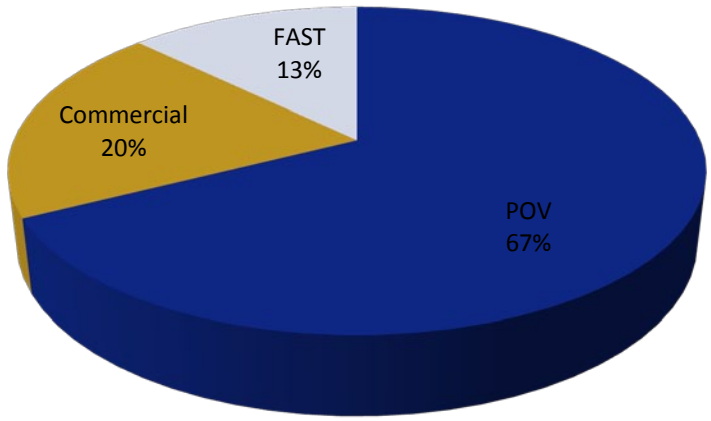
Figure C.12 Zaragoza POE Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Although 15 percent of total northbound trips were attributed to trucks in 2010, 20 percent of the 2010 peak delay occurred in Commercial lanes and another 13 percent in FAST lanes (see Figure C.13). This results in one third of the delay attributed to trucks in 2010, indicating that the truck delay is not proportionate to the truck trips. As a result, scenarios to be evaluated at the Zaragoza POE should include measures to reduce truck delays in Commercial and FAST lanes. One of the scenarios to be evaluated at the Zaragoza POE will be extending the commercial vehicle hours of operation.

Figure C.13 Zaragoza POE Share of 2010 Peak Delay by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

Planned Transportation Improvements

In December 2010, the "Ready Lane" 90-day pilot program began at the Zaragoza Bridge. Travelers with Western Hemisphere Travel Initiative (WHTI) Radio Frequency Identification (RFID) technology-enabled documents, which include the U.S. Passport card, the new legal permanent resident "green card," and the new Border Crossing Card, will be able to use the two ready lanes during 6 a.m. and 10 p.m. CBP officials expect a 25 percent reduction in wait times as a result (El Paso Times, December 19, 2010).

C.6 Fabens-Caseta Bridge Profile

Photo: http://www.elpasoborderplan.org.

Table C.11 Summary of Bridge Characteristics
Fabens-Caseta Bridge

Hours of Operation	6 a.m. to 10 p.m. M-Sun
Structure(s)	Two-lane bridge for northbound and southbound POV and light truck traffic
Length	510 feet
Toll	Free
Type and Number of NB Booths Available	POV (2)
2010 Total Count	1,500 (two-way, all vehicles)
2010 Percent Trucks (of counts)	0%
2010 Peak Delay	6 a.m. to 10 p.m. M-Sun

Travel Demand

As indicated in Table C.12, approximately 1,500 vehicles per day currently cross the border at the Fabens Bridge. The Fabens POE has the lowest northbound traffic volumes among the six POEs. However, it is expected to more than triple

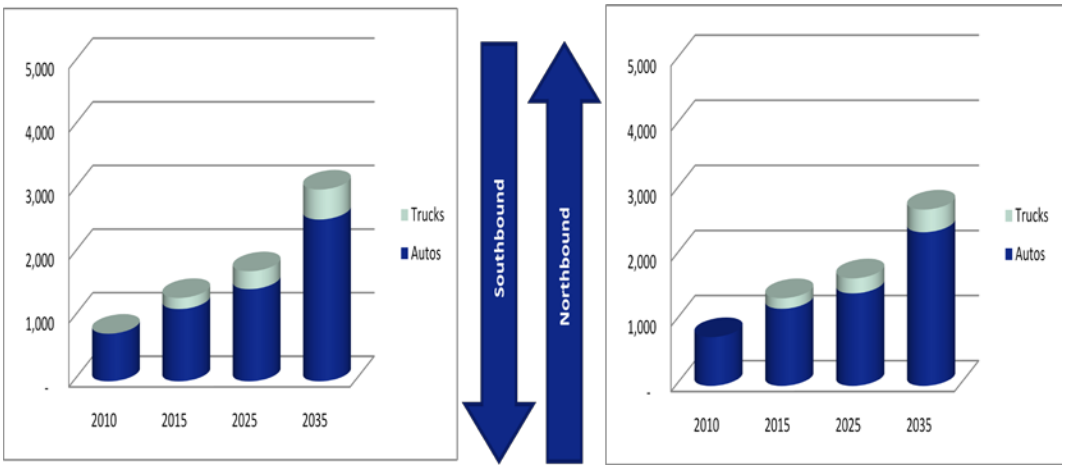
the number of trips between 2010 and 2035 as the POE. As illustrated in Figure C.14, southbound and northbound trips are expected to grow at a similar pace between 2010 and 2035.

Table C.12 Fabens-Caseta Traffic Counts and Forecasts

		Adjusted		
Direction	2010 Count	2015	2025	2035
		Autos		
NB	750	1,186	1,422	2,362
SB	750	1,137	1,451	2,545
Total	1,500	2,323	2,873	4,907
		Trucks		
NB		161	230	346
SB		174	280	471
Total		335	510	817
		All Vehicles		
NB	7,50	1,347	1,652	2,708
SB	7,50	1,311	1,731	3,016
Total	1,500	2,658	3,383	5,724

Source: U.S. Customs and Border Protection with Cambridge Systematics forecasts

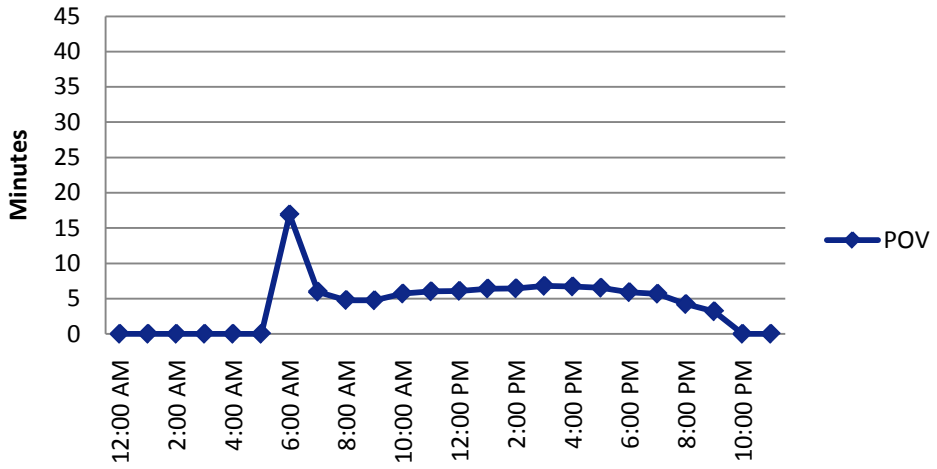
Figure C.14 Fabens-Caseta POE Trips by Directions and Mode



Traffic Delays

As illustrated in Figure C.15, only POV lanes are open in the northbound direction at the Fabens POE. Delays in 2010 were minimal within these POV lanes with a peak of 17 minutes at 6 a.m.

Figure C.15 Fabens-Caseta Average Hourly Delay in 2010 by Lane Type



Source: U.S. Customs and Border Protection with Cambridge Systematics calculations.

D. Commodity Flow and Socioeconomic Profile Technical Memorandum

D.1 Operational Overview

It is important to understand border crossing operational characteristics in the region, particularly as they relate to freight and cross-border trucking. While passenger and pedestrian movements in the area are well-documented – people routinely cross the border to work, shop, or visit friends and family – commercial operations are more complex and interconnected, and can have more significant impacts on the regional transportation system away from the border. After defining the study region, this section describes the maquiladora industry (which impacts cross-border trucking) and the operational characteristics of the regional truck fleet.

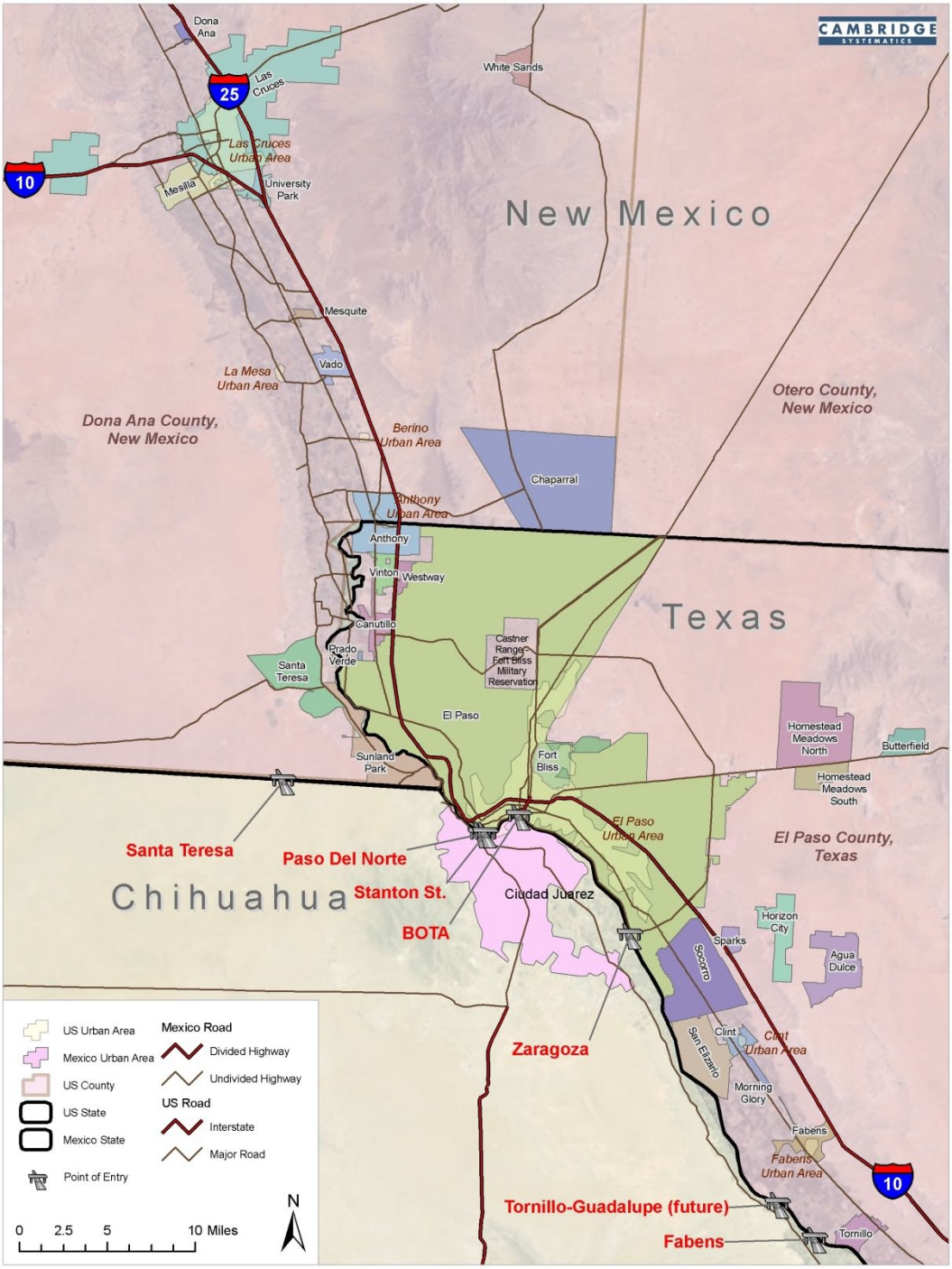
Study Area

Our study area includes El Paso County, Texas; Doña Ana County, New Mexico; and the Mexican State of Chihuahua, as shown below in Figure D.1.1. The study area encompasses the El Paso and Las Cruces metropolitan areas as well as Ciudad Juárez. We focus on six international POEs in this region:

- **Santa Teresa POE** is located in Doña Ana County, NM just west of Sunland Park. The POE is connected to I-10 via the Pete Domenici Highway.
- **The Bridge of the Americas** is the primary POE in the El Paso region, handling more than half of all international crossing traffic (passenger and commercial).[1] The bridge connects to U.S. 62 (Paisano Drive) and I-10 via I-110.
- **Paso del Norte International Bridge** handles northbound automobile traffic and northbound and southbound pedestrian traffic. It connects to U.S. 85 via El Paso Street and Santa Fe Street.
- **Stanton Street Bridge** lies just east of the Paso del Norte Bridge. It handles mostly southbound vehicular traffic but has one northbound Dedicated Commuter Lane.

[1] Texas Department of Transportation and RJ Rivera Associates, *Border Crossing Travel Time Study*, June 2008.

Figure D.1.1 Study Region



- **Ysleta-Zaragoza POE** is located in eastern El Paso. It connects to I-10 via State Highway 375 (North Americas Avenue).
- **Fabens-Caseta International Bridge** is a small, light-duty bridge originally constructed in 1938. It connects to I-10 via FM 1109, Texas 20, FM 76, and FM 793.[2]

The Bridge of the Americas, Ysleta-Zaragoza, and Santa Teresa crossings all handle commercial traffic in addition to passenger vehicles and pedestrians. Paso del Norte, Stanton Street, and Fabens-Caseta handle passenger/pedestrian movements only.[3]

The Maquiladora Industry

A critical component of the economy on both sides of the border is the maquiladora industry. Maquiladoras are foreign-owned assembly plants operating in Mexico. They also are known as maquilas, twin plants, and in-bond plants. Ordinarily, a maquiladora will import production inputs from a foreign country (usually the United States), process them, and then re-export them to the country of origin for further processing and/or distribution. The maquiladora's role may be the assembly of temporarily imported parts which are then re-exported for final assembly, or it could be the complete manufacture of a product using materials from all over the world. Although most maquilas are U.S.-owned, they do not have to be – firms from any nation are permitted to operate under the program. Shippers enjoy several advantages under this arrangement:

- **Favorable Tax Treatment –** Maquiladoras may import production materials and the machinery or equipment used to process them into Mexico without paying import tariffs. In addition, shippers typically only pay import duties on the value added by the Mexican manufacturing operation when the product is re-exported.
- **Low Labor Costs –** Firms operating maquiladoras benefit from Mexico's relatively low wages, as compared to wages for similar jobs in the United States. In 2007, for instance, the average hourly compensation for manufacturing workers in Mexico was $3.91, compared to $30.56 in the United States.[4]

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[2] A replacement bridge is currently under construction in Tornillo and will be complete by 2012. Once the new bridge is complete, the Fabens-Caseta International Bridge will be demolished. A more detailed description of the new facility is provided in Section 5.4.

[3] A comprehensive description of regional passenger and freight infrastructure will be provided in a separate technical memorandum developed by UTEP.

[4] U.S. Department of Labor, Bureau of Labor Statistics, March 2009.

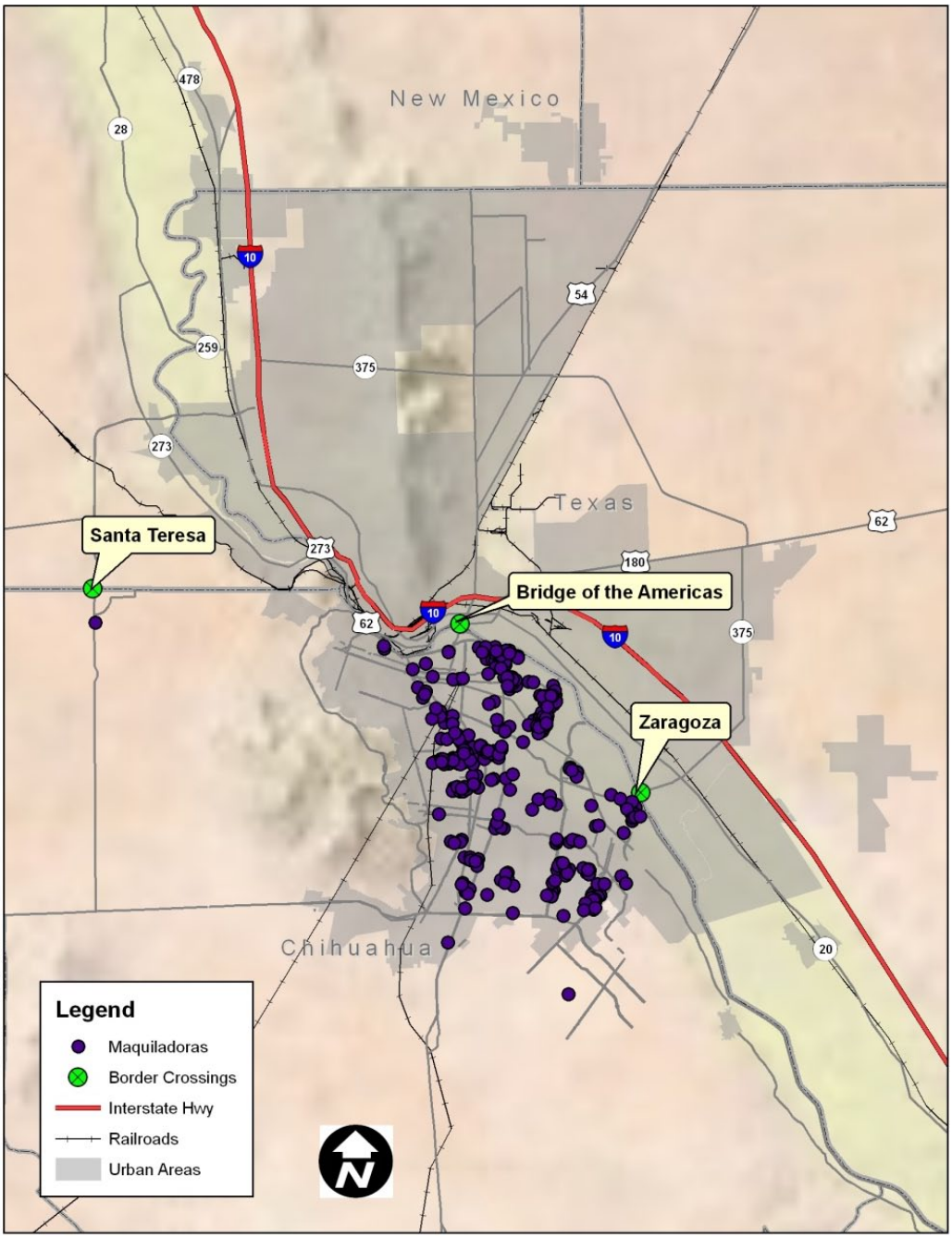
- **Reduced Shipping Costs –** Due to their close proximity to the U.S. market, freight costs for shipments to and from maquilas are minimal as compared to shipping to and from overseas locations.[5] Getting goods through customs on the U.S./Mexican border also is usually easier compared to many overseas locations, such as Asia.
- **Opportunities to Sell into the Mexican Market –** Normally, maquiladoras are required to export everything they produce. However, maquilas may sell some of their products into the Mexican market if they obtain the appropriate permits. This opens up new markets to firms operating twin plants in Mexico.

The benefits of maquiladora production can generate significant savings (or, potentially, new earnings) for multinational corporations. As a result, maquila industries have concentrated in border regions over the years. The State of Chihuahua has nearly 500 maquiladoras, the third highest among Mexican states, and there are more maquila jobs in Juárez (over 190,000) than any other border city.[6] The majority of these plants (approximately 350) are located in Ciudad Juárez, as shown in Figure D.1.2. Twin plants are scattered throughout the city, but are concentrated most heavily in designated industrial zones which are generally bounded by the BOTA and Zaragoza crossings.

[5] With a few exceptions, maquilas may be located anywhere in Mexico, but are most concentrated on or near the border to take advantage of lower shipping costs.

[6] El Paso Regional Economic Development Corporation.

Figure D.1.2 Maquiladoras in Ciudad Juárez



El Paso benefits from the maquila industry in several ways:[7]

- Companies operating twin plants in Juárez often require transportation and customs services from firms based in El Paso;
- Maquila operators also usually have distribution facilities and/or administrative offices on the U.S. side, thus stimulating the industrial real estate sector and providing employment for El Paso area residents;
- Maquila suppliers often will locate or expand in El Paso to be close to their customers across the border, which stimulates domestic manufacturing and provides high-skill, high-wage jobs to El Pasoans;
- Maquilas require the same legal, accounting, and financial services as other firms do, and these services are most often provided by white-collar professionals on the U.S. side; and
- Hotels, car rental agencies, and restaurants in El Paso also benefit since business travelers visiting the maquilas typically stay on the U.S. side.[8]

These benefits are illustrated by the following case study.

Case Study: Delphi Corporation

Delphi Corporation is a leading global supplier of automotive parts and components headquartered in Troy, MI. The company maintains facilities in 30 countries and employs nearly 150,000 people worldwide, and 42,000 in Mexico alone. Delphi has a significant presence in Juárez, with its Mexico Technical Center, 8 manufacturing sites, and a total of 12,000 employees.

Delphi's Juárez operations have significant benefits for the El Paso Region:

- Delphi employs 200 technical support personnel who come from all over the U.S., all of whom live in El Paso;
- Many El Paso residents work at the Juárez sites. These jobs tend to be high-paying, including engineering and management professions;
- Delphi employees that own homes in El Paso pay local property taxes which average about $4,000 annually;
- Thousands of suppliers and others who visit the Juárez sites each year spend an average of $200 per day at El Paso restaurants and hotels; and
- Delphi maintains a warehouse/distribution center in El Paso, providing additional jobs on the U.S. side.

Delphi makes extensive use of El Paso's Ports of Entry to support these operations. Currently about 700 northbound trucks per week cross the El Paso/Juárez bridges, amounting to around 35,000 trucks per year.

Source: Delphi Corporation.

[7] Note that a comprehensive assessment of the economic impact of the border will be provided in a separate technical memorandum.

[8] Vargas, L. *Maquiladoras: Impact on Texas Border Cities*. The Border Economy. Federal Reserve Bank of Dallas, June 2001.

Truck Operations

Due to the presence of the maquila industry, truck operations are of particular importance to the borderplex. Trucks/fleets in the El Paso region generally fall into one of two operational categories:

- **Drayage trucks**[9] provide short-haul transportation of goods (usually in intermodal containers) across the border, for example between a maquiladora on the Mexican side and a truck terminal on the U.S. side;
- **Long-haul trucks** are the over-the-road haulers that transport goods to their final destination, usually on a contract basis; for instance a long-haul truck may pick up a container dropped off by a drayage operator and transport it to a consignee.

Within each category, some trucks are owner-operated, others are company owned, and still others are offered for hire by third party logistics firms (3PL). Regardless of ownership, the operational characteristics of trucks in the borderplex have important implications for POE operations.

When the North American Free Trade Agreement (NAFTA) went into effect in 1994, one of its key provisions was the establishment of a border commercial zone along the U.S.-Mexico border by 1995. Figure D.1.3 illustrates the border commercial zone. In the El Paso region, the commercial zone includes the area within 20 miles of the El Paso POEs and all of Doña Ana County. Mexican trucks are permitted to operate within this zone to facilitate efficient cross-border freight movement.[10]

One effect of the border commercial zone is that cross-border truck moves between Juárez and El Paso are typically accomplished using short-haul drayage operators. Dray trucks are hired to transport loaded trailers across the border where long-haul trucks pick them up for final delivery to inland markets. Long-haul moves from Mexico's interior may involve up to three trucks – a Mexican long-haul truck to bring a load to the border, a Mexican drayage truck to haul it across, and finally a U.S. truck to pick it up for delivery. Maquiladora operators, meanwhile, require constant back-and-forth deliveries across the border for supplies and finished product.

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[9] "Drayage" moves are short-distance freight movements completed as part of a longer overall move.

[10] NAFTA also called for complete access to all U.S. states for Mexican trucks by 2000, but this was never implemented due to opposition from U.S. labor unions and truck owner-operators. Instead, a smaller pilot program involving 100 Mexican trucks was established, but funding for the program was cut off in early 2009, leading to an ongoing trade dispute between the United States and Mexico.

Figure D.1.3 U.S.-Mexico Border Commercial Zone

Source: Federal Motor Carrier Safety Administration.

The border commercial zone and the maquila industry have significant impacts on how goods move in the El Paso region, particularly as compared to other border cities such as Detroit (which lies across the Canadian border from Windsor, Ontario). There is no similar commercial zone on the Canadian border, so in Detroit approximately 80 percent of the cross border truck trips are long distance (i.e., have origins and/or destinations outside the Detroit/Windsor area) and 50 percent are "through movements" to and from interior Canadian and U.S. locations (i.e., they originate and terminate outside of Detroit/ Windsor).[11] By contrast, commercial crossings in the El Paso region are primarily local-to-local drayage movements, with the average truck making four to six individual crossings (two to three round trips) per day, often using more than one crossing on inbound and outbound trips. This kind of operation is markedly different than Detroit and can present different types of operational and management issues.

This reliance on dray fleets has important implications for border commerce, and therefore POE operations. In particular, the number of truck turns (pickups and deliveries) per day is critical for both shippers and truck operators. Delays at border crossings translate into fewer truck turns and therefore potentially lost revenue. Conversely, improving border crossing operational efficiency may make it possible for companies to make more deliveries each day, thereby increasing revenues. The number of turns per day also is crucial for drayage truck drivers since they are typically paid on a per load basis rather than by the hour. The following case study provides an example of a "typical" drayage operation.

[11] Detroit River International Crossing Study Final Environmental Impact Statement.

Case Study: Ryder Supply Chain Solutions

Ryder Supply Chain Solutions' Cross Border Group specializes in helping companies manage their product flows from Mexico-based manufacturing and distribution facilities to final destinations throughout North America. The company performs approximately 1,000 border crossings per week between El Paso and Juarez, mostly for Delphi or Hewlett Packard.

A typical day for one truck consists of the following activities:

- The driver inspects his rig, which has been parked overnight at a truck terminal in Juarez, when he arrives in the morning;
- Dispatch provides the driver with his routes for that day, which are planned out a week in advance;
- The driver arrives at a Mexican plant, goes through security, obtains the appropriate Customs paperwork, and picks up his load;
- The driver proceeds to the appropriate border crossing and waits to clear Customs;
- Typically, the truck is already approved to cross via the FAST program, though some trucks do get randomly inspected;
- Once the truck has cleared Customs, it proceeds to the Texas Department of Public Safety booth for a safety inspection; and
- The driver proceeds to the cargo drop-off point on the U.S. side, picks up a load bound for Juarez, and then repeats the process, until a shift change occurs or the commercial POEs close for the night.

On average, Ryder's trucks complete five to six trips per day, or about three turns total. Anything more than six trips is considered to be a good day; less than five is a bad day. Common causes of delay include accidents, manufacturing rushes to meet holiday demand, limited number of open inspection lanes, bomb threats, drug busts, and computer system problems at CBP or the Aduana (Mexican Customs).

Ryder measures fleet performance using several key metrics including number of border crossings per day and per shift, on-time performance, fuel use, and driver check-in at cargo pick-up, drop-off, and other key points. Operational conditions at El Paso Ports of Entry have a direct impact on several of these measures, including number of crossings, timeliness of deliveries, and fuel usage.

D.2 Existing Socioeconomic, Population, and Industry Characteristics

To a large extent, a region's socioeconomic and industrial makeup determine its travel patterns. In the El Paso/Juárez region, many residents commute across the border daily to shop, receive medical services, attend school, or work. The ports of entry also serve as key gateways for international trade. As a result, population levels and industrial activity on both sides of the border are key indicators of travel demand, including the demand for cross-border travel. This section describes the region's population, socioeconomic, industry, and other characteristics.

Socioeconomic Characteristics

Population

The El Paso-Juárez region had an estimated population of 2.1 million in 2009.[12] This makes the region the largest metropolitan area on the U.S.-Mexico border, with about the same population as the City of Houston, the nation's fourth largest city.[13] Of this binational total, El Paso accounts for approximately 35 percent.

Population in El Paso County[14] and Ciudad Juárez has been growing steadily for the past several decades. The population of this border region has grown from approximately 785,000 in 1970 to 2.1 million in 2009, representing a 175 percent increase (Figure D.2.1). The development of the maquila industry in Ciudad Juárez started in the 1970s and since then has attracted steady volumes of domestic migration from the central and southern regions of Mexico to take advantage of the employment opportunities provided by the maquilas. Since then, the population of Ciudad Juárez has surpassed El Paso's population. Accordingly, El Paso has become an important supplier of services and materials to the maquila industry. As a result, international migration, primarily from Mexico, has been a strong factor in El Paso's population growth since 1970.

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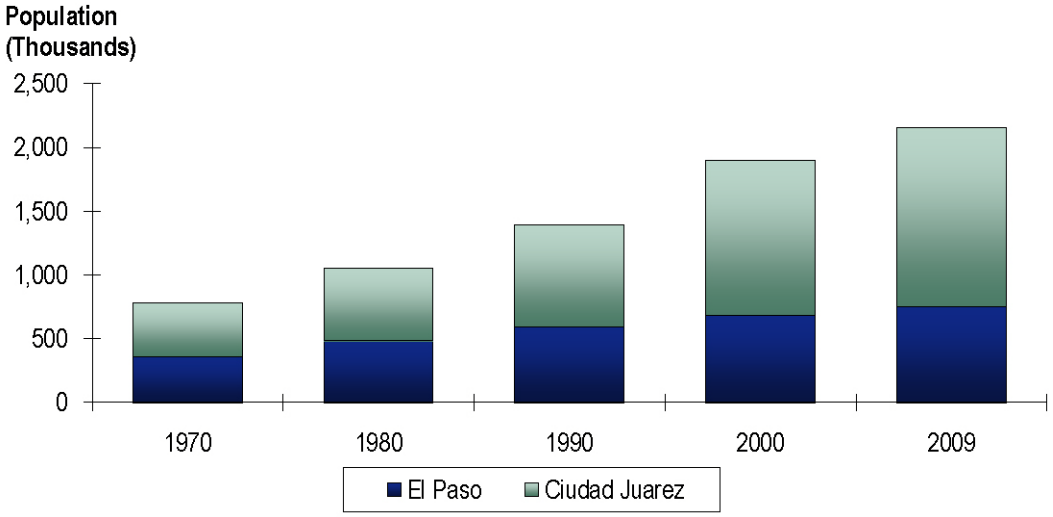
[12] University of Texas at El Paso (UTEP) Borderplex Economic Outlook: 2009-2011, December 2009.

[13] Houston population estimates for 2009 are 2.3 million according to the *Estimates of the Total Populations of Counties and Places in Texas for July 1, 2008 and January 1, 2009* published by the Texas State Data Center.

[14] In this report, unless otherwise specified, the term El Paso refers to El Paso County, rather than the City of El Paso or the El Paso Urbanized Area.

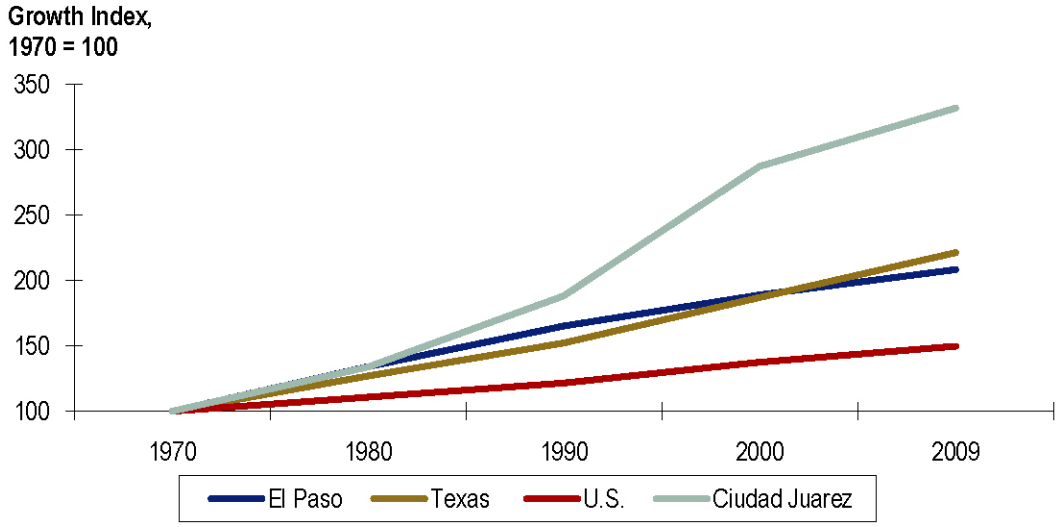
Between 1970 and 2009, the population of El Paso County grew by about 108 percent from just over 360,000 to 751,500. During this time Texas experienced an increase of over 117 percent, while the U.S. population grew by about 48 percent. Clearly, El Paso County has shared in Texas' overall population growth, which grew twice as fast as the U.S. as a whole. Ciudad Juárez's population growth has been more pointed, growing over 230 percent between 1970 and 2009, also outpacing the growth of Mexico (109 percent) by double. These figures suggest that over the last three decades, the El Paso-Juárez region has had exceptional population growth when compared to overall state and national growth (see Figure D.2.2).

Figure D.2.1 El Paso and Ciudad Juárez Population
1970 to 2009



Source: UTEP Border Region Modeling Project.

Figure D.2.2 Population Growth
1970 to 2009



Sources: U.S. Census and UTEP Border Region Modeling Project.

Per Capita Income

Per capita income measures the amount of wealth per person in a region and is therefore a barometer of consumers' spending power, correlated to the type and quantity of goods purchased as well as general demand for mobility. Growth in per capita income usually translates into additional freight demand to supply a regional market and increased passenger demand, as well. Comparing a city's per capita income to the national average or other metropolitan areas provides a good measure of its relative economic welfare and progress over time. Historically, El Paso per capita income has lagged behind that of Texas and the rest of the nation. In 2008, it stood at $28,071 per year, which was 70 percent of the nation's level, 74 percent of Texas', and 84 percent of New Mexico's (Figure D.2.3). One the reason for this, as observed by the Federal Reserve Bank of Dallas, is that El Paso jobs are concentrated in low-wage occupations, and these jobs pay poorly compared with similar jobs in cities of comparable size and geography, with cost of living having little effect.[15]

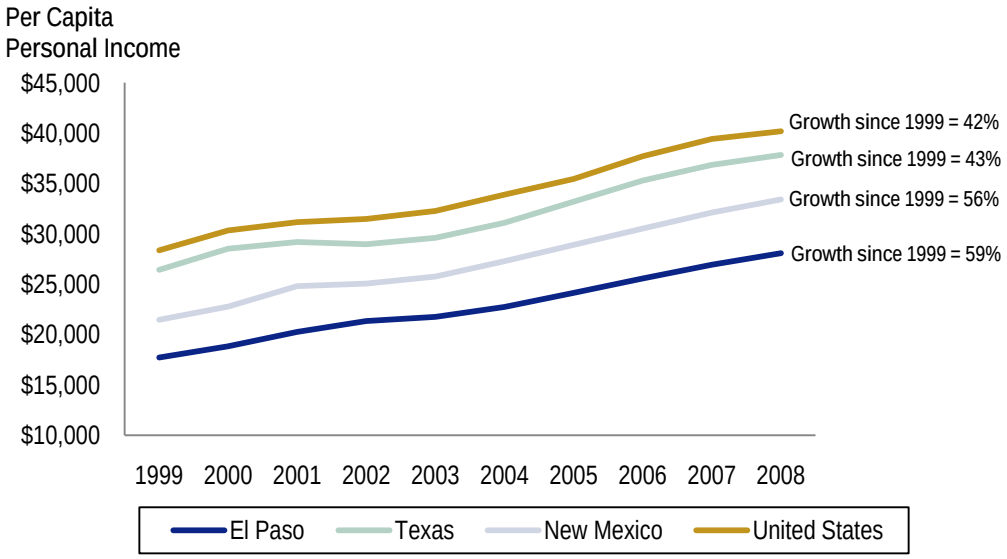
Looking at the trends over the last 10 years (Figure D.2.3), the per capita income in El Paso has been growing slightly faster than those of Texas, New Mexico, and the nation as a whole. Between 1999 and 2008, per capita income in El Paso grew by 59 percent, compared to 42 percent for the nation, 43 percent for Texas, and 56

[15] Article titled "Low-wage occupations remain a hallmark of El Paso Economy" in Crossroads Newsletter Issue 1, Federal Reserve Bank of Dallas, El Paso Branch, 2007.

http://www.dallasfed.org/research/crossroads/2007/cross0701a.pdf (last accessed in October 2010)

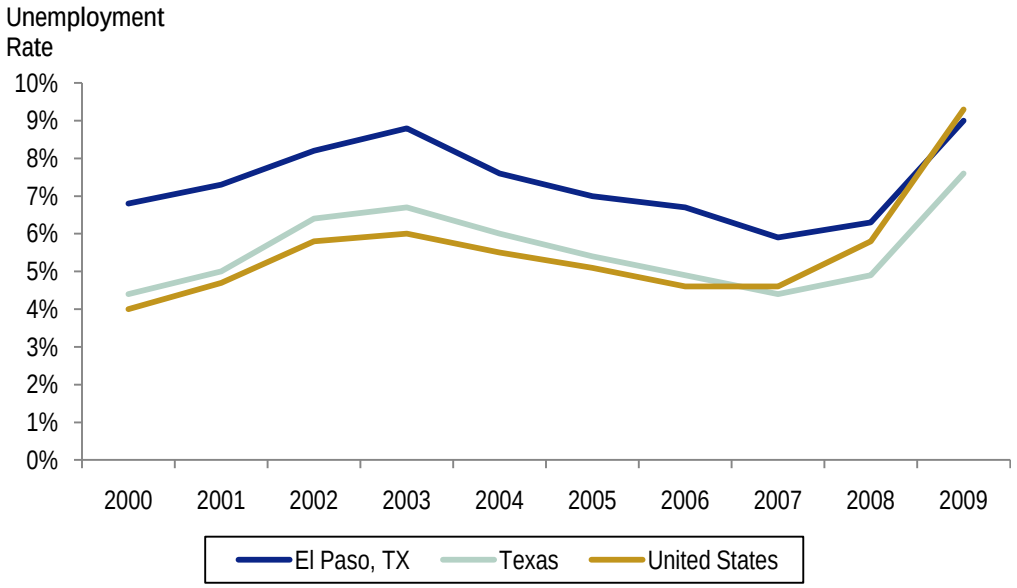
percent for New Mexico. This may be attributed to a closing gap in unemployment rates between El Paso and the U.S. (Figure D.2.4) rather than rising wage rates in El Paso. Overall, El Paso's progress remains slow in closing the per capita income gap between itself and the rest of the state and the nation

Figure D.2.3 El Paso per Capita Income
1999 to 2008



Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce.

Figure D.2.4 El Paso Unemployment Rate
2000 to 2009



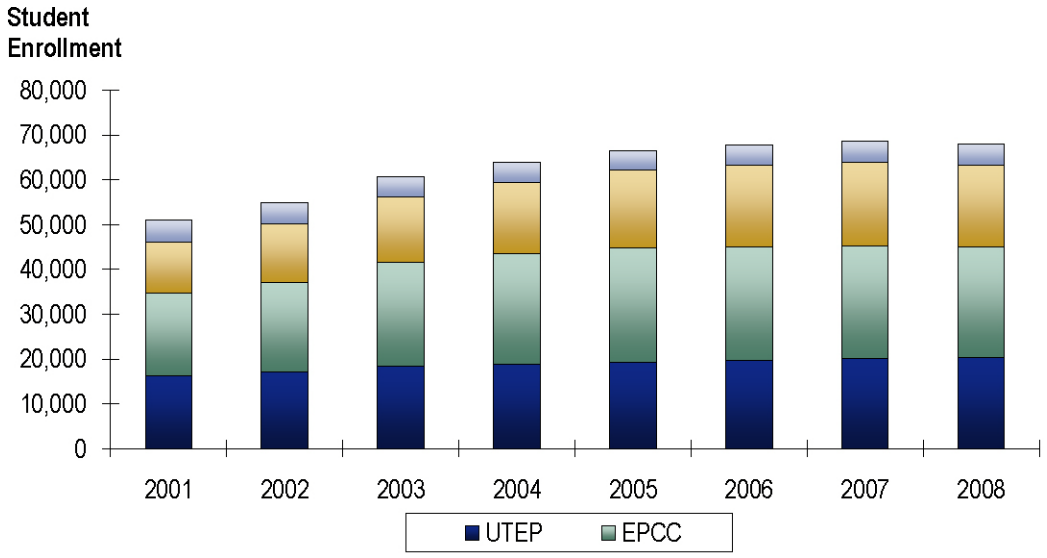
Source: Unemployment (LAUS) for El Paso MSA, Texas, and U.S.: not seasonally adjusted (2000-2009). Texas Workforce Commission's Texas Labor Market. www.Tracer2.com. (Last accessed in October 2010.)

College/University Enrollment

The level of enrollment levels in postsecondary educational programs in the region of El Paso as well as Ciudad Juárez play an important role in securing stronger border-region jobs and income performance.[16] Many of these jobs require frequent cross-border travel (e.g., a maquila manager who works in Juárez but lives in El Paso). Collectively, the El Paso/Juárez region has 18 postsecondary education institutions. Between 2001 and 2008, El Paso's postsecondary enrollment at its main university, University of Texas at El Paso (UTEP), grew 26 percent while its main community college, El Paso Community College (EPCC), has grown 32 percent from a total of 34,750 students to about 45,000 students when combined (Figure D.2.5). The Universidad Autónoma de Ciudad Juárez (UACJ) has increased its enrollment 61.5 percent between 2001 and 2008 while the Instituto Tecnológico Regional de Ciudad Juárez (ITRCJ) has slightly decreased 3.9 percent during the same period (see Figure D.2.5). Together, these four main universities and colleges accounted for over 68,000 students in the El Paso/Juárez region in 2008.

[16] University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

Figure D.2.5 El Paso and Ciudad Juárez College/University Enrollment Trends
2001 to 2008



Source: University of Texas at El Paso (UTEP) Borderplex Economic Outlook: 2009 to 2011, December 2009.

Industry Characteristics

Gross Regional Product

Gross Regional Product (GRP) is a measure of a region's economic output and growth over time, which directly impacts demand for freight transportation (virtually all goods must be shipped) and passenger transportation (a growing economy attracts workers, which translates into additional travel demand). In 2008, El Paso County's GRP stood at $21.4 billion in chained 2001 dollars.[17] Across the border, total output for the State of Chihuahua was about Mex$267 billion.[18] Comprehensive GRP data are not available for Ciudad Juárez, but it was estimated to be about $10.6 billion U.S. dollars in 2007, which means that Juárez accounted for about 43 percent of total economic output in Chihuahua that year.[19]

This economic output is spread across a variety of industries, as shown in Figure D.2.6 and Figure D.2.7. Most of El Paso's economic base is in services

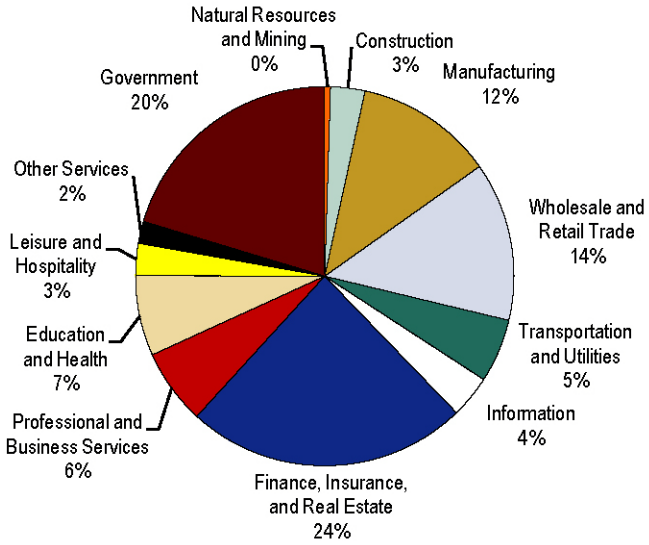
[17] U.S. Bureau of Economic Analysis.

[18] Instituto Nacional de Geografica y Estadistica (INEGI).

[19] http://www.desarrolloeconomico.org/index.php?option=com_content&task=blogcategory&id=73&Itemid=372. Accessed 09/08/2010.

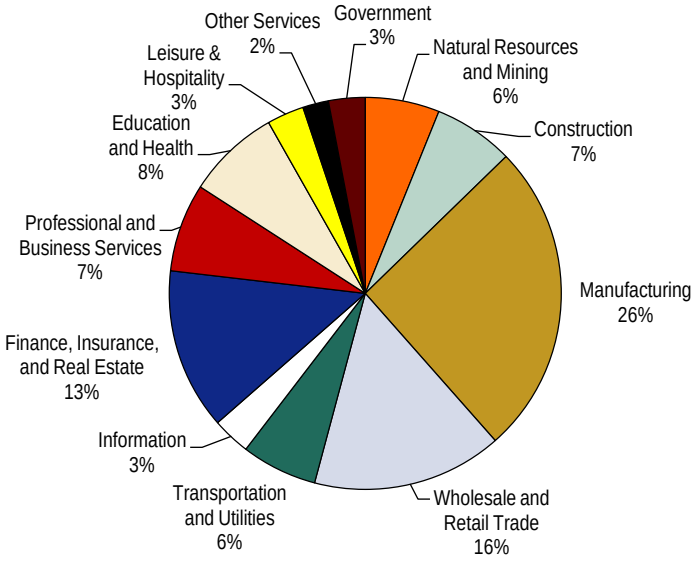
(for instance, government and finance, insurance, and real estate combined make up 44 percent of the economy), but it still retains significant activity in manufacturing, trade, and transportation. In Chihuahua, the reverse is true. Services make up a smaller share of Chihuahua's total, while manufacturing and trade account for 42 percent of output. These figures reflect the comparative advantages of the two economies – El Paso in services and Chihuahua in manufacturing, trade, and other labor-intensive activities.

Figure D.2.6 Industry Contribution to GRP in El Paso
2008



Source: Bureau of Economic Analysis, U.S. Department of Commerce, June 2009.

Figure D.2.7 Industry Contribution to the State of Chihuahua GSP
2008



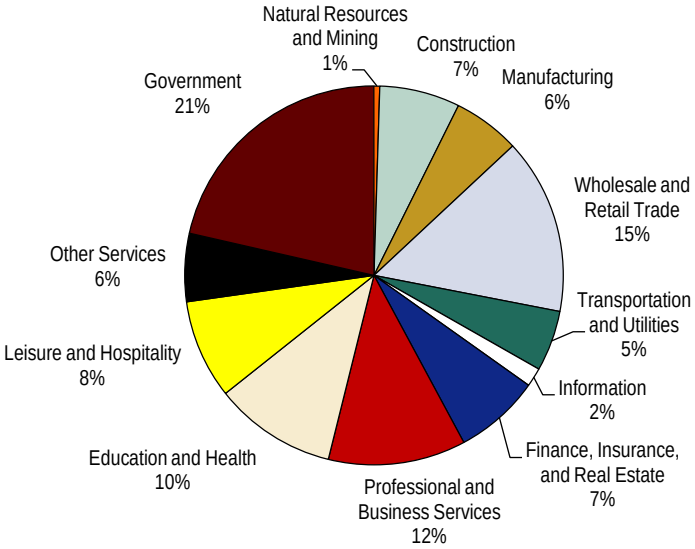
Source: System of National Accounts of Mexico, INEGI.

Employment

A region's industrial makeup also is reflected in its labor market. Figure D.2.8 and Figure D.2.9show employment levels by industry in El Paso and Ciudad Juárez. In El Paso, the service sector dominates in terms of the number of employees. Combined, information, finance, insurance, and real estate, business services, education/health, hospitality, government, and other services account for two thirds of the total jobs. In Juárez, the situation is reversed- approximately six out of every 10 jobs are in manufacturing. Ciudad Juárez pioneered the twin plant maquiladora industry in 1965, which launched over 40 industrial parks across the U.S. border and made manufacturing the leading industry in the city in terms of total number of employees.

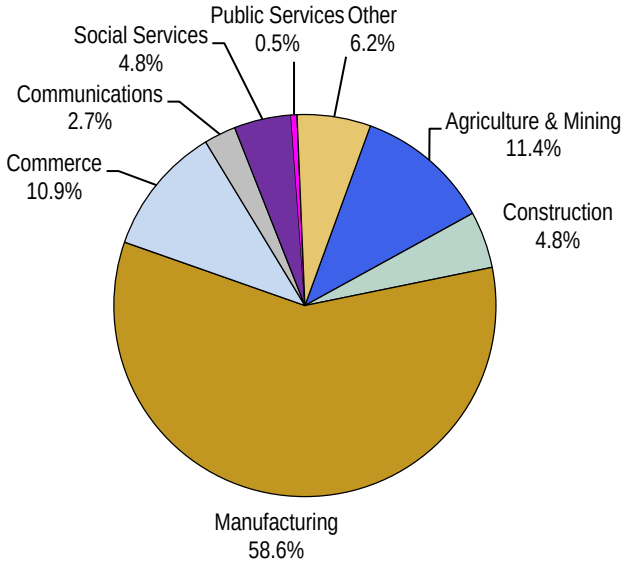
As shown previously in Figure D.2.4 comparing the unemployment rates in El Paso to those of Texas and the U.S., all three labor markets have been affected by the national economic recession. Like Texas and the U.S. as a whole, unemployment in El Paso increased in 2008 and moved sharply higher in 2009. While still higher than the overall unemployment rate in Texas, El Paso's unemployment rate dropped below the national average in 2009 for the first time in the last 10 years.

Figure D.2.8 El Paso Employment by Industry
2008



Source: Bureau of Economic Analysis, U.S. Department of Commerce, June 2009.

Figure D.2.9 Total Employment by Industry in Ciudad Juárez
2007



Source: Instituto Mexicano del Seguro Social (IMSS), March 2007.

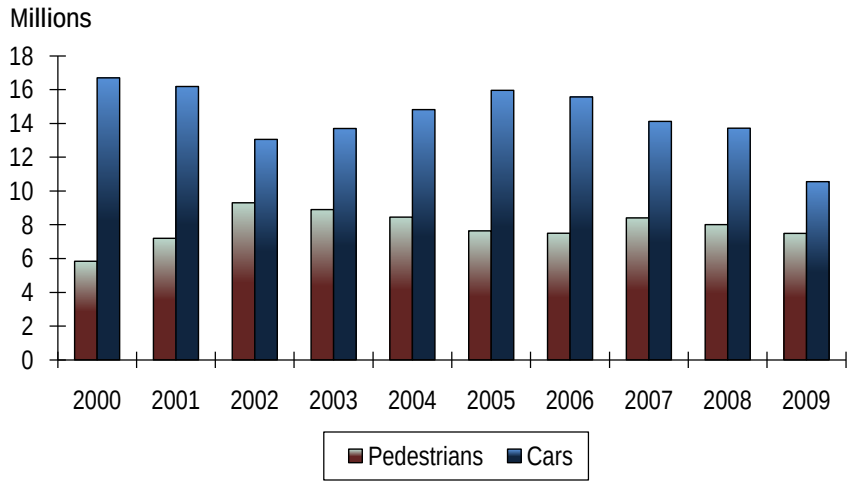
D.3 Existing Cross-Border Travel Flows

Maquiladora operations, as well as the region's socioeconomic and truck fleet characteristics, create unique patterns of passenger, pedestrian, and freight transportation demand at El Paso POEs. This section describes historical and current POE operations for both passenger/pedestrian traffic and freight activity.

Passenger and Pedestrian Movements

Figure D.3.1 shows total northbound crossings for passenger vehicles and pedestrians for the 10 years ended in 2009. Northbound crossings of passenger cars actually declined by 37 percent during this period. Pedestrian crossings, by contrast, grew by 28 percent, to about 7.5 million (though they peaked in 2002 at 9.3 million). Pronounced growth in pedestrian crossings (and concomitant declines in personal automobile crossings) has been linked to increasingly frequent service disruptions stemming from security concerns, particularly since 9/11.[20]

Figure D.3.1 Total Northbound Passenger Car and Pedestrian Volumes
2000 to 2009, in Millions



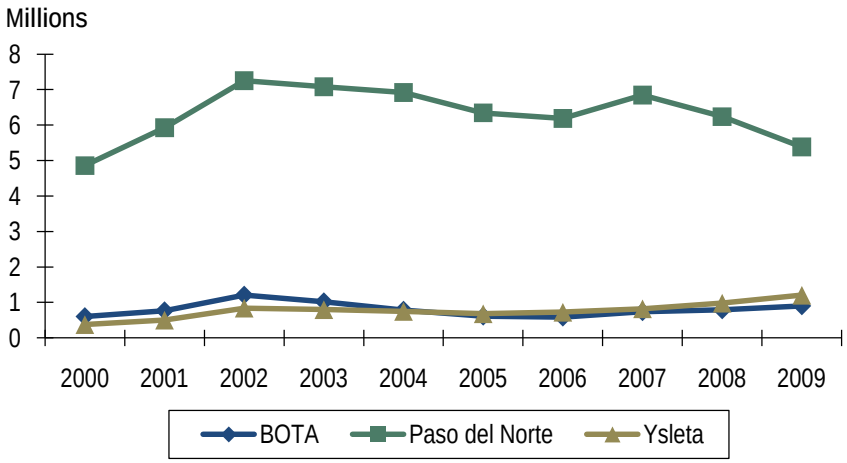
Source: UTEP.

As shown in Figure D.3.2, the Paso del Norte Bridge handles by far the most pedestrian traffic. In 2009, about 5.4 million people walked across the bridge to

[20] UTEP, *Borderplex Economic Outlook: 2007-2009*, October 2007.

El Paso, down about 855,000 people from the prior year and only about half a million higher than at the start of the decade. Volumes at BOTA have been lower (902,000 in 2009), but they also grew faster (49 percent, compared to 11 percent at Paso del Norte). Pedestrian traffic at Ysleta-Zaragoza grew the fastest of all, from 377,000 to 1.2 million (a 220 percent increase).

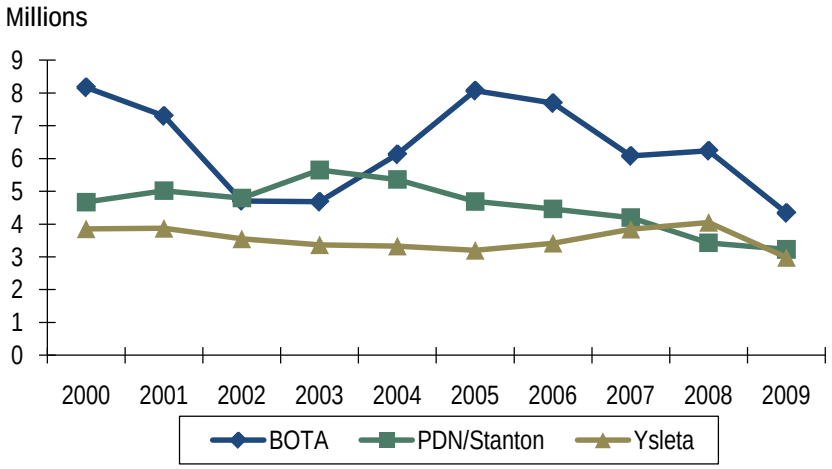
Figure D.3.2 Northbound Pedestrian Crossings by Bridge
2000 to 2009, in Millions



Source: UTEP.

Figure D.3.3 shows northbound automobile crossings by POE from 2000 to 2009. Volumes at BOTA have tended to fluctuate, dropping precipitously after the 2001 recession and 9/11 attacks, then climbing back up to about 8 million in 2005 before falling back again to 6.2 million in 2008. Volumes dropped steeply again in 2009 (to 4.3 million) as a result of the economic crisis. Personal vehicle crossings fell at all three locations during this period – by 47 percent at BOTA, 31 percent at Paso del Norte/Stanton, and 23 percent at Ysleta-Zaragoza. Again, this is mostly driven by changing national security risks combined with the global recession.

Figure D.3.3 Northbound Automobile Crossings by Bridge
2000 to 2009, in Millions



Source: UTEP.

Note: Figures for PDN/Stanton and Ysleta include Dedicated Commuter Lanes.

Commodity Movements

The unique characteristics of the borderplex have created distinct patterns of freight activity in the area. This section describes current freight flows in the region, focusing on cross-border flows.[21]

Overview

Approximately 97.6 million tons of freight valued at about $207.0 billion moved to, from, within, and through the borderplex region in 2008.[22] This represented about 6.1 percent by weight and 8.0 percent by value of Texas' total freight bill. The following sections describe in more detail the commodity flows moving into, out of, through, and within the El Paso/Ciudad Juárez region.

Figure D.3.4 shows total freight flows in the study area by type of movement:

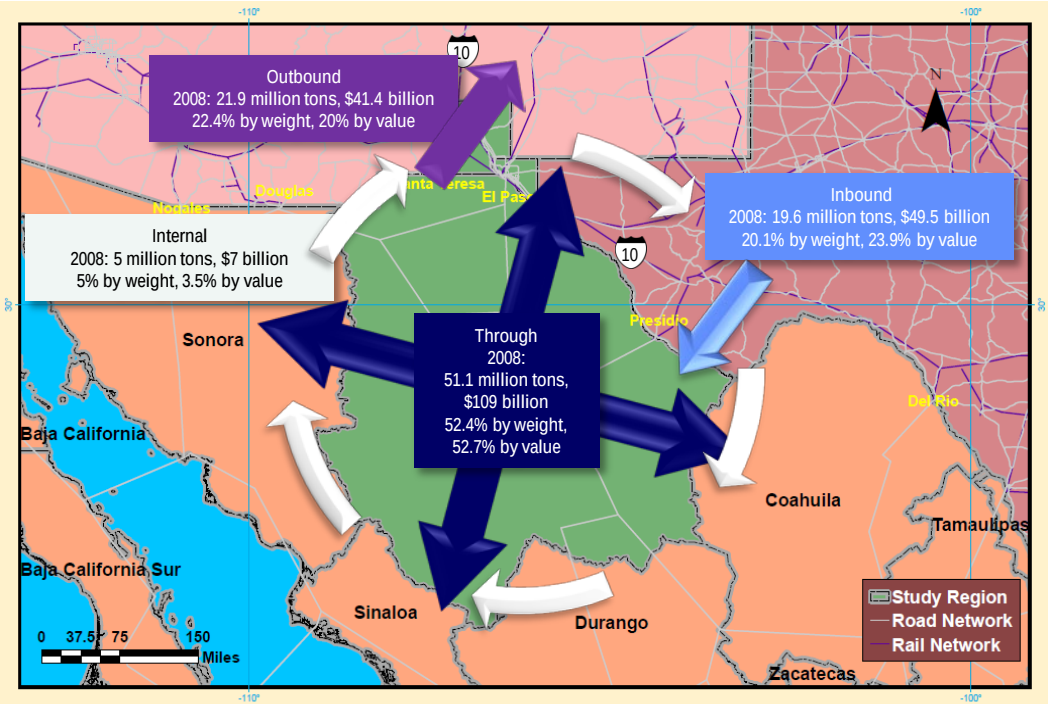
- **Through flows** were the largest single movement type in 2008, amounting to about 51.1 million tons of cargo valued at over $109.0 billion. The vast majority of this (nearly 50 million tons worth $101 billion) consisted of domestic east-west flows on Interstate 10.

[21] A detailed analysis of regional commodity flows is provided in Appendix A. The methodology and data sources used to estimate commodity flows in the region are described in Appendix C.

[22] Due to data limitations, 2008 commodity flow data is the most recent available.

- **Outbound flows** were the next largest share, at about 21.9 million tons valued at nearly $41.4 billion. This reflects El Paso's position as a major North American manufacturing center.
- **Inbound flows** totaled about 19.6 million tons of freight, worth slightly over $49.5 billion. Much of these flows can be attributed to the maquiladoras and their suppliers operating within the region.
- **Internal movements** (those occurring strictly within the study region) amounted to about 5.0 million tons valued at $7.0 billion.

Figure D.3.4 Regional Commodity Flows by Movement Type
2008



Cross-Border Shipments

The remainder of this section focuses on cross-border freight movements, since these are the primary concern from a POE operations perspective. In 2008, cross-border shipments at the region's POEs totaled about 11.8 million tons and $48.7 billion dollars, which is about 17.1 percent (by weight) and 22.6 percent (by value) of the cross-border movements at all Texas POEs combined with Santa Teresa.

Figure D.3.5 shows the 2008 mode shares for cross-border flows in the region by weight. Trucks handled 74 percent of these shipments, totaling about 8.7 million tons. The remaining 26 percent (about 3 million tons) was carried by rail. The dominance of the truck mode for these movements is to be expected since

shipments between maquiladoras and their suppliers north of the border are short by nature, and this is a characteristic which lends itself to shipping by truck.

When measured by value, trucks are even more dominant, as shown in Figure D.3.6. In 2008, trucks hauled 89 percent of the cross-border freight bill in the El Paso region, amounting to more than $43 billion. Again, this is not surprising since trucks offer considerable speed and route flexibility advantages which make them attractive for high-value, lower-weight cargoes such as electronic components, machinery, and car parts.

Figure D.3.5 Cross-Border Mode Shares by Weight
2008

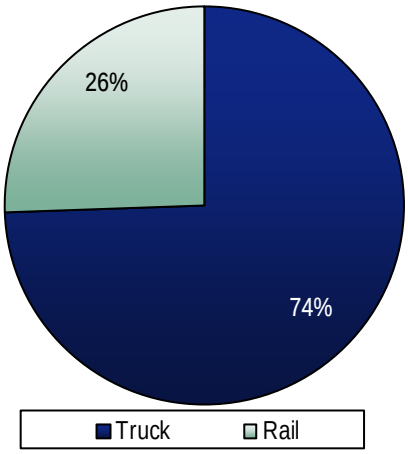


Figure D.3.6 Cross-Border Mode Shares by Value
2008

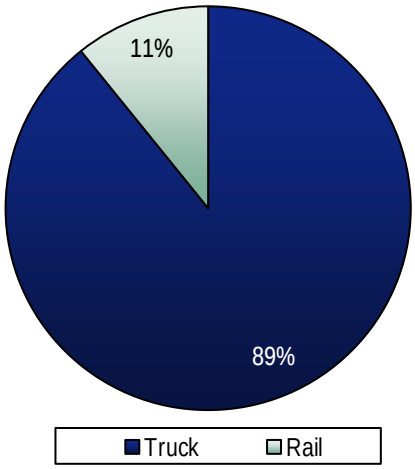
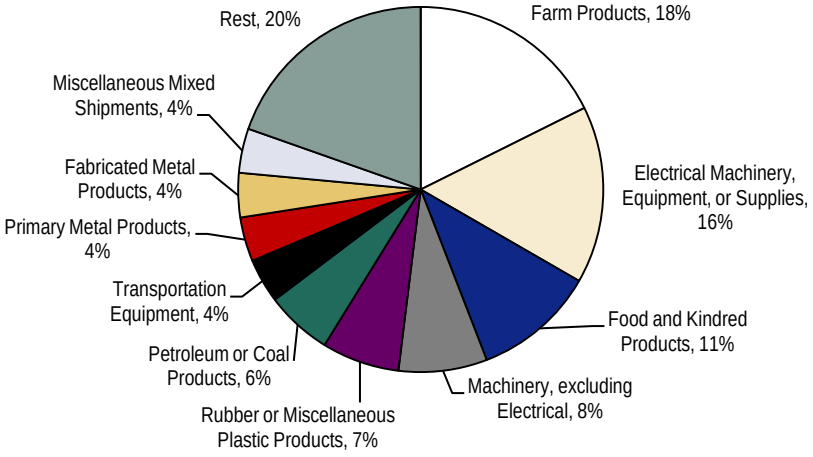


Figure D.3.7 shows the top 10 cross-border commodities by weight in 2008. Interestingly, farm products were the number one commodity by weight at 18 percent of the total, or 2.2 million tons. Besides being a major manufacturing hub, the El Paso region also is a key gateway for agricultural products. The Santa Teresa POE, for example, specializes in shipments of livestock as well as chili peppers and other field crops.

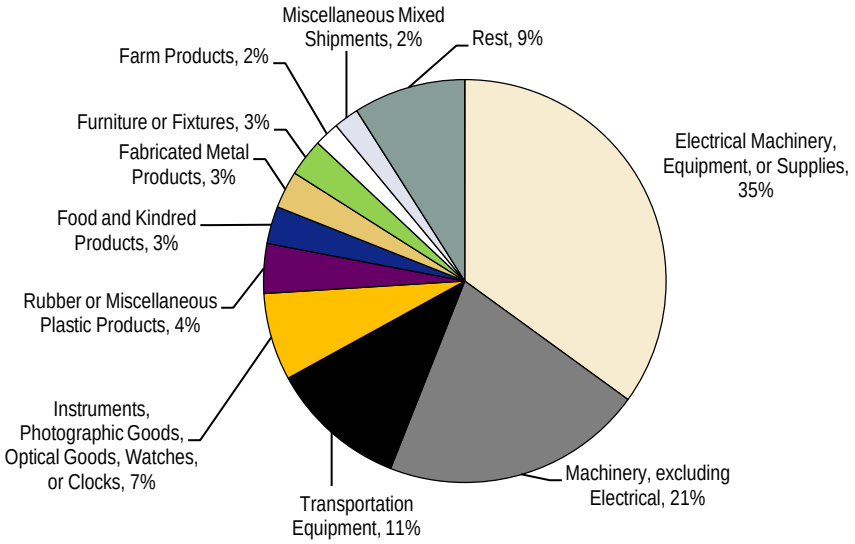
The remaining commodities tend to reflect the local maquila sector. The second most common cross-border commodity in 2008 was electrical machinery, at 14 percent of the total or 1.7 million tons. Food products made up another 11 percent, followed by nonelectrical machinery (8 percent, or about 960,000 tons) and rubber or plastic products (7 percent, or 796,000 tons). Other key cross-border commodities by weight include petroleum products, transportation equipment, primary and fabricated metal products, and miscellaneous mixed shipments (typically consumer goods).

Figure D.3.7 Top Cross-Border Commodities by Weight
2008



When measured by value, cross-border commodity flows are more diverse and more skewed toward higher-value goods. In 2008, electrical machinery and equipment accounted for 35 percent of cross-border shipments in the region by value, or about $17.2 billion (Figure D.3.8). Nonelectrical machinery was more than one fifth of the total, or nearly $10.0 billion. Transportation equipment was the third most common cross-border good at 10 percent of the total or $5.1 billion. Rounding out the top five are precision instruments (7 percent, or $3.2 billion) and rubber/plastic products (4 percent, or $2.1 billion). Taken together, these five commodities comprise 77 percent of the value of goods shipped through the region's three POEs. They also represent the predominant manufacturing sectors in the region, such as motor vehicle parts, electronic equipment, precision instruments, medical devices, communication equipment, and household appliances.

Figure D.3.8 Top Cross-Border Commodities by Value
2008



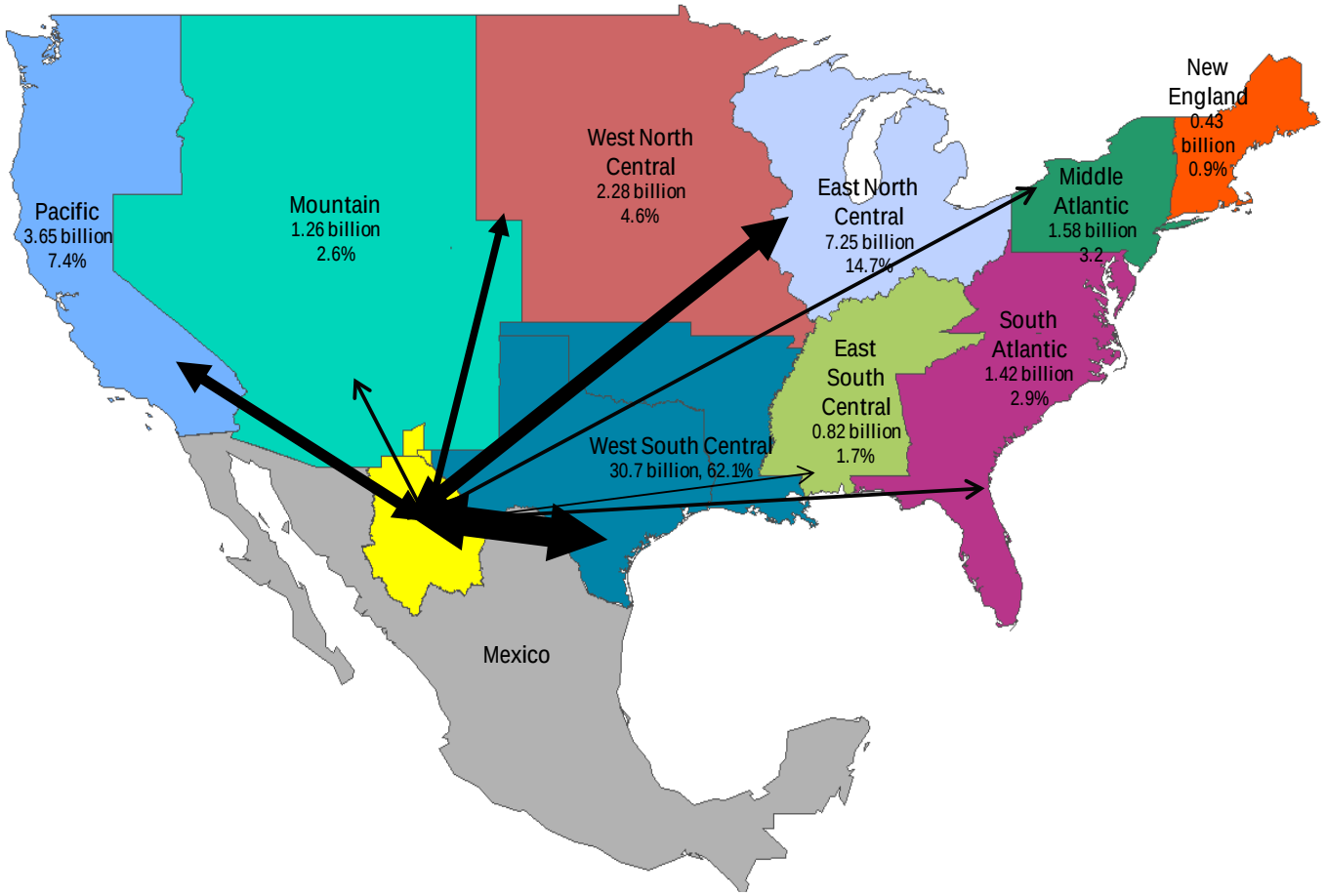
Distribution Patterns

It is useful to understand the overall distribution patterns of goods moving through the El Paso POEs, to get a sense of how border operations impact business activity in El Paso and elsewhere. Figure D.3.9 shows trade distribution patterns through the study area POEs by value in 2008 for each U.S. Census region:

- **The West South Central region** (Texas, Oklahoma, Arkansas, and Louisiana) dominates overall flows through the POEs due to the heavy volume of cross-border maquila activity, as well as geographic proximity to large population centers like Dallas-Fort Worth, Houston, San Antonio, and New Orleans;
- **The East North Central region** (Illinois, Michigan, Minnesota, Indiana, and Ohio) has the next largest share (nearly 15 percent of the total, or $7.3 billion), reflecting significant trading relationships with Midwestern manufacturers who maintain twin plants in Juárez;
- **The Pacific region** (California, Oregon, and Washington) makes up the next largest share at $3.7 billion (7.4 percent of the total), reflecting large consuming markets along the West Coast.

Trading volumes with other regions tend to correlate with geographic proximity (e.g., the Mountain region) and/or rapidly growing areas such as the Deep South. Overall, it is clear that El Paso POE operations are important to trade flows far beyond the region.

Figure D.3.9 Trade Flow Distribution Patterns by Region Through El Paso and Santa Teresa POEs for All Land Modes
2008, by Value



Source: TRANSEARCH Commodity Flow Data, 2008

D.4 Trends Driving Cross-Border Travel Demand in the Region

Freight and passenger transportation demand emerges from social and economic activity. This section describes key socioeconomic and industry forecasts that will shape cross-border freight and passenger demand in the future. It then evaluates the potential impact of security issues and border violence on trade in the region. It concludes with a discussion of key transportation infrastructure investments which will impact cross-border travel.

Socioeconomic Trends

Population

Population levels in the region are expected to continue climbing over the long term, as shown in Figure D.4.1. The population of El Paso is forecast to expand by 1.4 percent annually on average, reaching nearly one million people by 2029.[23] Ciudad Juárez is forecast to grow at an average annual rate of two percent, causing that city's population to grow to about 2.1 million by 2029. Nearly 3.1 million people are expected to reside in the El Paso-Juárez region in the next two decades.

This growth will be driven by natural increase as well as positive net migration due to a healthy labor market and regional economic growth. El Paso generally experiences more out migration than Ciudad Juárez because of a higher relative employment likelihood in the surrounding metropolitan and national labor market. Net migration to Ciudad Juárez is thus substantially higher than to El Paso. Additionally, while the fertility rate is slightly higher in El Paso, the larger population base and fairly young demographic of Ciudad Juárez cause the number of births to be noticeably higher. The expansion of Fort Bliss also will contribute to population growth – between 2006 and 2013, Fort Bliss will realize an increase of about 27,000 active duty personnel, who also will bring with them about 36,800 family members.[24]

Regional population growth will translate into a significantly larger consuming market in the coming years. This in turn will generate additional freight demand to supply that market as well as cross-border trips for shopping and other activities.

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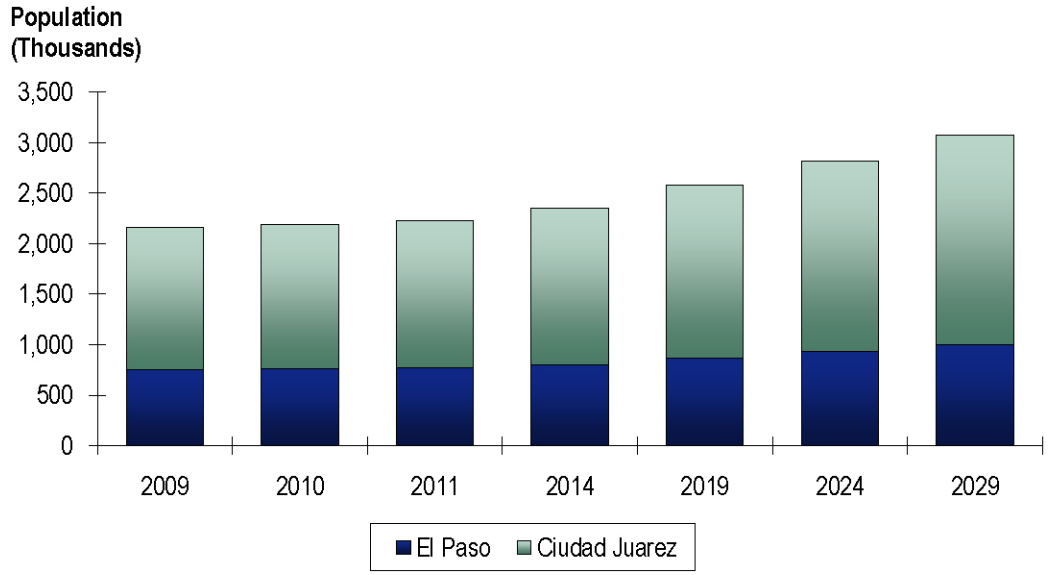
[23] University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

[24] El Paso Regional Economic Development Corporation – El Paso Military and Defense. http://www.elpasoreadco.org/TargetInd-MilitaryDefense.aspx. Accessed 9/13/2010.

Figure D.4.1 El Paso and Ciudad Juárez Population Forecasts
2009 to 2029



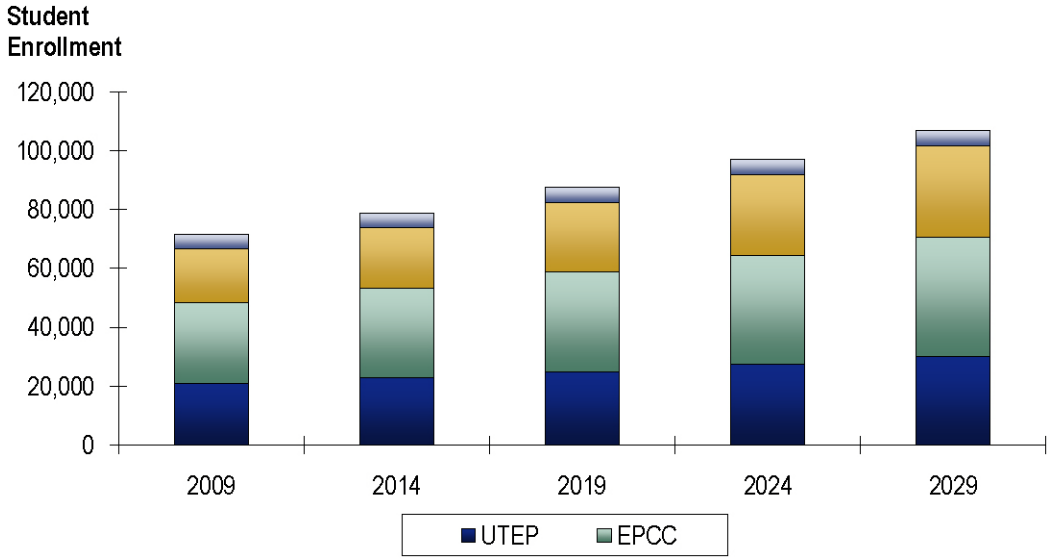
Source: University of Texas at El Paso (UTEP), Borderplex Long-Term Economic Trends to 2029, April 2010.

College/University Enrollment

In the next 20 years, college enrollments in the region are forecasted to increase steadily. As shown in Figure D.4.2, the University Autónoma de Ciudad Juárez (UACJ) is expected to reach the level of student enrollment at the University of Texas at El Paso (UTEP) by 2024 and slightly exceed it by 2029. El Paso Community College (EPCC) will continue to be the largest student body in the region while the student enrollment at the Instituto Tecnológico Regional de Ciudad Juárez (ITRCJ) is expected to remain mainly constant at about 5,000 students. The number of postsecondary students in the El Paso/Juárez region at these four main institutions is expected to surpass the 100,000-student mark by 2029. Given that educational skills will play a central role in attracting new investment in the region as labor quality requirements continue to intensify, the growth in university enrollments will contribute to a strong labor market in the El Paso/Juárez region.

In addition to the value of universities and colleges for employers and the contribution to the future labor pool, they also contribute to cross-border commuter traffic. For example, 1,800 of the 22,000 students at UTEP are Mexican nationals (historically about 10 percent of the student population per year), the majority of whom commute regularly over the border.

Figure D.4.2 El Paso and Ciudad Juárez College/University Enrollment Long-Term Trends
2009 to 2029



Source: University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

Industry Trends

Gross Regional Product

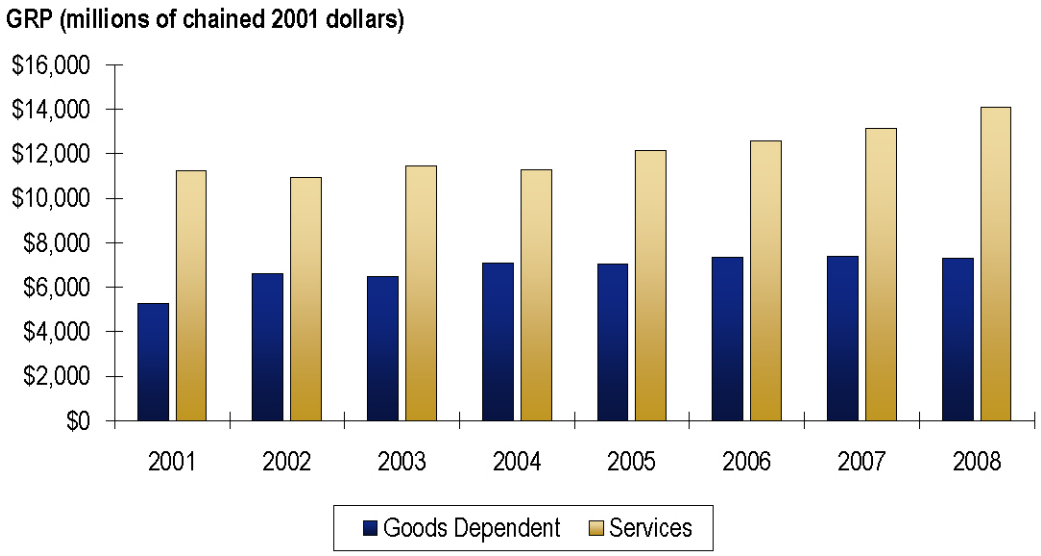
Growth in industry output relates directly to growth in freight traffic since economic output measures the value of firms' goods and services. Employment growth, meanwhile, has implications for passenger movements because additional hiring leads to more people commuting to and from jobs.

A useful way to think about employment and output as it relates to freight and passenger flows is to divide industries into two basic categories: goods-movement dependent and service-oriented. Goods-movement dependent industries are those that rely heavily on the efficient movement of freight, such as manufacturing, wholesale and retail trade, mining and agriculture, and distribution and logistics. Service industries include those that tend to be less directly impacted by goods movement issues, such as financial services, government, and education. However, these industries generate significant volumes of commuter traffic.

Figure D.4.3 and Figure D.4.4 show the historical contributions of goods-movement dependent versus service industries to the economies of El Paso and Chihuahua. In El Paso, goods-movement dependent industries are a smaller share of GRP than services. Nonetheless, goods-movement dependent industries make up about one third of El Paso's economy, averaging about $6.8 billion from 2001 to 2008. Service industries averaged about $12.1 billion in output during this time. In Chihuahua, the situation is the reverse – goods-movement

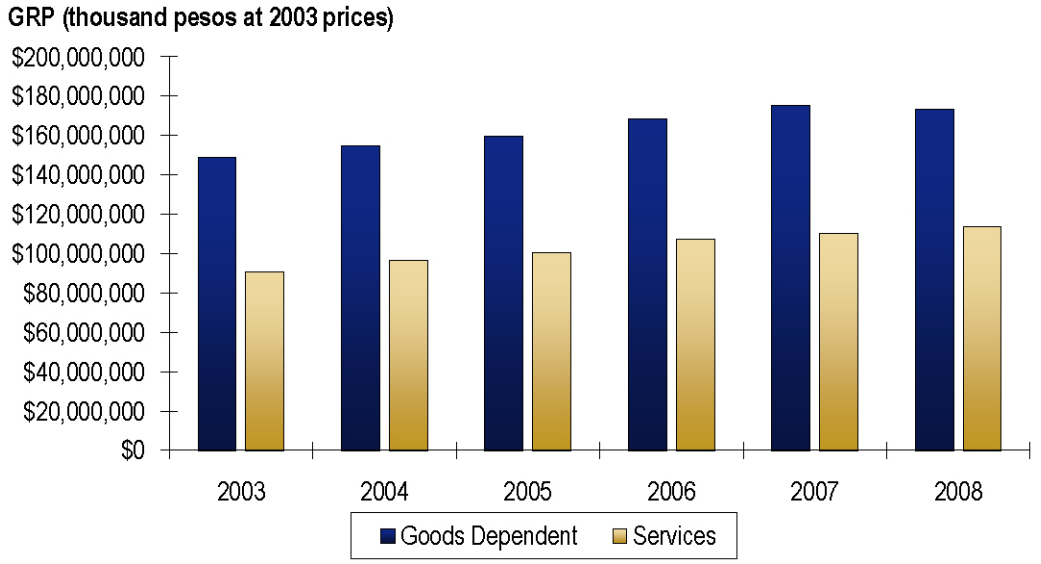
dependent industries accounted for about 58 percent of the State's economic output between 2003 and 2008, averaging about Mex$164 billion. By contrast, services averaged Mex$103 billion.

Figure D.4.3 Goods-Movement Dependent versus Service Sector Contributions to El Paso Gross Regional Product
2001 to 2008



Source: Bureau of Economic Analysis, U.S. Department of Commerce, June 2009.

Figure D.4.4 Goods-Movement Dependent versus Service Sector Contribution to the State of Chihuahua GSP
2003 to 2008



Source: System of National Accounts of Mexico, INEGI.

The goods-movement dependent sectors in El Paso and Chihuahua have been growing over time. In El Paso, goods-movement dependent industry output expanded by 38.1 percent from 2001 to 2008; in Chihuahua it grew by 18.6 percent from 2003 to 2008. In both regions, this growth was driven primarily by three key industries:

1. **Wholesale and Retail Trade,** which in 2008 contributed U.S.$2.9 billion to El Paso's economy and Mex$45.1 billion to that of Chihuahua;
2. **Manufacturing,** which was responsible for U.S.$2.5 billion in El Paso economic output and Mex$74 billion in Chihuahua for 2008; and
3. **Transportation and Utilities,** which contributed nearly U.S. $1.2 billion to El Paso GRP in 2008 and about Mex$18 billion to that of Chihuahua.

All three of these industries are closely intertwined with the maquiladora sector. Many merchant wholesalers are maquila suppliers, while some companies that operate twin plants also maintain manufacturing sites in El Paso. The Transportation and Utilities sector includes firms providing freight transport and logistics services for both cross-border and long-haul moves.

Service-oriented business output also has been growing in both regions. The El Paso service sector expanded by 25.1 percent from 2001 to 2008, led by growth in information, finance, insurance, real estate, professional services, and government. In Chihuahua, service industry output grew by 25.1 percent between 2003 and 2008 with significant growth in information, finance, insurance, and real estate, professional and business services, and education and health care. It is important to note that maquiladoras have increasingly been moving into service-oriented activities in recent years, including back-office functions such as coupon sorting.

Overall these indicators point to strong growth in both services and goods-movement dependent industries in the borderplex. This will fuel demand for both passenger and freight border crossings in the coming decades.

Employment

Figure D.4.5 shows long-term employment trends by industry in El Paso. Total employment in El Paso is expected to grow from about 456,000 jobs in 2008 to 674,000 jobs in 2029, a 1.9 percent average annual growth.

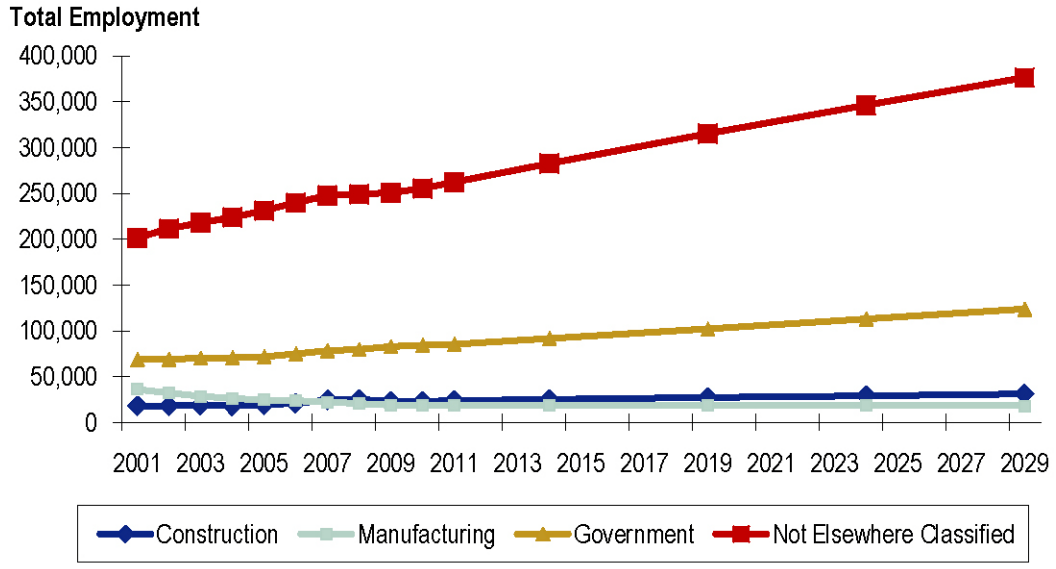
Most employment growth will occur in the service sector (included in the Not Elsewhere Classified category) as labor markets in El Paso continue their shift towards services-oriented forms of employment.[25] The expansion of Fort Bliss will lead to growth in civilian employment on base, new jobs in public schools

[25] University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

and other local government services, and approximately 2,000 new engineering, technical, and industrial jobs by 2013.[26] Meanwhile, the expansion of the Texas Tech Medical School also is expected to draw numerous students and professors and increase employment in the area by approximately 5,600 positions.[27]

Manufacturing jobs are expected to decline as the industry becomes more capital intensive and less labor intensive. The number of employees in manufacturing is expected to decrease annually by an average of 0.2 percent to approximately 18.3 thousand by 2029.

Figure D.4.5 El Paso Employment Trends by Industry
2001 to 2029



Source: University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

Note: Not Elsewhere Classified includes communications, services, retail, financial and other employment categories.

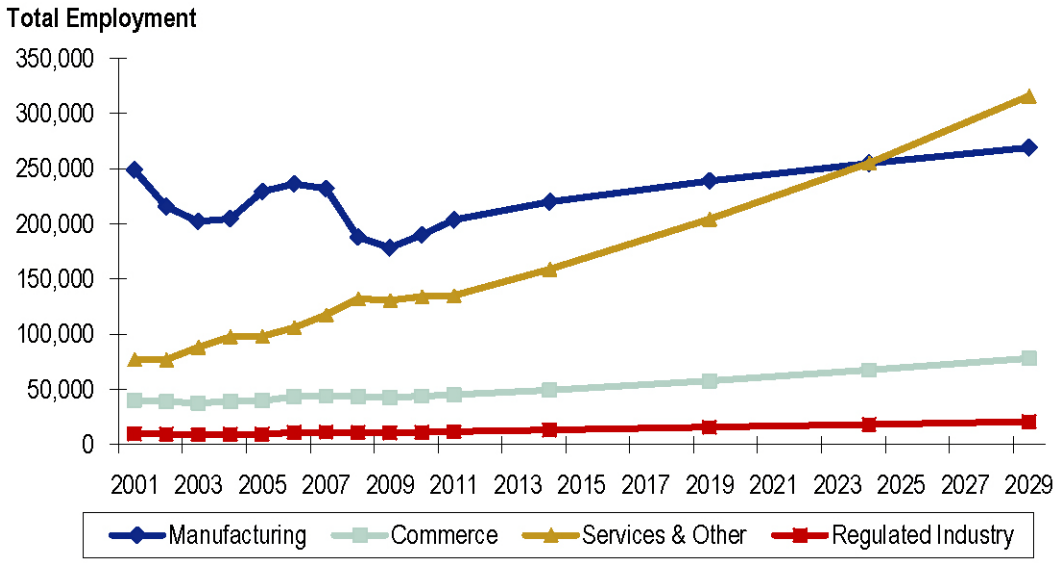
Employment in Ciudad Juárez will exceed 683,000 jobs by 2029, representing a growth of 2.9 percent per year from 2008 (Figure D.4.6). Manufacturing sector jobs are expected to show steady growth in the next 20 years, increasing 1.7 percent on average every year. However, like El Paso, much of the growth in employment is expected from the service sector, which will grow from 132,000 jobs in 2008 to 316,000 by 2029 or an increase of 4.1 percent per year.

[26] El Paso Metropolitan Planning Organization, TransBorder 2035 Metropolitan Transportation Plan, November 16, 2007.

[27] University of Texas at El Paso, Institute of Policy and Economic Development, 2004.

Transportation, communication, and public utility jobs (included in the Regulated Industry category) also are projected to increase rapidly (at 3.1 percent on average annually) while commercial sector jobs are expected to continue to increase as the economy of Ciudad Juárez grows in the next 20 years.

Figure D.4.6 Ciudad Juárez Employment Trends by Industries
2001 to 2029



Note: Regulated Industry includes transportation, communications, and public utilities.

Source: University of Texas at El Paso (UTEP) Borderplex Long-Term Economic Trends to 2029, April 2010.

Overall across the region, these figures point to a labor market in transition from one based on goods-movement dependent jobs to one largely based on services. Service sector jobs already make up the majority of El Paso employment, while in Juárez they will surpass goods-movement dependent jobs by 2024. Still, manufacturing is expected to add more than 90,000 jobs in Juárez by 2029 as economic growth leads to additional twin plant investments. This will drive further growth in transportation and warehousing, wholesale trade, and services on both sides of the border, leading to increasing freight traffic at the region's Ports of Entry.

Security Issues

Escalating drug violence along the border has been recognized as a key issue for the last several years. This is a trend affecting the entire U.S.-Mexico border – including El Paso/Juárez – as rival drug cartels fight over access to lucrative smuggling routes into the United States. By some measures, Ciudad Juárez is considered the world's murder capital with more than 6,000 homicides since

2008.[28] A recent news article in *The Guardian* concluded that the violence has resulted in the city ebbing away:

> *"Many offices and houses are empty and have "for sale" signs outside. About 10,670 businesses – 40 percent of the total – have shut. A study by the city's university found that 116,000 houses have been abandoned and 230,000 people have left."*

While this clouds the short-term population and business outlook in Juárez somewhat, the violence across the river is not anticipated to be a permanent feature of the demographic landscape and thus does not affect long-run population projections.

Meanwhile, the maquila sector appears to be largely insulated from the violence. Murders remain extremely rare within the Juárez industrial zones. Moreover, there are reasons to believe that most local maquilas will not leave the region anytime soon, not least because the companies that own them have invested significant resources in the area, including capital purchases and workforce training.

Evidence so far suggests that most companies considering a twin plant investment in Juárez are concerned about violence, but it has not yet had a significant effect on location or expansion decisions. For example:

- The maquila sector in Juárez added about 24,000 jobs from June 2009 to June 2010;
- Eleven firms announced plans to locate or expand in Juárez between January 2008 and March 2010, adding nearly 5,000 jobs and 675,000 square feet of industrial space;
- Northbound truck crossings from Juárez grew by nearly 22 percent in the first six months of 2010 as compared to the same period in 2009; and
- Ciudad Juárez continues to lead most other parts of Mexico in key indicators such as industrial absorption (the total volume of industrial space that is newly occupied in a given year) and foreign direct investment.[29]

As an example, in early 2009 Foxconn Technology Group (a contract electronics manufacturer) opened a new maquiladora in San Jeronimo, just south of the Santa Teresa POE. The firm planned to expand the new campus to 30,000 employees over the next four years (which would make it the largest maquila in Mexico), though the economic crisis may have delayed this to some degree.

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[28] Rory Carroll, "Mexico drug war: the new killing fields", The Guardian, published September 3, 2010. http://www.guardian.co.uk/world/2010/sep/03/mexico-drug-war-killing-fields.

[29] El Paso Regional Economic Development Corporation.

Nonetheless, Foxconn recently announced that it will hire 7,000 new employees at this location.[30]

All of this suggests that the appropriate stance is one of guarded optimism. As long as Juárez continues to offer cost advantages and security is reasonable, companies will probably continue to locate there. Nonetheless, border security is an important issue that bears monitoring by local officials and stakeholders.

Transportation Investments

In addition to demographic, industry, and other trends, there are three planned infrastructure investments on both the U.S. and Mexican sides that will impact regional travel patterns in the future. This section describes the potential impact on regional freight and passenger demand of these three key investments:

- The development of a new railroad border crossing at the Santa Teresa POE;
- Potential new investments in the approach network on the Mexican side at the Zaragoza POE; and
- The development of the Tornillo crossing near Fabens.

Santa Teresa Rail Crossing

The only freight rail border crossing in the region is located in downtown El Paso. Due to increasing congestion at this site, coupled with livability concerns in Ciudad Juárez, there is now an effort in the region to reroute northbound rail traffic from downtown El Paso to the Santa Teresa POE. In 2007, BNSF (which handles about 60 percent of El Paso cross-border rail volume), along with Mexico's Secretaria de Comunicaciones y Transportes (SCT) and Ferromex (the largest railroad in Mexico), proposed the "Paso del Norte" project as a solution to these issues. This project would consist of the following elements:

- The immediate construction of five highway-rail grade separations in Juárez, thus allowing for longer rail operating hours (rail traffic is now limited to eight hours per day due to grade crossing conflicts with maquila commuters);
- A new 52-mile rail bypass around El Paso/Ciudad Juárez through the Santa Teresa crossing, which would take about eight years to complete; and
- Upgrades to existing rail right-of-way in Juárez to facilitate passenger rail service.

A rail bypass and feasibility study is underway that will evaluate the alternative rail alignments. Figure D.4.7 shows the existing rail system in the region and proposed new alignments.

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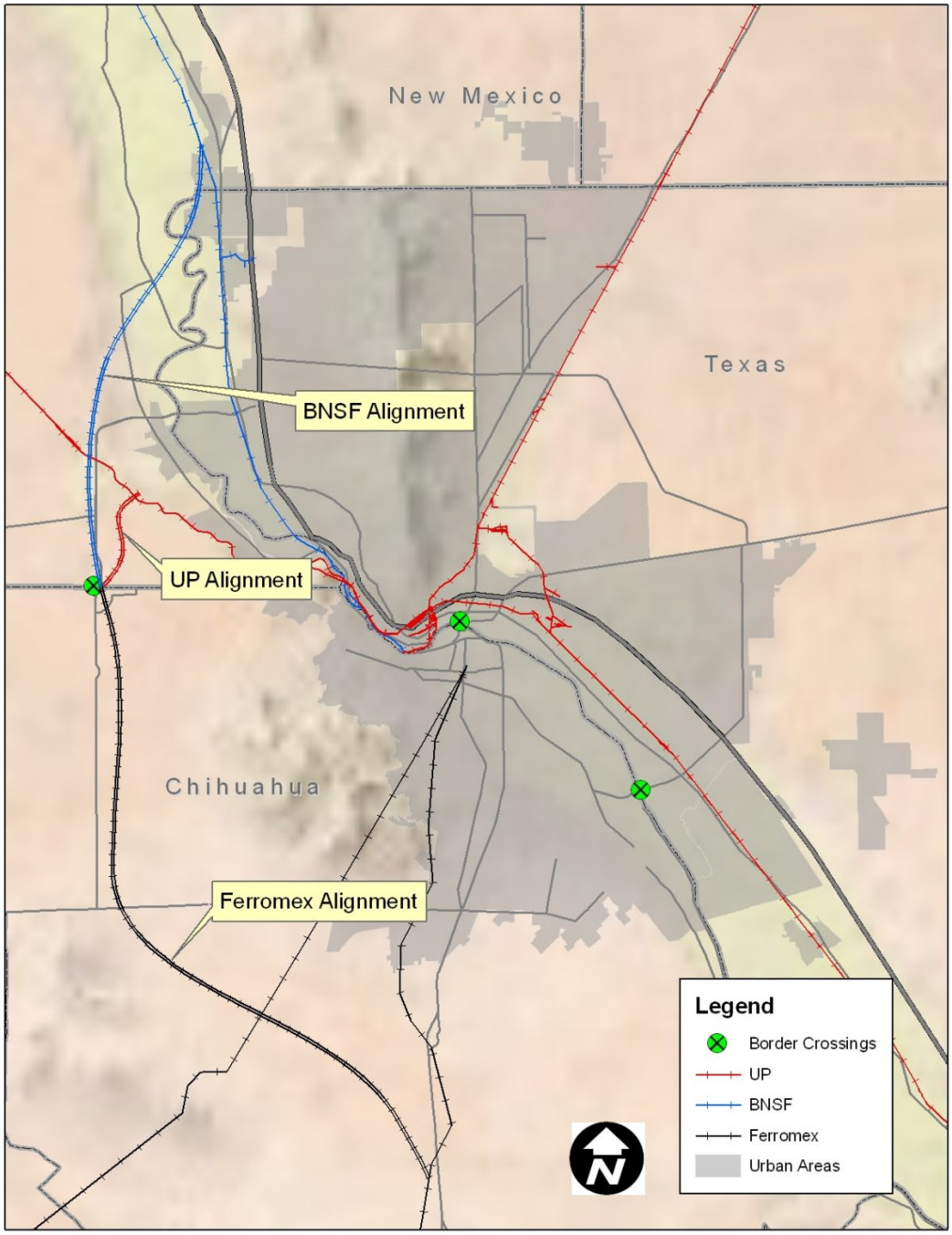
[30] Maquila Portal – Weekly Bulletin, August 13, 2010, http://www.mpbulletins.com/index.php?blog/show/Bulletin-481.html.

A new rail crossing at Santa Teresa would have numerous impacts on regional goods movement patterns:

- Accelerated cross-border trade as congestion at the El Paso rail crossing is relieved;
- New industrial developments in Santa Teresa and San Jeronimo (on the Mexican side) would receive a boost by being located near an intermodal transportation hub; and
- Increased trucking activity as light manufacturing and warehousing and distribution businesses locate in the area to be close to intermodal transportation services.

Figure D.4.7 Proposed Rail Improvements for Santa Teresa POE



Mexican Investments at Zaragoza POE

On the Mexican side, the Zaragoza POE is run by a private company on a concession basis. Under this arrangement, the Mexican government grants the concessionaire the right to collect tolls from the users of the POE in exchange for

private financing of the infrastructure. Promofront S.A. de C.V. has the concession until 2017.

Promofront currently is investing in the POE approach network on the Mexican side. This involves a targeted program of infrastructure improvements designed to increase capacity on key approach routes to the international bridge and better handle anticipated growth in demand. These improvements include:

- **New Overpasses,** which will relieve congestion at key intersections near the POE and separate international traffic from local traffic;
- **Improvements to existing roads,** such as widening, extension, and reconstruction, to improve overall traffic flows; and
- **Construction of new alignments** to provide additional options and increased capacity for cross-border flows.

These improvements, coupled with natural geographic expansion of Ciudad Juárez to the east (development to the west is constrained by mountainous terrain), will promote growth in passenger and cargo flows through the Zaragoza POE. In fact, northbound truck flows at Zaragoza are expected to surpass 800,000 trucks annually by 2029, while personal vehicles (including Dedicated Commuter Lane users) will hit the 7.8 million mark.[31]

New Tornillo-Guadalupe POE

The U.S. General Services Administration recently contracted for the design and construction of a new POE in Tornillo, which is about 30 miles east of El Paso near the current Fabens POE. This project will complement the new Tornillo-Guadalupe International Bridge, scheduled for completion in 2012. (The existing Fabens-Caseta Bridge will be demolished when the new bridge is complete.) The new Port of Entry facility will cover 117 acres on the U.S. side, including a new main building, headhouse, commercial inspection facilities, and commercial and privately operated vehicle lanes. When complete, the new bridge and POE facility will help to relieve congestion in El Paso by diverting eastbound freight traffic from the Bridge of the Americas and Zaragoza POEs.

El Paso County is presently coordinating improvements to the highway approach network on the U.S. side with agency partners, including TxDOT and the El Paso County Water Improvement District. This will include a new roadway alignment connecting the POE to SH 20 and then on to Interstate 10, as shown in Figure D.4.8. Construction will be complete by the end of 2012.

[31] UTEP Border Region Modeling Project, *Borderplex Long-Term Economic Trends to 2029*, April 2010.

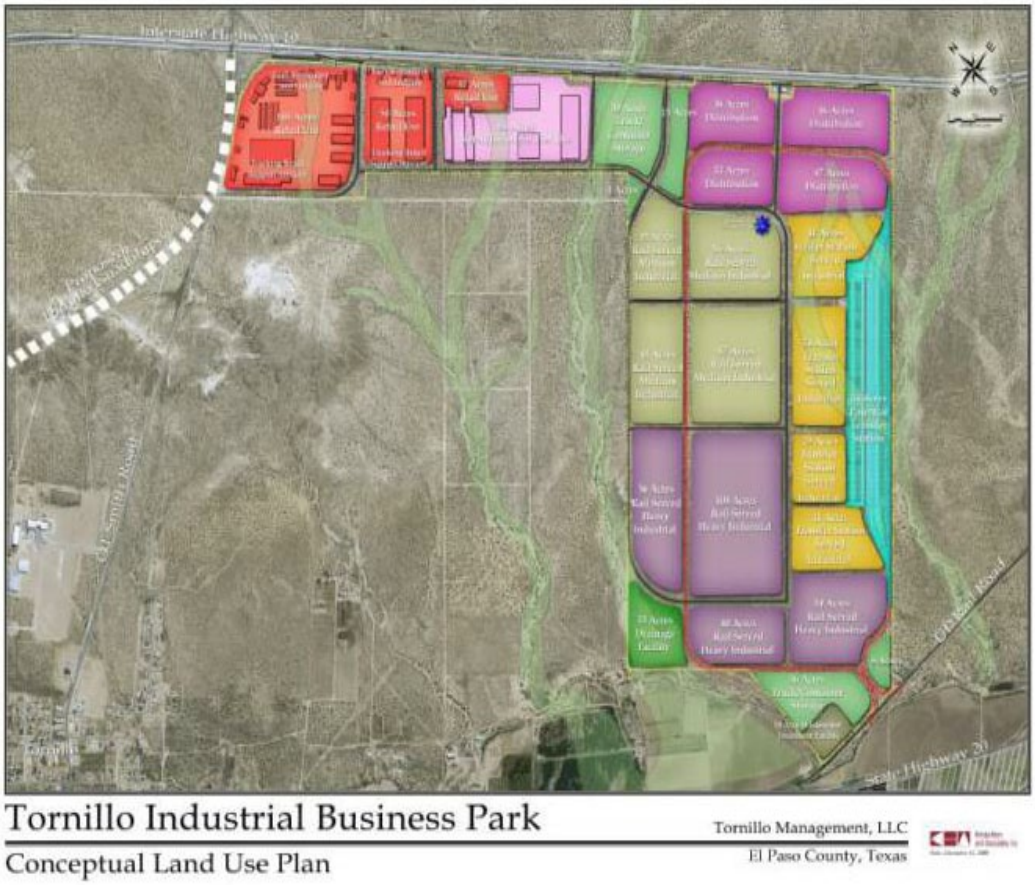
Figure D.4.8 Planned Road Improvements for New Tornillo POE

Source: El Paso County.

The SCT is soliciting bids for improvements to the Mexican side, which include Mexico's portion of the international bridge, a new port of entry, and an extension of the Juárez Bypass to the new crossing. Funding for Mexico's part of the project will be obtained through a public/private toll concession, involving construction and operation of both the Bypass and the new bridge.

Completion of the new Tornillo POE will provide additional freight capacity for regional shippers, particularly those that ship large volumes of goods to points east of El Paso. These shippers will likely respond by shifting some cargo to the new POE, thereby relieving congestion at the BOTA and Zaragoza bridges. In the longer term, the development of this crossing could spur new construction of warehouse and industrial space to accommodate growing international trade. In fact, this already is occurring to a certain degree. Scarborough Lane Development is planning a new industrial park on nearly 1,400 acres along I-10 at O.T. Smith/Tornillo Road (Figure D.4.9). The site will have about two miles of frontage on I-10 and will be located near the new POE. There also is the possibility of constructing a rail spur which would connect to the Union Pacific Sunset Line, thus providing additional intermodal shipping options for area industries.

Figure D.4.9 Proposed Tornillo I-10 Industrial Business Park



Source: Scarborough Lane Development.

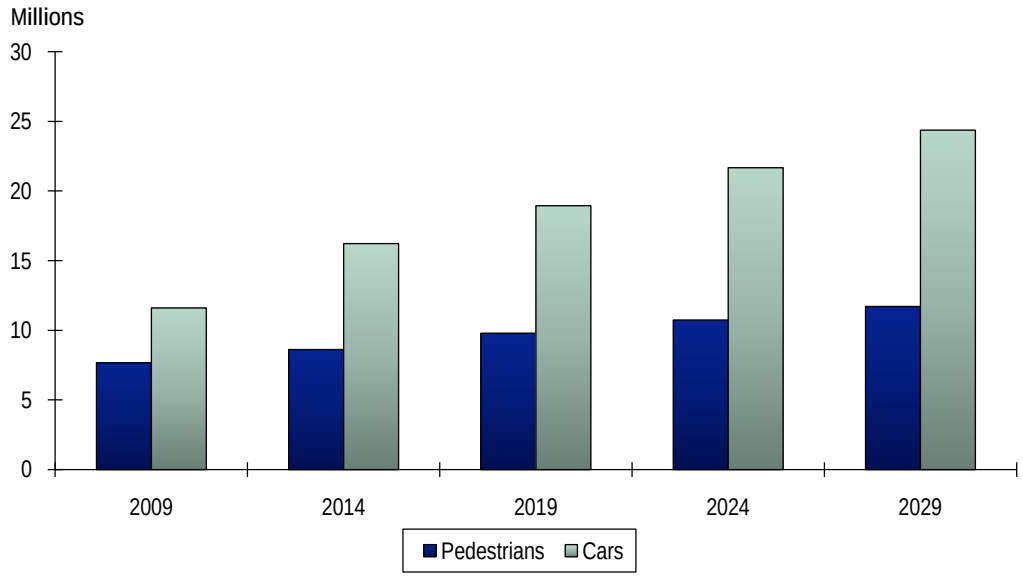
D.5 Future Cross-Border Travel Flows

The trends and issues outlined above will lead to new patterns of passenger and freight travel demand at El Paso region POEs. Anticipated cross-border pedestrian, passenger, and freight flows are presented below. As mentioned earlier, this information will be used as a reference during the development and calibration of the operational model.

Passenger and Pedestrian

Total northbound vehicle and passenger traffic is forecasted to rise in the future, as shown in Figure D.5.1. UTEP predicts that northbound pedestrian crossings will grow by 2.1 percent annually, reaching 11.7 million by 2029. Automobile crossings will reach 24.3 million that year (3.8 percent annual growth), driven by rapid growth in population and car registrations.[32]

Figure D.5.1 Total Northbound Passenger Car and Pedestrian Volumes
2009 to 2029, in Millions



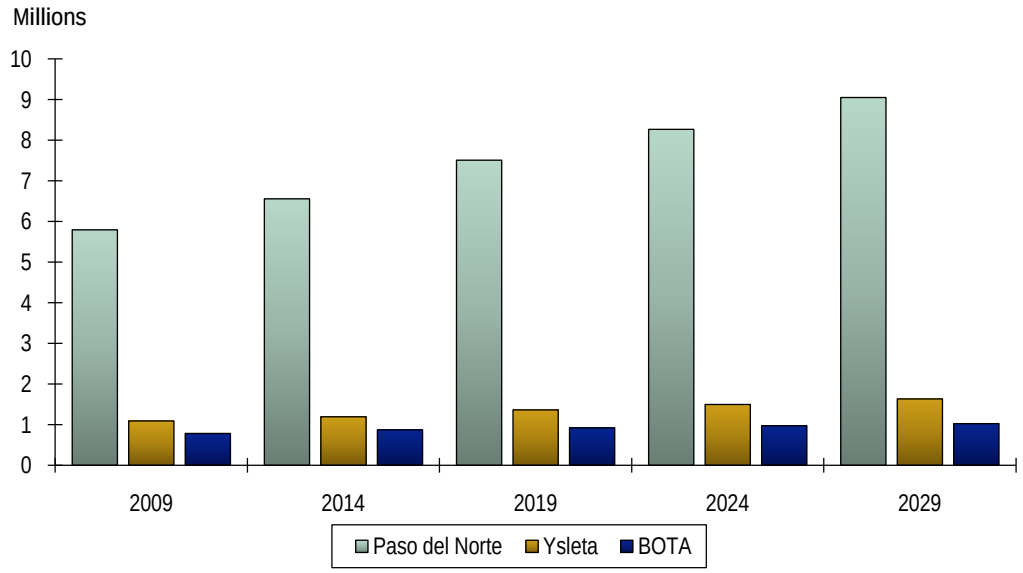
Source: UTEP Border Region Modeling Project.

Paso del Norte Bridge will still dominate in terms of total pedestrian crossings, as shown in Figure D.5.2. This POE is expected to reach over 9 million northbound pedestrian crossings by 2029, a 56 percent increase. Pedestrian crossings at Ysleta – which surpassed those at BOTA in 2005 – will continue to grow quickly as more people move eastward, reaching 1.6 million by 2029. Northbound

[32] UTEP, *Borderplex Long-Term Economic Trends to 2029*, April 2010.

crossings at BOTA are expected to grow more slowly, but will still pass the 1 million mark by 2029.

Figure D.5.2 Northbound Pedestrian Crossings by Bridge
2009 to 2029, in Millions



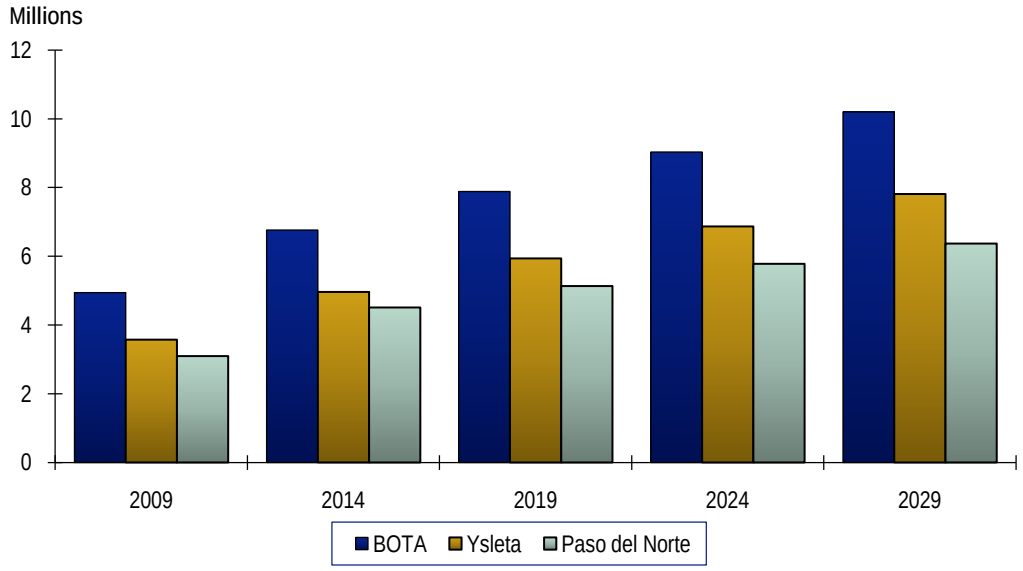
Source: UTEP Border Region Modeling Project

Northbound automobile crossings also will grow rapidly, as shown in Figure D.5.3. BOTA will remain the most popular bridge for northbound traffic (owing in part to a lack of tolls); the total number of cars going north using this bridge will reach about 10.2 million in the next 20 years. Ysleta-Zaragoza will be the second most utilized facility, reaching about 7.8 million northbound cars during this time (4 percent annual growth). Paso del Norte automobile crossings, meanwhile, will grow by about 3.7 percent annually and reach almost 6.4 million in the forecast horizon.

Overall, population growth in both Juárez and El Paso will generate growth in all three types of traffic, leading to additional demand at the POEs. Zaragoza in particular will experience rapid rates of growth due to the geographic expansion of urban areas towards the east.[33]

[33] Ibid.

Figure D.5.3 Northbound Automobile Crossings by Bridge
2009 to 2029, in Millions



Note: Figures for PDN/Stanton and Ysleta include Dedicated Commuter Lanes.

Source: UTEP Border Region Modeling Project

Commodity Flows

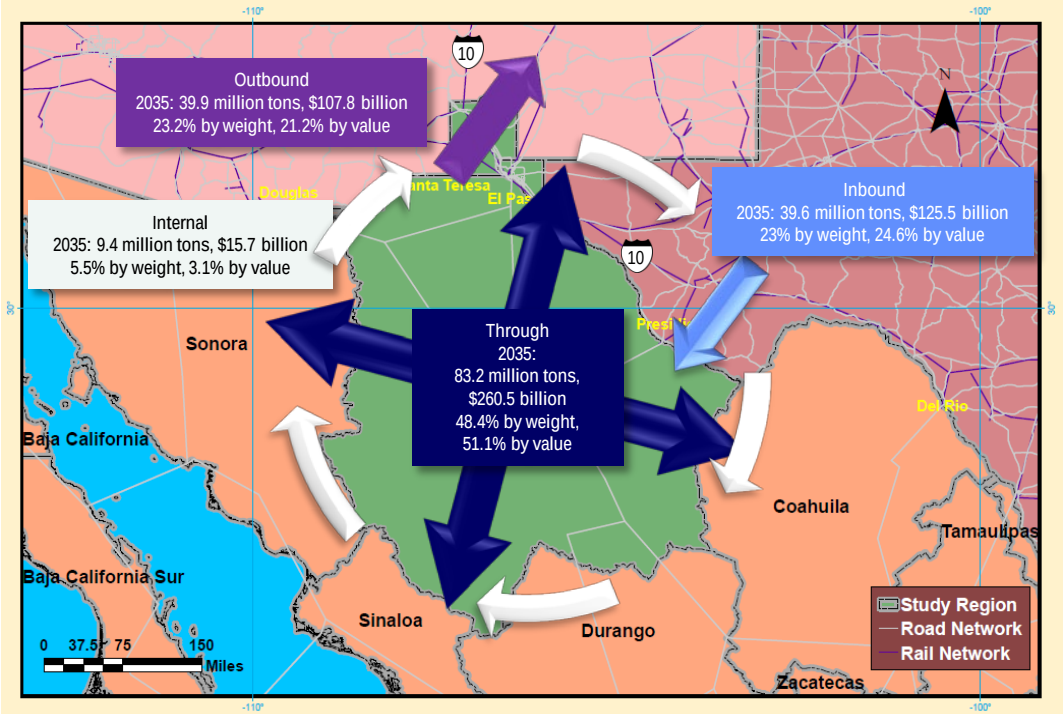
Industry growth, especially in goods-movement dependent industries, will lead to growth in the volume and value of freight in the El Paso region and consequently through its Ports of Entry. This section describes expected future freight movements, emphasizing cross-border commodity flows.

Overview

- **Total freight flows** to, from, within, and through the El Paso area are expected to grow by more than 76 percent by 2035, reaching 172.1 million tons. When measured by value, this cargo will be worth about $509.4 billion in 2035, a growth of about 146 percent over 2008. This will amount to about 6.2 percent (by weight) and 8.5 percent (by value) of Texas' total freight bill. Figure D.5.4 shows 2035 freight volume and value by movement type in the study region.
- **Through flows** will remain the predominant movement type by both weight and value, totaling nearly 83.2 million tons (48.4 percent of the total) and $260.5 million (51.1 percent of the total) by 2035. However, as a fraction of the total, through freight will be a smaller share in the future than it is now, indicating that a greater proportion of commodity flows will be attributable to economic activity within the study region.

- **Outbound freight** will represent about 23.2 percent (by weight) of total regional flows by 2035. On a value basis outbound flows will reach 21.2 percent of the total.
- **Inbound shipments** will total about 39.5 million tons worth $125.5 billion by 2035. This will represent 23 percent (by weight) and 25 percent (by value) of total regional flows. Growth in this movement type will be directly attributable to population growth and industry expansion in the region.
- **Internal movements** will reach nearly 9.4 million tons valued at $15.7 billion by 2035. Much of this growth will be driven by increasing cross-border drayage movements made by truck.

Figure D.5.4 Regional Commodity Flows by Movement Type
2035

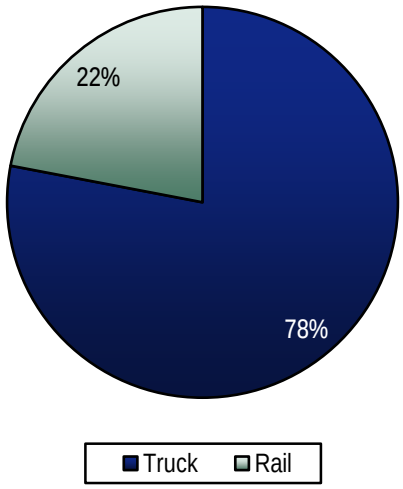


Cross-Border Shipments

Cross-border shipments at El Paso POEs and Santa Teresa POE are expected to reach 25.5 million tons and $111.0 billion by 2035, which is about 16.7 percent (by weight) and 22.5 percent (by value) of the cross-border movements at all Texas ports of entry plus Santa Teresa. Although the overall share of NAFTA trade crossing in the El Paso region will remain relatively constant, the mode shares, top commodities, and distribution patterns of that trade will change in the future, as shown below.

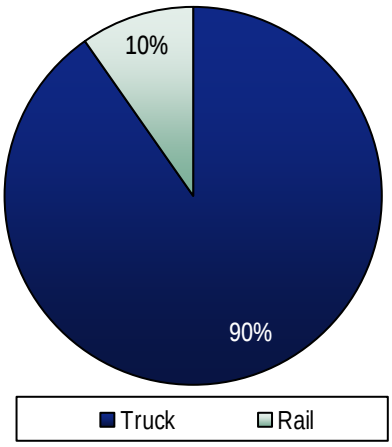
Figure D.5.5 shows predicted mode shares between truck and rail/intermodal in 2035. Trucks will carry 78 percent of cross-border freight in the region by 2035, a total of nearly 19.8 million tons. The remaining 22 percent (5.7 million tons) will cross by rail. This compares to 74 percent and 26 percent for truck and rail respectively in 2008, meaning that truck crossings will grow faster than rail crossings in the future, despite the potential construction of a new rail crossing at Santa Teresa.

Figure D.5.5 Cross-Border Mode Shares by Weight
2035



Trucks will increase their relative dominance (slightly) when measured by freight value, as well. As shown in Figure D.5.6, trucks are expected to handle 90 percent of the cross-border freight bill in the region by 2035, amounting to $100.3 billion and up slightly from 89 percent in 2008. As the region's economy continues to move up the value chain (particularly in the manufacture of high-tech products) the growth in freight value transported by truck will translate into additional demand at the commercial ports of entry. These numbers also suggest that the regional freight rail network may not be able to fully absorb expected increases in demand.

Figure D.5.6 Cross-Border Mode Shares by Value
2035



Farm products will remain the number one cross-border commodity in the region by weight in 2035 at 15 percent of the total, or approximately 3.9 million tons (Figure D.5.7). This share is slightly less than 2008, when farm products made up 18 percent of POE freight traffic. Electrical components will comprise 14 percent of cross-border shipments by weight, or about 3.6 million tons. Food and kindred products are expected to reach 3.3 million tons (13 percent of the total, up from 11 percent in 2008), while nonelectrical machinery and rubber and plastic products will grow to about 2.2 million tons (nine percent) each by 2035.

Overall, farm products and electrical equipment tonnage will decline as a percentage of overall POE volumes, though they will still grow substantially in absolute terms. Meanwhile, shipments of food and kindred products, nonelectrical machinery, and rubber/plastics will grow at a more rapid pace, thereby accounting for a greater share of the total in 2035.

Figure D.5.7 Top Cross-Border Commodities by Weight
2035

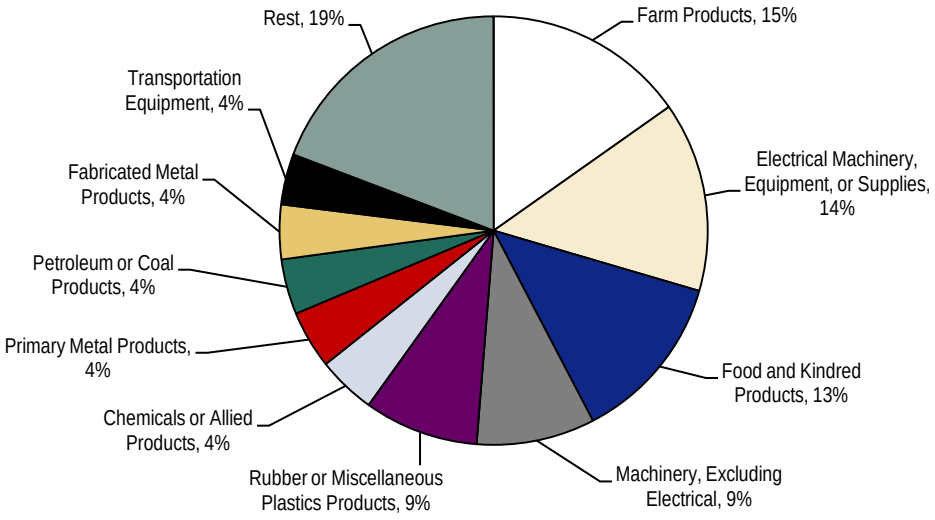


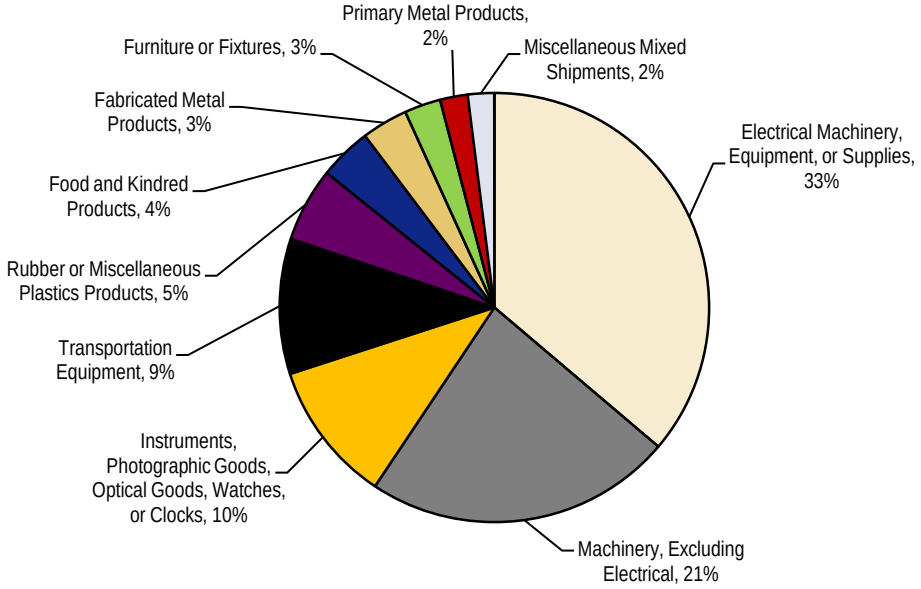
Figure D.5.8 shows the top cross-border commodities by value in 2035. Electrical machinery and equipment will remain the top POE commodity by value in the future at 33.2 percent of the total (nearly $36.9 billion). Nonelectrical machinery will comprise 21.3 percent of the total, or about $23.6 billion, followed by precision instruments (9.8 percent, or $10.8 billion) and transportation equipment (9.3 percent, or $10.4 billion).

Compared to 2008, the share of cross-border freight value in electrical machinery and transportation equipment will decline slightly, but this is made up for by rapid growth in the value of precision instruments shipments. This commodity group includes medical device manufacturing, of which there is a growing industry cluster in El Paso. These include disposable device manufacturers as well as makers of specialty devices for cardiovascular and general/plastic surgery.[34]

Overall, the analysis of top cross-border commodities suggests that the regional manufacturing base will continue to move up the value chain into higher value-added goods.

[34] El Paso Regional Economic Development Corporation.

Figure D.5.8 Top Cross-Border Commodities by Value
2035



Distribution Patterns

Expected distribution patterns by U.S. Census region for El Paso area cross-border flows in 2035 are shown in Figure D.5.9:

- **The West South Central region** (primarily Texas) will continue to be the number one origin/destination for El Paso area POE flows, and will grow as a share of the total as well. Flows to and from this Census region will total nearly $81 billion in 2035, representing over 65 percent of the total (compared to 62 percent in 2008).
- **The industrial Midwest (East North Central region)** will still be the second most important trading region for the POEs at $15.8 billion, or 13 percent of total cross-border flows by value. This is more than double the level of 2008; however it is smaller as a share of the total as more flows will be going to and from fast-growing areas in the West South Central region.
- **Other regions** will maintain relatively stable shares of total El Paso POE flows, but the overall value of these shipments will grow dramatically, leading to more cross-border truck trips in El Paso as well as additional freight transfer activities at warehouses and distribution centers on both sides of the border.

Figure D.5.9 Projected Trade Flow Distribution Patterns by Region through El Paso and Santa Teresa POEs for All Land Modes *2035, by Value*

Figure 6.9 Trade Flow Distribution Patterns by Region Through El Paso and Santa Teresa POEs for All Land Modes
2035, by Value

Technical Appendices

D.6 Regional Commodity Flows

This appendix summarizes the data sources and methods used to estimate commodity flows in the El Paso region. It also provides detailed results, including current (2008) and future (2035) freight volumes moving to, from, through, and within the area as well as cross-border flows.

Data and Methodology

Study Area

For purposes of this commodity flow analysis, the study region was defined as El Paso County plus Doña Ana County in New Mexico and the Mexican State of Chihuahua. This area includes the El Paso, Ciudad Juárez, and Las Cruces metropolitan areas. It also encompasses all three commercial border crossings in the region (the Bridge of the Americas, Ysleta-Zaragoza, and the Santa Teresa POE in New Mexico). Note that because this is a commodity flow analysis, only commercial crossings are considered.

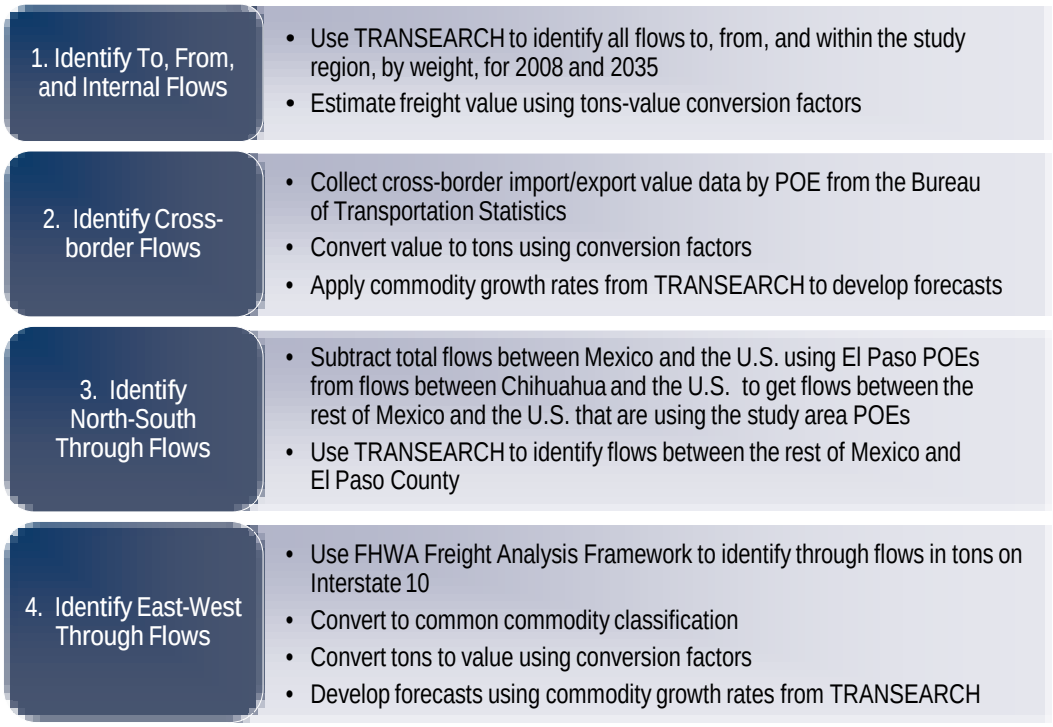
Commodity Flow Estimation

This commodity flow profile was developed using many data sources which provide information on regional freight volume and value, socioeconomic conditions, industry economic output and employment, and trends driving freight demand. Figure D.6.1 describes our overall approach for estimating current and future commodity flows in the region.[35] The analysis relied on three primary data sources:

1. **TRANSEARCH freight flow database –** This is a proprietary data set which provides base year (2003) and forecast (2035) commodity flows in tons for all Texas counties, all 50 U.S. states, and each Mexican state.
2. **North American Transborder Freight Data –** This data is available from the Bureau of Transportation Statistics and provides cross-border freight flow data for each Port of Entry in the study region.
3. **FHWA Freight Analysis Framework –** This is a publicly available commodity flow database providing base year and forecast commodity flow data among states and metropolitan regions. We used it to develop estimates of freight through flows on Interstate 10.

[35] A detailed description of the estimation methodology can be found in Appendix B.

Figure D.6.1 Approach for Estimating Study Region Commodity Flows



Overview of Current Commodity Flows

Approximately 97.6 million tons of freight valued at about $207.0 billion moved to, from, within, and through the borderplex region in 2008. This represented about 6.1 percent by weight and 8.0 percent by value of Texas' total freight bill. The following sections describe in more detail the commodity flows moving into, out of, through, and within the El Paso/Ciudad Juárez region.

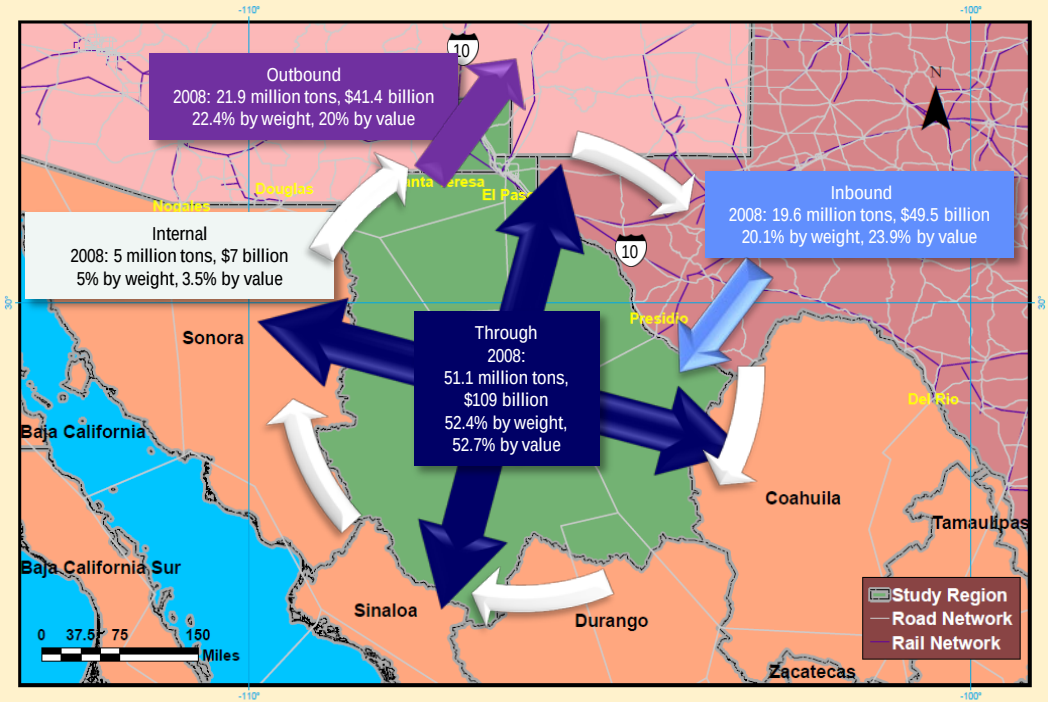
Regional Commodity Flows by Movement Type

Figure D.6.2 shows total freight flows in the study area by type of movement:

- **Through flows** were the largest single movement type in 2008, amounting to about 51.1 million tons of cargo valued at over $109.0 billion. The vast majority of this (nearly 50 million tons worth $101 billion) consisted of domestic east-west flows on Interstate 10.
- **Outbound flows** were the next largest share, at about 21.9 million tons valued at nearly $41.4 billion. This reflects El Paso's position as a major North American manufacturing center.
- **Inbound flows** totaled about 19.6 million tons of freight, worth slightly over $49.5 billion. Much of these flows can be attributed to the maquiladoras and their suppliers operating within the region.

- **Internal movements** (those occurring strictly within the study region) amounted to about 5.0 million tons valued at $7.0 billion.

Figure D.6.2 Regional Commodity Flows by Movement Type
2008



Mode Splits

It is important to determine how freight is moving along the system in order to get a sense of modal dependencies and traffic patterns. Trucks are particularly important in the El Paso region due to the high volume of cross-border trucking operations. As the table shows, trucks handled nearly three quarters of the region's total freight tonnage that year (nearly 74 million tons), compared to about 23 million tons for rail and truck/rail intermodal. When measured by value, trucks carried an even greater share – 81.6 percent, or $169 billion. This is to be expected since trucks' speed and route flexibility make them attractive for certain high-value, lower-weight commodities, including electronic components and other maquiladora supplies and products.

Table D.6.1 shows the overall mode splits for the region in 2008. As the table shows, trucks handled nearly three quarters of the region's total freight tonnage that year (nearly 74 million tons), compared to about 23 million tons for rail and truck/rail intermodal. When measured by value, trucks carried an even greater share – 81.6 percent, or $169 billion. This is to be expected since trucks' speed and route flexibility make them attractive for certain high-value, lower-weight

commodities, including electronic components and other maquiladora supplies and products.

Table D.6.1 Overall Mode Shares by Weight and Value
2008

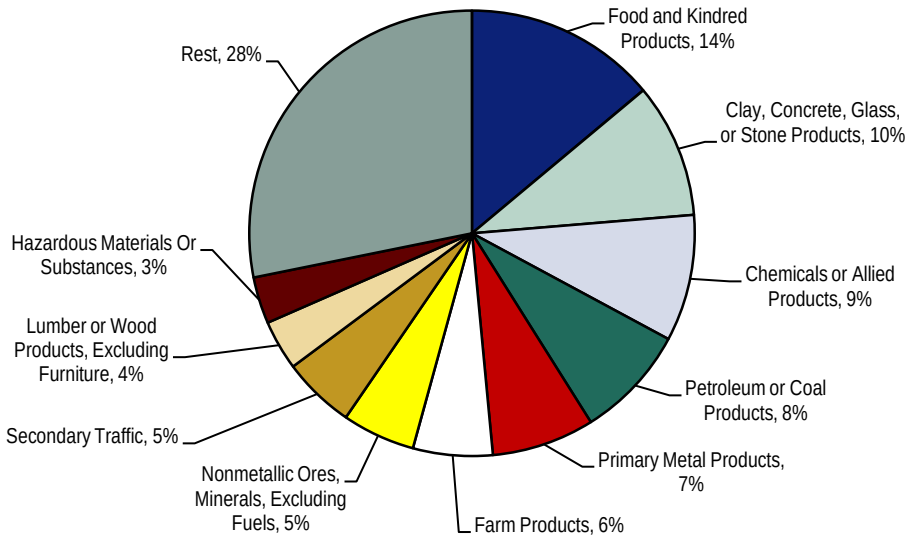
	By Weight		By Value	
	Tons in Thousands	Percent	Dollars in Millions	Percent
Truck	74,239	76.1%	$168,939	81.6%
Rail and Intermodal	23,325	23.9%	$38,086	18.4%
Total	97,564	100.0%	$207,026	100.0%

Source: Cambridge Systematics analysis.

Top Commodities

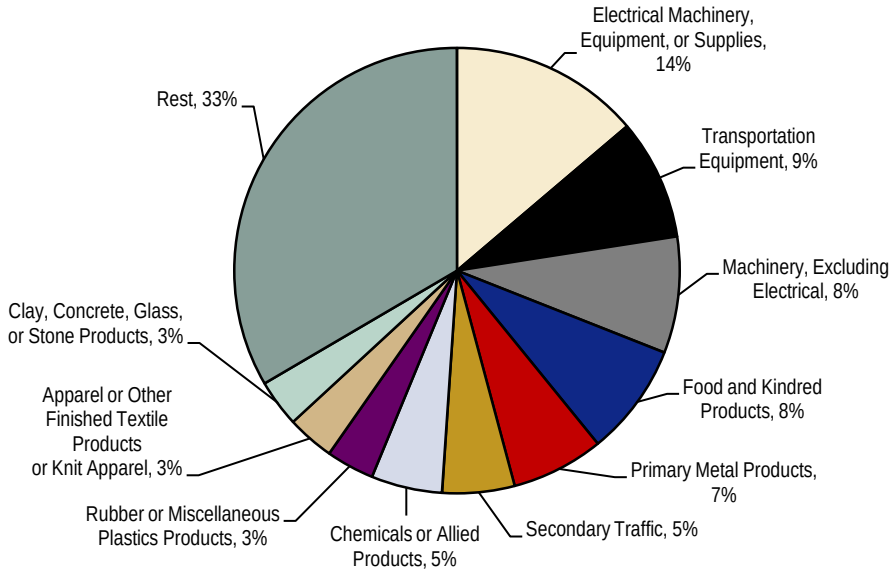
Analyzing the key commodities being transported in a region provides insights into how the system is being used and what industries are being supplied. Figure D.6.3 shows the top 10 commodities in the study region by weight for 2008. Food and kindred products and clay, concrete, glass and stone products were at the top and made up 14 percent and 10 percent of the total, respectively. Other key commodities include chemicals (9 percent), petroleum or coal products (8 percent), and metal products (7 percent); farm products, nonmetallic ores and minerals and secondary traffic (5 percent each); and lumber/wood products (4 percent).

Figure D.6.3 Top Commodities by Overall Weight
2008



It also is important to consider commodity value. Figure D.6.4 presents the top 10 commodities in the region when measured by value for 2008. Not surprisingly, the commodity mix is dominated by high value-added products such as electrical equipment (14 percent, or $28.6 billion), transportation equipment (9 percent, or about $18 billion) and nonelectrical machinery (8 percent, or $17.5 billion). Overall, these commodities reflect the diversified manufacturing base in the region, especially the maquila sector. For example, transportation equipment represents the supplies and outputs of the various auto parts manufacturers operating in El Paso and Juárez, such as Delphi. Electrical machinery and equipment includes the products of area high-tech manufacturers.

Figure D.6.4 Top Commodities by Overall Value
2008



Top Trading Partners

Although the borderplex conducts most of its domestic trade with Texas, it also has important trading partners elsewhere in the country and internationally, particularly when measured by value. Because most freight tonnage and value in the region is carried by truck, continued population growth in its key trading partners will lead to additional truck trips in the borderplex.

Figure D.6.5 shows the top 10 domestic trading partners by weight for the region in 2008. Texas is by far the largest at 53 percent of the total (about 22 million tons). California is the next largest at seven percent or 2.8 million tons, followed by Illinois and New Mexico at four percent each (i.e., 1.8 million tons). Other key trading partners include Arizona (3 percent); and North Carolina, Louisiana,

Michigan, Kansas, and Georgia (2 percent each); and Kansas and Georgia (1.5 percent each).

When measured by value (Figure D.6.6), the region's mix of trading partners is more diverse but still dominated by Texas, which accounts for 48 percent of the region's freight value (nearly $43 billion). California is second at 8 percent of the total, or about $7.3 billion, followed by Midwestern states of Illinois and Michigan at about 7 and 4 percent, respectively. Louisiana, New Mexico, Arizona, North Carolina, Florida, and Virginia round out the top 10.

Figure D.6.5 Top Trade Partners by Inbound and Outbound Weight
2008

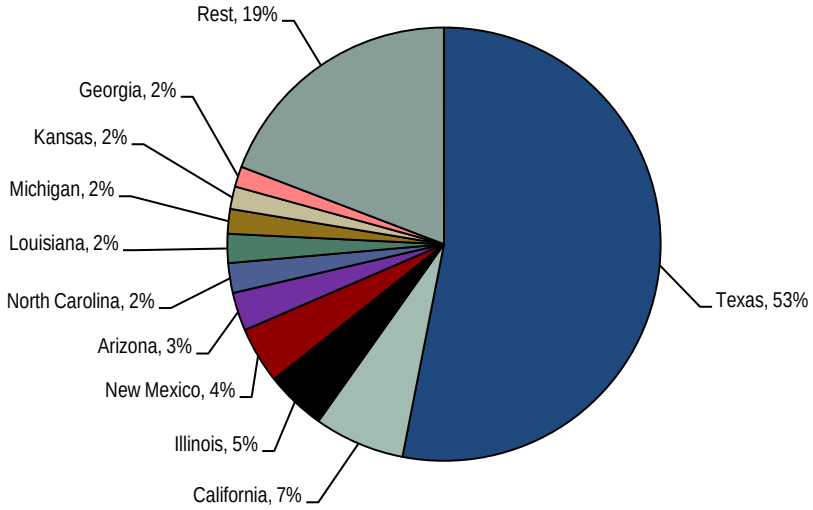
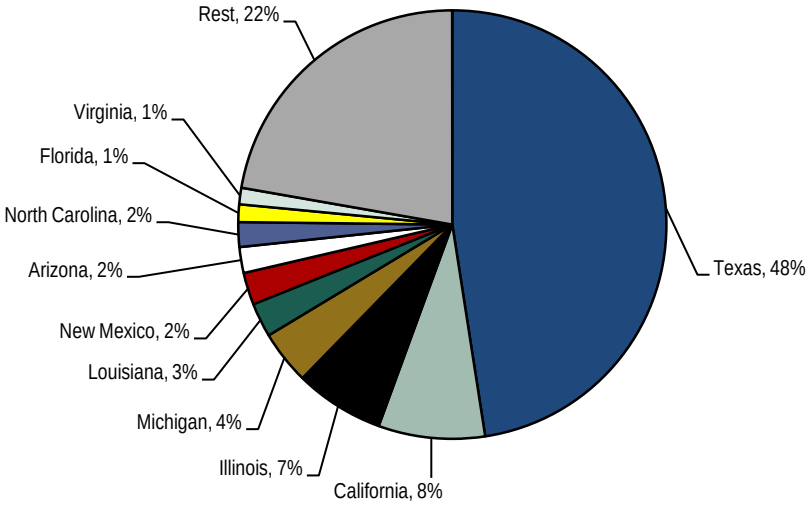


Figure D.6.6 Top Trade Partners by Inbound and Outbound Value
2008



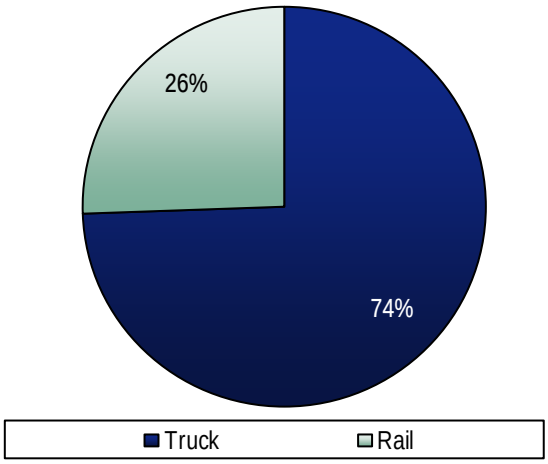
Current Cross-Border Moves

The remainder of this section focuses on cross-border freight movements, since these are the primary concern from a POE operations perspective. In 2008, cross-border shipments at the region's POEs totaled about 11.8 million tons and $48.7 billion dollars, which is about 17.1 percent (by weight) and 22.6 percent (by value) of the cross-border movements at all Texas POEs combined with Santa Teresa. The following sections describe the mode splits, top commodities, and distribution patterns of this traffic in 2008.

Mode Splits

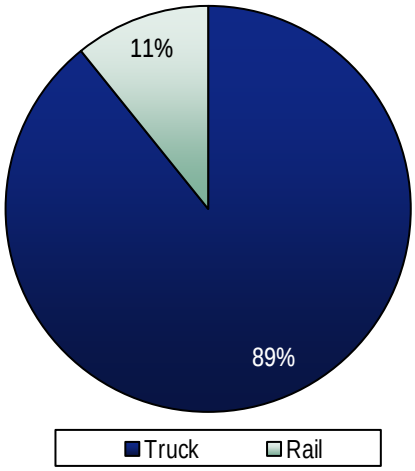
Figure D.6.7 shows the 2008 mode shares for cross-border flows in the region by weight. Trucks handled 74 percent of these shipments, totaling about 8.7 million tons. The remaining 26 percent (about 3 million tons) was carried by rail. The dominance of the truck mode for these movements is to be expected since shipments between maquiladoras and their suppliers north of the border are short by nature, and this is a characteristic which lends itself to shipping by truck.

Figure D.6.7 Cross-Border Mode Shares by Weight
2008



When measured by value, trucks are even more dominant, as shown in Figure D.6.8. In 2008, trucks hauled 89 percent of the cross-border freight bill in the El Paso region, amounting to more than $43 billion. Again, this is not surprising since trucks offer considerable speed and route flexibility advantages which make them attractive for high-value, lower-weight cargoes such as electronic components, machinery, and car parts.

Figure D.6.8 Cross-Border Mode Shares by Value
2008



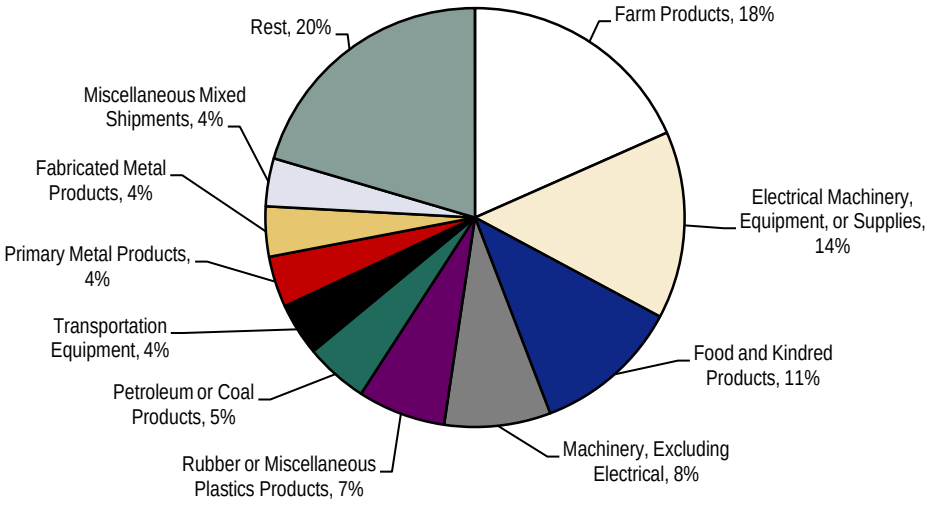
Top Commodities

Figure D.6.9 shows the top 10 cross-border commodities by weight in 2008. Interestingly, farm products were the number one commodity by weight at 18 percent of the total, or 2.2 million tons. Besides being a major manufacturing

hub, the El Paso region also is a key gateway for agricultural products. The Santa Teresa POE, for example, specializes in shipments of livestock as well as chili peppers and other field crops.

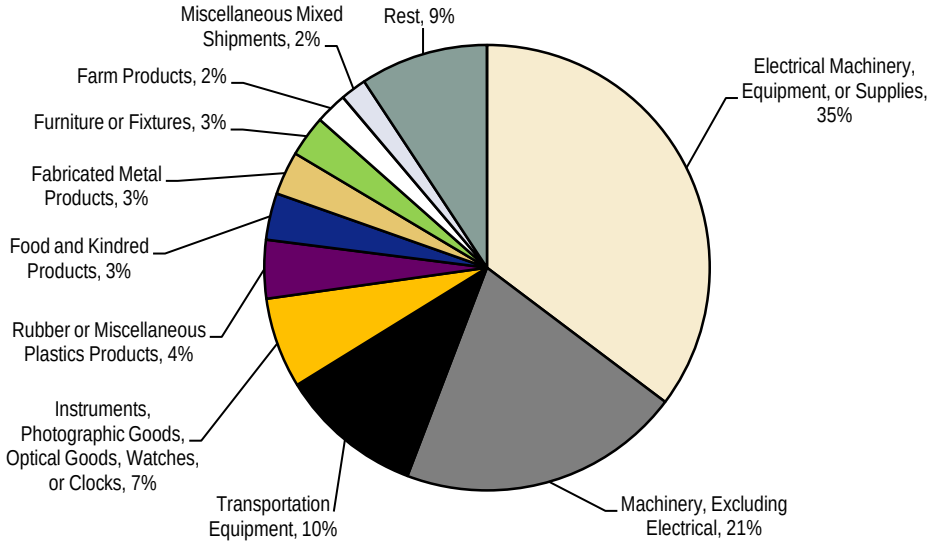
The remaining commodities tend to reflect the local maquila sector. The second most common cross-border commodity in 2008 was electrical machinery, at 14 percent of the total or 1.7 million tons. Food products made up another 11 percent, followed by nonelectrical machinery (8 percent, or about 960,000 tons) and rubber or plastic products (7 percent, or 796,000 tons). Other key cross-border commodities by weight include petroleum products, transportation equipment, primary and fabricated metal products, and miscellaneous mixed shipments (typically consumer goods).

Figure D.6.9 Top Cross-Border Commodities by Weight
2008



When measured by value, cross-border commodity flows are more diverse and more skewed toward higher-value goods. In 2008, electrical machinery and equipment accounted for 35 percent of cross-border shipments in the region by value, or about $17.2 billion (Figure D.6.10). Nonelectrical machinery was over one fifth of the total, or nearly $10 billion. Transportation equipment was the third most common cross-border good at 10 percent of the total or $5.1 billion. Rounding out the top five are precision instruments (7 percent, or $3.2 billion) and rubber/plastic products (4 percent, or $2.1 billion). Taken together, these five commodities comprise 77 percent of the value of goods shipped through the region's three POEs. They also represent the predominant manufacturing sectors in the region, such as motor vehicle parts, electronic equipment, precision instruments, medical devices, communication equipment, and household appliances.

Figure D.6.10 Top Cross-Border Commodities by Value
2008



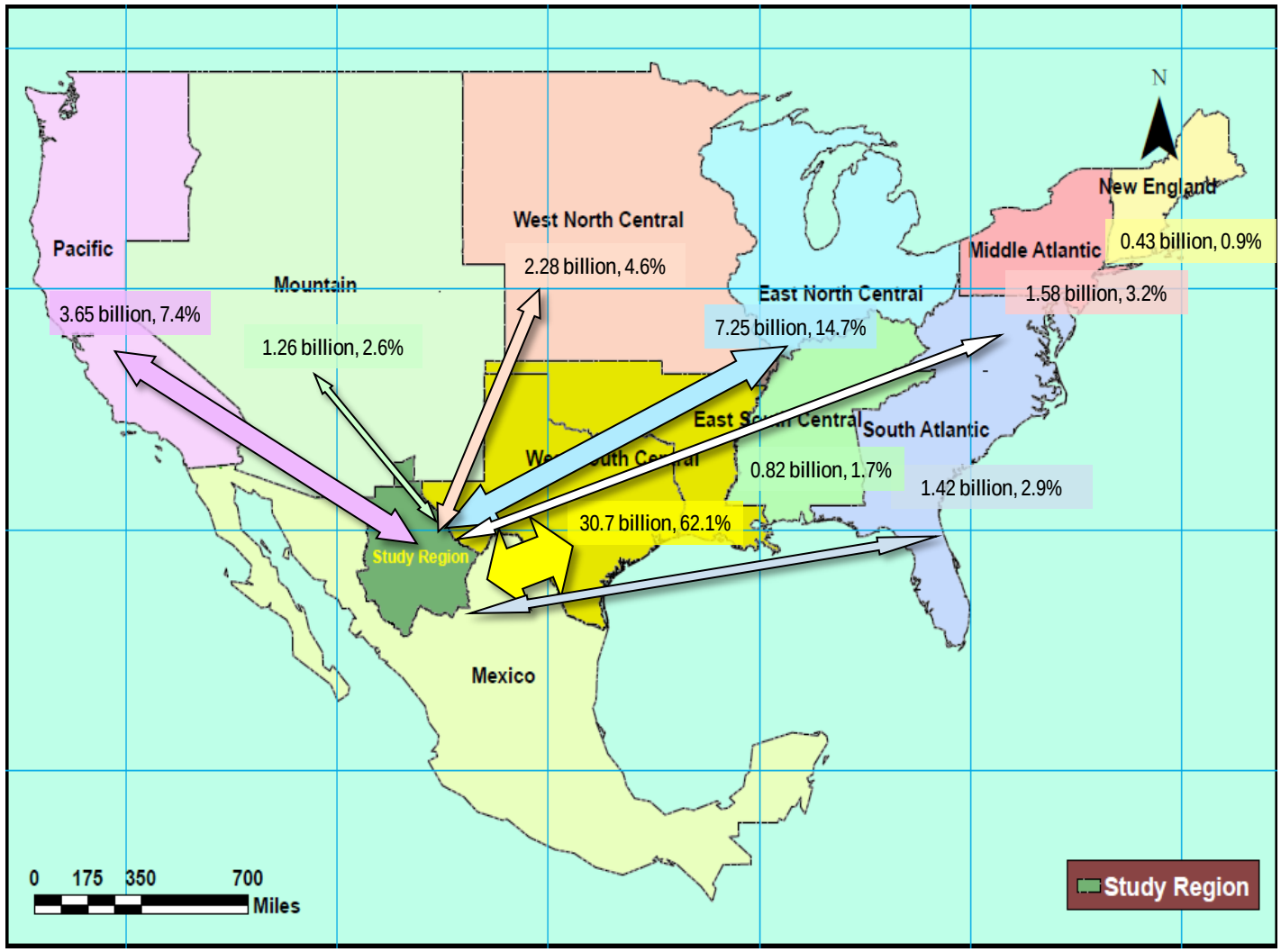
Distribution Patterns

The Transborder Freight Database also provides state-level origin and destination data for NAFTA trade. It can therefore be used to analyze distribution patterns for trade through the study region ports of entry. Figure D.6.11 shows trade distribution patterns through the study area POEs by value in 2008 for each U.S. Census region:

- **The West South Central region** (Texas, Oklahoma, Arkansas, and Louisiana) dominates overall flows through the POEs due to the heavy volume of cross-border maquila activity, as well as geographic proximity to large population centers like Dallas-Fort Worth, Houston, San Antonio, and New Orleans;
- **The East North Central region** (Illinois, Michigan, Minnesota, Indiana, and Ohio) has the next largest share (nearly 15 percent of the total, or $7.3 billion), reflecting significant trading relationships with Midwestern manufacturers who maintain twin plants in Juárez;
- **The Pacific region** (California, Oregon, and Washington) makes up the next largest share at $3.7 billion (7.4 percent of the total), reflecting large consuming markets along the West Coast.

Trading volumes with other regions tend to correlate with geographic proximity (e.g., the Mountain region) and/or rapidly growing areas such as the Deep South.

Figure D.6.11 Trade Flow Distribution Patterns by Region Through El Paso and Santa Teresa POEs for All Land Modes *2008, by Value*



Overview of Future Commodity Flows

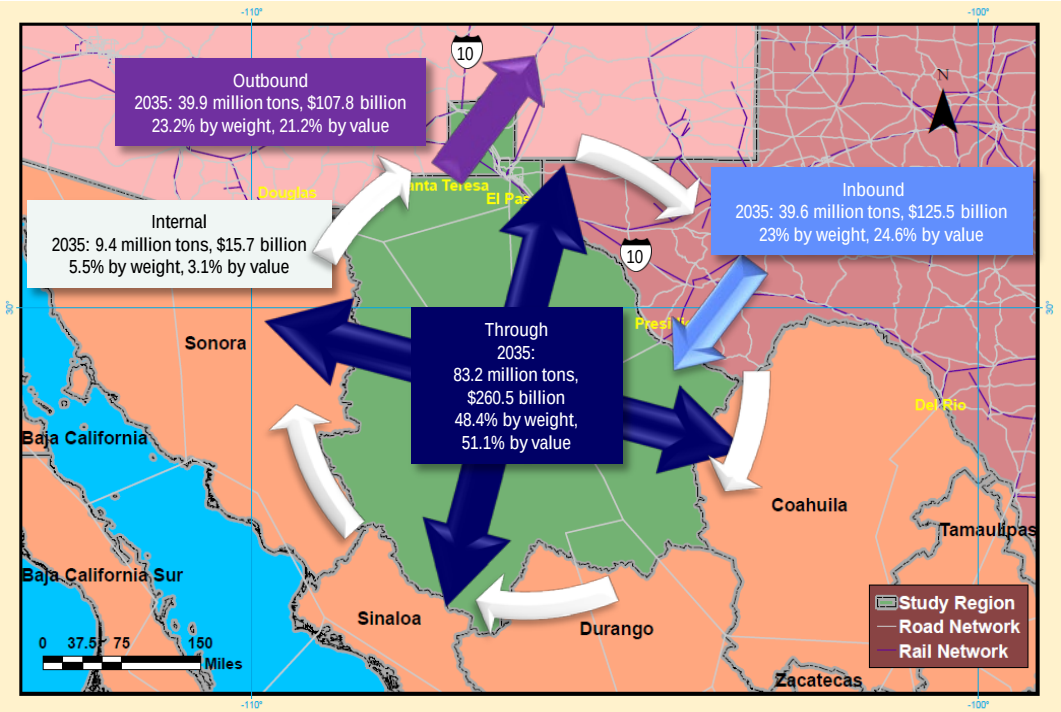
Overall freight tonnage in the El Paso region will grow by an average of 2.1 percent annually, causing total volume to expand by 76 percent by 2035. When measured by value, the growth is even faster, averaging 3.4 percent on an annual basis and causing the region's total freight bill to increase by nearly 150 percent. The following sections provide an overview of freight flows in the region through 2035.

Regional Commodity Flows by Movement Type

Figure D.6.12 shows 2035 freight volume and value by movement type in the study region.

- **Through flows** will remain the predominant movement type by both weight and value, totaling nearly 83.2 million tons (48.4 percent of the total) and $260.5 billion (51.1 percent of the total) by 2035. However, as a fraction of the total, through freight will be a smaller share in the future than it is now, indicating that a greater proportion of commodity flows will be attributable to economic activity within the study region.
- **Outbound freight** will represent about 23.2 percent (by weight) of total regional flows by 2035. On a value basis outbound flows will reach 21.2 percent of the total.
- **Inbound shipments** will total about 39.5 million tons worth $125.5 billion by 2035. This will represent 23 percent (by weight) and 25 percent (by value) of total regional flows. Growth in this movement type will be directly attributable to population growth and industry expansion in the region.
- **Internal movements** will reach nearly 9.4 million tons valued at $15.7 billion by 2035. Much of this growth will be driven by increasing cross-border drayage movements made by truck.

Figure D.6.12 Regional Commodity Flows by Movement Type
2035



Mode Splits

As shown in Table D.6.2, trucks are expected to carry 79.7 percent of total freight volumes in the El Paso region by 2035 (up from 76.1 percent in 2008), with the remaining tonnage (20.3 percent) handled by rail and intermodal (down from 23.9 percent in 2008). On a value basis, truck and rail shares remain relatively stable but total freight value will expand a great deal. Overall, this suggests that rail may not be able to absorb expected volume growth despite planned improvements to regional rail infrastructure. However, the addition of a rail crossing and intermodal facility at Santa Teresa may make intermodal rail an attractive option for certain long-distance movements.

Table D.6.2 Overall Mode Shares by Weight and Value
2035

	By Weight		By Value	
	Tons	Percent	Dollars	Percent
Truck	137,201	79.7%	$436,011	85.6%
Rail and Intermodal	34,849	20.3%	$73,435	14.4%
Total	172,050	100.0%	$509,446	100.0%

Source: Cambridge Systematics analysis.

Top Commodities

Figure D.6.13 shows the top 10 commodities by weight in 2035. Food and kindred products account for 14 percent of total freight volume by 2035 and clay, concrete, glass, or stone products make up about 10 percent of total freight volume by 2035 (23.3 million tons and 16.7 million tons, respectively). These are followed by electrical machinery and chemicals (9 percent each) and primary metal products (7 percent, or 12.5 million tons). Secondary traffic (truck drayage moves) also will represent about 7 percent of the total, or 12.2 million tons. This is up from 5.3 percent in 2008, indicating that these short drayage movements will grow faster than other commodity types. Together, these products will comprise 56 percent of total freight by weight in the El Paso area. Electrical machinery – which includes household appliances, communication equipment, and electrical components for cars – will grow especially fast since this commodity group was not even in the top 10 on a tonnage basis in 2008. Other key commodities are similar to 2008, such as metal products, petroleum products, nonmetallic ores and minerals, rubber/plastic products, and agricultural products.

Figure D.6.14 shows the top commodities by value in 2035. Electrical machinery will remain the top overall commodity in the region by value at nearly 32 percent of the total ($160.8 billion). This represents a substantial increase from 2008, when these products comprised just under 14 percent of total freight value, and is indicative of an economy shifting towards more capital-intensive, high-tech goods. Nonelectrical machinery will move up to the number two commodity by value at 9 percent of the total, or about $46.9 billion. At number three is transportation equipment (7 percent, or $34.5 billion). These three commodities combined will make up 48 percent of the region's freight flows by value in 2035. The rest of the commodity mix is fairly similar to 2008, though there will be additional shipments of precision instruments in the future. These will comprise about 4 percent of regional commodity value by 2035, or nearly $18.9 billion.

Figure D.6.13 Top Commodities by Overall Weight
2035

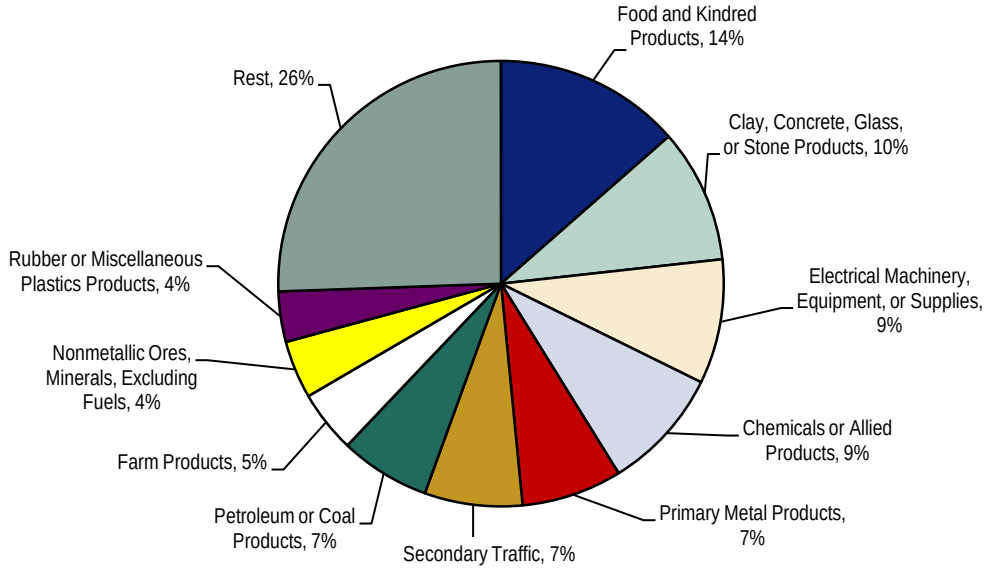
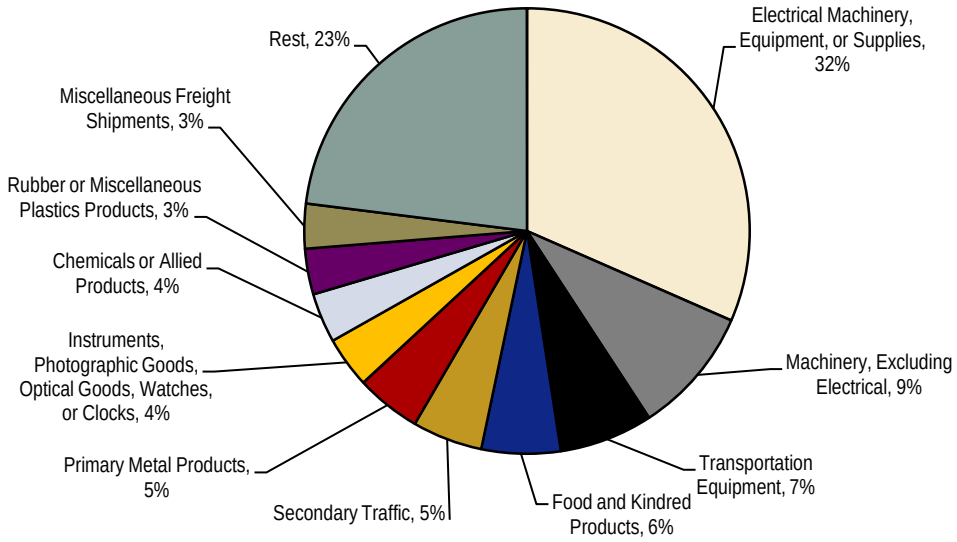


Figure D.6.14 Top Commodities by Overall Value
2035



Top Trading Partners

Texas will remain the dominant trading partner for the study region in the future, but the overall mix of domestic trading partners will become more diverse. As shown in Figure D.6.15, Texas will still account for more than half of the region's inbound and outbound trade by weight in 2035 (about 42 million tons), with almost the same share as in 2008. California will remain the number

two trading partner by volume at 8 percent (6.5 million tons), up slightly from 7 percent in 2008. Illinois and New Mexico will maintain their number three and number four spots with 4 percent and 3 percent, respectively (i.e., about 3.1 million tons and 2.6 million tons). Growth in trade with Virginia is anticipated; it did not enter the top 10 in 2008 but is seen to take the fifth position in 2035. Other important trading partners are fairly similar to 2008 and include states in the Mountain West, South, and Midwest.

The total value of the region's trade with the rest of Texas will reach $106 billion by 2035 (Figure D.6.16), but as a share of overall inbound and outbound freight value this will be down from 2008 (45.3 percent versus 47.6 percent). This difference will be made up by growth in other markets, especially California (nine percent, or nearly $21.4 billion) and Virginia (7 percent of the total, or about $16.4 billion). Trade also will expand with Midwestern states such as Michigan, Illinois, and Indiana as well as the South and Mid-Atlantic regions (North Carolina, Maryland, and Louisiana).

On both a tonnage and value basis, growing trade with states such as Maryland and Virginia could be indicative of growth in the local defense sector. Virginia and Maryland are home to many defense contractors, and the El Paso/southern New Mexico area has a significant military/defense complex of its own, including Fort Bliss, White Sands Missile Range, and Holloman Air Force Base. Raytheon, Boeing, and Lockheed-Martin all have a presence in the region. Fort Bliss is set to receive a net increase of 27,000 active duty soldiers by 2013, the largest net gain of any base in America. Meanwhile, White Sands performs crucial weapons system testing for all branches of the armed forces while Holloman AFB hosts a Tactical Fighter Wing and is one of three U.S. bases to house the Air Force's new F/A-22 Raptor.[36]

[36] El Paso Regional Economic Development Corporation.

Figure D.6.15 Top Trade Partners by Inbound and Outbound Weight
2035

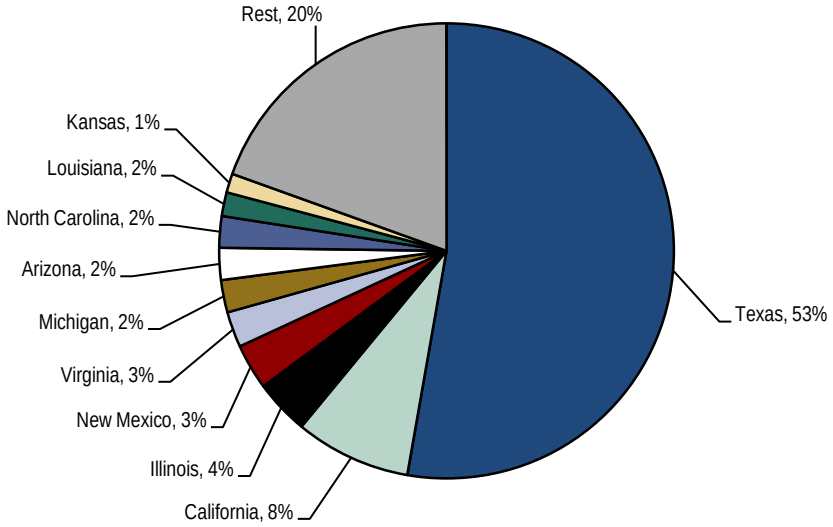
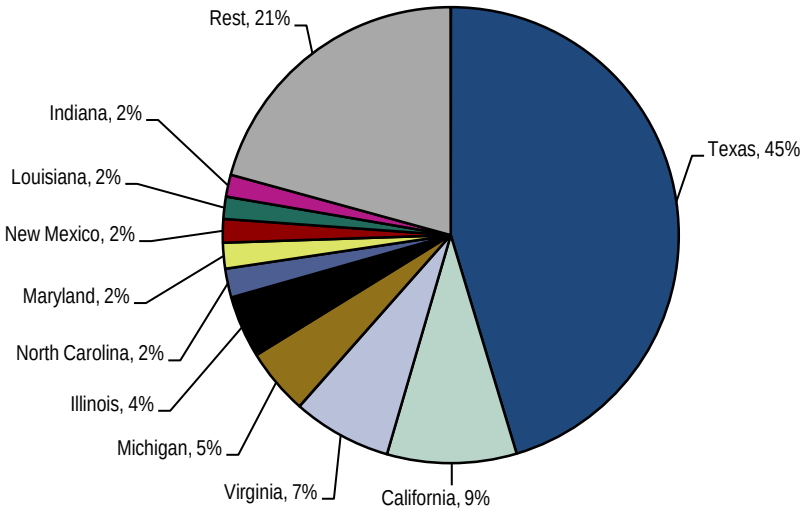


Figure D.6.16 Top Trade Partners by Inbound and Outbound Value
2035



Future Cross-Border Moves

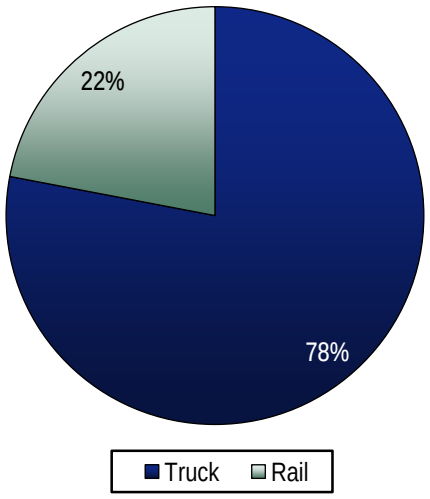
Cross-border shipments at El Paso POEs and Santa Teresa POE are expected to reach 25.5 million tons and $111.0 billion by 2035, which is about 16.7 percent (by weight) and 22.5 percent (by value) of the cross-border movements at all Texas ports of entry plus Santa Teresa. Although the overall share of NAFTA trade

crossing in the El Paso region will remain relatively constant, the mode shares, top commodities, and distribution patterns of that trade will change in the future, as shown below.

Mode Splits

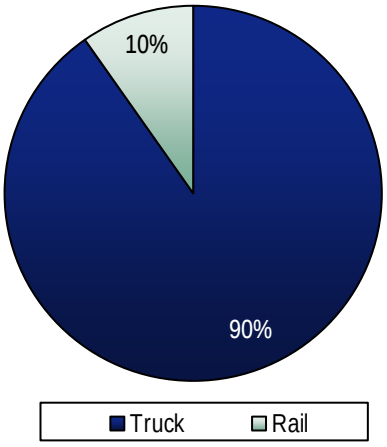
Figure D.6.17shows predicted mode shares between truck and rail/intermodal in 2035. Trucks will carry 77 percent of cross-border freight in the region by 2035, a total of nearly 20 million tons. The remaining 23 percent (5.8 million tons) will cross by rail. This compares to 74 percent and 26 percent for truck and rail respectively in 2008, meaning that truck crossings will grow faster than rail crossings in the future.

Figure D.6.17 Cross-Border Mode Shares by Weight
2035



Trucks will increase their relative dominance when measured by freight value too. As shown in Figure D.6.18, trucks are expected to handle 90 percent of the cross-border freight bill in the region by 2035, amounting to $100 billion and up slightly from 89 percent in 2008. As the region's economy continues to move up the value chain (particularly in the manufacture of high-tech products) the growth in freight value transported by truck will translate into additional demand at the commercial ports of entry.

Figure D.6.18 Cross-Border Mode Shares by Value
2035



Top Commodities

Farm products will remain the number one POE commodity in the region by weight in 2035 at 15 percent of the total, or approximately 3.9 million tons (Figure D.6.19). This share is slightly less than 2008, when farm products made up 18 percent of POE freight traffic. Electrical components will comprise 14 percent of cross-border shipments by weight, or about 3.6 million tons. Food and kindred products are expected to reach 3.3 million tons (13 percent of the total, up from 11 percent in 2008), while nonelectrical machinery and rubber and plastic products will grow to about 2.2 million tons (9 percent) each by 2035. Overall, farm products and electrical equipment tonnage will decline as a percentage of overall POE volumes, though they will still grow substantially in absolute terms. Meanwhile, shipments of food and kindred products, nonelectrical machinery, and rubber/plastics will grow at a more rapid pace, thereby accounting for a greater share of the total in 2035.

Figure D.6.19 Top Cross-Border Commodities by Weight
2035

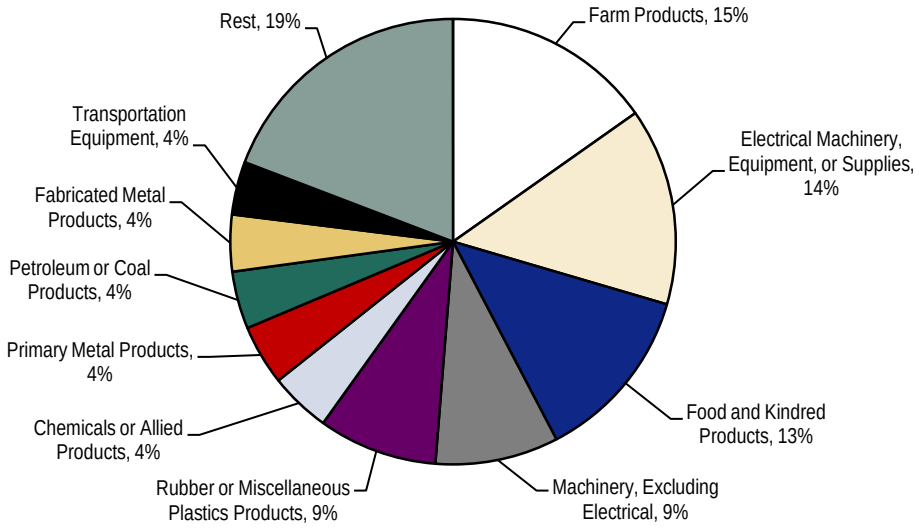
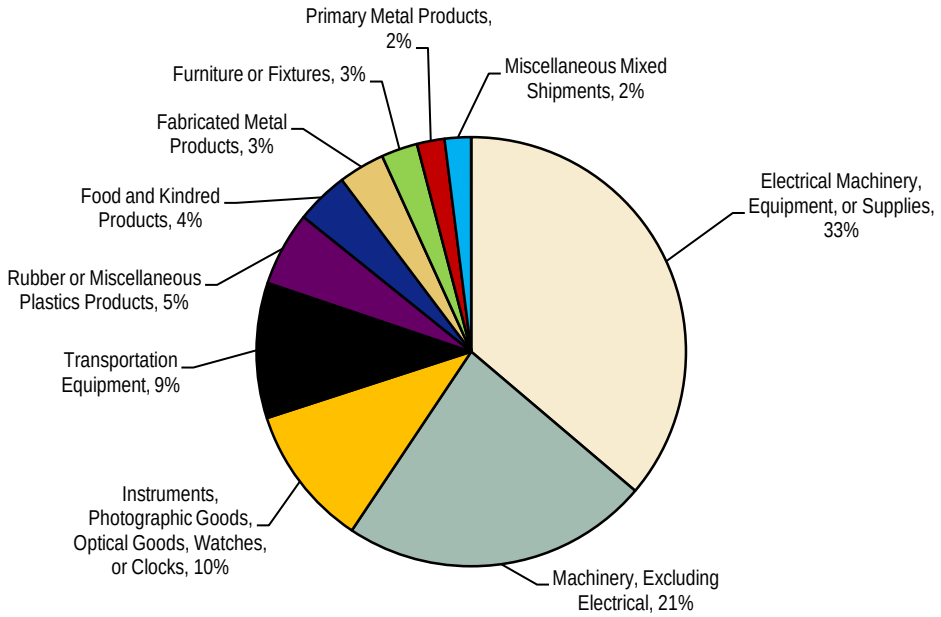


Figure D.6.20 shows the top cross-border commodities by value in 2035. Electrical machinery and equipment will remain the top POE commodity by value in the future at 33 percent of the total (nearly $36.9 billion). Nonelectrical machinery will comprise 21 percent of the total, or about $23.6 billion, followed by precision instruments (10 percent, or $10.8 billion) and transportation equipment (9 percent, or $10.4 billion). Compared to 2008, the share of cross-border freight value in electrical machinery and transportation equipment will decline slightly, but this is made up for by rapid growth in the value of precision instruments shipments. This commodity group includes medical device manufacturing, of which there is a growing industry cluster in El Paso. These include disposable device manufacturers as well as makers of specialty devices for cardiovascular and general/plastic surgery.[37]

[37] El Paso Regional Economic Development Corporation.

Figure D.6.20 Top Cross-Border Commodities by Value
2035

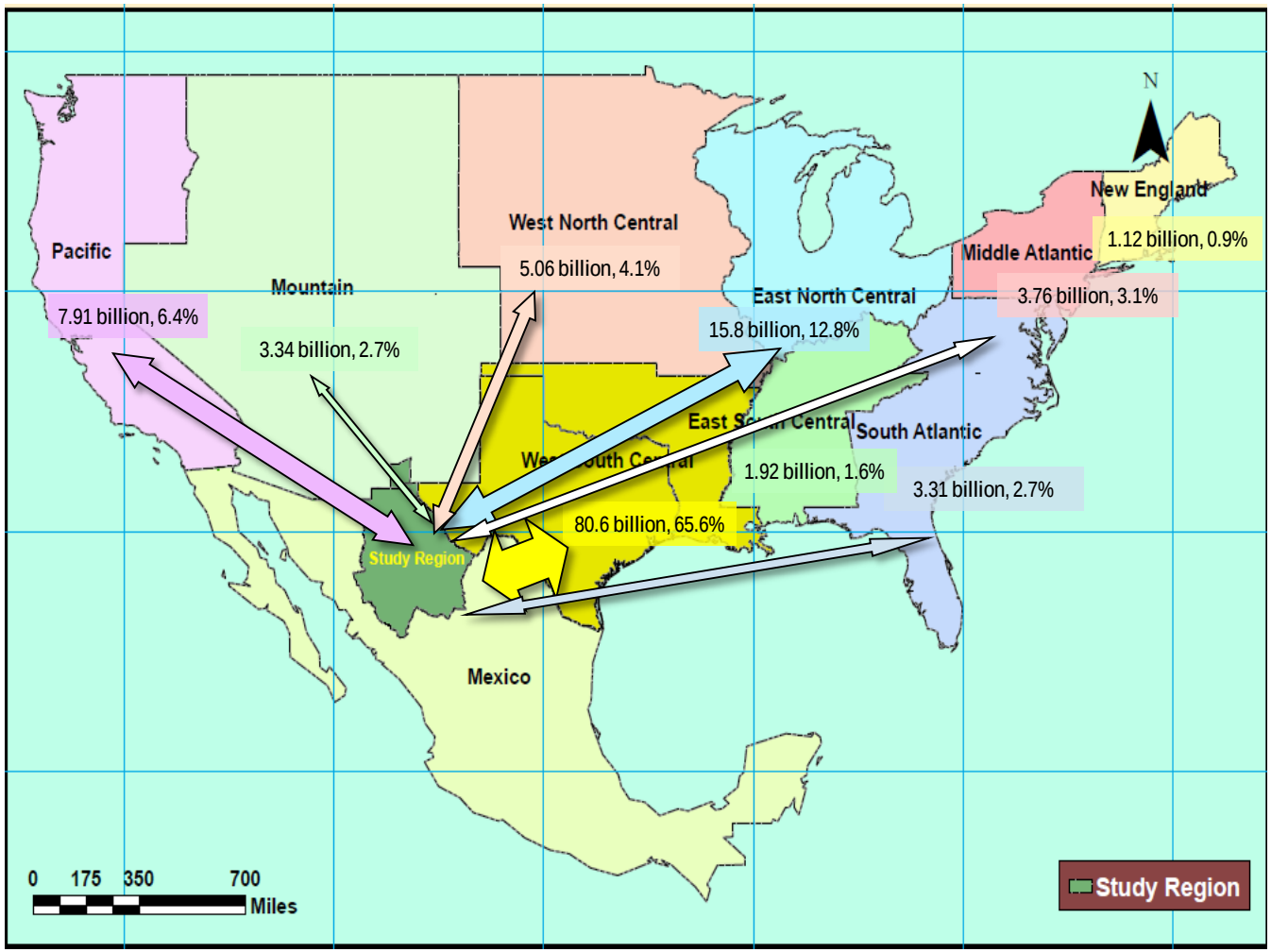


Distribution Patterns

By applying compound annual growth rates for export and import trade value to and from Mexico developed from TRANSEARCH, we estimated distribution patterns by U.S. Census region for El Paso area cross-border flows in 2035. The results are shown in Figure D.6.21.

- **The West South Central region** (primarily Texas) will continue to be the number one origin/destination for El Paso area POE flows, and will grow as a share of the total as well. Flows to and from this Census region will total nearly $81 billion in 2035, representing over 65 percent of the total (compared to 62 percent in 2008).
- **The industrial Midwest (East North Central region)** will still be the second most important trading region for the POEs at $15.8 billion, or 13 percent of total cross-border flows by value. This is more than double the level of 2008; however it is smaller as a share of the total as more flows will be going to and from fast-growing areas in the West South Central region.
- **Other regions** will maintain relatively stable shares of total El Paso POE flows, but the overall value of these shipments will grow dramatically, leading to more cross-border truck trips in El Paso as well as additional freight transfer activities at warehouses and distribution centers on both sides of the border.

Figure D.6.21 Projected Trade Flow Distribution Patterns by Region through El Paso and Santa Teresa POEs for All Land Modes *2035, by Value*



D.7 Commodity Flow Methodology and Data Sources

Commodity Flow Data

Multiple data sources were needed to develop a complete picture of current and future commodity flow patterns in the study region, including Global Insight's 2003 TRANSEARCH freight flow database, 2008 North American Transborder Freight Data, and the 2002 Freight Analysis Framework (FAF[2]) Commodity Origin-Destination Database. This section describes our basic approach and the data used for each step.

Step 1: Identify To, From, and Internal Flows

TRANSEARCH is a proprietary data set that provides base year (2003) and forecast (2035) estimates of commodity flows by weight moving to, from, and within Texas. The forecasts were recently updated by Global Insight to account for the 2008-2009 recession. Forecasts for interim years also are available in five-year increments beginning in 2010. Data is provided for every Texas County, all 50 U.S. states plus the District of Columbia, and each Mexican state. Commodity flows are described using two-digit Standard Transportation Commodity Codes (STCC)[38] and are assigned to one of six modes: truck, rail, air, water, pipeline, and other (unclassified).

We used TRANSEARCH to identify and summarize all commodity flows to, from, and within the study region, by weight, in 2008 and 2035.[39] Freight value was estimated using Texas-specific tons-to-value conversion factors.[40]

Step 2: Identify Cross-Border Flows

TRANSEARCH identifies the total volume of freight crossing between Texas and Mexico, but it does not assign those volumes to particular border crossings. It also does not identify freight crossing the border in New Mexico since it was purchased by TxDOT for use in statewide analysis and modeling. It was therefore necessary to use an alternate data source to identify cross-border flows in the study region.

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[38] STCC codes are a commonly used commodity classification system developed by the Association of American Railroads (AAR). A list of STCC codes and their corresponding commodities is presented in Table B.1 of Appendix B.

[39] 2008 data was obtained by interpolating between the 2003 base year and 2010 forecast year.

[40] A list of commodity conversion factors is provided in Table D.8.2 of Appendix C.

North American Transborder Freight Data is provided by the Bureau of Transportation Statistics (BTS), and cross-border flow data by weight or value can be collected through the use of an on-line query tool.[41] The U.S.-Mexico export and import flows by value are available for each port of entry at either Mexico state level and all commodity types (using two-digit Harmonized System or HS[42] codes), or Mexico country level and individual commodity type.

We collected the cross-border-related export and import value data through the study region using the 2008 Transborder freight data for the El Paso POEs (BOTA and Zaragoza) and the Santa Teresa POE in a manner similar to the *Texas NAFTA Study Update*.[43] The commodity flows in HS codes were converted to STCC codes using a HS-STCC crosswalk as shown in Table D.8.3 of Appendix D.8. The growth rates by commodity and movement type from TRANSEARCH were used in estimating these through flows for 2035. Values were converted to tons using the same conversion factors applied to the TRANSEARCH data.

Step 3: Identify Through Flows

TRANSEARCH does not explicitly call out through movements in the study region (i.e., shipments that neither originate nor terminate in the region but are merely passing through). We estimated these flows using analytical techniques we have developed and employed in other regions throughout the country, as described below.

Based on the geographic location of El Paso County, through flows for the study region consist of two major components: a) north-south cross-border through flows; and b) east-west domestic through flows that take place on Interstate 10.

Estimate North-South Cross-Border through Flows

For the north-south through flows, the following data sets were used:

1. Commodity-wise study region total cross-border flow value data between the U.S. and Mexico in 2008 and 2035 as obtained in Step 2;
2. Study region cross-border flow value data between Chihuahua State and the U.S. in 2008; and
3. 2008 and 2035 estimates of import and export tons and value for El Paso County from TRANSEARCH.

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[41] http://www.bts.gov/programs/international/transborder/ (Last accessed on September 22, 2010).

[42] HS is an international nomenclature for the classification of traded goods for customs purposes. At 2-digit level, it gives a broad description of the good type.

[43] Texas Department of Transportation, *Texas NAFTA Study Update*, February 2007.

The first data set provided the tons and value of flow between Mexico and the U.S. through the El Paso and Santa Teresa POEs. The aggregated flow value per ton and compounded annual growth rate estimates from this were used on the second data set (also obtained from North American Transborder data) to estimate the flow tons between Chihuahua and the U.S. Consequently, the difference provided estimates of tons and value for flows between the Rest of Mexico States (i.e., excluding Chihuahua State) and the U.S. The third data set provided tons and value for the cross-border flows between the Rest of Mexico States and El Paso County. A final difference resulted in estimates of tons and value of flows that pass through the study region that had either an origin or destination in Mexico.

Estimate East-West Domestic through Flows

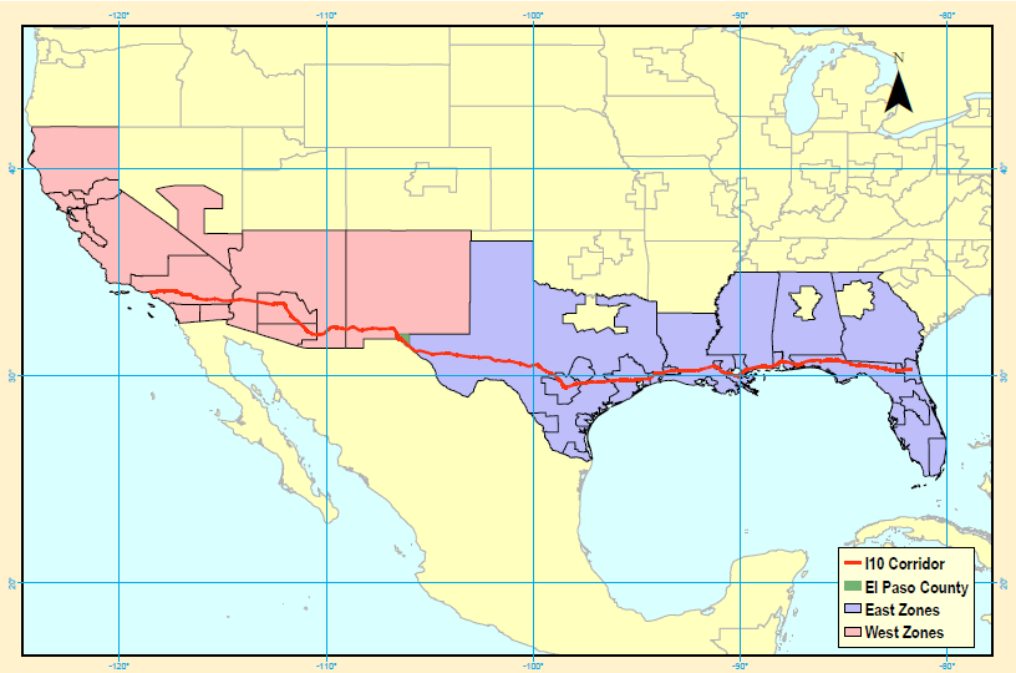
We estimated east-west domestic through flows using the FHWA Freight Analysis Framework (FAF^2). FAF^2 is a database of freight movements among states and major metropolitan areas developed using the 2002 Commodity Flow Survey and other sources. Estimates of tonnage and value by commodity type (using two-digit Standard Classification of Transported Goods [SCTG[44]] codes), mode, origin, and destination are available, of which only the tonnage information was used. Forecasts through 2035 also are available, however were not used in our analysis. FAF^2 data typically provides a better disaggregation of geographical areas for states other than Texas, so that only movements that are most likely using the I-10 corridor in El Paso County are captured.

Flows between FAF^2 zones east and west of the study region lying along the I-10 freight corridor were considered, as shown in Figure D.7.1. Major metropolitan areas lying along the I-20 corridor (which runs parallel to I-10 in the eastern zones) and less likely to use I-10 for goods movement were avoided in our analysis, e.g., Dallas, Birmingham and Atlanta.

Commodity flows were estimated for the year 2008 in SCTG codes and were then converted to STCC codes using a SCTG-STCC crosswalk as shown in Table D.8.5 of Appendix C. Methods similar to the cross-border flows data were used to estimate the current value and future tons and value of the east-west through flows.

[44]SCTG codes were developed by the U.S. Department of Transportation, U.S. Bureau of the Census, Statistics Canada, and Transport Canada to replace the STCC codes previously used in Commodity Flow Survey (CFS). At two-digit level, they provide analytically useful commodity groupings for getting an overview of transported goods. A list of SCTG codes and corresponding commodities is provided in Table C.4 of Appendix C.

Figure D.7.1 FAF East/West Zones for Domestic through Flows Analysis



Other Data Sources

Population estimates and forecasts from the U.S. Census Bureau and UTEP Border Region Modeling Project were used to describe population trends in the region. Industry data from the U.S. Bureau of Economic Analysis and the Border Region Modeling Project were used to analyze key goods-movement dependent industries. Data provided by the El Paso Regional Economic Development Corporation describe trends in the regional maquiladora industry. Table D.7.1summarizes the data sources used for the analysis and how they were employed in the study.

Table D.7.1 Summary of Data Sources

Data Type	Data Set/Source	Used For
Commodity Flow	TRANSEARCH	Estimating base year (2008) and future (2035) borderplex commodity flows
	Transborder Freight Data[a]	Estimating cross-border flows in the study area
	Tons to Value Conversion Factors	Converting TRANSEARCH tonnage estimates to freight value estimates
	FAF[2]	Estimating east-west domestic through flows
Socioeconomic	U.S. Census Bureau[b]	Population growth rates in the study region
	UTEP Border Region Modeling Project[c]	Border region population, industry output, and other socioeconomic indicators
	U.S. Bureau of Economic Analysis[d]	Gross Regional Product and employment estimates by industry
	El Paso Regional Economic Development Corporation[e]	Maquiladora employment and permit application activity
	Instituto Nacional de Geografica y Estadistica (INEGI)[f]	Gross Regional Product estimates by industry for Chihuahua
Plans and Studies	TxDOT NAFTA Study Update	Disaggregating El Paso border crossing activity in TRANSEARCH

[a] http://www.bts.gov/programs/international/transborder/.

[b] http://www.census.gov.

[c] http://academics.utep.edu/Default.aspx?alias=academics.utep.edu/border.

[d] http://www.bea.gov/.

[e] http://www.elpasoredco.org/.

[f] http://200.23.8.5/inegi/default.aspx.

D.8 Commodity Descriptions and Conversion Tables

Table D.8.1 STCC Codes and Commodities

STCC Codes and Commodities	
1	Agriculture Production and Livestock
	Cotton, grain, oil kernels/nuts/seeds, field seeds, miscellaneous field crops, fresh fruits and vegetables, livestock, dairy farm products, animal fibers, live poultry, poultry eggs, horticultural specialties, animal specialties, and farm products not elsewhere classified
8	Forest Products
	Crude barks or gums and miscellaneous forest products
9	Fresh Fish or Marine Products
	Fresh fish or whale products, marine products, and fish hatcheries
10	Metallic Ores
	Iron ores, copper ores, lead ores, zinc ores, lead and zinc ores combined, gold ore, silver ore, bauxite or other aluminum ores, manganese ores, tungsten ores, chromium ores, and miscellaneous metal ores
11	Coal
	Anthracite, bituminous coal, and lignite
13	Crude Petroleum or Natural Gas
	Crude petroleum, natural gas, and natural gasoline
14	Nonmetallic Minerals
	Dimension stone (quarry), broken stone or riprap, gravel or sand, clay ceramic or refracted minerals, chemical or fertilizer mineral crude, miscellaneous nonmetallic minerals not elsewhere classified, and water
19	Ordnance or Accessories
	Guns/howitzers/mortars, guided missiles or space vehicles, ammunition or related parts not elsewhere classified, tracked combat vehicles or parts, military fire control equipment, small arms, small arms ammunition, and miscellaneous ordnance or accessories
20	Food or Kindred Products
	Fresh or chilled meat, fresh frozen meat, meat products, inedible animal by-products, fresh or frozen dressed poultry, processed poultry or eggs, creamery butter, condensed/evaporated/dry milk, ice cream/frozen desserts, cheese or special dairy products, processed milk, canned or cured sea foods, canned specialties, canned fruits/vegetables, dehydrated or dried fruits/vegetables, pickled fruits/vegetables, processed fish products, frozen fruit/vegetables/juice, frozen specialties, canned food, flour, prepared or canned feed, milled rice/flour/meal, cereal preparations, wet corn milling or milo, dog/cat/pet food, bread or other bakery products, biscuits/crackers/pretzels, sugar/sugar mill products or by-products, candy/confectionery, malt liquors, malt, wine/brandy/brandy spirit, distilled/blended liquors, soft drinks/mineral water, miscellaneous flavoring extracts, cottonseed/soybean/nut/vegetable oils or by-products, marine fats or oils, coffee, margarine/shortening, ice, macaroni/ spaghetti, and miscellaneous food preparations not elsewhere classified
21	Tobacco Products
	Cigarettes, cigars, chewing, or smoking tobacco, and stemmed or redried tobacco
22	Textile Mill Products
	Cotton broad-woven fabrics, manmade or glass woven fiber, silk-woven fabrics, wool broad-woven fabrics, narrow fabrics, knit fabrics, carpets/mats/rugs, yarn, thread, felt goods, lace goods, padding/upholstery fill, processed textile waste, coated or imprinted fabric, industrial cord or fabrics, wool/mohair, cordage/twine, and textile goods not elsewhere classified

STCC Codes and Commodities	
23	Apparel or Related Products
	Men's/boys/women's/children's clothing, millinery, caps or hats or hat bodies, fur goods, gloves/mittens/linings, robes or dressing gowns, raincoats or other rain wear, leather clothing, belts, apparel not elsewhere classified, curtains or draperies, textile house furnishings, textile bags, canvas products, pleated textile products, apparel findings, and miscellaneous fabricated textile products
24	Lumber or Wood Products
	Primary forest materials, lumber or dimension stock, miscellaneous sawmill or planning mill, millwork or cabinetwork, plywood or veneer, prefabricated wood buildings, wood kitchen cabinets, structural wood products, wood containers or box shooks, treated wood products, rattan or bamboo ware, lasts or related products, cork products, hand tool handles, scaffolding equipment or ladders, wooden ware or flatware, wood products not elsewhere classified, and miscellaneous wood products
25	Furniture or Fixtures
	Benches/chairs/stools, tables or desks, sofas/couches, buffets/china closets, bedsprings/mattresses, beds/dressers/chests, cabinets or cases, children's furniture, household or office furniture, public building or related furniture, wood or metal lockers/ partitions, venetian blinds or shades, and furniture or fixtures not elsewhere classified
26	Pulp, Paper, or Allied Products
	Pulp or pulp mill products, paper, fiber/paper/pulp board, envelopes, paper bags, wallpaper, die-cut paper or pulp board products, pressed or molded pulp goods, sanitary paper products, miscellaneous converted paper products, paper containers or boxes, sanitary food containers, fiber cans/drums/tubes, and paper or building board
27	Printed Matter
	Newspapers, periodicals, books, miscellaneous printed matter, manifold business forms, greeting cards/seals, loose leaf binder/blank book, and service industries for print trades
28	Chemicals or Allied Products
	Industrial/inorganic/organic chemicals, potassium or sodium compound, industrial gases, crude products of coal/gas/ petroleum, cyclic intermediates or dyes, inorganic pigments, plastic matter/synthetic fibers, drugs, soap, cleaning preparations, surface active agents, cosmetics, paints/lacquers, gum or wood chemicals, fertilizers, miscellaneous agricultural chemicals, adhesives, explosives, printing ink, and chemical preparations not elsewhere classified
29	Petroleum or Coal Products
	Petroleum refining products, coal or petroleum liquefied gases, asphalt paving blocks or mix, asphalt coatings or felt, miscellaneous coal or petroleum products
30	Rubber or Miscellaneous Plastics
	Tires/inner tubes, rubber/plastic footwear, reclaimed rubber, rubber or plastic hose or belting, miscellaneous fabricated products, and miscellaneous plastic products
31	Leather or Leather Products
	Leather, industrial leather belting, boot or shoe cut stock, leather footwear/slippers/gloves/mittens/luggage/handbags, and leather goods not elsewhere classified
32	Clay, Concrete, Glass, or Stone
	Flat glass, laminated safety glass, glass containers, miscellaneous blown or pressed glassware, Portland cement, clay brick or tile, ceramic floor or wall tile, refractories, miscellaneous structural clay products, vitreous china, porcelain, pottery, concrete, lime, gypsum, cut stone, abrasive products, asbestos products, gaskets/packing, processed nonmetal minerals, and mineral wool, miscellaneous nonmetallic minerals
33	Primary Metal Products
	Blast furnace/coke, primary iron or steel products, electrometallurgical products, steel wire/nails/spikes, cold finishing of steel shapes, iron or steel castings, copper/lead/zinc/other nonferrous smelter products, copper/aluminum/other nonferrous basic shapes, nonferrous wire, aluminum/copper/other nonferrous castings, iron/steel/nonferrous metal forgings, and primary metal products not elsewhere classified

	STCC Codes and Commodities
34	Fabricated Metal Products
	Metal cans, cutlery, edge or hand tools, hand saws or saw blades, builders or cabinet hardware, miscellaneous hardware, metal sanitary ware, plumbing fixtures, nonelectrical heating equipment, structural metal products, metal doors/sash, fabricated plate products, sheet metal products, architectural metal work, miscellaneous metal work, bolts/nuts/screws, metal stampings, miscellaneous fabricated wire products, shipping containers, metal safes or vaults, steel springs, valves or pipe fittings, and fabricated metal products not elsewhere classified
35	Machinery
	Steam engines/turbines, internal combustion engines, farm machinery, lawn or garden equipment, construction machinery, mining machinery, oil field machinery, elevators or escalators, conveyors or parts, hoists/cranes, industrial trucks, machine tools, dies/tools/jigs, machine tool accessories, metalworking machinery, food products machinery, textile machinery, woodworking machinery, paper industries machinery, printing trades machinery, special industry machinery, pumps, bearings, ventilating equipment, mechanical power transmission equipment, industrial furnaces, miscellaneous general industrial, typewriters, electronic data processing equipment, accounting or calculating equipment, scales or balances, office machines, merchandising machines, commercial laundry equipment, refrigeration machinery, service industry machinery, carburetors/ pistons, and miscellaneous machinery or parts
36	Electrical Equipment
	Measuring instruments, transformers, switchboards, motors or generators, industrial controls or parts, welding apparatus, carbon products for electrical uses, miscellaneous electrical industrial equipment, household cooking equipment/refrigerators/ laundry equipment, electric house wares or fans, vacuum cleaners, sewing machines, household appliances, lamps, lighting fixtures, wiring equipment, noncurrent wiring devices, radio or TV receiving sets, phonograph records, telephone or telegraph equipment, radio or TV transmitting equipment, electronic tubes, solid-state semiconductors, miscellaneous electronic components, storage batteries or plates, primary batteries, x-ray equipment, electric equipment for internal combustion engines, and electrical equipment not elsewhere classified
37	Transportation Equipment
	Motor vehicles, motor car/truck/bus bodies, motor vehicle parts or accessories, truck trailers, aircraft, aircraft or missile engines, aircraft propellers or parts, miscellaneous aircraft parts, ships or boats, locomotives, railroad cars, motorcycles or bicycles, missile or space vehicle parts, trailer coaches, and transportation equipment not elsewhere classified
38	Instruments, Photo Equipment, and Optical Equipment
	Scientific equipment, mechanical measuring or control equipment, automatic temperature controls, optical instruments, medical instruments, orthopedic or prosthetic supplies, dental equipment or supplies, ophthalmic or opticians goods, photographic equipment or supplies, and watches/clocks
39	Miscellaneous Manufacturing Products
	Jewelry/precious metals, silverware or plated ware, musical instruments, games or toys, sporting goods, pens, pencils/ crayons/artists materials, marking devices, carbon paper or inked ribbons, costume jewelry, feathers/plumes, buttons, apparel fasteners, brooms/brushes, linoleum or other coverings, signs or advertising displays, morticians goods, matches, dressed or dyed furs, and manufactured products not elsewhere classified
40	Waste or Scrap Materials
	Ashes, metal scrap, textile scrap, wood scrap, paper waste, chemical or petroleum waste, rubber or plastic scrap, stone/clay/ glass scrap, leather scrap, and miscellaneous waste or scrap
41	Miscellaneous Freight Shipments
	Special commodities and miscellaneous freight shipments
42	Shipping Containers
	Shipping containers, semitrailers returned empty, and empty equipment (reverse route)
43	Mail or Contract Traffic
	Mail and express traffic and other contract traffic
44	Freight Forwarder Traffic

STCC Codes and Commodities	
	Freight forwarder traffic
45	Shipper Association Traffic
	Shipper association traffic
46	Miscellaneous Mixed Shipments
	FAK shipments and multi-STCC mixed shipments
47	Small Packaged Freight Shipments
	Small packaged freight shipments
48	Waste Hazardous Materials
	Waste compressed gases, waste flammable/combustible liquids, waste flammable/combustible solids, waste oxidizing materials, waste organic poison, waste poisonous materials, waste etiologic agents, waste radioactive materials, waste corrosive materials, waste other regulated materials, waste miscellaneous hazardous materials, and other regulated waste stream
49	Hazardous Materials
	Ammunition, explosives, nonflammable compressed gases, flammable/combustible liquids, flammable/combustible solids, oxidizing materials, organic peroxides, organic/inorganic poisons, etiologic agents, radioactive materials, corrosive materials, other regulated materials, and environmentally hazardous materials
50	Secondary Traffic
	Rail intermodal drayage to/from ramp and air freight drayage to/from airport

Table D.8.2 Commodity Conversion Factors Used in Commodity Flow Analysis
Dollars per Ton

STCC	Commodity	TXDOT Study[a] Value (in 2003 $)	ODOT Study[b] Value (in 1998 $)	CPI Adjusted Value[c] (in 2008 $)
1	Farm	$423		$518
8	Forest	$758		$1,027
9	Fish/Marine	$873		$1,253
10	Metallic Ores	$187		$202
11	Coal	$119		$14
13	Crude Petro/Natural Gas	$144		$235
14	Nonmetallic Minerals	$154		$180
19	Ordnance/Accessories	$2,503		$5,583
20	Food/Kindred	$684		$1,236
21	Tobacco	$702		$10,646
22	Textile Mill	$5,667		$6,820
23	Apparel	$6,520		$7,664
24	Lumber/Wood	$847		$990
25	Furniture/Fixtures	$6,328		$7,451
26	Pulp/Paper/Allied	$1,461		$1,781
27	Printed Matter	$2,085		$2,514
28	Chemicals/Allied	$858		$1,190
29	Petroleum/Coal	$311		$580
30	Rubber/Plastics	$2,216		$2,596
31	Leather	$5,614		$7,644
32	Clay/Concrete/Glass/Stone	$384		$744
33	Primary Metal	$1,552		$1,906
34	Fabricated Metal	$2,801		$3,372
35	Machinery Except Electrical	$8,676		$10,386
36	Electrical Machinery/Equipment/Support	$8,636		$10,121
37	Transportation Equipment	$9,065		$10,621
38	Instruments/Optical/Watches/Clocks	$10,558		$12,695
39	Miscellaneous Manufacturing	$697		$5,105
40	Waste/Scrap Materials	$1,089		$1,326
41	Miscellaneous Freight Shipments		$4,763	$6,291
42	Containers, Carriers or Devices, Shipping, Returned Empty		$1,120	$1,479
43	Mail or Contract Traffic		$1,333	$1,761
44	Freight Forwarder Traffic		$1,606	$2,121
45	Shipper Association Traffic		$1,606	$2,121
46	Miscellaneous Mixed Shipments		$1,606	$2,121

STCC	Commodity	TXDOT Study[a] Value (in 2003 $)	ODOT Study[b] Value (in 1998 $)	CPI Adjusted Value[c] (in 2008 $)
47	Small Packaged Freight Shipments		$1,606	$2,121
48	Waste hazardous materials or substances		$291	$384
49	Hazardous Materials	$1,141		$1,335
50	Secondary Traffic		$1,606	$2,121
59	Unclassified		$8,917	$11,778
60	Unclassified		$8,917	$11,778

Sources: [a] TXDOT NAFTA Study conducted by Cambridge Systematics, Inc. using TRANSEARCH Data.

[b] ODOT Freight Impacts on Ohio Roadways study conducted by Cambridge Systematics, Inc. using TRANSEARCH Data used only for missing commodity code value per ton.

[c] Values were adjusted using Consumer Price Index: All Urban Consumers – (CPI-U), U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C. 20212, last updated on August 13, 2010, ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt (Last accessed on September 22, 2010). CPI-U Values for 1998, 2003, and 2008 are 163.0, 184.0, and 215.3, respectively.

Table D.8.3 HS to STCC Crosswalk

HS-2 Code	HS Commodity Description	STCC-2 Code	STCC Commodity Description
01	Live Animals	01	Agriculture
02	Meat and Edible Meat Offal	20	Food
03	Fish, Crustaceans, and Aquatic Invertebrates	20	Food
04	Dairy Prods, Birds Eggs, Honey, and ED Animal PR NESOI	20	Food
05	Products of Animal Origin and NESOI	20	Food
06	Live Trees, Plants, Bulbs Etc., and Cut Flowers Etc.	08	Forest Products
07	Edible Vegetables and Certain Roots and Tubers	01	Agriculture
08	Edible Fruit and Nuts, Citrus Fruit, or Melon Peel	01	Agriculture
09	Coffee, Tea, Mate, and Spices	20	Food
10	Cereals	01	Agriculture
11	Milling Products, Malt, Starch, Insulin, and Wheat Gluten	20	Food
12	Oil Seeds Etc., Miscellaneous Grain, Seed, Fruit, and Plant Etc.	01	Agriculture
13	Lac; Gums, Resins and Other Vegetable Sap, and Extract	20	Food
14	Vegetable Plaiting Materials and Products NESOI	20	Food
15	Animal or Vegetable Fats, Oils Etc., and Waxes	20	Food
16	Edible Preparations of Meat, Fish, Crustaceans Etc.	20	Food
17	Sugars and Sugar Confectionary	20	Food
18	Cocoa and Cocoa Preparations	20	Food
19	Prep Cereal, Flour, Starch or Milk, and Bakers Wares	20	Food
20	Prep Vegetables, Fruit, and Nuts or Other Plant Parts	20	Food
21	Miscellaneous Edible Preparations	20	Food
22	Beverages, Spirits, and Vinegar	20	Food
23	Food Industry Residues and Waste and Prep Animal Feed	20	Food

HS-2 Code	HS Commodity Description	STCC-2 Code	STCC Commodity Description
24	Tobacco and Manufactured Tobacco Substitutes	21	Tobacco
25	Salt, Sulfur, Earth and Stone, Lime, and Cement Plaster	14	Nonmetallic Minerals
26	Ores, Slag, and Ash	10	Metallic Ores
27	Mineral Fuel, Oil Etc., Bitumen Substitute, and Mineral Wax	29	Petroleum
28	Inorganic Chemicals, Precious- and Rare-Earth Metals, and Radioactive Compounds	28	Chemicals
29	Organic Chemicals	28	Chemicals
30	Pharmaceutical Products	28	Chemicals
31	Fertilizers	28	Chemicals
32	Tanning and Dye Ext Etc, Dye, Paint, Putty Etc., and Inks	28	Chemicals
33	Essential Oils Etc., Perfumery, Cosmetic Etc., and Preps	28	Chemicals
34	Soap Etc., Waxes, Polish Etc., Candles, and Dental Preps	28	Chemicals
35	Albuminoidal Substitute, Modified Starch, Glue, and Enzymes	28	Chemicals
36	Explosives, Pyrotechnics, Matches, and Pyro Alloys Etc.	39	Misc Mfg Products
37	Photographic or Cinematographic Goods	38	Instruments
38	Miscellaneous Chemical Products	28	Chemicals
39	Plastics and Articles Thereof	30	Rubber/Plastics
40	Rubber and Articles Thereof	30	Rubber/Plastics
41	Raw Hides and Skins (no Furskins) and Leather	20	Food
42	Leather Art, Saddlery Etc., Handbags Etc., and Gut Art	31	Leather
43	Furskins and Artificial Fur and Manufactures Thereof	39	Misc Mfg Products
44	Wood and Articles of Wood and Wood Charcoal	24	Lumber
45	Cork and Articles of Cork	24	Lumber
46	Mfr of Straw, Esparto Etc., Basketware, and Wickerwork	24	Lumber
47	Wood Pulp Etc., Recovered (Waste and Scrap) PPR and PPRBD	40	Waste
48	Paper and Paperboard and Articles (Including Paper Pulp Articles)	26	Paper
49	Printed Books, Newspapers Etc., Manuscripts Etc.	27	Printed Goods
50	Silk, Including Yarns and Woven Fabric Thereof	22	Textiles
51	Wool and Animal Hair, Including Yarn and Woven Fabric	22	Textiles
52	Cotton, Including Yarn And Woven Fabric Thereof	22	Textiles
53	Vegetable Text Fiber NESOI, Vegetable Fiber, Paper Yarns, and Woven Fabrics	22	Textiles
54	Manmade Filaments, Including Yarns and Woven Fabrics	22	Textiles
55	Manmade Staple Fibers, Including Yarns and Woven Fabrics	28	Chemicals
56	Wadding, Felt Etc., SP Yarn, Twine, Ropes Etc.	40	Waste
57	Carpets and Other Textile Floor Coverings	22	Textiles
58	Special Woven Fabrics, Tufted Fabric, Lace, Tapestries Etc.	22	Textiles
59	Impregnated Etc. Text Fabrics and Tex Art for Industry	22	Textiles
60	Knitted or Crocheted Fabrics	22	Textiles
61	Apparel Articles and Accessories, Knit or Crochet	23	Apparel
62	Apparel Articles and Accessories and Not Knit Etc.	23	Apparel

HS-2 Code	HS Commodity Description	STCC-2 Code	STCC Commodity Description
63	Textile Art NESOI, Needlecraft Sets, and Worn Text Art	23	Apparel
64	Footwear, Gaiters Etc., and Parts Thereof	31	Leather
65	Headgear and Parts Thereof	23	Apparel
66	Umbrellas, Sun Umbrellas, Walking-Sticks, Whips, Riding-Crops, and Parts Thereof	39	Misc Mfg Products
67	Prep Feathers, Down Etc., Artificial Flowers, and H Hair Art	39	Misc Mfg Products
68	Art of Stone, Plaster, Cement, Asbestos, and Mica Etc.	32	Clay, Concrete, Glass
69	Ceramic Products	32	Clay, Concrete, Glass
70	Glass and Glassware	32	Clay, Concrete, Glass
71	Nat Etc. Pearls, Precious Etc. Stones, Precious Metal Etc. and Coin	39	Miscellaneous Mfg Products
72	Iron and Steel	33	Metal
73	Articles of Iron or Steel	34	Metal Products
74	Copper and Articles Thereof	33	Metal
75	Nickel and Articles Thereof	33	Metal
76	Aluminum and Articles Thereof	34	Metal Products
78	Lead and Articles Thereof	33	Metal
79	Zinc and Articles Thereof	33	Metal
80	Tin and Articles Thereof	33	Metal
81	Base Metals NESOI, and Cermets and Articles Thereof	33	Metal
82	Tools and Cutlery, Etc. of Base Metal and Parts Thereof	34	Metal Products
83	Miscellaneous Articles of Base Metal	34	Metal Products
84	Nuclear Reactors, Boilers, and Machinery Etc., Parts	35	Machinery
85	Electric Machinery Etc., Sound Equipment, and TV Equipment and Pts	36	Electrical Equipment
86	Railway or Tramway Stock Etc. and Traffic Signal Equipment	37	Transportation Equipment
87	Vehicles, Except Railway or Tramway, and Parts Etc.	37	Transportation Equipment
88	Aircraft, Spacecraft, and Parts Thereof	37	Transportation Equipment
89	Ships, Boats, and Floating Structures	37	Transportation Equipment
90	Optic, Photo Etc., Medic or Surgical Instruments Etc.	38	Instruments
91	Clocks and Watches and Parts Thereof	38	Instruments
92	Musical Instruments, and Parts and Accessories Thereof	39	Misc Mfg Products
93	Arms and Ammunition and Parts and Accessories Thereof	19	Ordnance
94	Furniture, Bedding Etc., Lamps NESOI Etc., and Prefab Beds	25	Furniture
95	Toys, Games, and Sport Equipment and Parts and Accessories	39	Misc Mfg Products
96	Miscellaneous Manufactured Articles	39	Misc Mfg Products
97	Works of Art, Collectors' Pieces, and Antiques	39	Misc Mfg Products
98	Special Classification Provisions, and NESOI	46	FAK
99	Reserved for Special Use by Contracting Parties	42	Shipping Containers

Source: Cambridge Systematics, Inc.

Table D.8.4 SCTG Commodity Descriptions

SCTG-2	SCTG Description
01	Live Animals and Fish
02	Cereal Grains (Including Seed)
03	Other Agricultural Products, Except for Animal Feed
04	Animal Feed and Products of Animal Origin, N.E.C.
05	Meat, Fish, Seafood, and their Preparations
06	Milled Grain Products and Preparations and Bakery Products
07	Other Prepared Foodstuffs and Fats and Oils
08	Alcoholic Beverages
09	Tobacco Products
10	Monumental or Building Stone
11	Natural Sands
12	Gravel and Crushed Stone
13	Nonmetallic Minerals, N.E.C.
14	Metallic Ores and Concentrates
15	Coal
16	Crude Petroleum Oil
17	Gasoline and Aviation Turbine Fuel
18	Fuel Oils
19	Coal and Petroleum Products, N.E.C.
20	Basic Chemicals
21	Pharmaceutical Products
22	Fertilizers
23	Chemical Products and Preparations, N.E.C.
24	Plastics and Rubber
25	Logs and Other Wood in the Rough
26	Wood Products
27	Pulp, Newsprint, Paper, and Paperboard
28	Paper or Paperboard Articles
29	Printed Products
30	Textiles, Leather, and Articles of Textiles or Leather
31	Nonmetallic Mineral Products
32	Base Metal in Primary or Semifinished Forms and in Finished Basic Shapes
33	Articles of Base Metal
34	Machinery
35	Electronic and Other Electrical Equipment and Components and Office Equipment
36	Motorized and Other Vehicles (Including Parts)
37	Transportation Equipment, N.E.C.
38	Precision Instruments and Apparatus
39	Furniture, Mattresses and Mattress Supports, Lamps, Lighting Fittings, and Illuminated Signs
40	Miscellaneous Manufactured Products
41	Waste and Scrap
43	Mixed Freight

Source: FAF[2] Technical Documentation Report 4 – FAF Commodity Classification, http://ops.fhwa.dot.gov/freight/freight_analysis/faf/faf2_tech_document.htm (Last accessed on September 22, 2010).

Table D.8.5 SCTG to STCC Crosswalk

STCC-2 Code	SCTG-2 Code	SCTG Count
01	03	109
01	04	20
01	01	13
01	02	9
01	07	2
01	22	1
08	03	5
08	24	1
09	04	9
09	05	6
09	01	5
09	07	1
10	14	31
10	40	4
10	22	2
11	15	10
13	19	6
13	18	1
13	16	1
14	13	24
14	12	6
14	22	5
14	10	3
14	07	2
14	11	2
14	19	1
19	40	10
19	36	2
19	37	2
19	38	2
20	07	170
20	04	40
20	06	34
20	05	32
20	03	9
20	08	7
20	23	2
20	43	2
21	09	8
21	03	2
22	30	61

STCC-2 Code	SCTG-2 Code	SCTG Count
22	07	1
22	41	1
23	30	77
23	36	1
23	37	1
23	40	1
24	26	69
24	25	9
24	39	4
24	40	2
24	41	1
25	39	45
25	33	7
25	34	6
25	35	3
25	40	1
26	28	34
26	27	27
26	26	3
26	24	2
26	32	2
26	23	1
27	29	20
27	28	4
27	34	3
28	20	83
28	23	29
28	22	21
28	24	9
28	19	4
28	07	2
28	13	2
28	21	2
28	41	2
29	19	27
29	31	4
29	17	2
29	18	2
30	24	31
30	30	8
31	30	14
32	31	79

STCC-2 Code	SCTG-2 Code	SCTG Count
32	34	18
32	13	11
32	20	4
32	39	2
32	33	1
33	32	71
33	33	46
33	41	9
33	40	5
33	19	2
33	22	2
33	35	1
34	33	94
34	34	26
34	32	5
34	39	3
34	40	3
34	36	1
34	43	1
35	34	147
35	35	10
35	36	6
35	33	4
35	37	1
35	40	1
36	35	75
36	34	11
36	38	6
36	39	6
36	33	4
37	36	52
37	37	20
37	34	17
37	40	1
38	38	25
38	31	4
38	23	3
38	39	3
38	40	1
39	40	50
39	34	7
39	33	6

STCC-2 Code	SCTG-2 Code	SCTG Count
39	23	5
39	41	5
39	30	3
39	28	2
39	31	2
39	39	1
40	41	15
41	43	6
41	35	1
41	36	1
41	37	1
41	40	1
42	37	6
42	33	1
43	37	1
43	99	1
44	99	1
45	99	1
46	43	2
47	99	1
48	41	37
49	20	86
49	19	19
49	23	11
49	40	5
49	22	3
49	18	2
49	31	2
49	03	1
49	05	1
49	13	1
99	99	1

Source: FAF[2] Technical Documentation Report 8 – Crosswalks for Commodities Classified under the Standard Transportation Commodity Code and the Standard Classification of Transported Goods, http://ops.fhwa.dot.gov/freight/freight_analysis/faf/faf2_tech_document.htm (Last accessed on September 22, 2010).

E. Economic Impact of the Border Crossings Technical

E.1 Introduction

The objective of the El Paso Regional Ports of Entry (POE) Operations Plan (POE Plan) was to review all existing ports of entry within the El Paso region, assess the current efficiency of the ports, and make recommendations to improve cross-border mobility in the region. The Plan includes prioritized recommendations for infrastructure, operational, and institutional improvements, to be phased in over the short-term (less than 5 years), medium-term (5 to 10 years), and long-term (more than 10 years).

To attain the above objective, it was critical to understand the economic importance of efficient and safe border crossings to economic vitality of the binational region. This technical memorandum describes the economic role of the border and provides information on the border's impact on businesses and related jobs in the region.

It is important to note that this report is intended to provide readers with an understanding of broad economic impact of cross-border movements of people and goods in the El Paso/Juárez region. The analysis in Section 8.0 of the Project Summary Report provides detailed estimates of economic impact of border wait time on the region and describes economic benefits of potential project, policy, and management scenarios. Our overall economic analysis approach is closely linked to the operational model developed and applied as part of the Plan to provide more detailed estimates of POE operational characteristics such as automobile/truck volumes and border wait times. The data and information included within this technical memorandum was used as a reference during model development, calibration, and application.

The following sections provide an overview of the El Paso/Juárez regional economy, a description of the "border-dependent" businesses in the region, and a summary of the overall economic impact of these businesses.

E.2 Regional Economic Overview

Texas leads all U.S. states in trade with Mexico with over $130 billion in goods and services exchanged in 2008. This represents three times more trade than California, which ranks number two in trade with Mexico. A major reason for the significantly higher volumes of trade is the maquiladora industry which is

concentrated at the Texas border, in particular in the El Paso-Ciudad Juárez region.

Table E.2.1 Top 10 States Trading with Mexico, All Modes of Transportation *By Value, 2008*

Rank	State	Total All Modes
1	Texas	$130.8
2	California	$54.3
3	Michigan	$30.2
4	Louisiana	$12.9
5	Illinois	$11.6
6	Arizona	$11.2
7	Ohio	$8.6
8	Mississippi	$6.6
9	North Carolina	$6.5
10	Tennessee	$6.1

Source: U.S. Department of Transportation TransBorder Freight Data. Figures in billions U.S.$.

As noted in the Commodity Flow and Socioeconomic Profile (Appendix D) and depicted in Table E.2.2, El Paso is the second busiest land port in the U.S. by value representing 17 percent of total trade between the U.S. and Mexico by surface modes in 2008. El Paso is followed by ports at Otay Mesa-San Diego, California, the Hidalgo-Pharr-McAllen region in Texas, and Nogales, Arizona. El Paso's share of U.S. trade with Mexico, by value, has declined steadily since 2000. Laredo also has lost share over the past 10 years, while Otay Mesa has increased moderately. However, from 2008 to 2009, all ports experienced significant declines due to the global economic downturn.

Table E.2.2 Top Five Ports by Percent Share of U.S.-Mexico Trade by Value
Millions of U.S. Dollars

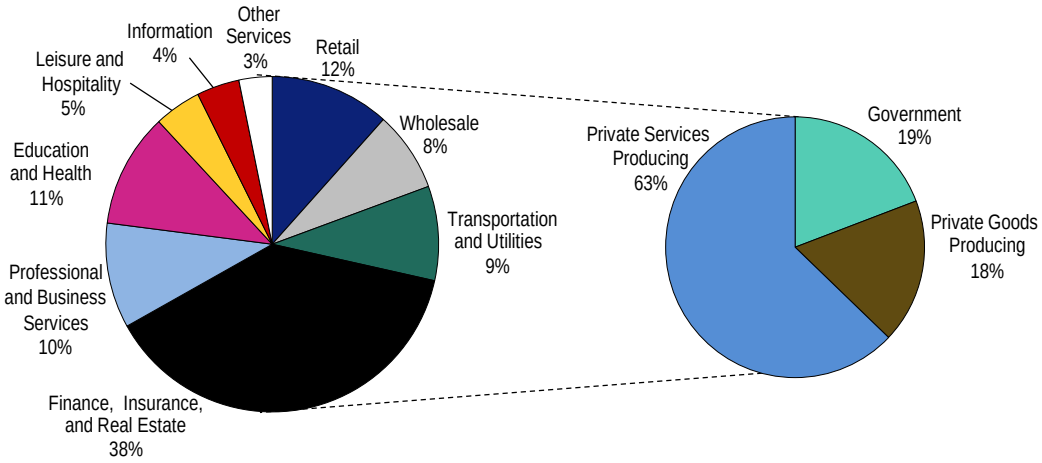
Port	2001	2002	2003	2004	2005	2006	2007	2008
Laredo, Texas	41.2%	41.1%	40.5%	41.0%	40.2%	39.4%	39.7%	40.8%
El Paso, Texas	18.8%	19.3%	19.8%	19.5%	18.5%	17.7%	17.6%	16.9%
Otay Mesa, California	10.0%	10.6%	10.1%	10.2%	10.5%	10.8%	11.0%	11.2%
Hildalgo, Texas	6.4%	6.6%	7.4%	7.3%	7.8%	7.6%	7.9%	7.8%
Nogales, Arizona	6.5%	5.6%	5.3%	5.5%	6.0%	7.2%	6.5%	6.7%

Source: U.S. Department of Transportation TransBorder Freight Data.

Gross Regional Product

Gross regional product (GRP) is one of several measures of the size of a region's economy. GRP is defined as the market value of all final goods and services produced within a region in a given period of time. Figure E.2.1 displays of the composition of the El Paso's GRP in 2007. Service-oriented business output represents nearly two-thirds of the El Paso GRP. The service sectors in El Paso are dominated by the financial and real estate sectors, which contributed over a third of the regional GRP. Manufacturing was responsible for $2.5 billion in El Paso economic output, or approximately 18 percent of El Paso's GRP and government services account for about 19 percent of GRP.

Figure E.2.1 El Paso Regional GRP Distribution
2007

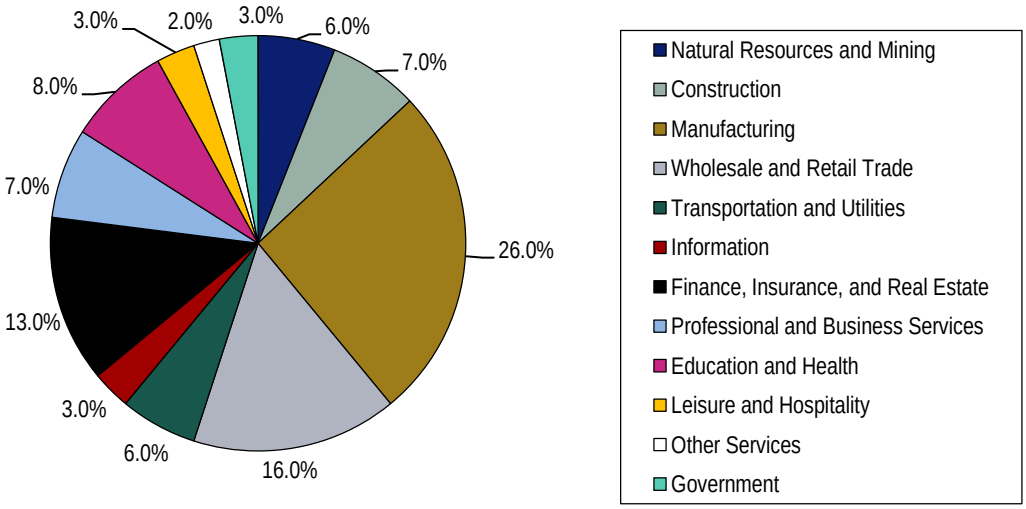


Source: U.S. Bureau of Economic Analysis.

Note: GRP data available through 2007 only. The difference between 2007 and 2008, the year used for analysis in this analysis, is not expected to impact the conclusions in this report.

Figure E.2.2 displays GRP data for Ciudad Juárez. GRP in Ciudad Juárez is dependent on service-providing industries. However, manufacturing, natural resources, and construction (goods-producing industries) have a much larger share than in El Paso. As noted in the draft Commodity Flow and Socioeconomic Profile, maquiladora activity has moved toward service-oriented activities in recent years, including back-office functions such as coupon sorting.

Figure E.2.2 2008 Gross Regional Product Ciudad Juárez



Source: University of Texas at El Paso.

Comparison of Employment and GRP: El Paso and Cuidad Juárez

Comparisons of key industries by GRP and by employment show that some industries, such as retail and hospitality (food services), employ relatively high number of people with comparatively lower economic output. This may suggest two trends common with shifts to services. One, the area attracted high-skill, high-income positions in finance, real estate and technical manufacturing fields. Two, service jobs (retail, food services, health care) related to direct consumer services created high numbers of low-skill, low-income jobs that also boost the economy and maintain customer bases. This is reflected in median earnings for selected service occupations, which are displayed in Table E.2.3. Some positions related to retail, healthcare, and transportation have low annual earnings. However, the management and administration occupations, another large sector in the El Paso region, show strong median earnings.

Table E.2.3 Median Earnings for Selected Service Sector Occupations in El Paso MSA
2008

Service Occupations	Average Wage
Building Cleaning and Maintenance	$10,874
Construction, Maintenance, Repair	$20,820
Fire Fighting and Prevention, Other Protective Service	$21,301
Food Preparation and Serving	$9,605
Healthcare Practitioner and Technical Occupations	$50,294
Healthcare Support Occupations	$16,329
Law Enforcement	$55,795
Management, Business, and Financial Occupations:	$43,582
Personal Care and Services	$10,999
Professional and Related Occupations:	$40,213
Sales and Office	$17,506
Transportation and Material Moving	$22,340

Source: U.S. Census Bureau; all figures in 2008 inflation-adjusted dollars for civilian population aged 16 and over.

Manufacturing jobs in El Paso tend to be high-paying jobs (see Table E.2.4). Even though the employment numbers in this sector have declined, the remaining industries employ high-skilled workers with greater earnings than occupations in areas such as apparel production. Manufacturing jobs in El Paso pay on average $41,000-$86,000. This compares favorably to the average wage per job of $33,310 reported by the Bureau of Economic Analysis (BEA).

Table E.2.4 Average Wage of Selected Sectors
2007

High-Paying and Technological/Technical Jobs	Average Wage
Valve and Fittings (Except Plumbing)	$86,000
Scientific R&D Services	$57,000
Semiconductor and Related Device Manufacturing	$44,000
Printed Circuit Assembly Manufacturing	$68,000
Copper Rolling, Drawing, Extruding, and Alloy	$51,000
Motor and Generator Manufacturing	$73,000
Surgical and Medical Instrument	$71,000
Software Publishers	$74,000
Synthetic Dye and Pigment Manufacturing	$47,000
Architectural and Engineering-Related Services	$46,000
Wiring Device Manufacturing	$41,000

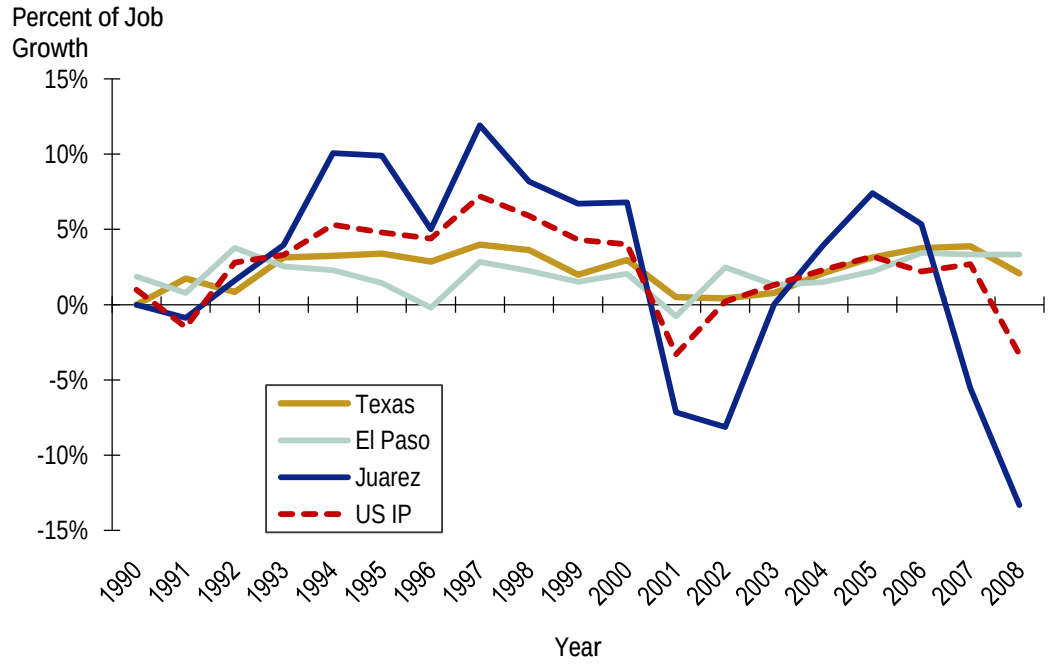
Source: University of Texas at El Paso, *Cuidad Juárez Manufacturing and El Paso Industry Linkages*, 2008.

Economic development in El Paso has been heavily influenced by activities at the border. Prior to Mexico joining the General Agreement on Tariffs and Trade (GATT) in 1986, job growth in El Paso lagged that of the State as a whole. Following GATT, job growth in El Paso accelerated and outpaced the State two years later. In 1994, the North American Free Trade Agreement (NAFTA) gave a boost to job growth in Mexico, although the rate of growth declined slightly in El Paso due to general economic decline experienced in the U.S. during the late 1990s and early 2000s. Job growth accelerated in 2003 and continued until the current economic recession started in 2008.

Changes in employment have been more stark in Juárez than in El Paso, as manufacturing jobs react more strongly to changes in economic and industry production cycles. Figure E.2.3 shows the relationship between the industrial production (IP) index[45] and regional employment. While Juárez sees volatile changes in jobs, employment in El Paso generally tracks the IP Index. One exception appears to be a recent decline of the IP Index as El Paso's employment growth leveled out at approximately four percent. At the same time, Juárez experienced a decline of over 10 percent. These changes also affected Texas employment growth, which has performed slightly better in terms of job growth than El Paso, and exhibited steady growth until the 2008 economic decline.

[45] The IP index is released monthly by the Federal Reserve Board and measures the relative amount of output from the manufacturing, mining, electric and gas industries.

Figure E.2.3 Employment and U.S. IP Index



Source: U.S. BEA, U.S. Federal Reserve (IP Index Total Industry, seasonally adjusted, year-over-year).

To summarize, job and industry growth in El Paso is underpinned by:

- Growing local facilities and firms such as Fort Bliss Army Base, Texas Tech Medical School, Tenet Healthcare, University of Texas at El Paso, and local services to meet consumer demand.
- Companies operating twin plants in Juárez, which often require transportation and customs services from firms based in El Paso.
- Maquiladora operators, who often use distribution facilities, administrative offices and temporary employment services located in El Paso. This stimulates the industrial real estate sector and provides employment for area residents.
- Maquiladora suppliers located or expanding in El Paso to be close to their customers across the border, which stimulates domestic manufacturing and provides high-skill, high-wage jobs to residents of El Paso.
- The need for legal, accounting, and financial services for the maquiladora industry, which are often provided in El Paso.

- Hotels, car rental agencies, and restaurants in El Paso that serve business travelers visiting the maquiladoras.[46]
- A large government sector that supports border crossing, security, and the Fort Bliss Army Base.

E.3 Border Dependent Businesses

Location quotient (LQ) analysis was employed to estimate the concentration of the dominant sectors in El Paso and to identify border dependent industries. LQ is a measure the concentration of an industry in a local economy relative to the national concentration of that industrial sector. In general, sectors with LQ greater than 1.0 have an advantage compared to the U.S. and is typically either exporting goods and services or responding to significantly higher local demand. If the LQ is less than 1.0, it means the local economy may have a comparative disadvantage in that sector compared to the U.S., and it is a net importer of goods and services.

In the El Paso region, the comparative advantage is often the system of border crossings, which creates exceptional export opportunities as well as unusually high demand for certain goods and services. We classify industries having location quotients greater than 1.0 and engaging in or supporting significant cross border activities as "border dependent."

Based on the LQ displayed in Table E.3.1, manufacturing, retail, and transportation and warehousing sectors were identified as dominant sectors in El Paso's economy and primary border dependent industries. Other sectors such as real estate, financial, and professional services also were identified as border dependent because a large part of their activities is in support of industries that are directly engaged in border crossing activities.

Table E.3.1 Location Quotients of El Paso Employment in Selected Sectors

Industry Sector	2001	2007
Retail and Wholesale	1.6	1.7
Government	1.5	1.6
Federal	1.6	1.8
Military	2.9	3.8
State/Local Government	1.4	1.3
Transportation and Warehousing	1.3	1.5
Manufacturing	1.1	0.8

Source: U.S. Bureau of Economic Analysis. Analysis by Cambridge Systematics, Inc.

[46] Vargas, L. (2001), *Maquiladoras: Impact on Texas Border Cities*. Federal Reserve Bank of Dallas.

Manufacturing

The expansion of U.S.-Mexico trade has attracted various manufacturers to El Paso to take advantage of the proximity to their markets, particularly the maquiladoras in Ciudad Juárez. This has contributed significantly to the region's economic growth over the last decade. However, the LQs for manufacturing in 2001 and 2007 (see Table E.3.1) indicate that the manufacturing sector in the region is mature and its future performance will be less dependent on continued attraction of manufacturers and more dependent on the health of broader national and global economies. For instance, the decline in concentration of manufacturing sector in El Paso from 2000 to 2007 (LQs declining from 1.0 to 0.8) may be attributed to the sharp response of the manufacturing sector in Cuidad Juárez to the off-shoring of manufacturing activities to Asia. The decline in Cuidad Juárez's economy led to a decline in demand for input material from El Paso. However, the narrowing wage gap between Chinese and Mexican laborers, combined with other international trade and transportation trends, may cause this trend to reverse in the mid- to long-term.[47]

Table E.3.2 shows that most of the inputs demanded by the maquiladoras are supplied from El Paso. Of the top 20 suppliers of inputs material to each of the 10 most significant maquiladoras industries, 14 to 18 of them are located in El Paso. This confirms the integration of the manufacturing sector in El Paso and the maquiladoras in Ciudad Juárez. Therefore, expansions of maquila operations in Cuidad Juárez will result in the expansion of the manufacturing sector in El Paso and vice versa, hence the dependency of the manufacturing sector on the border.

[47] While Mexican workers made double the wages of their Chinese counterparts in 2003, today that gap has shrunk to only 15 percent.

Table E.3.2 Input Demand and Supply Relationship between Ciudad Juárez Maquiladora and El Paso Suppliers

Juárez Demand for Inputs	Supply of Inputs to Juárez from El Paso	Top Two Supplies
Motor Vehicle Parts Manufacturing	17 of the top 20 suppliers operate in El Paso	Motor vehicle parts; iron and steel mills and ferroalloy
Semiconductor and Other Electric Parts Manufacturing	17 of the top 20 suppliers operate in El Paso	Semiconductor and related device, printed circuit (electronic) assembly
Electrical Equipment Manufacturing	16 of the top 20 suppliers operate in El Paso	Relay and industrial control, iron and steel mills and ferroalloy
Medical Equipment and Supplies Manufacturing	15 of the top 20 suppliers operate in El Paso	Surgical and medical instrument, surgical appliance and supplies, and advertising and related services
Communications Equipment Manufacturing	17 of the top 20 suppliers operate in El Paso	Broadcast and wireless communication equipment, semiconductor and related services, software publishers
Printing Ink Manufacturing	14 of the top 20 suppliers operate in El Paso	Synthetic dye and pigment, paint and coating manufacturing
Navigational, Measuring, Electromedical, and Control Instruments	16 of the top 20 suppliers operate in El Paso	Software publishers, scientific R&D services
Audio and Video Equipment Manufacturing	18 of the top 20 suppliers operate in El Paso	Electron tube manufacturing, printed circuit (electronic) assembly manufacturing
Plastics and Product Manufacturing	15 of the top 20 suppliers operate in El Paso	Plastics material and resin manufacturing, plastics packaging materials, and unlaminated film and sheet
Household Appliances Manufacturing	18 of the top 20 suppliers operate in El Paso	Plastics packaging materials and unlaminated film and sheet, other plastics product manufacturing

Source: C. Juárez Manufacturing and El Paso Industry Linkages.

Note: Cuidad Juárez Manufacturing and El Paso Industry Linkages, Institute for Policy and Economic Development.

Retail Services

Retail sales provide a strong tax base for a region and can often be exported to nonresidents. Because retail sales data were not available, we used per capita sales tax as a proxy. Per capita sales tax is highly correlated with retail sales in Texas, since ad-valorem is the mode of sales tax collections.

As seen in Table E.3.3, per capita sales tax income in El Paso exceeded that of Texas as a whole and grew between 2001 and 2008. Although El Paso's personal income rates were lower than Texas overall, per capita sales tax is about five times the state average and the border is a primary reason. The retail sector is more highly concentrated in the El Paso region than in other parts of the State as measured using the location quotient. It is estimated that El Paso's retail activity is approximately 60 percent and 70 percent greater than in Texas overall in 2001

and 2007, respectively. Regional retail activity is bolstered primarily by sales to shoppers from Mexico, and by visiting professionals on work trips to the area.

Table E.3.3 Sales Tax in Texas and El Paso

	Texas			El Paso		
Year	Sales Tax ($Million)	Population (Million)	Per Capita Sales Tax	Sales Tax ($Million)	Population (Million)	Per Capita Sales Tax
2001	27,230	21	1,277	4,230	0.68	6,177
2002	26,276	22	1,209	4,370	0.69	6,345
2003	26,127	22	1,185	4,500	0.69	6,478
2004	27,913	22	1,245	4,700	0.70	6,691
2005	29,838	23	1,307	5,100	0.71	7,196
2006	33,544	23	1,432	5,500	0.72	7,631
2007	36,956	24	1,554	5,800	0.73	7,969
2008	41,358	24	1,702	5,900	0.74	7,901

Source: State of Texas Annual Cash Budget, Cambridge Systematics, Inc. analysis, UTEP.

Transportation and Warehousing

Due to the presence of the maquila industry, truck operations are of particular importance to the El Paso borderplex. Truck fleets in the El Paso region generally fall into one of two operational categories, described below:

- **Drayage trucks** provide short-haul transportation of goods (usually in intermodal containers) across the border, for example between a maquiladora in Mexico and truck terminals in the U.S.
- **Long-haul** trucks are over-the-road haulers that transport goods to their final destination, usually on a contract basis. A long-haul truck may pick up a container dropped off by a drayage operator and transport it to a consignee.

Operations

Within each category, some trucks are owner-operated, others are company owned, and still others are offered for hire by third-party logistics firms. Regardless of ownership, the operational characteristics of trucks in the borderplex have important implications for port of entry operations.

When NAFTA went into effect in 1994, one of its key provisions was the establishment of a 25-mile commercial zone along the U.S.-Mexico border by 1995. Mexican trucks are permitted to operate within this zone to facilitate

efficient cross-border freight movement, while U.S. trucks are afforded the same ability to operate on the Mexican side.[48]

The effect of this is that cross-border truck moves between Juárez and El Paso are typically accomplished using drayage operators. Long-haul moves from Mexico's interior may involve up to three trucks – a Mexican long-haul truck to bring a load to the border, a Mexican drayage truck to haul it across, and finally a U.S. truck to pick it up for final delivery. Maquiladora operators, meanwhile, require constant back-and-forth deliveries across the border for supplies and finished product.

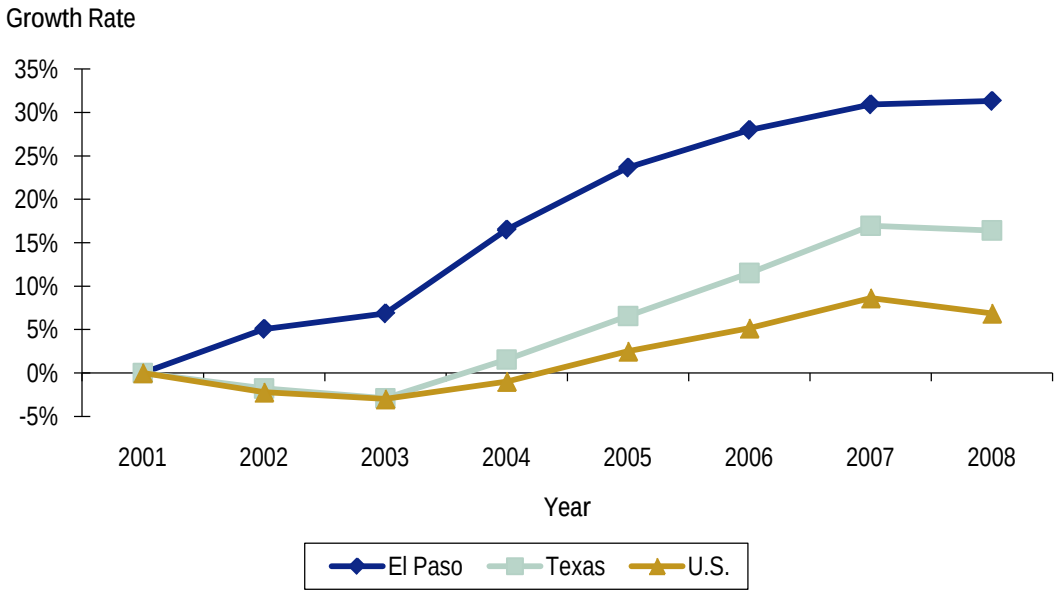
Economic Effects

The transportation and warehousing sector in El Paso has benefitted enormously from cross-border trade. From Table E.3.1, the location quotient for the transportation and warehousing sector was 1.3 in 2001 and 1.5 in 2007. This means the El Paso has a significantly higher demand in this sector compared to the U.S. Its high concentration stems from its unique location as a border city with Cuidad Juárez.

The transportation and warehousing sector in El Paso is resilient. As shown in Figure E.2.1, El Paso posted strong growth at 6.8 percent between 2001 and 2003 while Texas and the U.S. both declined by approximately 3.0 percent each. Additionally, in the midst of the current recession, El Paso grew 0.4 percent between 2007 and 2008 while Texas and the U.S. declined 0.5 percent and 1.8 percent respectively. Between 2001 and 2008, employment in transportation and warehousing sector averaged 16,714 and total output was estimated to be $6.73 billion, almost all of which is dependent on the border crossing.

[48] NAFTA called for access to all U.S. states for Mexican trucks by 2000, but this was never implemented due to opposition from organizations in the U.S. A pilot program involving 100 Mexican trucks was established, but funding for the program was cut in early 2009, leading Mexico to add tariffs to some U.S. exports. As of January 2011 the U.S. DOT is assisting efforts to restart negotiations with Mexico. For more information see comments by U.S. DOT Secretary Ray LaHood at the CMC3 2001 Jump Start Conference: http://www.dot.gov/affairs/2011/lahood01182011.html, accessed February 4, 2011.

Figure E.3.1 Transportation and Warehousing Services Growth Rates



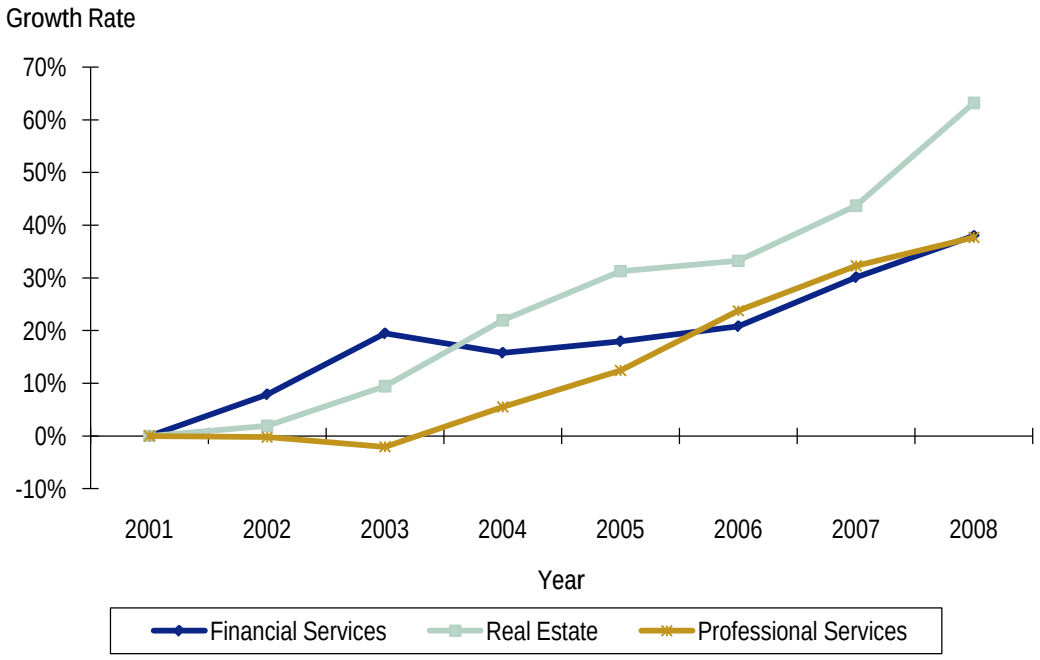
Source: U.S. Bureau of Economic Analysis, Cambridge Systematics, Inc. analysis.

Financial, Real Estate, and Professional Services

The financial, real estate, and professional services sectors together accounted for 19 percent of El Paso's regional employment in 2008, with 42,277 jobs, up from approximately 29,000 in 2001. Over the same period, the sectors combined contributed $1.17 billion to El Paso's economy.

Between 2001 and 2008, the real estate sector grew over 60 percent followed by 37 percent growth in financial and professional services. The growth in these sectors was primarily due to the expansion of the maquiladora industry in Juárez. These services are vertically integrated with maquila operations. As the maquila operations expand, so does the demand for financial and real estate services. Financial services include subsectors such as insurance, taxes, management consulting (accountants, financial advisors, human resources, marketing), and legal services. The growth of the real estate sector is a direct response to the growing demand for industrial facilities and land as well as office and retail space for businesses supporting the maquiladora industry.

Figure E.3.2 Growth of Financial, Real Estate, and Professional Services



Source: U.S. Bureau of Economic Analysis, Cambridge Systematics, Inc. analysis.

Federal Government Services

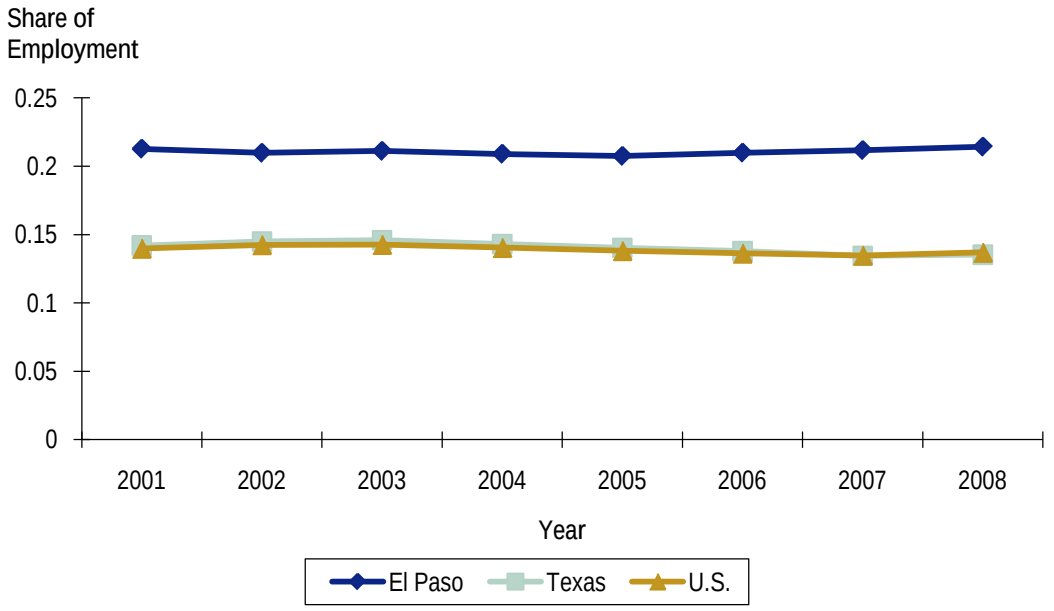
The U.S. government contributes to the regional economy through the operation of a number of law enforcement and military installations. The U.S. Customs Services, the Immigration and Naturalization Service and various Federal law enforcement agencies are directly related to border activity, ensuring the safe and efficient operation of international trade and travel. El Paso also is home to Fort Bliss, the second largest military installation in the U.S., which had an estimated employment of over 18,500 in 2008, growing from 11,740 in 2001.[49] Fort Bliss houses the U.S. Army Air Defense Artillery School, the William Beaumont Army Medical Center, The U.S. Army Sergeants Major Academy, and the Joint Task Force North. The U.S. Senate approved over $1.5 billion in funding to expand the base by 20,000 soldiers and their families by 2011.

These institutions explain the high concentration of government services in El Paso. The location quotient for government jobs is 1.6 in 2007, marginally up from 1.5 in 2001. This means that government jobs accounts for a greater share of jobs in El Paso than the U.S. average, as shown in Figure E.2.3. The location

[49] Bureau of Economic Analysis.

quotients for Federal governments and military for 2007 are 1.8 and 3.8 respectively.

Figure E.3.3 Government Jobs as Share of Employment



Source: U.S. Bureau of Economic Analysis, Cambridge Systematics, Inc. analysis.

While the majority of Federal government jobs are associated with Fort Bliss, a significant number is directly attributable to the border crossing, thus making them border dependent.

E.4 Economic Impact of Border Crossings

The total economic impact of border dependent businesses is the sum of the direct, indirect, and induced impacts, defined as follows:

- **Direct impacts** are the initial, immediate output, employment, and income effects of the border dependent businesses.
- **Indirect impacts** are the incremental business sales and associated income and employment effects arising from the purchase of input materials (supplies, materials, equipment, and services) by border dependent businesses.
- **Induced impacts** are incremental business sales and associated income and employment effects resulting from household spending and respending on goods and services as a result of the direct and indirect impacts.

Generally, changes in employment or final demand associated with a business or industrial sector are the basis for modeling direct economic impact. For this

analysis, the direct impacts are reductions in direct employment by border dependent businesses. The economic model used in the analysis is a customized model developed by Regional Economic Modeling Inc. (REMI). This economic simulation estimated indirect and induced impacts, resulting in total economic impact. The total impact is measured as changes in employment, output or gross regional product (GRP), value added, and personal income.

Methodology

The purpose of the analysis is to establish the total economic significance of the border ports of entry in the El Paso region. To accomplish this, we conducted a simulation of the economic impact of a reduction in employment by border dependent industries. A reduction in employment in these industries could result from several scenarios, including the closing of ports of entry, increased cost of border crossings as result of increased congestion or tolls, or increased safety and security concerns.

Table E.4.1 displays the total direct employment impact for border dependent industries which totals over 690,000 jobs. For this analysis, two scenarios were analyzed. The first assumed a 50 percent reduction in employment (or 346,000 jobs) in border dependent businesses and the second assumed an 80 percent reduction (or 553,600 jobs). For each scenario, the reduction was applied evenly across each of the border dependent industry sector. For example, the 50 percent scenario assumed a 50 percent employment reduction in manufacturing, transportation and warehousing, retail services and finance and real estate. The economic impact analysis of these direct employment reductions was conducted utilizing the 42 sector multiregion U.S.-Mexico REMI Model.

Table E.4.1 Direct Employment and Output of Border Dependent Sectors, 2008

Sector	El Paso	Chihuahua	Dona Ana	Total
Manufacturing[50]	14,576	302,863	1,961	319,400
Retail and Wholesale Trades	58,400	177,210	10.833	246,443
Financial Services	27,244	7,213	4,899	39,356
Transportation and Warehousing	14,441	71,393	1,011	86,845
Total	114,661	558,679	18,677	692,017

Source: REMI

[50] This refers to only border dependent manufacturing subsectors.

Results

Reductions in border dependent economic activity would have significant impacts on the regional economy. A 50 percent reduction in direct employment in border dependent sectors would result in a loss of nearly 450,000 jobs in the binational region. An 80 percent reduction in direct employment would lead to a loss of nearly 808,000 jobs. The distribution of employment impact by locality is presented in Table E.4.2.

Table E.4.2 Job Loss Arising from Reductions in Border Dependent Activity

	50 Percent Employment Reduction in Border Dependent Sectors		80 Percent Employment Reduction in Border Dependent Sectors	
Region	Direct Jobs	Total Jobs	Direct Jobs	Total Jobs
El Paso	57,331	83,100	91,729	137,955
Dona Ana	9,352	12,135	14,963	20,710
Chihuahua	279,340	392,807	446,943	649,120
Total	356,022	448,042	553,636	807,970

Source: Cambridge Systematics, Inc analysis using REMI.

The State of Chihuahua stands to sustain the greatest loss if border dependent activities subside in the region as shown in Table E.4.3. An average of 521,000 jobs or 39 percent of total employment could be at stake. These activities translated into 32.0 percent to 52.7 percent of GRP.

Table E.4.3 Summary of Total Economic Impacts of Reduction in Border Dependent Business – State of Chihuahua, MX

	Total Impact	
Economic Variables	Number Lost	Percent Lost
Employment (Thousands)	393-649	29.0-48.0%
Gross Regional Product (Billion U.S.$)	$13-21.4	32-52.7%
Personal Income (Billion U.S.$)	$7.15-11.7	23.2- 38%

Source: Cambridge Systematics, Inc analysis using REMI.

Note: Results based on assumed reductions in direct employment in border dependent sectors equal to 50 percent and 80 percent, respectively.

The total economic impact of a 50 to 80 percent contraction in border dependent sectors in El Paso is displayed in Table E.4.4. The impacts are estimated to range

from 83,000 to 138,000 jobs, representing 22.3 to 37.0 percent of El Paso's total employment, 24 to 39 percent of GRP and 13 to 21 percent of personal income.

Table E.4.4 Summary of Total Economic Impacts of Reduction in Border Dependent Business – El Paso, TX

	Total Impact	
Economic Variables	Number	Percent
Employment (Thousands)	83.1-138	22.3-37%
Gross Regional Product (Billion U.S.$)	$4.6-7.57	23.8-39%
Personal Income (Billion U.S.$)	$2.55-4.18	12.9-21.2%

Source: Cambridge Systematics, Inc. analysis using REMI.

Note: Results based on assumed reductions in direct employment in border dependent sectors equal to 50 percent and 80 percent, respectively.

Although Dona Ana County, NM would be the least impacted by declining border activities, the impacts are still significant. As shown in Table E.4.5, a 50 to 80 percent decline in border dependent employment would have a total impact of 12,000 to nearly 21,000 jobs, representing up to 22 percent of County's total employment and 11 percent of the GRP and personal income.

Table E.4.5 Summary of Total Economic Impacts of Reduction in Border Dependent Business– Dona Ana County, NM

	Total Impact	
	Number	Percent
Employment (Thousands)	12.1-20.7	13.1-22.3%
Gross Regional Product (Billion U.S.$)	$0.7-1.2	16.23-27.4%
Personal Income (Billion U.S.$)	$0.34-0.56	6.5-11.0%

Source: Cambridge Systematics, Inc. analysis using REMI.

Note: Results based on assumed reductions in direct employment in border dependent sectors equal to 50 percent and 80 percent, respectively.

F. Technology Applications Technical Memorandum

F.1 Introduction

One focus of the El Paso Regional Ports of Entry Operations Plan was to investigate the use of technology applications, particularly intelligent transportation systems (ITS) and other technologies, to reduce congestion and make cross-border travel more efficient and "green." This technical memorandum assesses the availability and functionality of both existing and emerging technologies to make border crossing operations more efficient, without compromising security. This planning document is organized as follows:

- **Section F.2** describes the existing trade process, policies, programs, and procedures at the U.S.-Mexico border crossings and the current use of technologies at the El Paso international border crossings;
- **Section F.3** identifies some of the new and emerging freight border crossing technologies that can help improve border crossing operations;
- **Section F.4** develops and assesses technology service alternatives based on regional needs and enabling technologies, and provides detail on corresponding potential operational concepts and phasing;
- **Section F.5** presents a realistic, near-term, and achievable border freight mobility technology implementation plan for the El Paso region, centering on a ***Border Traveler and Cargo Information*** System that can be designed, tested; and deployed within the next two to four years.

F.2 Existing Trade Process, Programs, and Technologies at the Border

This section describes the existing policies, programs, and procedures at the U.S.-Mexico border crossings, as well as the current use of technologies at El Paso international border crossings.

Context

Two of the major contextual issues that are acting to impede the swift movement of vehicles across the El Paso region's border crossings are historically increasing levels of trade coupled with new security requirements and processes.

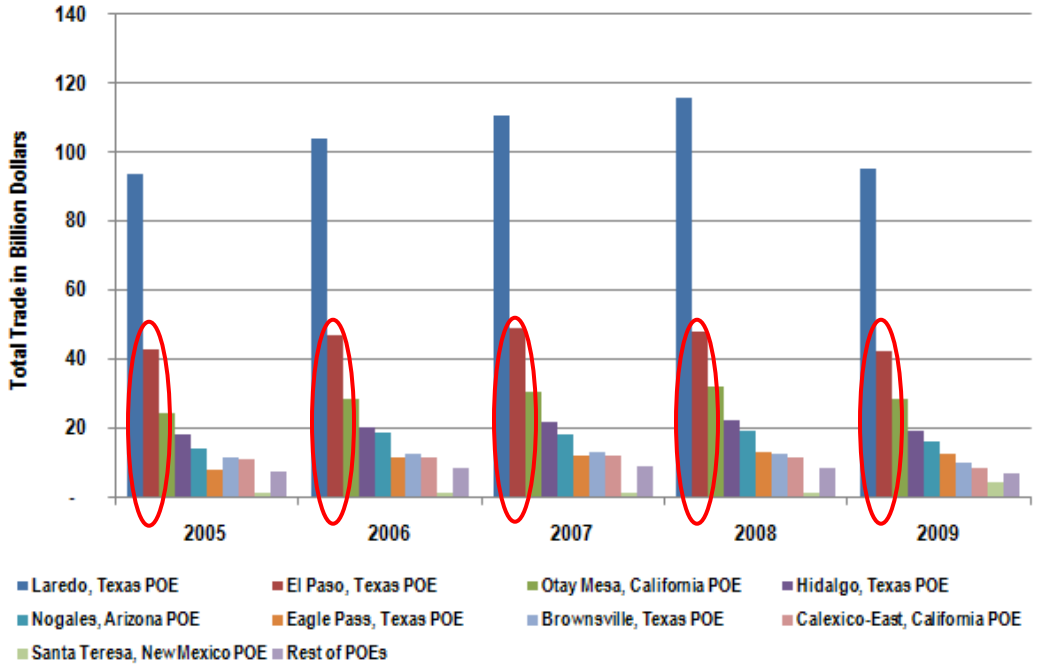
Figure F.2.1 below provides an overview of the total trade in dollars for these U.S.-Mexico crossings, with the El Paso levels highlighted. This shows that the total trade in dollars through the El Paso ports of entry (POEs) was about $42.3 billion in 2009, which makes a substantial portion (about 17.4 percent) of the total U.S.-Mexico trade, next only to Laredo, Texas. The effects of the 2007-2009 economic recession[51] are highlighted by the pronounced drop in trade levels from the near $50 billion level set in 2007.

Despite this temporary reduction in cross-border trade, stakeholder interviews have confirmed that significant border crossing time delay for freight and passengers across the border remain at crisis levels, with no imminent solution in sight. Stakeholders in the region clearly indicated that a reduction in crossing times would help facilitate trade, reduce the cost of doing business, and improve the economic competitiveness of the region.

As the economic recovery continues, it can be expected that cross-border trade levels will reach well past the 2007 levels later this decade. This will further exacerbate existing problems with delay and crowding at the El Paso border crossings, and put further pressure on developing solutions for them.

[51] Conference Call Meeting of the Business Cycle Dating Committee of the National Bureau of Economic Research on September 19, 2010. Available at: http://www.nber.org/cycles/sept2010.html (last accessed on October 7, 2010).

Figure F.2.1 Cross-Border U.S.-Mexico Total Trade in Dollars by Land Modes



Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, 2005-2009 TransBorder Freight Data.

Since the 9/11 attacks, the increased focused on security at U.S. border crossings has resulted in new procedures and systems being deployed by Customs and Border Protection (CBP). More specifically, systems and processes such as Free and Secure Trade (FAST) lanes and the Customs-Trade Partnership Against Terrorism (C-TPAT) trade/freight industry security best practices have been implemented over the past eight years. These programs, though increasing the safety of the borders, also have acted to further increase crossing times in the region.

Stakeholder interviews have confirmed that a portion of border crossing time delay is due to the necessary security processes of CBP; and much of the feedback in this area has been on providing suggestions on how these processes might be sped up (e.g., increased number of lanes open, separation of FAST lane approaches, and use of new technologies). In general, stakeholders believe that the use of improved operational strategies, improved CBP staffing, and the introduction of new technologies can ensure security, while at the same time allowing for significant improvements in border crossing times. Stakeholders also suggested leveraging technologies and information to disperse demand across available capacity throughout the day and/or among the POEs in the region.

Cross Border Trade Process

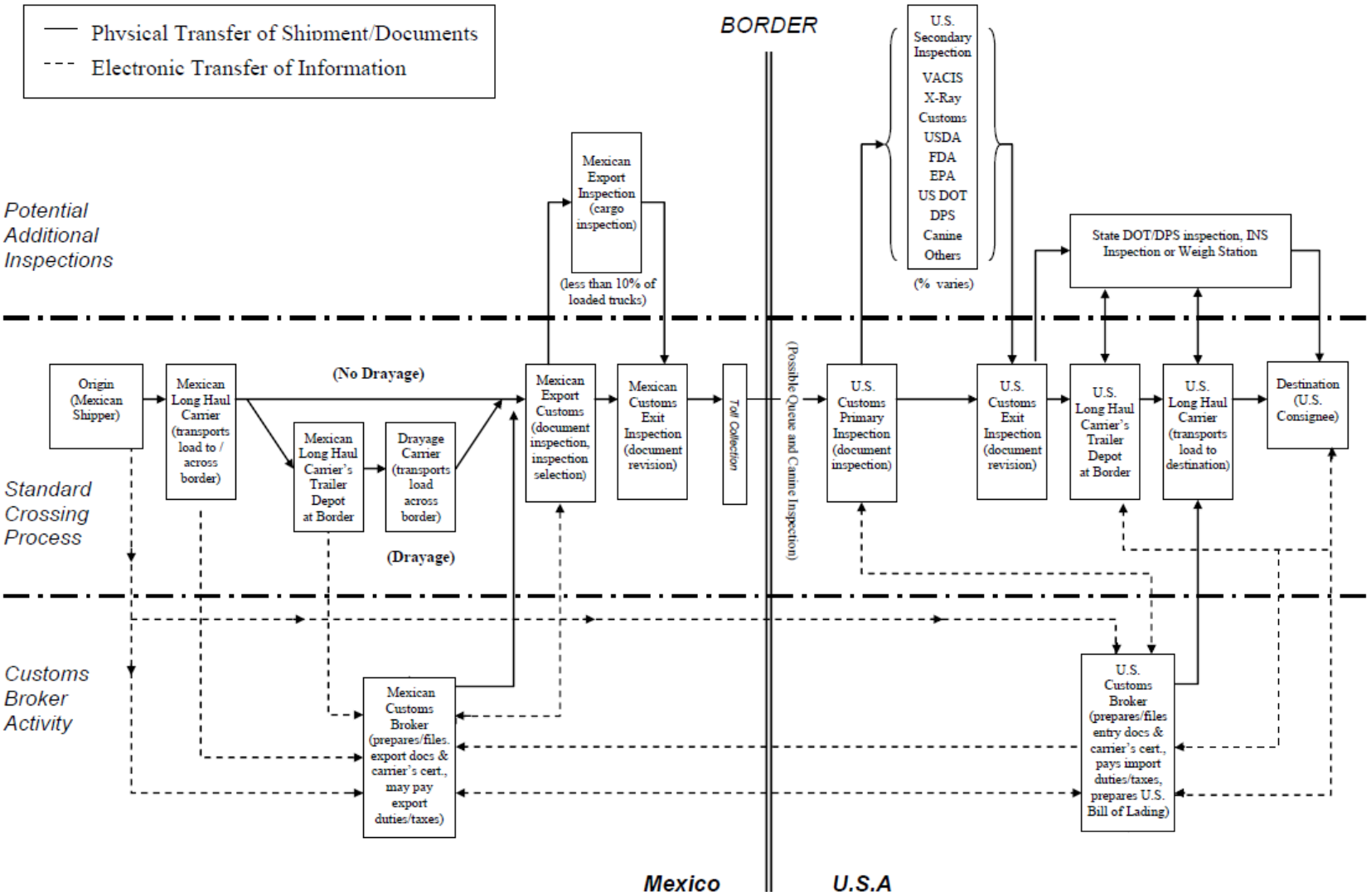
Figure F.2.2, developed by researchers at the Texas Transportation Institute (TTI), provides a detailed overview of the U.S.-Mexico border crossing processes for trucks. While this chart focuses on the Northbound processes, the general processes are similar in reverse for Southbound movements.

There are several stakeholders in the process, including CBP, Mexico Aduana, Texas Department of Public Safety (DPS), shippers, consignees, carriers (long haul and drayage), railroads, customs brokers, and toll collectors. Mexico Aduana and CBP work in coordination with several other government agencies, as required by cross border policies and programs in the two nations, to keep the borders secure.

CBP carries out many functions, including inspection, screening, remote surveillance, targeting, patrolling, specialty checks (such as food/agriculture, weapons, nuclear devices, radiation), communication and coordination with other government and international agencies, and antiterrorism efforts. Under a limited use of technology, these procedures can be highly burdensome both on the border protection agency and cross-border travelers; and the time delays could mean loss of business revenue to the carriers, railroads, shippers, and consignees.

The subsections to follow describe the recent history of the U.S.-Mexico border security policies and programs, and the association of the CBP procedures with these programs.

Figure F.2.2 Schematic Flowchart of Northbound Commercial Border Crossing Process



Source: Texas Transportation Institute, *Truck Transportation Through Border Ports of Entry: Analysis of Coordination Systems*, TxDOT Final Report, November 2002.

U.S. Border Security Policies, Programs, and Procedures since 9/11

As a consequence of 9/11, the Department of Homeland Security (DHS) was established on January 24, 2003, by the Homeland Security Act of 2002.[52] Before the establishment of the DHS, homeland security activities were spread across more than 40 Federal agencies and an estimated 2,000 separate Congressional appropriations accounts. DHS was established to ensure economic security of the United States by efforts, activities, and programs aimed at securing the homeland.

CBP (formerly the U.S. Customs Service) was established on March 1, 2003 as part of the DHS' Directorate for Border and Transportation Security. CBP is responsible for protecting the nation's borders with a priority mission of preventing terrorists and terrorist weapons from entering the United States, while also facilitating the flow of legitimate trade and travel. It implements several U.S. laws and regulations, and is a diverse organization made up of law enforcement professionals, trade specialists, intelligence analysts, agricultural scientists, and other employees with a wide range of backgrounds.

The CBP uses a strategically layered risk management approach and focuses resources on Priority Trade Issues (PTI) (i.e., high-risk areas that can cause significant revenue loss, hurt the U.S. economy, or threaten the health and safety of the American people). Currently, there are seven PTIs: 1) Agriculture; 2) Antidumping and Countervailing Duties (AD/CVD); 3) Import Safety; 4) Intellectual Property Rights (IPR); 5) Penalties; 6) Revenue; and 7) Textiles.

Customs and Trade Partnership against Terrorism (C-TPAT)

C-TPAT is a voluntary government-business initiative started after 9/11 to build cooperative relationships that strengthen and improve overall international supply chain and U.S. border security. It requires importers, carriers, consolidators, licensed customs brokers, and manufacturers to ensure the integrity of their security practices and communicate and verify the security guidelines of their business partners within the supply chain. For C-TPAT firms, this enables more secure and expeditious customs clearance by the CBP. To participate in C-TPAT, importers, brokers, carriers, and other eligible entities must submit a Memorandum of Understanding (MOU), and complete a Supply Chain Security Profile Questionnaire. This questionnaire is based on a structured self-assessment of supply chain security best practices that are implemented by each participating company.

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[52] History Office, *Brief Documentary History of the Department of Homeland Security: 2001-2008*, Department of Homeland Security, available on-line at: http://www.dhs.gov/xlibrary/assets/brief_documentary_history_of_dhs_2001_2008.pdf (last accessed on October 8, 2010).

According to CBP, the chief benefits of participation in C-TPAT include:

- Eligibility for participation in special programs, including the FAST program on the U.S./Mexico border and the Automated Commercial Environment (ACE);
- Importer Self-Assessment Program (ISA) and removal from audit pools and a reduced number of inspections (reduced border wait times);
- Account-based bimonthly/monthly payments, and assigned CBP account manager and access to the C-TPAT membership list; and
- Participants avoid the possible consequences if they do not participate, such as increased chances for greater scrutiny of cargo, added examinations, requests for information, no guarantees for cargo processing times, and increased reviews and audits.

Most notably, at a recent Commercial Operations Advisory Committee (COAC) meeting, CBP officials provided statistics showing that certified C-TPAT participants are three to five times less likely to be examined for trade or compliance reasons, and five to eight times less likely to be examined for enforcement reasons.[53]

The FAST Program

Free and Secure Trade (FAST) program is a Border Accord Initiative between the United States, Mexico, and Canada, according to which the three nations have agreed to coordinate, to the maximum extent possible, their commercial processes for clearance of commercial shipments at the border. The program uses common risk-management principles, supply chain security, industry partnership, and advanced technology to improve the efficiency of screening and clearing commercial traffic at the shared borders. The initial phase of FAST for the U.S. and Mexico bound commercial shipments began on September 27, 2003 in El Paso. CBP's goals for the FAST program are to:

- Increase the integrity of supply chain security by offering expedited clearance to carriers and importers enrolled in C-TPAT;
- Streamline and to integrate registration processes for drivers, carriers, and importers; minimizing paperwork and ensuring only low-risk participants are enrolled as members;
- Expedite the clearance of transborder shipments of compliant partners by reducing Customs information requirements, dedicating lanes at major crossings to FAST participants, using common technology, and physically examining cargo transported by these low-risk clients with minimal frequency;

[53] C-TPAT – The Trade Library; http://www.tuttlelaw.com/subjects/ctpat.html.

- Serve as a catalyst for both Customs administrations to participate in the enhanced technologies by using radio frequency identification (RFID) transponders, which would make it easier to clear low-risk shipments, and would mitigate the cost of program participation for FAST partners; and
- Provide benefits to carriers, including dedicated lanes (where available) for greater speed and efficiency in the clearance of FAST transborder shipments; and a reduced number of examinations for continued compliance with Customs FAST requirements.

FAST is a clearance process for known low-risk shipments through dedicated lanes. Any truck using FAST lane processing must be a C-TPAT-approved carrier, carrying qualifying goods from a C-TPAT-approved importer, and the driver in the possession of a valid FAST Commercial Driver Registration ID Card. The southern border has two additional requirements. The manufacturer must be an approved C-TPAT participant, and they must also adhere to CBP high security seal requirements.

The two cargo release methods for FAST eligible shipments are as follows:

4. **"FAST System" (formerly National Customs Automated Prototype (NCAP)),** a fully electronic and completely paperless cargo release mechanism put into place by the CBP. Paperless processing is achieved through advanced electronic data transmissions and transponder technology.
5. **Prearrival Processing System (PAPS),** an Automated Commercial System (ACS) border cargo release system that utilizes barcode technology to expedite the release of commercial shipments while still processing each shipment through Border Cargo Selectivity (BCS) and the Automated Targeting System (ATS). Each PAPS shipment requires a unique barcode label, which the carrier attaches to the invoice and the truck manifest while the merchandise is still in Canada or Mexico. The barcode consists of the Standard Carrier Alpha Code (SCAC) and Pro-Bill number or entry number. The licensed U.S. Customs broker in the United States must indicate this sequencing of SCAC code and unique number in the BCS entry in ACS. Upon a truck's arrival at the border, the CBP officer scans the barcode, which automatically retrieves the entry information from ACS.

The FAST system outlined above consists of RFID tags, tag readers (deployed at CBP POE facilities), and a back office computer system/software application. As shown in Figure F.2.3, the FAST windshield sticker tag is a paper-thin, RF-programmable, battery-free, low-cost, tamper and weather resistant tag that operates in the 915 MHz range. The tag has a read range of 5 meters. The tag has a 1024 bit memory, capable of reading, writing, and rewriting information; or permanently setting individual bytes.

Figure F.2.3 FAST RFID Windshield Sticker

Source: TransCore.

The FAST system can be described as an intelligent border crossing system that can have the potential to more swiftly move trusted and legal truck freight through border crossings. More specifically, FAST allows CBP agents to instantly identify designated low-risk vehicles and drivers who are compliant with the C-TPAT. These vehicles, equipped with FAST windshield tags, are expedited through border crossings, reducing congestion and helping agents target a smaller pool of potentially high-risk vehicles for closer inspection. In practice though, in many deployments of FAST on the northern and southern U.S. borders, including the Bridge of the Americas (BOTA) in El Paso, the approach lanes to the FAST gates are not separated from the general truck (or in some cases, passenger) lanes, thus minimizing most of the potential throughput benefit that might be realized from the system.

Other Programs and Activities[54,55]

The following describes some of the goods related programs and activities taken up by the CBP since its establishment in a chronological order:

- **2003.** CBP adopted the ACE Secure Data Portal to provide easy-to-use access to consolidated border processing information to increase import and export efficiency while enhancing border security.

[54] U.S. Customs and Border Protection Timeline, available on-line at: http://nemo.customs.gov/opa/TimeLine_062409.swf (last accessed on October 8, 2010).

[55] CBP Fact Sheet. http://www.itintl.com/factsheet-us-customs-and-border-protection-actions-taken-since-911.html (last accessed on October 6, 2010).

On December 5, 2003, the CBP published rules, as required by the Trade Act of 2002, mandating submission of electronic advanced manifest information on all cargo shipments entering and leaving the country. The timeline for presentation of this information for the different shipment types is shown in Table F.2.1 below. This helps National Targeting Center (NTC), a coordination point of all CBP's antiterrorism efforts, to perform transactional risk assessments, evaluate potential national security risks, and identify cargo that may pose a threat prior to its arrival at the border.

Table F.2.1 Timeline for Electronic Advance Manifest Information

Trade Type	Mode of Shipment	Additional Description	Timeline
Import	Air and Courier	From nearby areas	"wheels up"
		From other foreign locations	Four hours prior to arrival in the U.S.
	Rail	–	Two hours prior to arrival to a U.S. POE
	Vessel	–	Twenty-four hours prior to lading at foreign port
	Truck	FAST	Thirty minutes prior to arrival in the U.S.
		Non-FAST	One hour prior to arrival in the U.S.
Export	Air and Courier	–	Two hours prior to schedule departure from the U.S.
	Rail	–	Two hours prior to the arrival of the train at the border
	Vessel	–	Twenty-four hours prior to departure from U.S. port where cargo is laden
	Truck	–	One hour prior to the arrival of the truck at the border

Source 1: Byrd, E. Article in Customs and Border Protection Today, March 2004. Available at: http://www.cbp.gov/xp/CustomsToday/2004/March/Other/rules_cargosecurity.xml (last accessed on October 8, 2010).

Source 2: Federal Register, 19 CFR Parts 4, 103, e al., Required Advance Electronic Presentation of Cargo Information; Final Rule. Available on-line at: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2003_register&docid=03-29798-filed.pdf (last accessed on October 8, 2010).

- **2004.** CBP unveiled new highly sophisticated radiation portal monitors that scan cargo shipments in Jersey City, New Jersey, to prevent the smuggling of radiological materials used in nuclear and radiological dispersal devices through U.S. seaports. The portals developed by are now deployed at several land border POEs.
- **2004.** CBP partnered with the Food and Drug Administration (FDA) to establish the 24/7 Prior Notice Center to assess the risks of imported food shipments.

- **2005.** CBP created the AG/Bio-Terror Countermeasures (ABTC) program to prevent the entry of ag/bio-terrorist and their weapons and equipment.
- **2007.** CBP launched the National Agriculture Release Program, an automated program that allowed the inspection of high-volume, very-low risk commodities to be expedited.
- **2007.** CBP deployed the ACE electronic truck manifest (e-Manifest) systems to the land border POEs.

In addition to the above, there are ongoing training programs for the CBP employees to assume specialized roles.

Performance Measurement at the Border Crossings

The performance of inspection and trade facilitation at POEs is measured and monitored by the Department of Homeland Security.[56] The performance goals and the results of performance measures as of fiscal year (FY) 2008 that are relevant to the land commercial border crossings are as follows:

- **Automation Modernization**:
  - *Total number of linked electronic sources from CBP and other government agencies for targeting information*: 19 in number (target for 2008 was met);
  - *Number of trade accounts with access to ACE functionality to manage trade information*: 15,465 in number (target for 2008 was met);
  - *Percent of CBP workforce using ACE functionality to manage trade information*: 38.3 percent (target for 2008 was not met due to a timing issue of the ACE releases); and
  - *Percent of network availability*. 99.7 percent (target for 2008 was met).
- **Domestic Nuclear Detection**:
  - *Number of Advanced Technology Demonstrations transitioned to development or deployment in a fiscal year*: measure was not in place in 2008; and
  - *Percent of cargo, by volume, that passes through fixed radiation portal monitors at land and sea POEs*: 97 percent (target for 2008 was met).
- **Border Security Inspections and Trade Facilitation at POEs**:
  - *Compliance rate for C-TPAT members with the established C-TPAT security guidelines*: 99.9 percent (target for 2008 was met).

[56] Department of Homeland Security Annual Performance Report: Fiscal Years 2008-2010, Department of Homeland Security, May 2009. http://www.dhs.gov/xlibrary/assets/cfo_apr_fy2008.pdf (last accessed on October 8, 2010).

– *Percent of truck and rail containers screened for contraband and concealed people*: 35.8 percent (target for 2008 was not met- ATS rules underwent refinement in FY 2008, resulting in an overall reduction in the number of mandatory Non-Intrusive Inspection (NII) examinations required and was not compensated for by a corresponding increase in discretionary [CBP Officer selected] exams).

Apart from the above, the CBP reports border wait times for the POEs,[57] which are estimated wait times for reaching the primary inspection booth, the first point of contact with CBP when crossing the land borders. These are updated hourly and are reported separately for the regular and FAST lanes. This information currently is provided for all of the El Paso region POEs.

Cross Border Infrastructure, Technologies, and Performance at the El Paso Region POEs

The TxDOT[58] and the New Mexico Border Authority[59] provided descriptions of the physical infrastructure and ongoing improvements at the commercial border crossings of El Paso region as follows:

- **Bridge of the Americas (BOTA).** The U.S. side layout of the border crossing is indicated in Figure F.2.4. The crossing is located in the El Paso region on Highway 110, connecting U.S. 62 (Paisano Drive) and I-10. It has six lanes for commercial traffic, including one FAST lane that has been operational since 2004. The hours of operation for all commercial vehicle crossings are 6:00 a.m. to 6:00 p.m., Monday through Friday; and 6:00 a.m. to 2:00 p.m. on Saturday.

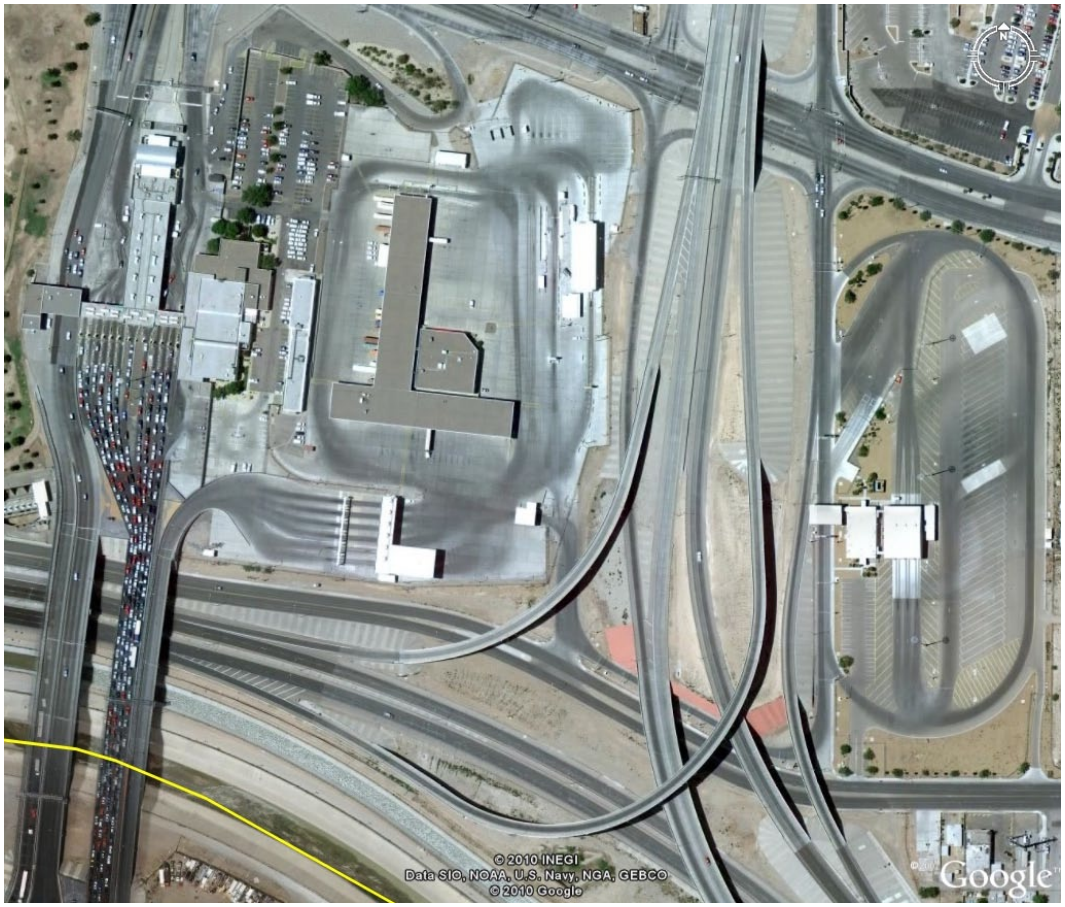
  As of 2010, General Services Administration (GSA) and CBP are finalizing a feasibility study for expansion and modernization of the commercial and noncommercial operations. This project would increase the number of commercial lanes. Design and construction dates have not been established.

[57] CBP Border Wait Times by POE. http://apps.cbp.gov/bwt/ (last accessed on October 8, 2010).

[58] Texas Department of Transportation (TxDOT), *2010 Texas-Mexico International Bridges and Border Crossings Existing and Proposed*, 2010.

[59] http://www.nmborder.com/santa_teresa.html.

Figure F.2.4 Layout of the U.S. Side of BOTA POE



Source: Google Earth.

- **Ysleta-Zaragoza Bridge POE.** The configuration of the POE is indicated in Figure F.2.5 below. The border crossing is located in eastern El Paso near State Loop 375, Cesar Chavez Border Highway, and Americas Avenue; and connects to I-10. It consists of two structures – one of which is an eight-lane (four lanes in each direction) bridge for commercial traffic. There are three FAST lanes; one of which opened in June 2004 and the other two became operational in October 2008. It is a tolled facility, and commercial trucks must pay a fee of $3.50 per axle to cross.

  As of 2010, the extension of the Border Highway from the Zaragoza POE to the Fabens POE recommended in a 1997 study remains on the long-range plan. The hours of operation for all commercial vehicle crossings are 6:00 a.m. to midnight, Monday to Friday; and 8:00 a.m. to 4:00 p.m. on Saturday.

Figure F.2.5 Layout of the U.S. Side of Ysleta-Zaragoza Bridge POE

Source: Google Earth.

- **Santa Teresa POE.** The U.S. side layout of the border crossing is shown in Figure F.2.6. The crossing is located in Doña Ana County, 42 miles south of Las Cruces, New Mexico; and 20 minutes from downtown El Paso. From the POE, Interstate 10 is 12 miles from the Pete Domenici Highway. Santa Teresa is the newest POE on the U.S./Mexico border, completed in 1997 and replacing the original port which opened in 1992. It currently is open

10 hours a day (8:00 a.m. to 6:00 p.m.), Monday to Friday; and one-half days on Saturdays from 8:00 a.m. to 2:00 p.m.[60]

Figure F.2.6 Layout of the U.S. Side of Santa Teresa POE

Source: Google Earth.

- **Paso del Norte and Stanton Street POEs.** The U.S. side layout of the border crossings is shown in Figure F.2.7. Located in downtown El Paso, the Paso del Norte POE handles northbound automobile traffic and northbound and southbound pedestrian traffic. The Stanton Street Bridge lies just east of the Paso del Norte bridge and handles southbound passenger vehicle traffic and one northbound Dedicated Commuter Lane. The POEs connect to U.S. 62 (Paisano Drive) via Santa Fe Street and Stanton Street, respectively. Southbound tolls are $2.50 for personal vehicles and $0.50 for pedestrians. Both bridges operate 24 hours per day.

[60]http://www.nmmtdpolice.org/districts/district06/index.php.

Figure F.2.7 Layout of the U.S. Side of Paso del Norte and Stanton Street POEs

Source: Google Maps.

The El Paso region POEs currently implement the following border crossing systems:

- FAST system;
- ACE on-line data portal system;
- Radiation portal monitoring system;
- ATS advanced targeting system;
- SBInet technology system;
- Secondary U.S. Customs inspection system consisting of X-ray screening; and
- State manual safety inspection system with Weigh-in-Motion facility.

The above systems are managed by the CBP, and the Federal and state inspection agencies, with support from GSA; vendors; C-TPAT; NTC; FDA; defense contractors; intelligence agencies; and other Federal, state, and international agencies.

The FAST System deployments to date in the El Paso region consist of the following:

- **BOTA.** Two FAST Gates (no dedicated lanes).
- **Ysleta-Zaragoza.** Three FAST Gates (dedicated lanes on U.S. side only[61]). (Note: Potential expansion to 10 FAST Gates on U.S. side is being developed by GSA; however, no additional approach lanes will be added).
- **Santa Teresa**: One FAST Gate (dedicated lane).

The functions of U.S. Customs at secondary inspection are being carried out using dogs, X-ray machines, wands, and scanners.[62] Texas National Guardsmen operate the fixed and mobile X-ray machines in the commercial secondary inspection areas of the POEs. Fixed site truck X-ray systems are operational at the BOTA and Ysleta-Zaragoza border crossings.

The state safety inspection is performed by Texas Department of Public Safety (DPS) at two levels as follows:

- A **Level 1 inspection** includes each of the items specified under the North American Standard Inspection Procedure. The inspection includes checking the driver's requirements, including driver license, medical certificate, medical waiver, off-duty status record, driver's vehicle inspection report, shipping papers, alcohol, drugs, presence of hazardous materials, steering mechanism, brake system, electrical system, wheels, tires, rims, suspension, fuel system, brakes, and suspension system. A Level 1 inspection requires two persons. DPS officers conduct Level 1 inspections at the international border crossings and at roadsides away from the international bridges.
- A **Level 2 inspection** is a "walk-around" driver and vehicle inspection – a visual inspection of all items that do not require inspecting underneath the vehicle. A Level 2 inspection requires only one DPS officer. If no critical defect is found during the inspection, a Commercial Vehicle Safety Allowance (CVSA) sticker is affixed to the window of the vehicle and the sticker is good for 90 days. If a critical defect is found, the driver is required to repair the defect before he can leave the secondary inspection area.

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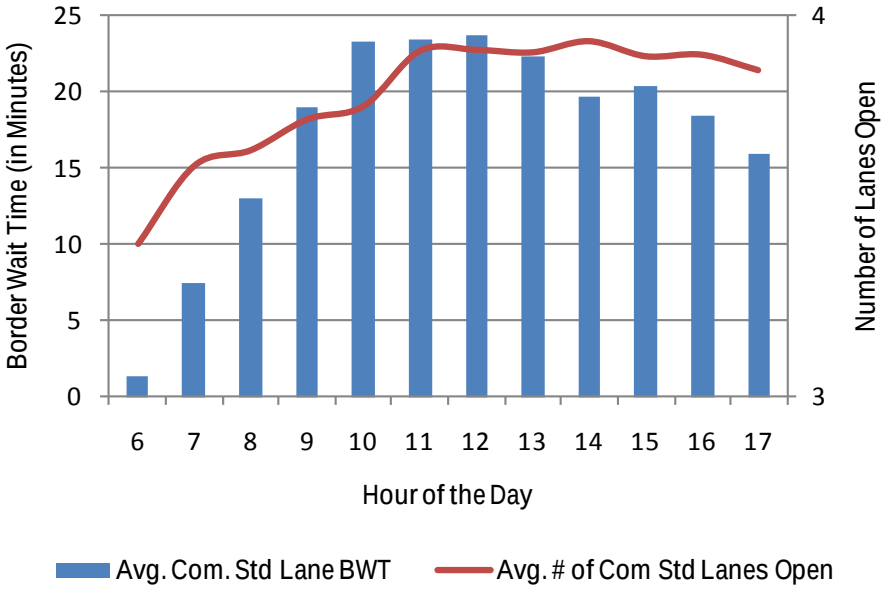
[61] Researchers compiling information for the Camino Real Corridor Border Improvement Plan found that roadway constraints on the Mexican side of the Ysleta-Zaragoza Bridge limited the flow of traffic across the bridge. Trucks attempting to enter the facility often experienced excessive wait times before even having the opportunity to enter the dedicated FAST lane (Texas Transportation Institute, 2007).

[62] http://www.window.state.tx.us/specialrpt/border/sfatb3.html (last accessed on November 18, 2010).

Using CBP border wait time data[63] for 2008 to 2010 retrieved and archived by TTI (discussed in previous section), a typical weekday (Monday to Friday) performance of the BOTA and Ysleta-Zaragoza border crossings was determined on an hourly basis as shown in Figure F.2.8 through Figure F.2.11. The border wait time data was not archived for the Santa Teresa POE.

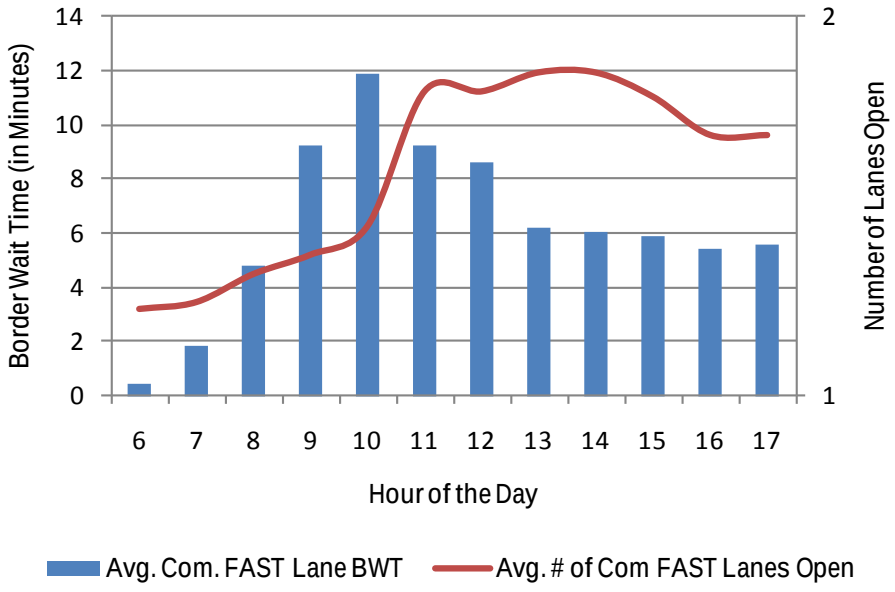
Figure F.2.8 Typical Weekday Hourly Border Wait Times for the BOTA Border Crossing Standard Lanes



Source: CBP border wait time data retrieved and archived by TTI between June 30, 2009, to October 29, 2010, for weekday operations at the BOTA POE between 6:00 a.m. to 6:00 p.m., Monday to Friday.

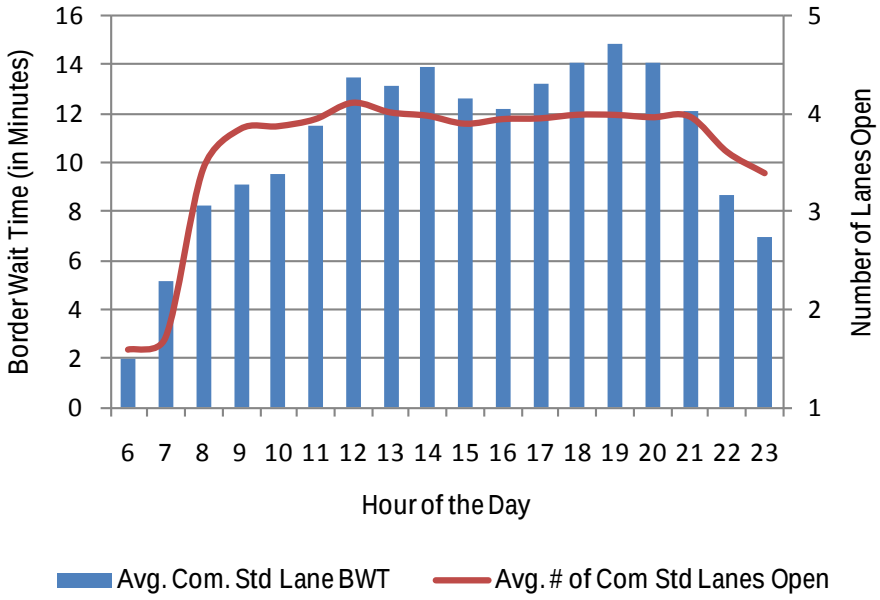
[63] http://apps.cbp.gov/bwt/ (last accessed on November 18, 2010).

Figure F.2.9 Typical Weekday Hourly Border Wait Times for the BOTA Border Crossing FAST Lanes



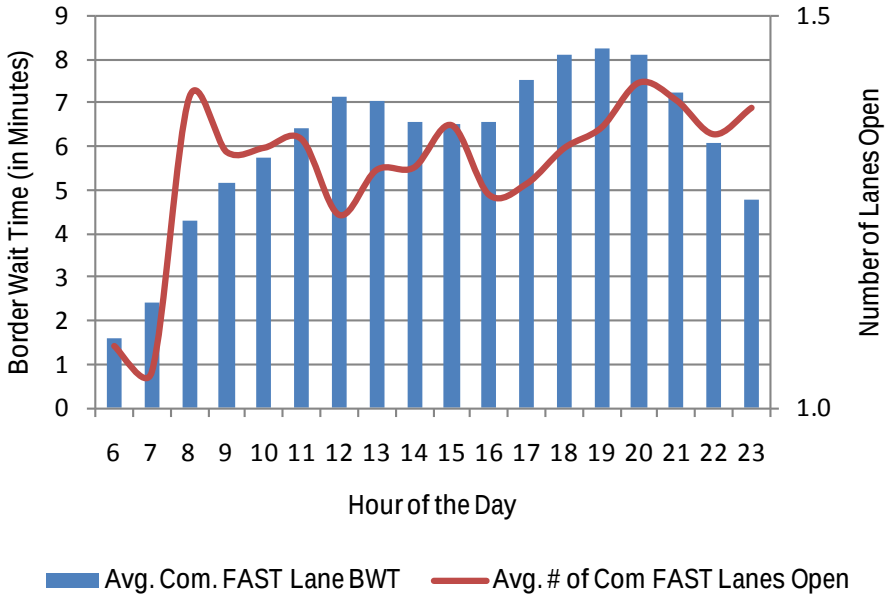
Source: CBP border wait time data retrieved and archived by TTI between June 30, 2009, to October 29, 2010, for weekday operations at the BOTA POE between 6:00 a.m. to 6:00 p.m., Monday to Friday.

Figure F.2.10 Typical Weekday Hourly Border Wait Times for the Ysleta-Zaragoza Border Crossing Standard Lanes



Source: CBP border wait time data retrieved and archived by TTI between June 30 2009, to October 29, 2010 for weekday operations at the Ysleta-Zaragoza POE between 6:00 a.m. to Midnight, Monday to Friday.

Figure F.2.11 Typical Weekday Hourly Border Wait Times for the Ysleta-Zaragoza Border Crossing FAST Lanes



Source: CBP border wait time data retrieved and archived by TTI between July 11, 2008, to October 29, 2010, for weekday operations at the Ysleta-Zaragoza POE between 6:00 a.m. to Midnight, Monday to Friday.

F.3 Survey of New Technologies for Operational Improvements at the Border

There are several ongoing efforts to improve cross border operations and to facilitate trade using technology. This section provides a comprehensive survey on new and emerging technologies based on national programs, recent field operational tests and studies.

International Border Crossing Electronic Screening (IBC E-Screening) System[64]

State enforcement officers, and, at southern border ports, Federal Motor Carrier Safety Administration (FMCSA) inspectors, are responsible for ensuring that the motor carriers, trucks, trailers and drivers released by the CBP meet specific state and U.S. DOT safety and regulatory compliance requirements by conducting a safety inspection.

At present, state and FMCSA inspection selection and screening processes at virtually all state border inspection sites are manual processes. Manual inspection selection processes are limited in terms of efficiency and coverage. At high-volume locations, where queues require processing a vehicle every few seconds, there is not enough time to consistently conduct manual verifications on every vehicle. On the other hand at low-volume locations, there is not sufficient manpower to manually conduct these detailed verifications on every vehicle. In mobile screening environments, where officers are working out of a patrol car at the roadside, there is virtually no opportunity to query central sources prior to making a decision to pull over a vehicle for further inspection.

The inspection selection and clearance decisions at the border currently are made based on a variety of factors, including:

- Officer/inspector knowledge of safety performance and history of specific carriers;
- Visual check of the vehicle's Commercial Vehicle Safety Alliance (CVSA) decal and its currency;
- Manual verification of a limited sample of information, on a sample of trucks and drivers;
- Walk-around/visual check of tire pressure, air brakes, and obvious physical defects;
- Sometimes, limited conversation with the driver;

[64] Information provided by the FMCSA.

- Officer expertise; and
- Random inspection.

Therefore, in 2008, FMSCA sponsored the development of IBC E-Screening concept, which is designed to provide operational and process improvements to enable states and FMCSA to focus limited enforcement resources on inspection and enforcement rather than identification and manual verification.

IBC E-Screening for Trucks and Buses is an alert-based system that expedites the safe and legal flow of freight and passengers across the U.S. borders, while targeting unsafe operations by wirelessly obtaining commercial vehicle information and verifying compliance with relevant requirements during the border crossing process.

The IBC E-Screening concept leverages FMCSA's investment in the FMCSA Query Central[65] (QC) and CBP's Automated Commercial Environment/ International Trade Data System (ACE/ITDS)[66] to provide an automated, data-driven approach to selection of vehicles for inspection at the borders, enabling uniform and consistent application of policies and procedures related to safety and compliance assurance of cross-border commercial traffic. IBC E-Screening enables northern and southern border states and FMCSA to utilize the QC-ACE/ITDS data, augmented to include verification of more than 20 additional screening factors, in an automated system-to-system environment, enabling identification and full safety/compliance verification of carriers, trucks, trailers, and drivers electronically, within three seconds or less of a truck's presentation at a state IBC processing point rather than the current 15-minute manual process.

Using funds under Section 5503 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), a deployment and testing study of an IBC E-Screening System based on the RFID wireless technology for motor carriers under realistic operating conditions was carried out. RFID technology was selected because 80–90 percent of trucks entering the United States from Mexico already are equipped with RFID transponders issued by CBP – either FAST transponders or User Fee transponders. The Santa Teresa POE was selected as the demonstration test site because it is low volume (~120 to 140 trips per day); staffed 5.5 days per week with a full complement of FMCSA border inspectors and State Motor Carrier Safety Assistance Program (MCSAP) officers.

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[65] Description of Query Central: http://www.fmcsa.dot.gov/about/infosys/publicinformationsystems/publiccoresystems.aspx#QC (last accessed on October 12, 2010).

[66] Description of Automated Commercial Environment/International Trade Data System: http://www.fmcsa.dot.gov/about/infosys/publicinformationsystems/publiccoresystems.aspx#Ace (last accessed on October 12, 2010).

The results indicated that the technology performed reliably and as expected, and the demonstration met the objectives defined in five of the six hypotheses; results for the final hypothesis were inconclusive, where the hypotheses are as shown in Table F.3.1 below.

Table F.3.1 Hypotheses Underlying Demonstration and Related Results

Hypothesis	Results
1. RFID Technology can be used to reliably identify vehicles/drivers at ramp speeds	The RFID readers and tags used in the demonstration project performed reliably (99+% read rate).
2. In-station e-screening can reduce the time required to process vehicles for inspection selection, resulting in productivity improvements for both inspectors and carriers.	Full electronic verification of enrolled vehicles was routinely accomplished via the e-screening system in less than 1 second, versus 15 minutes required to manually verify all items checked by the screening system.
3. In-station e-screening has the potential to increase the number of vehicles/drivers routinely subject to full compliance verification.	The Baseline evaluation showed that, on average, 237 vehicles per month were subject to full safety/ compliance verifications of all criteria included in the e-screening system. Subsequent to e-screening system implementation, the number of vehicles screened for full compliance was increased to an average of 965 vehicles per month, an increase of 307 percent.
4. In-station e-screening focuses limited enforcement resources on noncompliant/ unknown vehicles/drivers.	The system identified compliant/noncompliant vehicles more than 99 percent of the time, enabling officers to focus their efforts on vehicles with "fail" reads and those that are not transponder-equipped.
5. In-station e-screening has the potential to reduce processing time for compliant vehicles.	Average time saved per vehicle when distributed among all vehicles in the queue was 1.8 minutes per vehicle.
5. In-station e-screening provides the potential to increase capacity/throughput.	Traffic volumes at Santa Teresa were too low to draw significant conclusions – positive or negative – regarding this hypothesis.

Source: Santa Teresa RFID E-Screening Demonstration Project Evaluation: http://www.fmcsa.dot.gov/facts-research/research-technology/tech/Santa-Teresa-RFID-E-Screening-Demonstration.pdf (last accessed on October 12, 2010).

The Santa Teresa Project team also identified a need to interface the subset of ITDS data verified by FMCSA with e-screening systems. It would obviate the need for on-site enrollment. The ITDS data set ties the truck, trailer, and driver together on a per-trip basis. If the truck can be identified via the RFID tag, the driver and trailer can be identified and screened electronically, even in the absence of driver and trailer RFID tags. Lastly, the participating carriers have shown positive response.

Past Tests of AVI Transponders for Automated Border Clearance

International Border Clearance (IBC) Program[67]

The IBC program was initiated under the provisions of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The program directed and coordinated the testing and deployment of ITS technologies at border crossings to facilitate trade and transportation safety, and expedite the processing of commercial vehicles through POEs in states along international borders. It used advancements in information technology and vehicle identification to provide Federal and state agencies the information necessary to quickly and effectively make informed decisions regarding the cargo, vehicle, and driver crossing the border, and the need to inspect vehicles entering the U.S. Early studies under the IBC program used transponders based on dedicated short-range communications (DSRC) systems, and local processing systems and networks for vehicle identification, the installation for the purposes of field tests for these was sponsored and cofunded by the Federal Highway Administration (FHWA).

Some observations from the past field operational test (FOT) evaluation reports related to the transponder performance are summarized below:

- **Ambassador Bridge International Border Crossing System (ABBCS) at Detroit, Michigan**
  - DSRC is capable of supporting trade processing decision support systems (or the prototype followed for clearance process); and
  - The test events indicated that prolonged exposure to the vehicle identification readers resulted in dramatically reduced transponder battery life, necessitating the replacement of current batteries with extended life units.
- **International Border Electronic Crossing (IBEX) at Otay Mesa, California**
  - The large number of trucks operating in close proximity, in a compound configured such that looping sometimes becomes necessary, places a premium on antennae and reader placement. Antennae footprints must be carefully tuned to avoid extraneous and missed reads.
  - RF (radio frequency) network was found to be capable of supporting basic information exchange requirements.

[67] Intelligent Transportation Systems at International Borders: A Cross-Cutting Study. Facilitating Trade and Enhancing Transportation Safety. U.S. Department of Transportation, April 2001. http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11490.pdf (last accessed on October 12, 2010).

- The initial investment associated with equipping vehicles with transponders was considered acceptable, provided that processing paper-based transactions in parallel was eliminated.

Most technologies presented in the 2001 IBC cross-cutting study have been replaced or enhanced with new or better intelligent transportation system technologies as already discussed under the subsection on U.S. Border Security Programs after 9/11.

International Mobility and Trade Corridor (IMTC)/FHWA Tests[68]

IMTC is a partnership established between the public and private stakeholders in Washington State and British Colombia. The IMTC partnered with the U.S. DOT, Transport Canada, the Washington State Department of Transportation (WSDOT), and others to deploy the first fully operational and binational electronic border crossing system for trucks in North America; also referred to as the "trade corridor." It was funded jointly by northbound and southbound automated border crossing development projects and field operational tests of electronic cargo container seals and freight information exchanges based on dedicated short-range communications (DSRC) technology. The operational prototype system was intended to provide services of dedicated ITS truck lanes on both sides of the border, and binational weigh-in-motion data sharing enhanced systems and thus elimination of broker visits.

The field operation tests under the IBC program studied mainly the technology effectiveness. In contrast, for the trade corridor deployment the evaluation team (Science Applications International Corporation [SAIC] and TranSys International Consultants Limited [TSi], with the support of the FHWA Office of Freight Management and Operations and the U.S. DOT ITS-Joint Program Office), focused efforts on modeling the corridor, trade and regulator benefits.

The evaluation findings and conclusions are summarized below:

- **Utility of Dedicated ITS Truck Lanes at the Border**. Using on a previously built and validated border travel demand model, corridor ITS inputs and a 10-year benefit-cost model, it was found that even under the most conservative modeling scenario (only 10 percent of trucks with transponders in 2003 growing to 15 percent in 2013), the deployed dedicated ITS truck lanes (including reduced broker stops) would have resulted in significant benefits to the regional economy, mainly through motor carrier travel and operations savings for both ITS and non-ITS equipped trucks. Depending on

[68]SAIC and TranSys. Washington State – British Columbia. International Mobility and Trade Corridor (IMTC): ITS-CVO Border Crossing Deployment Evaluation Final Report, U.S. Department of Transportation, October 2003. http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13952/13952.pdf (last accessed on October 12, 2010).

level of ITS market penetration, the benefit-cost ratio ranged from 29:1 to 42:1.

- **Utility of Binational Virtual Weigh Stations.** Significant time savings for motor carriers and resource savings for enforcement personnel were estimated in the 10-year benefit-cost analysis, which was based on statistical weigh station usage data provided by the WSDOT and the Insurance Corporation of British Columbia (ICBC), and focused on five weigh stations along the IMTC corridor. The corridor bypass time savings occur as driver/vehicle/shipment are screened initially via electronic means or through physical inspection, then are cleared from further inspections along the corridor. Again, depending on the level of ITS participation, the benefit-cost ratio ranged from 4:1 to 8.5:1.
- **Private Sector Benefits.** The analysis showed that the motor carriers would have realized net positive returns on ITS participation almost immediately, given the relatively small costs of participation with the large travel time benefits. This was demonstrated by using a sample mid-size trucking firm.
- **Public Sector Benefits.** Public-sector costs involve ITS deployment infrastructure at the border crossing and weigh stations, while benefits accrue to the public sector through enhanced motor carrier safety enforcement and improved air quality impacts. The estimated public-sector benefit-cost ratios ranged from 1.6:1 to 4.4:1, moving from low to high ITS deployment scenario.
- **Lessons Learned from the IMTC Partnership.** An international model for development of freight border ITS projects across international borders was established. The IMTC and project stakeholders successfully addressed a concern related to the freight data privacy of this system. The partnership also has facilitated open discussions between the customs agencies of the United States and Canada at Blaine/Surrey international border crossing. A primary issue identified was that as use of transponders expand in the IMTC region, there is a need for more uniformity in transponder interoperability to preclude motor carriers from having to equip their vehicles with several transponders.

Use of Positioning Technologies to Assess Border Traffic Conditions

Travel time in crossing borders is a key performance measure from a private shipper, carrier, and consignee perspective. TTI, in a 2009 study,[69] has developed an international border crossing travel-time information system prototype combining findings from some of their previous studies on a related topic. In

[69] Texas Transportation Institute, *Expansion of the Border Crossing Information System: Final Report*, U.S. Department of Transportation, March 2009.

addition to real-time information, the project serves as a valuable data source for three other important activities: 1) estimating the economic impact of border crossing delay and potential improvements; 2) validating dynamic cross-border traffic assignment models; and 3) long-range transportation planning.

The study identified the desired pretrip traveler information for commercial travelers through stakeholder meetings as follows: 1) current and predicted border crossing times; 2) current and predicted travel time of segments entering POE; 3) current bridge closure information; 4) location of recent roadway incidents; 5) incoming and outgoing HAZMAT; 6) current Homeland Security threat level; 7) predicted travel time between predefined O-D within the region; and 8) current and predicted conditions of highway segments.

The study also identified the following archiving requirements for various types of commercial border crossing data through stakeholder meetings: 1) border crossing time; 2) border closure information; 3) northbound and southbound volume; 4) Homeland Security threat level; 5) northbound and southbound commodity volume; 6) volume of HAZMAT containers; 7) travel time of segments entering and exiting POE; 8) number of trips and average travel time of trips within the region; and 9) distribution of ultimate origin-destinations of trucks.

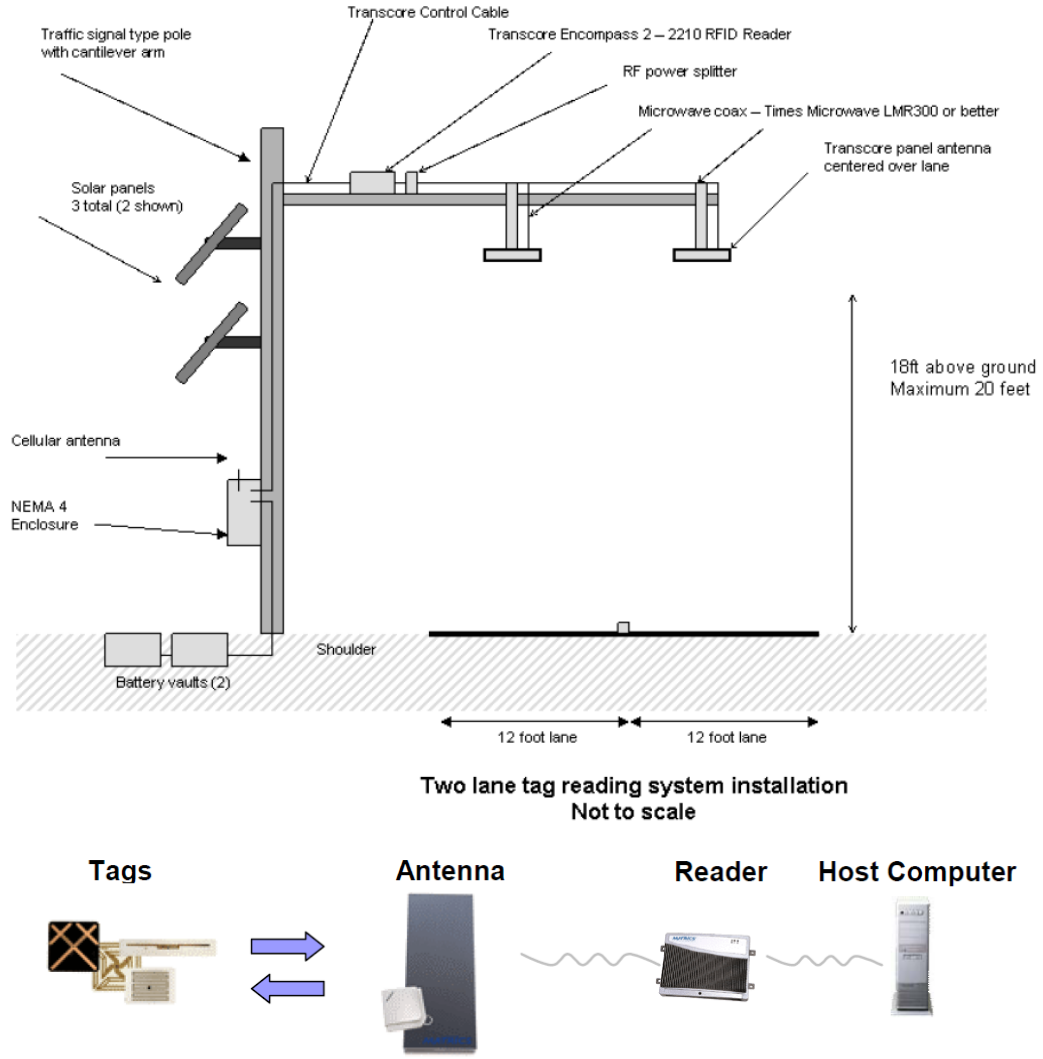
The TTI study has suggested alternate performance measures (total delay, delay per vehicle) and indices (border-crossing index, buffer index, border planning index) for measuring performance of border crossings. For example, border-crossing index is a dimensionless quantity that compares travel time during peak periods to travel time during off-peak conditions.

There are a number of technologies that have shown to help determine and/or archive such information on travel time and patterns at the border crossings. These are summarized below.

Radio Frequency Identification

Figure F.3.1 provides a typical design of a RFID detector station and RFID components.

Figure F.3.1 Typical Design of a RFID Detector Station and RFID Components



Source 1: Battelle and Texas Transportation Institute, *Measuring Border Delay and Crossing Times at the U.S./Mexico Border: Task 3 Report Final Design Document*, Federal Highway Administration, U.S. Department of Transportation, November 2008.

Source 2: Smart Border Alliance: RFID Feasibility Study Final Report, Attachment D: RFID Technology Overview, Department of Homeland Security, January 2005.

The 2009 TTI study described at the beginning of this subsection aimed to test the border crossing information system (BCIS) prototype using RFID technology on the BOTA POE.

RFID technology operates by transmitting data using radio waves for communication between a tag and a reader, and communication to a database. A typical RFID system consists of four main components: tags (or transponders), an encoder, readers, and a central data processing unit. An RFID tag is a device used for the purpose of identification using radio waves. RFID tags come in three general types: passive, active, or semipassive (also known as battery-

assisted). Semipassive and active tags require a power source, usually a small battery. Passive tags require no internal power source; they are only active when a reader is nearby to power them. The small amount of electrical current induced in the antenna by the incoming radio frequency signal provides enough power for an integrated circuit in the tag to power up and transmit a response, which is an identification number of the tag. The RFID tags have a practical read distance of a few feet within line of sight of the tag reader. Passive RFID lack an onboard power supply, hence can be conveniently small and inexpensive.

The study proposed to install RFID reader station at the entrance of the commercial vehicle inspection station on the Mexico side of BOTA and another station at the exit of the Department of Public Safety inspection station on the U.S. side. The RFID readers used were calibrated to read a variety of tags carried by the trucks, including the ones issued by CBP and other Mexican agencies. The tag query process recovers a unique identifier for each vehicle. The reader station time stamps the tag read and forwards the resulting data record to a BCIS database for further processing via a data communication link. Commercial vehicle border crossing times are converted to hourly averages, which are archived for future use and relayed to the public using BCIS web site as part of the pretrip border crossing information.

While testing integration of RFID technology with the BCIS, the study found that measurement of commercial vehicles' crossing times could be easily achieved by deploying RFID technology. However, according to the authors measuring crossing times may become more challenging as the volume of vehicles entering the U.S. becomes high (as in the case of passenger vehicles).

Bluetooth Technology

The TTI collaborated with Turnpike Global (TG) to perform a study[70] to apply Bluetooth technology for measurement of border crossing times of passenger vehicles at international POEs in the El Paso region. The use of the technology for commercial vehicles was not studied but is not likely to be much different.

Figure F.3.2 shows a typical portable Bluetooth equipment that is placed on the roadside for data collection.

[70] Texas Transportation Institute, *Field Experiment to Identify Potentials of Applying Bluetooth Technology to Collect Passenger Vehicle Crossing Times at the U.S.-Mexico Border*, Texas Transportation Institute, July 2009.

Figure F.3.2 Typical Portable Bluetooth Equipment Used for Travel-Time Measurement

Source: Texas Transportation Institute, *Bluetooth®-Based Travel Time/Speed Measuring Systems Development: Final Report*, U.S. Department of Transportation, June 2010.

Bluetooth technology operates in the unlicensed industrial, scientific, and medical (ISM) band at 2.4 to 2.485 GHz. Bluetooth technology's adaptive frequency hopping (AFH) capability was designed to reduce interference between wireless technologies sharing the 2.4 GHz spectrum. The operating range depending on the device class can be from 1 meter, or 3 feet to 100 meters, or 300 feet. The highest range is primarily for industrial use.

The Bluetooth protocol uses an electronic identifier in each device called a media access control (MAC) address. Bluetooth readers are able to search for nearby devices using a refresh rate defined by the software running inside the reader and can obtain the MAC addresses of Bluetooth-enabled devices along with a timestamp. Because each MAC address is unique, traditional matching algorithms analogous to those used for license plate, cellular, or toll tag tracking can be used to estimate travel time between two locations on a highway. MAC addresses are not directly associated with any of the users' personal information, thus minimizing privacy concerns.

The Bluetooth reader software is rather basic: each reader constantly issues a Bluetooth discovery request. According to the standard Bluetooth protocol, a Bluetooth device set to "discoverable" mode must respond to the discovery request by transmitting its unique Bluetooth identifier (12 hex digits) and device class (6 hex digits).

The study managed to match on average only about 5 percent of the total entering vehicles with the exiting vehicles, the attributed reasons were the market penetration and percentage of drivers enabling the Bluetooth technology, and possibly poorer data collection capability of the Bluetooth technology under higher speeds of traffic.

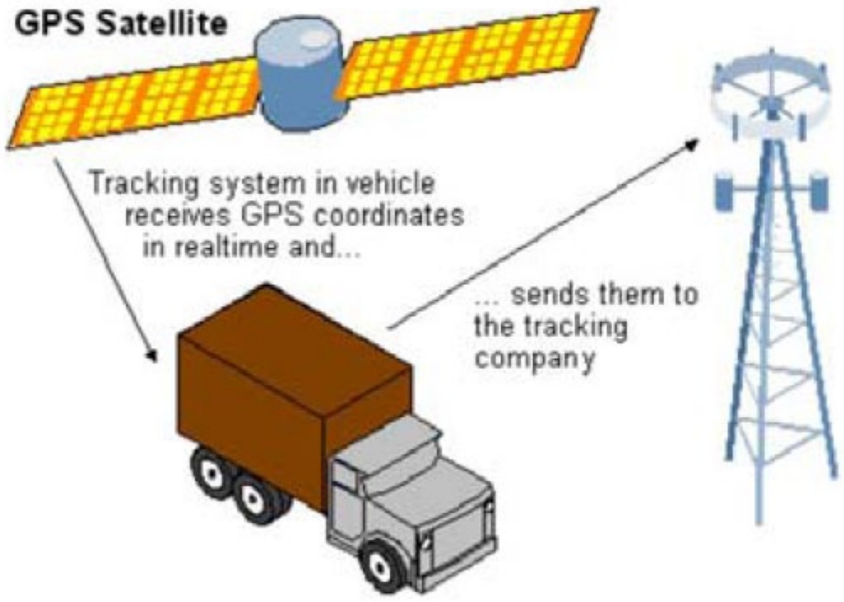
After matching the MAC addresses and obtaining time stamps, filtering algorithms need to be applied to travel-time data samples to eliminate "outliers" in order to estimate average travel time over short periods of time, which can be communicated to the passengers and commercial vehicle drivers crossing the borders.

The data collection may give multiple readings of the same vehicle if more than one Bluetooth device is carried in a single vehicle. Interference is a bigger issue in using the Bluetooth technology than the RFID technology. Hence, it is suggested in previous studies to place the Bluetooth equipment in a remote portion of the highway, where the moving vehicles are the only source of Bluetooth transmissions.

Truck GPS Data

Figure F.3.3 indicates the components of a Global Positioning System (GPS)-based travel-time data collection.

Figure F.3.3 GPS-Based Traffic Data Collection System Components



Source: Transport Canada, *Inventory of Current Programs for Measuring Wait Times at Land Border Crossings*, Customs and Border Protection, Department of Homeland Security, May 2008.

A GPS receiver in a vehicle determines its latitude and longitude coordinates at multiple locations along its route. Tracking data can either be immediately

transmitted to the service provider via the cell phone network or a two-way satellite link, or logged for later download. For logged data, the data is transmitted via a wireless antenna to the tracking service company when the truck returns to its depot. The data is analyzed to calculate the vehicle's position at regular time intervals in order to calculate the border wait time.

For this method of travel-time data collection, it is required that a sufficiently large population of commercial vehicles are subscribing to a fleet management service using GPS. It also would require agreement with the tracking service provider and include ongoing fees or a payment for purchase.

Through "geofencing", portions of the trip through the border region can be segmented to provide transit times of selected zones within the overall customs facility. It also can provide data on travel times on the road network before or after the border. GPS signals may be hampered by tall buildings, tunnels, or dense foliage. Generally, it provides insufficient for calculating lane-by-lane travel times.

Otay Mesa cross-border travel times project[71] conducted a GPS technology evaluation. It was considered as a cost-effective solution for obtaining travel-time data over a large region. Different deployment models that have been identified by the FHWA for use in travel-time estimation are as follows: 1) collect GPS data by deploying units in trucks; 2) purchase GPS data from vendors (no carrier involvement); 3) carrier request GPS data from vendor to be exported to study team; and 4) collect travel-time information from third-party provider (e.g., Calmar, Inrix). The risks associated with Number 1 or Number 2 were qualitatively evaluated in terms of budgetary requirement, sustained data availability, (or long-term viability) and privacy concerns and found to be high, while Number 3 was medium and Number 4 was low/medium. The last option was thus recommended for the Otay Mesa cross-border travel-time estimation.

According to the authors, third-party providers are experienced in paying and contracting with carriers to acquire data. These data can be geo-fenced to determine travel-time characteristics of different movements, including laden, FAST, and empty as well as movements requiring secondary inspection by CBP or state inspection. The costs are however variable, may increase (or decrease) based on coverage and market conditions.

License Plate Readers

Figure F.3.4 shows typical processing carried out by a license plate reader for recognition of a license plate number from an image of the front or rear of the vehicle.

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[71] Delcan, *Measuring Cross-Border Travel Times for Freight: Otay Mesa International Border Crossing: Technology Evaluation*, Federal Highway Administration, March 2008.

Figure F.3.4 Typical Image Processing for Automatic License Plate Recognition (ALPR)

Source: Transport Canada, *Inventory of Current Programs for Measuring Wait Times at Land Border Crossings*, Customs and Border Protection, Department of Homeland Security, May 2008.

Video cameras take picture of license plates of vehicles passing by using Optical Character Recognition (OCR) software (i.e., a computer calculates an estimation of the letters and numbers on the plate). Subsequently, the results are communicated to a central database or control center for matching the license plates and using their time stamps to estimate travel time.

Automatic License Plate Recognition (ALPR) systems already are widely used, including traffic management, weigh-in-motion commercial vehicle inspections, security, parking, border control, and toll collection. It requires no additional on-board equipment. It can provide separate performance measures for FAST lanes.

On the other side, the accuracy of the ALPR camera system varies quite a bit. The public has privacy concerns. Dirt, rust, and damage on plates can reduce accuracy. There is a possibility of vandalism if installed outside of security areas. Occlusion is another concern under heavy stop-and-go truck traffic flow conditions.

The project mentioned earlier for the Otay Mesa border crossing[72] also performed evaluation of the ALPR technology. The suggested business model for deploying ALPR in Otay Mesa is to purchase ALPR equipment from an

[72]Delcan, *Measuring Cross-Border Travel Times for Freight: Otay Mesa International Border Crossing: Technology Evaluation*, Federal Highway Administration, March 2008.

ALPR vendor and install two mounted digital cameras and a station to collect a total cross-border travel time.

Other Vehicle Sensing Technologies to Assess Border Traffic Conditions

In addition to the technology applications described above, there are other vehicle sensing technologies that are suitable for collecting data on traffic conditions, including queue length, vehicle speeds, and vehicle travel times; and have the potential to be used at border crossings. For traffic measurements, the available technology options are presented below.

Inductive Loop Detectors

Loops of cable embedded in the roadway are often used to measure the number of inspection booths open, the average inspection time, the length of the queue, and the arrival rate of vehicles at the end of the queue. Software uses these data to estimate the number of vehicles in the queue, and the wait time for the next arriving vehicle. The technology requires cable loops spaced every couple of hundred meters, equipment cabinets, and field controllers, communications link to traffic management center.[73]

The benefits of this technology is its low installation and operation and maintenance cost and its general acceptance within the industry. It does not require on-board equipment and can provide separate measures for FAST lanes. To get a reasonably accurate assessment of the traffic conditions, large number of detectors loops may be required and proper calibration of loop detector algorithms is essential. During construction and maintenance of the pavement, the data will cease to be available.

The loop detectors also have been enhanced to produce a vehicle inductive signature through a serial port on the card used with a detector loop.[74] This unique signature results from the net decrease in the detector's inductance when the metallic mass of a vehicle passes over the magnetic field generated by the inductive loop. Inductive signature analysis can allow vehicle classification data to be derived. The technology saves the need for using double loop detectors but may have limited application at the border crossing as the vehicles are segregated prior to the inspection, but the enhancement is useful in the context of road network before and after the road crossing.

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[73] Transport Canada, *Inventory of Current Programs for Measuring Wait Times at Land Border Crossings*, Customs and Border Protection, Department of Homeland Security, May 2008.

[74] Battelle, *Assessment of Automated Data Collection Technologies*, Office of Freight Management and Operations, Federal Highway Administration, U.S. Department of Transportation, April 2002.

Cell Phone Tracking

There are a number of techniques for tracking cell phones, including triangulation between nearby cell phone towers, or the detection of the hand-off of a call between towers. The cell phone's location can be determined at a number of points along its route, which can be analyzed to calculate the amount of time the vehicle was waiting in the queue. The technology option requires a sufficiently large population of vehicles carry cell phones, an adequate density of towers in the border region, and agreements with cell phone service providers.[75] It does not require installation of any new equipment, can collect travel data over the full regional roadway network, and provide estimates of delay with the use of appropriate algorithms.

There may be ongoing fees as per agreement with cell phone service providers on both sides of the border. It may give multiple readings of the same vehicle if more than one cell phone device is carried in a single vehicle.

CAPITAL (Cellular Applied to ITS Tracking and Location) Operational Test and Demonstration Program was conducted in 1994 in the Washington, D.C. metropolitan region. It was one of the first actual field deployments of technology to geolocate cell phone calls and investigated various traffic management applications. The technology advanced since that time.[76]

As a result, another mobile call tracking system launched in 1999, namely Capital Wireless Integrated Network (CapWIN). The proprietary "Location Pattern Matching" process used by this system determines a wireless subscriber's location by measuring the distinct radio frequency (RF) patterns and multipath characteristics of radio signals arriving at a cell site from a caller. The technology identifies the unique RF pattern or "signature" of the call and matches it with a similar pattern stored in a central database; therefore, the caller's geographic location is identified and mapped. By continually updating the location data for multiple callers on a specified road segment, the speed at that segment of roadway also can be computed algorithmically.

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[75] Transport Canada, *Inventory of Current Programs for Measuring Wait Times at Land Border Crossings*, Customs and Border Protection, Department of Homeland Security, May 2008.

[76] Battelle, *Assessment of Automated Data Collection Technologies*, Office of Freight Management and Operations, Federal Highway Administration, U.S. Department of Transportation, April 2002.

Emerging Electronic Drivers Licenses and Passport RFID Technologies to Improve Border Clearance Times

According to an article on the Tucson Citizen web site,[77] the CBP was planning to introduce a new RFID for people crossing the border at the Mariposa POE in Nogales. The device is capable of reading information stored in a chip embedded in U.S. passport cards up to 20 feet before the vehicle approaches the border using the RFID technology. It would transmit information on a person's biographical information, immigration status, and photographs entered into the system when the passport card was issued. It seems possible to extend the development to the truck driver identification process at the commercial border crossings.

In a related article on the Government Executive web site,[78] it was mentioned that the state and Homeland Security departments awarded more than $160 million in contracts for electronic identifying systems using radio frequencies that are designed to speed up border crossings. General Dynamics, on behalf of the State Department, was given the contract to develop a RFID passport card that travelers can use at U.S. land border crossings and sea ports of entry. Unisys, on behalf of the DHS' CBP, was given the contract to provide the RFID equipment needed to read the new passport cards and to install technologies that can capture images of automobile license plates as travelers drive through Customs. Intermec was going to supply the RFID readers for the border project and Perceptics was going to provide the license plate reader technology. These developments are likely to bring substantial operational improvements to passenger travel across the border. At the time of the article, their application for commercial traffic was still not finalized.

Immigration regulations and policies have long held that alien truck drivers may qualify for admission as B-1 visitors for business to pick up or deliver cargo traveling in the stream of international commerce.[79] Canadian citizen drivers entering the United States as visitors for business do not require either a passport or a visa. However, each applicant for admission is required to satisfy the

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[77] Echavarri, F., Article: New technology at Nogales border crossing aimed at reducing delay. Tucson Citizen web site, September 5, 2008. http://tucsoncitizen.com/morgue/2008/09/05/95840-new-technology-at-nogales-border-crossing-aimed-at-reducing-delays/ (last accessed on October 13, 2010).

[78] Brewin, B., Article: State, DHS grant RFID contracts to speed border crossings. Government Executive web site, January 17, 2008. http://www.govexec.com/dailyfed/0108/011708bb1.htm (last accessed on October 13, 2010).

[79] The CBP web site on Cargo Security for Land Carriers: http://www.cbp.gov/xp/cgov/trade/cargo_security/carriers/land/how.xml (last accessed on October 13, 2010).

inspecting officer of his or her citizenship. On the other hand, Mexican citizen drivers entering the United States as visitors for business are required to present a valid passport and nonimmigrant visa. They must carry one of the following:

- B-1/B-2 visa (issued at both U.S. and Mexico Consulates with or without Mexican Border Crossing Card (issued only at Consulate of Mexico).
- Form DSP-150, "Laser Visa," a credit-card style document that is both a Border Crossing Card and a B1/B2 visitor's visa obtained by applying at a United States Consular post in Mexico. The Laser Visa may be obtained by applying at one of the following U.S. Consular posts in Mexico: Mexico City, Ciudad Juárez, Guadalajara, Hermosillo, Merida, Matamoros, Monterrey, Nogales, Nuevo Laredo, Tijuana, and at the Tijuana and Mexicali Temporary Processing Facilities.

The Border Crossing Card (BCC) and "Laser Visa" have expedited the process of driver identification and hence the customs clearance. On October 1, 2008, a second generation of the "Laser Visa" commenced.[80]

Electronic Container/Door Seals

Traditionally, containers in international trade are secured using manual cargo seals. There are no international standards for the manual seals. The shipment integrity is dependent on the shipper practices.

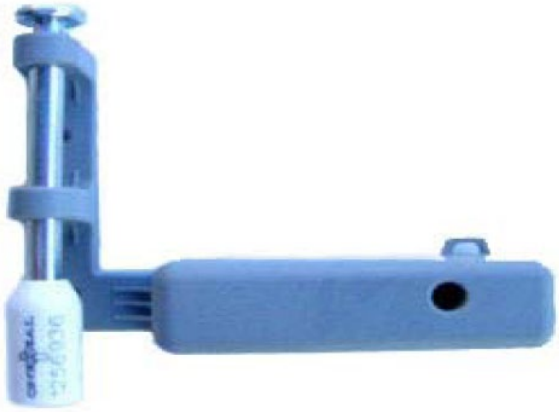
An E-Seal on the other hand is an electronic device used to transmit container information, including alerts due to tampering or damage, thus enabling tracking of shipments and determining the integrity of the shipment while in transit or storage.[81,82] Figure F.3.5 shows an example E-seal product.

[80] Bureau of Consular Affairs, U.S. Department of State web site on Border Crossing Card: http://travel.state.gov/visa/temp/types/types_1266.html.

[81] Wolfe, M., Electronic cargo seals: context, technologies, and marketplace, North River Consulting Group, prepared for the Intelligent Transportation Systems Joint Program Office, Federal Highway Administration, D.C., July 2002.

[82] Zhang et al., Smart container security – the E-seal with RFID technology. Proceedings – Seventh International Navigational Symposium on Marine Navigation and Safety of Sea Transportation, Gdynia, Poland, June 2007, pp. 545-547.

Figure F.3.5 Example E-Seal Product



Source: HAZMAT safety and security field operational test, Task 2: Concept of operations Executive summary, Federal Motor Carrier Safety Administration, U.S. Department of Transportation, Washington, D.C., March 2003, http://www.fmcsa.dot.gov/safety-security/hazmat/fot/Exec-Ops-Concepts.pdf (last accessed on October 14, 2010).

A series of field operational tests completed by Washington State over a 10-year period has shown that E-seals can increase the efficiency and improve the security of containerized cargo movement.[83] It has a great potential in expediting the customs clearance process.

There are several types of E-Seals depending on the method for communications with the reader, which are RFID, infrared, direct contact, long-range cellular, or satellite. Among these, RFID is the most commonly used E-seal. Similar to other RFID technologies, these seals could be active (use in-built battery power to initiate signal) or passive (use energy from a reader signal or on-board power to initiate signal).

Although there is a potential to improve efficiency and security, there also are some concerns in using electronic seals that need consideration: 1) risks of increasing complexity, opening new avenues of attack, and generating false confidence; 2) need for independent assessment of vendor claims; 3) need to assess operational impacts as well as technical performance; and 4) requirement to manage and sift increased data flow, identify false positives, and act on true positives. Nevertheless, ISO 18185 is a Draft International Standard for electronic container seals. It includes passive and active protocols. The active protocols have been subject to disagreements and lack of consensus amongst nations due to political, regulatory, and private company market advantage issues.

[83] McCormack et al., *Lessons from Tests of Electronic Container Door Seals*, Transportation Research Board 2009 Annual Meeting, January, Washington, D.C., 2009.

Applicable Technologies in U.S. DOT's Smart Roadside and Connected Vehicle Programs

The vision for the Smart Roadside is one in which commercial vehicles, motor carriers, enforcement resources, highway/intermodal/border facilities, toll facilities, and other nodes on the transportation system collect data for their own purposes and share the data seamlessly in order to improve safety, security, operational efficiency, and freight mobility. Similarly, the U.S. DOT's Connected Vehicle program (previously referred to as VII) aims to advance connectivity among vehicles and roadway infrastructure in order to significantly improve the safety and mobility of the U.S. transportation system. Both these goals will be achieved through the application of interoperable technology and information sharing between in-vehicle, on-the-road, and freight facility systems.

Connected Vehicle systems and applications are based on existing wireless communications and information technologies. U.S. DOT's current Connected Vehicle research is focused on refining these technologies and testing their use in surface transportation; developing Connected Vehicle safety, mobility, and environmental applications; determining actual benefits in the field; and developing consensus standards that will ensure the interoperability of Connected Vehicle applications and system components.

A few programs and technologies being considered in these programs also are applicable to improving safety and mobility at border crossings.

Wireless Roadside Inspections (WRI)

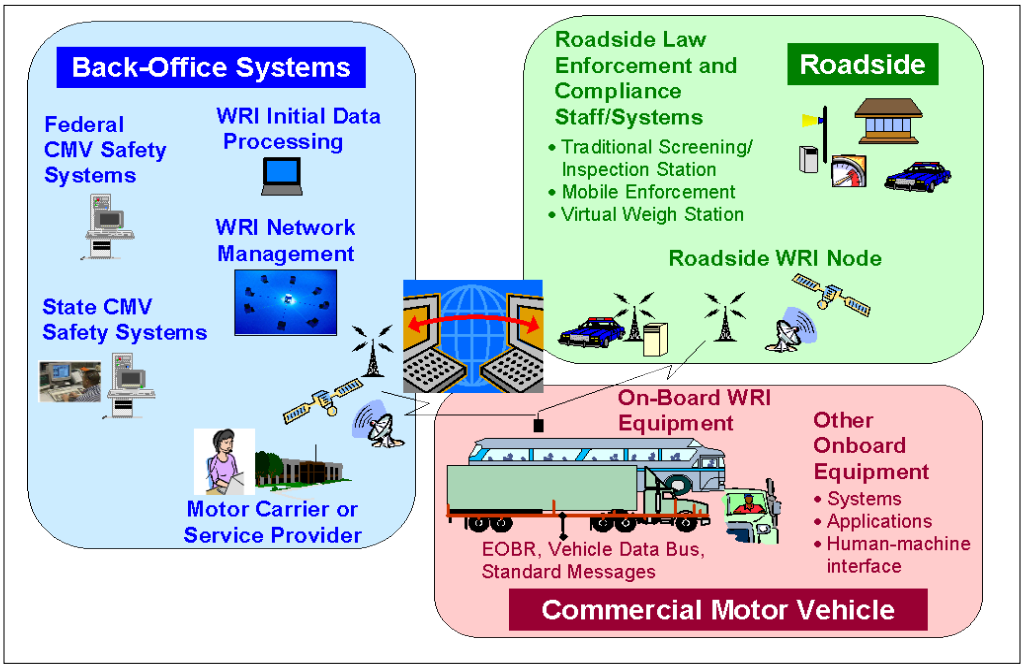
The FMCSA WRI program is evaluating different strategies for identifying and inspecting commercial vehicles at the roadside using a mix of technologies, including dedicated short-range communications (DSRC), satellite-based technology, and license plate reader technology. FMCSA is coordinating and will be evaluating three separate deployments of the WRI architecture in the states of Kentucky, Tennessee, and New York. Inspection results will be made available in real-time to motor carriers as well as state and Federal enforcement personnel.

A "wireless inspection" is a process where public sector entities (people and systems) examine the condition of the vehicle and driver by assessing data collected by on-board systems. The data used in the assessment is termed the "Safety Data Message Set" (SDMS). The SDMS will be delivered using wireless communications in real time to the public sector infrastructure. The SDMS will contain basic identification data (for driver, vehicle, carrier, container, and cargo), record of duty status, and vehicle condition data that are typically available to safety inspectors during current roadside inspections. The roadside enforcement sites that will query and receive SDMSs from CMVs are envisioned to include fixed weigh stations, unmanned remote sites on bypass routes and state borders, and mobile police cruisers. Depending on the availability of

enforcement resources, interdiction strategies acting on the SDMS will include real-time and nonreal-time scenarios.

The concept was significantly differentiated from current electronic prescreening programs in that real-time information about the condition of the vehicle (e.g., brake, tire diagnostics; etc.) and the driver [e.g., Hours-of-Service (HOS) status] would be transmitted to the enforcement personnel. Current prescreening programs such as NorPass and PrePass only transmit a unique ID number [via the onboard radio frequency identification (RFID) tag] which is then cross-referenced to a U.S. Department of Transportation (DOT) number in an off-board operation. Further, the proposed concept would call for driver- and vehicle-specific ID information to be transmitted, thus facilitating the implementation of more sophisticated and accurate screening strategies. The Wireless Roadside Inspection for Trucks and Buses project currently has completed the proof of concept and is in the pilot testing phase. Figure F.3.6 provides an overview of the Wireless Roadside Inspection System.

Figure F.3.6 Overview of Wireless Roadside Inspection System



Source: FMCSA web site http://www.fmcsa.dot.gov/facts-research/media/webinar-07-11-07-slides.pdf

There are numerous wireless technologies currently available or under development that could support wireless inspections. These technologies vary significantly in range, bandwidth, security, current deployment level, complexity, and cost. Due to the many technical challenges associated with the wireless inspection concept (i.e., speed of the traveling vehicles, message size requirements, security provisions, and implementation costs), the most promising short-range communications technology appears to be 5.9 GHz DSRC.

Dedicated Short-Range Communication (DSRC) at 5.9 GHz

In October 1999, the United States Federal Communications Commission (FCC) allocated the 75 MHz of spectrum in the 5.9 GHz band for DSRC to be used exclusively by ITS. The decision to use the spectrum in the 5 GHz range is due to its spectral environment and propagation characteristics, which are suited for vehicular environments – waves propagating in this spectrum can offer high data rate communications for long distances (up to 1,000 meters) with low weather dependence. DSRC is a short- to medium-range communications service that supports both public safety and private operations in roadside to vehicle and vehicle to vehicle communication environments. It is one of the most effective means to deliver rapidly changing information that is time and location dependent. DSRC can be added to dynamic message signs and highway advisory radio to broadcasting localized traffic or road information directly into the vehicle. Traffic information is enhanced by using DSRC to collect vehicle link times and deliver this local traffic information back to all the participating vehicles. DSRC also is suited for the wireless inspections, since multiple vehicles could simultaneously communicate with a roadside access point within a one-half-mile range while traveling at high speeds. Most importantly, 5.9 GHz DSRC is being targeted as the technology of choice to support many other safety and convenience applications currently under development.

With U.S. DOT's support, 5.9 GHz DSRC will likely become the standard for vehicle-to-roadside and vehicle-to-vehicle communications in both heavy- and light-duty vehicles. It will support a variety of applications, including intersection collision avoidance, road condition warning, curve speed assistance, cooperative cruise control, and many others. Convenience applications, advanced truck parking notification, rest stop information, or mobile media also will use the high-data rates of 5.9 GHz communications. DSRC technology is sufficiently robust, offers good security, and supports two-way communications. It can support a large family of vehicular safety and nonsafety applications. The Connected Vehicle program's research analysis indicates that DSRC is the only available technology in the near term that offers the latency, accuracy, and reliability needed for active safety.

Cross-Town Improvement Project (C-TIP) Program Dynamic Mobility Applications

The movement of intermodal freight within the U.S. often requires the use of multiple truck/drayage moves in addition to the primary movement by rail or ship. The truck moves are often short, cross-town trips in or near metropolitan areas where freight terminals or warehousing and distribution facilities are

located. Cross-Town Improvement Project (C-TIP) seeks to provide a sustainable solution to cross-town intermodal interchange issues.[84]

The C-TIP was first conceived in the fall of 2004 at an Intermodal Freight Technology Working Group (IFTWG) meeting in San Antonio, and has since then developed into a five-part pilot demonstration as follows with support from public sector, freight industry companies, and vendor community:[85]

- **Intermodal Move Exchange (IMEX) –** An open architecture port that allows for a collaborative dispatch management model among rail lines, truckers and facility operators;
- **Wireless Drayage Updating (WDU) –** An open architecture mechanism utilizing low cost wireless technology as an interface between drivers and dispatchers;
- **Chassis Utilization Tracking (CUT) –** An open architecture application that allows for accurate chassis identification and status reporting, and allocation of usage costs;
- **Real-Time Traffic Monitoring (RTTM) –** Real-time monitoring and distribution of route-specific and location-specific travel-time and congestion information; and
- **Interchange Capacity Management (ICM) –** A combination of a simulation tool and a terminal management system that utilizes schedules to better manage container storage and retrieval.

Of particular interest to reducing delay at international border crossings is the RTTM system. It is intended to perform the following functions: 1) fleet data acquisition and integration with live traffic data (collected using roadway sensors, traffic probes, and third party providers); 2) travel-time prediction; 3) integration of travel speeds, roadway condition and weather information; and 4) travel information dissemination, route advisory/guidance, traffic signal timing changes and construction zone management by public agencies.

The Delcan/SAIC consultation consortium tested a concept of operations for the above technology systems at Kansas City. A sample proposition was made in terms of the traffic congestion mitigation as follows:

> *Information regarding train arrivals and departures, grade crossing occupancy data, and individual shipment entry into and departure from terminal facilities*

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[84] http://www.intermodal.org/iftwg_files/Current_Projects.shtml#C-TIP (last accessed on October 29, 2010).

[85] Delcan and SAIC, *Cross-Town Improvement Project: Concept of Operations*, Intermodal Freight Technology Working Group (IFTWG), March 2007. http://www.intermodal.org/iftwg_files/Concept_Of_Operations_Report_032907.pdf (Last accessed on October 29, 2010).

would flow from the railroads and terminal operators, through the C-TIP RTTM function, to KC Scout (road network performance information system in Kansas City), where it would be combined with travel-time and volume data. The data will be redistributed to the motoring public using roadside signage, directly via the web, or through the web to intermediate service providers, who repackage and distribute it to personal communications devices or on-board vehicle systems.

C-TIP also would make this information directly available to trucking companies, either through a direct B2B link, or more likely through a web portal. In return, trucking companies would make available, through C-TIP, any data they have access to that enhances the ability of KC Scout to better monitor roadway conditions. This might come from cellular or other traffic probe-based applications that rely on devices installed in trucks or in the possession of drivers.

Delcan also is suggesting implementation of a Dynamic Route Guidance (DRG) capability to greatly enhance the RTTM system. It would enable motor carrier dispatchers and drivers to adjust their travel decisions, including routing choices, departure times, and load retrieval and delivery sequences, to actively avoid congestion-related delays. The road network for potential routes would require full coverage in terms of measuring traffic conditions, and the routes will have "decision points" to allow drivers to select alternate routes.

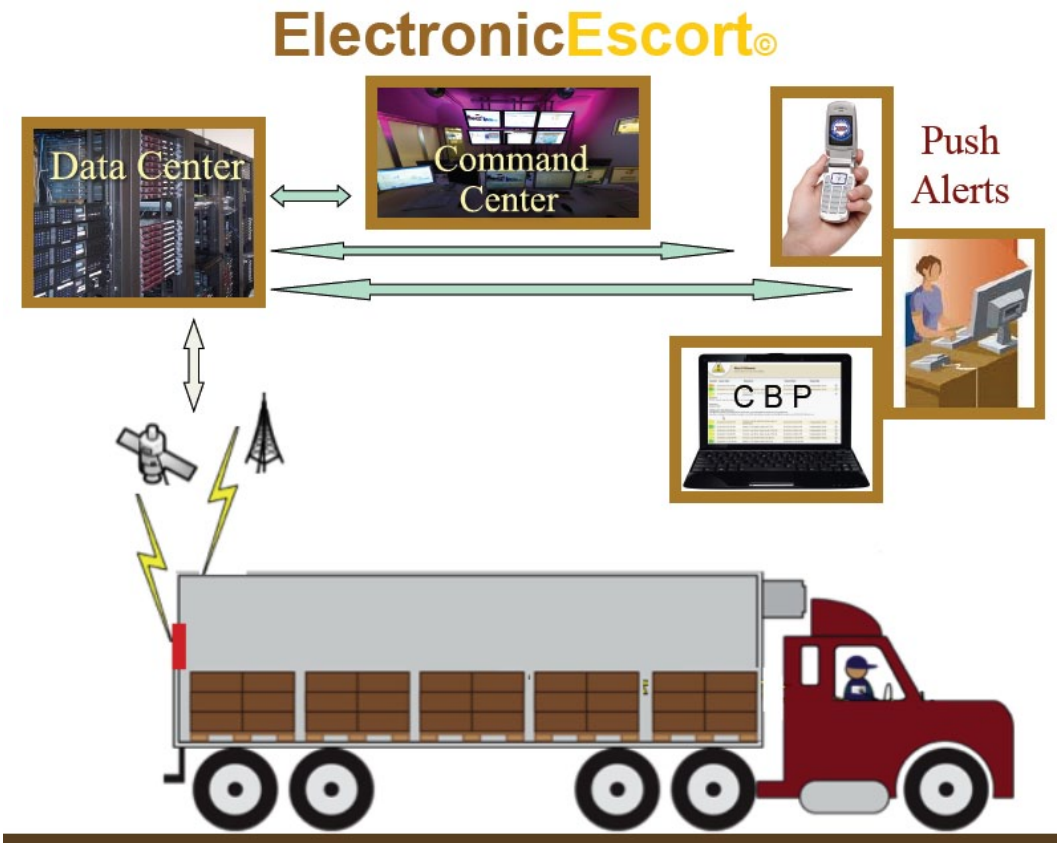
Border Crossing Solutions by SecureOrigins

SecureOrigins is an El Paso-based, border-based technology services company that is focused on leveraging new and emerging technologies and software innovations to improve supply chain logistics and security. The company has developed a technology platform focused on origin-to-destination supply chain visibility for cross border cargo (and mobile assets) with intelligent alerts known as LiveLogistics™.

LiveLogistics™ is a solution architected in such a way that it delivers supply chain visibility and security in one package. It provides: 1) quick response to changing customer and market needs; 2) scalability; 3) a holistic solution; 4) minimization of supply chain risk with "real-time" alerts and resolution options, resulting in overall shipment reliability and security; 5) reduction in supply chain cost and improvement in supply chain productivity; and 6) ElectronicEscort™ service (See Figure F.3.7).

SecureOrigins headquarters features a live, state-of-the-art command center (see Figure F.3.7) that fuses information in "real time". The Command Center is utilized for software R&D, live monitoring, supply chain event recreation, and for client demonstrations and audits. A video wall displays live supply chain assets and solution applications in action. The Command Center utilities a high speed, high-volume capacity, world-class data center that supports global telecommunications.

Figure F.3.7 ElectronicEcscort™ Service Physical Architecture



Source: SecureOrigins, El Paso, Texas.

Due to its pivotal location at the intersection of two major transportation corridors for international trade, the crossroads of two nations and three states, the company claims to be an "international urban laboratory" presenting a unique array of opportunities for solutions that address the realities of many borders and trade corridors throughout the world.

The advantage of LiveLogistics™ in terms of freight efficiency is the ability to make informed, timely decisions with intelligent alerts that get the right information to the right person at the right time. From a freight security perspective, the solution:

- Ensures authorized route adherence of mobile assets or cargo;
- Secures each shipping container or trailer using intelligent devices to provide 6-sided protection;
- Monitors critical conditions with special sensors, such as temperature, leakages, and truck speed;
- Reduces shrinkage and prevention of cargo contamination; and

- Reports every aspect of the shipment using ElectronicEscort™, including authorized driver, route, timing benchmarks, and authorized stops and checkpoints.

F.4 Development of Technology Service Alternatives

This section assesses and synthesizes the information provided from the previous sections to develop three primary groupings of "Technology Services Alternatives," each which represent a potential package of technologies and processes which has a specific focus in supporting this planning activity:

- Traveler Information System with/without Dynamic Route Guidance;
- Fleet Security and Freight Information Management System; and
- Advanced Roadside Inspection System.

For each of these alternatives, potential operational concepts are described in terms of regional context, functions, benefits and costs, and relationship to the existing ITS infrastructure of the region. In addition, a set of potential deployment strategies for each technology service alternatives is presented, including a potential time phasing of the solutions.

Context: The El Paso Regional ITS Architecture

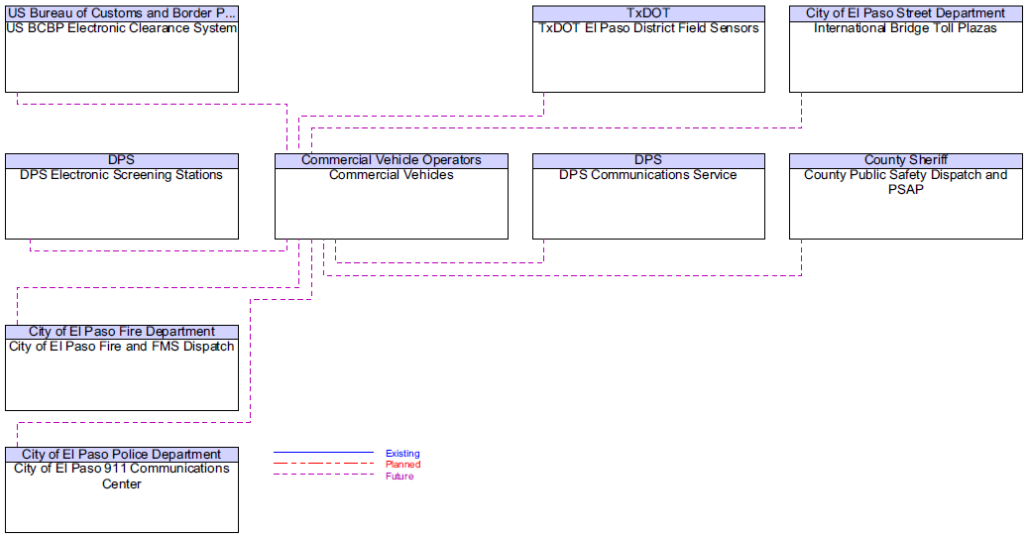
Before beginning the discussion of the three technology service alternatives, it is first necessary to describe a significant enabling planning activity for ITS services in the region – the El Paso Regional ITS Architecture. Sponsored by the El Paso Metropolitan Planning Organization, and developed by Kimley-Horn and ConSysTec (see Section F.6 for the "sausage" diagram and detailed list of elements). As presented in Table F.4.1and Figure F.4.1, the architecture has a wide range of technology services and involves numerous regional stakeholders.

Table F.4.1 Elements of Existing Regional ITS Architecture of El Paso Metropolitan Planning Organization (MPO)

Key Operating Agencies	Key Customized Market Packages	Key Technology Elements	Key Stakeholders Identified
• City of El Paso Traffic Management Center (TMC) • TransVista (TxDOT El Paso District's ITS Agency) • International Bridge and Water Commission (IBWC) Operations Center • CBP Border Patrol Communications Center • CBP Customs Area Security Center (CASC) • Texas Department of Transportation (TxDOT) • Texas Department of Public Safety (DPS) • Texas Commission on Environmental Quality (TCEQ)	• Network Surveillance • Surface Street Control • Traffic Information Dissemination • Regional Traffic Information • Incident Management • Electronic Toll Collection • Emissions Monitoring and Management • Emergency Response and Routing • Roadway Maintenance and Construction • Workzone Management	• City of El Paso Field Equipment • International Bridge Field Equipment • Sun Metro Transit Kiosks • Incident Management • TxDOT El Paso District CCTV • TxDOT El Paso District Field Sensors • TxDOT 511 System • Traffic Signals • Lane Control Signals • Ramp Meters • Dynamic Message Signs • Highway Advisory Radio • Sun Metro Transit Kiosks • BOTA (Bridge of the Americas) Field Equipment • Field Emissions Monitors • Rail Operators Wayside Equipment • El Paso Regional Smart Card	• Private Travelers • Commercial Vehicle Operators • Rail Operators • City of El Paso (TMC, Emergency Operations Center (EOC), Fire and Fire Medical Services (FMS), Maintenance, 911 Communications Center, etc.) • El Paso MPO • El Paso County (Road and Bridge, Emergency Management, Sheriff, etc.) • IBWC Operations Center • TxDOT (TransVista, 511 Agency, District Public Information Office, etc.) • Texas DPS (TxDPS) • New Mexico DOT (NMDOT) • New Mexico DPS (NMDPS) • City of Las Cruces, New Mexico • Las Cruces MPO • City of Juárez, Mexico • Juárez Planning Organization (Juárez IMIP) • Private Sector Traveler Information Service Providers • Sunland Park Municipal Agency (Public Works Department, Public Safety, etc.) • Private Sector Traveler Information Service Providers • U.S. BCBP • FBI El Paso • U.S. Army (Fort Bliss Operations Center) • Others (including Transit, Amtrak, Travel Services, Visitors Bureau, School Districts, Media, Weather Services, Utility Companies, Medical Facilities, Community Colleges and University)

Source: Regional ITS Architecture of El Paso MPO, Kimley-Horn and Associates, Inc., and ConSysTec Corp., 2003.

Figure F.4.1 Interface Diagram for Commercial Vehicles in the Existing El Paso MPO Regional ITS Architecture



Source: Regional ITS Architecture of El Paso MPO, Kimley-Horn and Associates, Inc., and ConSysTec Corp., 2003.

Based on reviewing the El Paso Regional ITS Architecture, there are two key findings related to the development of freight mobility border technology solutions:

1. The existing traveler information system, managed by the City of El Paso and TransVista (TxDOT's El Paso District ITS), does not provide a comprehensive solution to travelers seeking travel time across the border and route guidance on El Paso region highways; and
2. There are no existing commercial vehicle operations-related ITS systems (all of them are planned for the future as shown by the interface diagram in Figure F.4.1).

Hence, there is a clear need to add new ITS systems that address the operational needs of the border crossing commercial vehicles.

Background: Developing the Three Technology Service Alternatives

From the objectives of this study, it is clear that TxDOT is interested in improving the efficiency and security of the border crossing process in the El Paso region. Therefore, technology services that align well with these goals of cross border operational improvement are required.

The first attempt at finding technology solutions was made in a Cambridge Systematics' technical memorandum for this study that conducted a generalized search for project solutions to address cross border mobility.[86] In this document, a master list of potential solutions was compiled through extensive interactions with regional stakeholders. Several of these solutions involved the implementation of technologies. The following criteria were used to rate the technology solutions:

1. Optimizes the use of existing capacity or streamlines existing processes;
2. Preserves security;
3. Reduces crossing times;
4. Reduce total end-to-end travel time (excluding wait/inspection times at the border); and
5. Are implementable.

Table F.4.2 presents the potential technology solutions that were developed from this process, and provides the overall stakeholder rating of the perceived utility of each technology solution.

Table F.4.2 Technology Scenario Options

Potential Solution	Overall Rating
Install ITS devices on bridges and approaches to alert drivers of lane openings/closures, crossing times, and lane assignments	●
Implement queue monitoring technology	●
Implement noninvasive inspection technology for cargo	●
Implement a pilot program using an RFID-based system to measure truck crossing times and a mobile device signal detection technology (Bluetooth) to measure POV crossing times	◒
Implement interoperable technology for license plate recognition and FAST/SENTRI tags that could be used at all of the region's POEs	○

Note: ● Rates well against initial screening criteria, ◒ Partially meets the initial screening criteria, and ○ Does not meet the initial screening criteria.

It was felt important to conduct a more focused search for technology solutions that are tailored to the El Paso region, but capable of producing systemic changes. Earlier in Section A.1, we discussed some of the new and emerging technologies and solutions that can be applied in general to the U.S.-Mexico cross

[86] Cambridge Systematics, *Screening Criteria and Scenario Development: Technical Memorandum, El Paso Regional Ports of Entry Operations Plan*, submitted to Texas Department of Transportation (TxDOT), October 6, 2010.

border trade. To help decide on a specific implementation for the El Paso region, a two-stage assessment was performed.

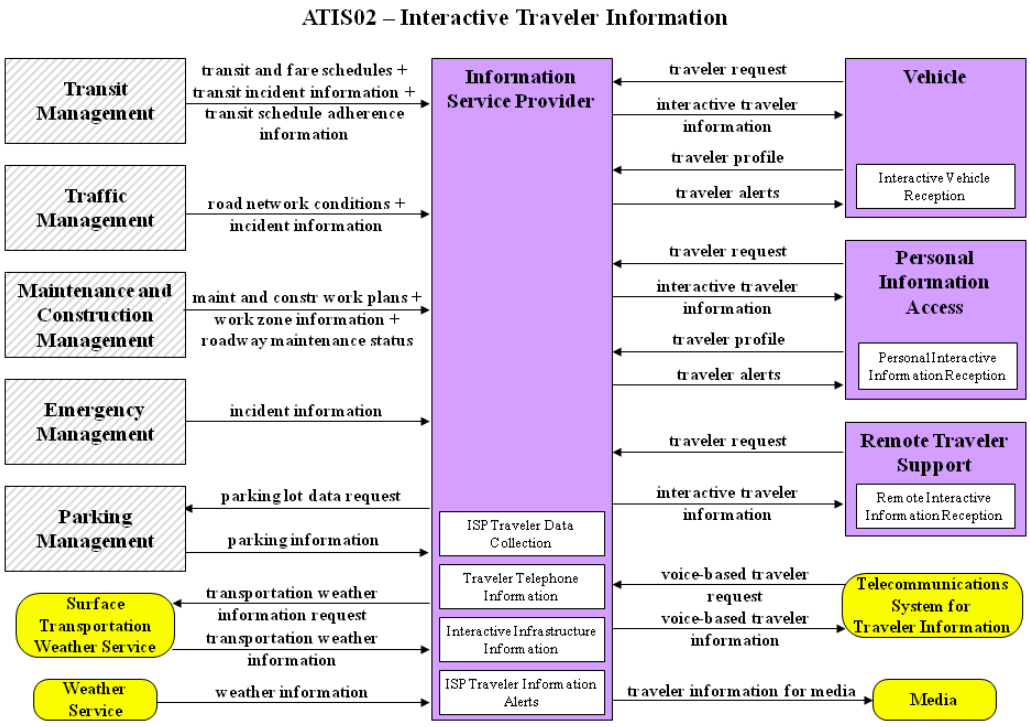
This technology user needs assessment, combined with the context of the El Paso Regional ITS Architecture presented previously, provided the starting point for selecting and developing the three technology service alternatives that are discussed in the succeeding three subsections.

Traveler Information System with/without Dynamic Route Guidance

There are two broad forms of traveler information systems currently in use in Intelligent Transportation Systems (ITS), namely, pretrip and en-route. In both cases, the primary purpose of the information is to reduce the travel time, improve on-time reliability, and help inform route choices for vehicles.

Typical market packages for traveler information system and dynamic route guidance are defined by the Iteris developed National ITS Architecture,[87] as shown in Figure F.4.2 and Figure F.4.3.

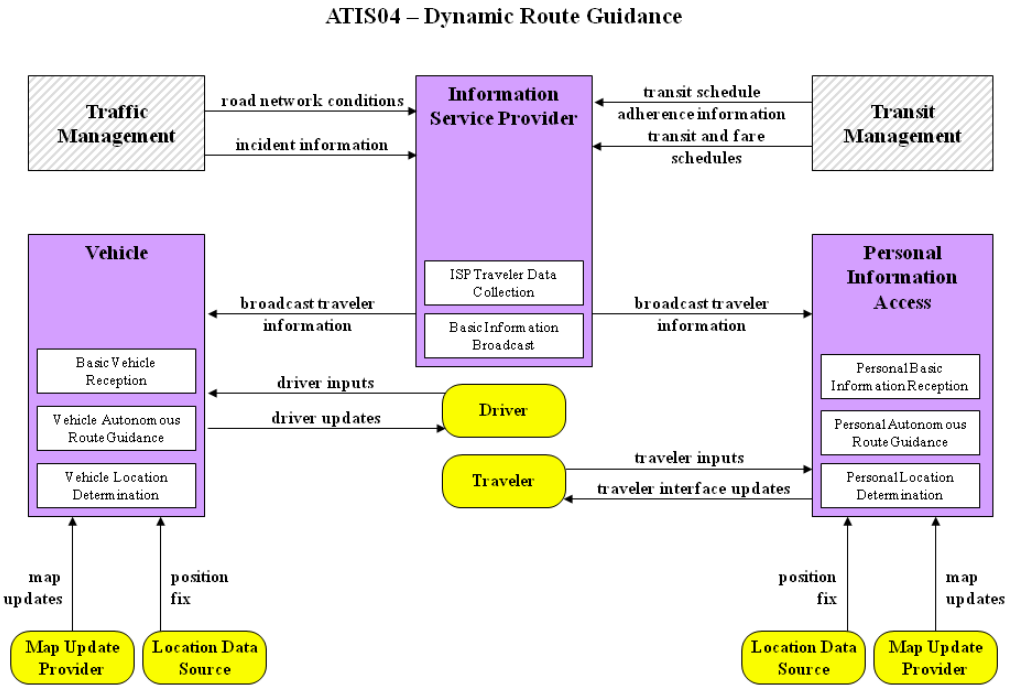
Figure F.4.2 Interactive Traveler Information Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gatis02.htm (last accessed on November 28, 2010).

[87] http://www.iteris.com/itsarch/ (last accessed on November 28, 2010).

Figure F.4.3 Dynamic Route Guidance Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gatis04.htm (last accessed on November 28, 2010).

User Context and Ability to Meet Regional Needs

The general users of the traveler information system are the travelers whose trip costs are sensitive to travel time. They include both passenger and commercial travelers. They require timely and reliable travel-time information for specified segments of the highway system, while they may or may not require route guidance. In the context of this study, a "user" is defined as:

> *A user is the commercial vehicle subsystem that undergoes at least one El Paso region border crossing per trip.*

There are a couple of ways in which a traveler information system in the El Paso region can meet the efficiency improvement needs of the "users": 1) provide estimates of travel time to help both northbound and southbound "users" select the start time of a trip to avoid long queues at the POEs and to avoid delays on the El Paso highways; and 2) helping southbound "users" make a choice between the commercial border crossings in the El Paso region and providing en-route directions.

Few positive consequences on the border security are anticipated. To the extent the trip start times of the trucks are shifted, there would be reduction in peak border crossing truck volume, and thus a better spread of inspection workload over a day. If dynamic route guidance is followed, a more uniform distribution

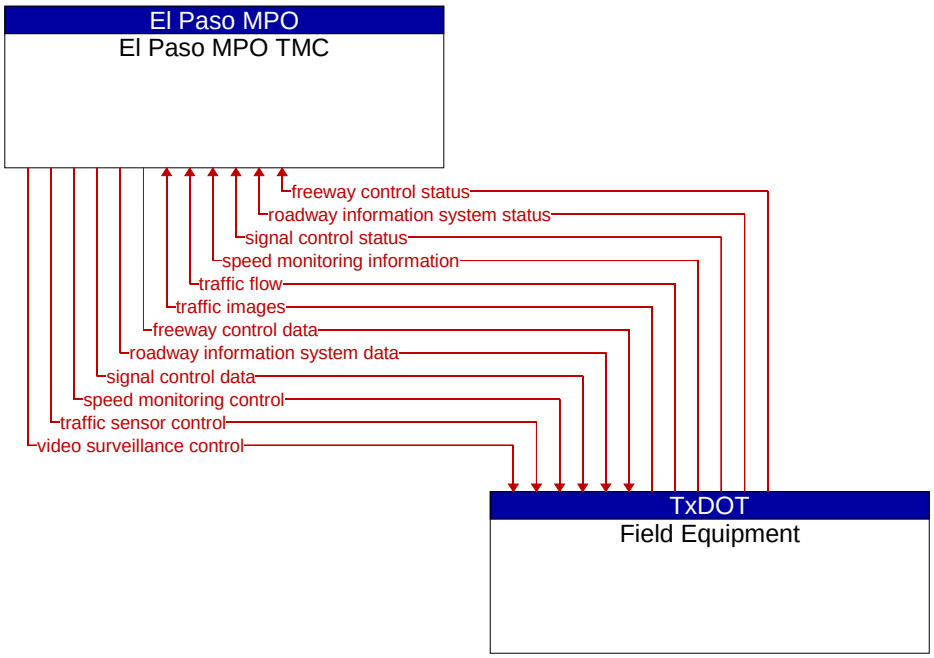
of the inspection workload across POEs can be realized, and thus better resource utilization by the border security administration will be possible.

Stakeholders and Desired Information Flows

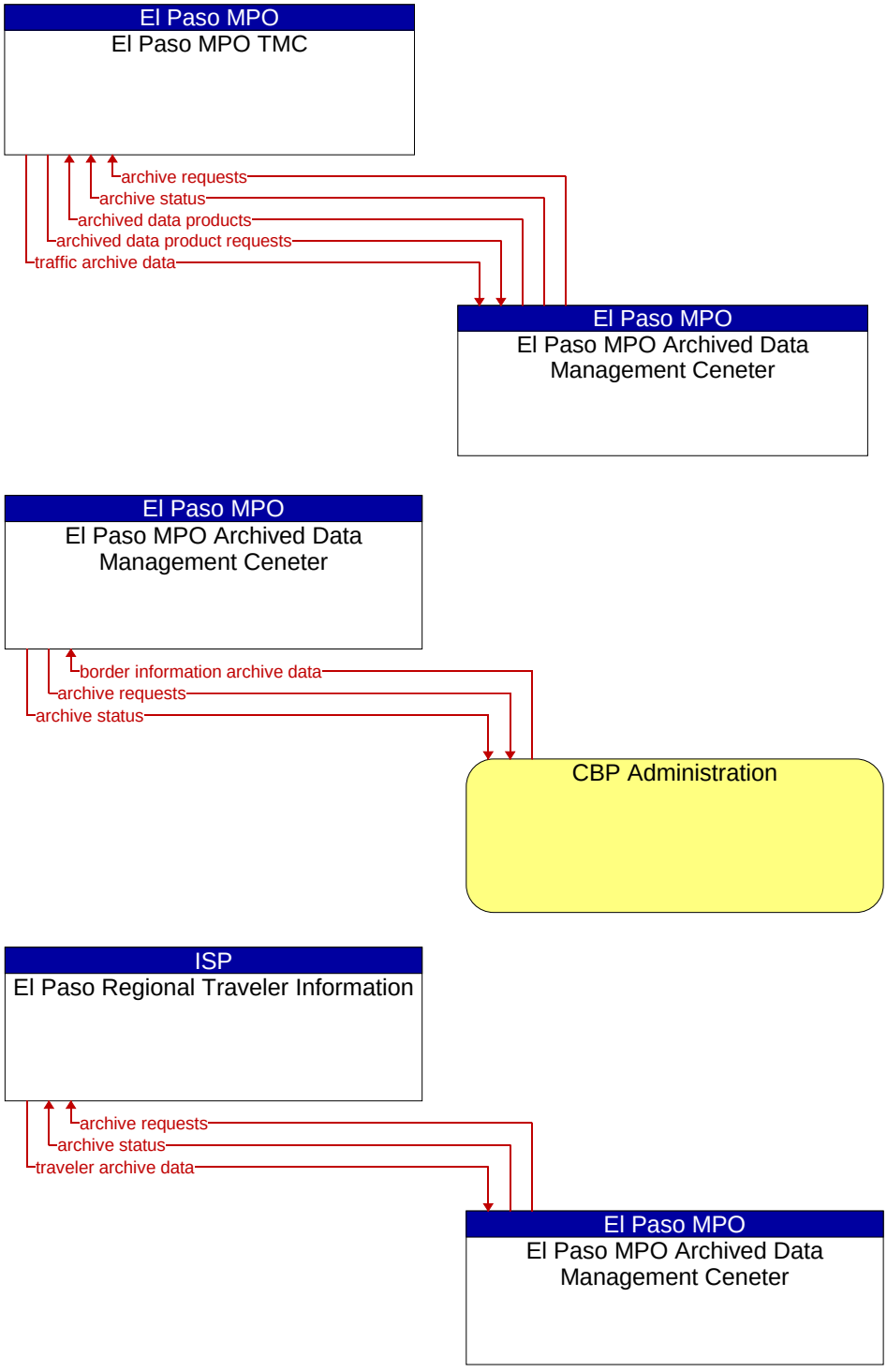
In the context of the study, the key stakeholders for the regional traveler information system are the general users, the study "users" (for e.g., members of the C-TPAT), regional traffic management center, traffic data archiving and field personnel, the CBP administration, information service provider, vendors for telecommunication devices and roadside infrastructure, and software developers. The members of the C-TIP program, public officials of the Cities of El Paso and Juárez also can be part of the stakeholder group.

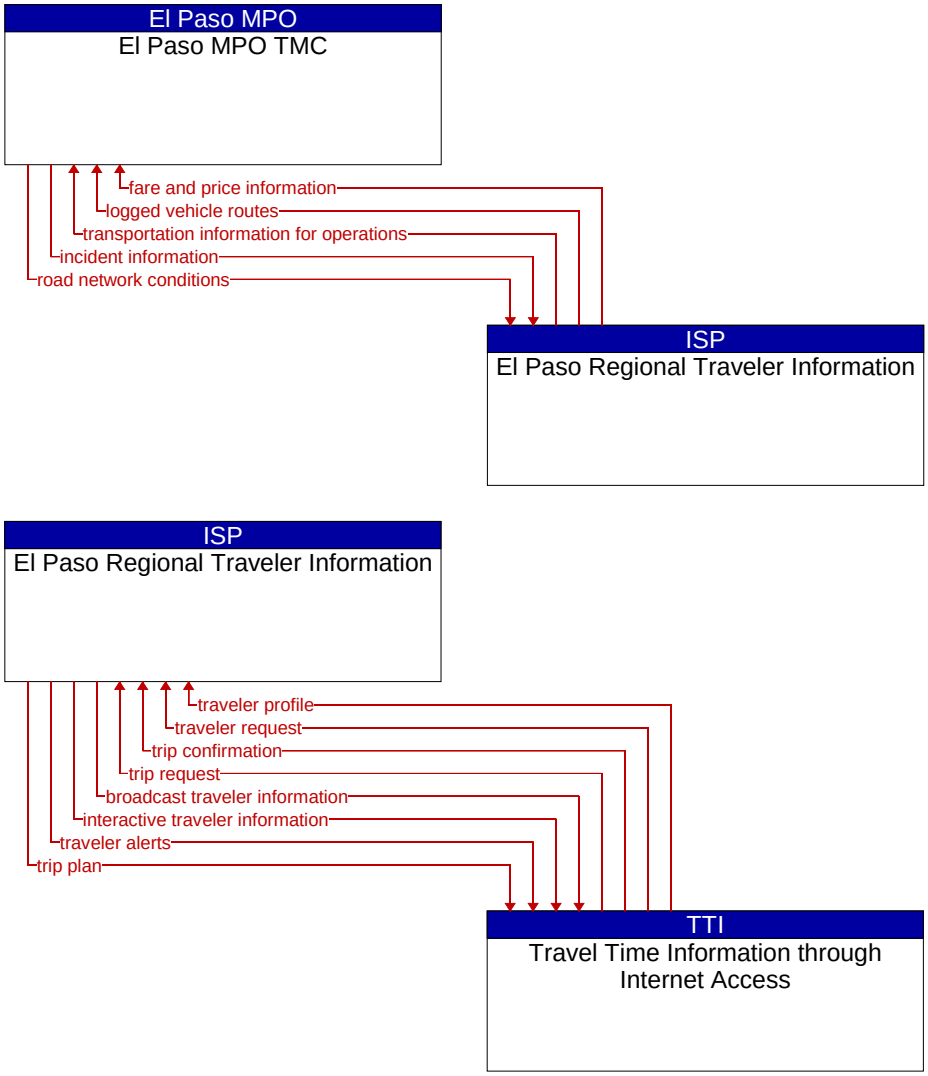
Based on a sketch planning Regional ITS Architecture developed using the National ITS Architecture's Turbo Architecture software Version 5.0[88] developed by Iteris, the desired information flows between the various entities of a traveler information system are shown in Figure F.4.4 below.

Figure F.4.4 Key Interface Diagrams for Traveler Information System



[88] http://www.iteris.com/itsarch/html/turbo/turbomain.htm (last accessed on November 27, 2010).


El Paso MPO
El Paso MPO TMC
archive requests
archive status
archived data products
archived data product requests
traffic archive data
El Paso MPO
El Paso MPO Archived Data Management Ceneter
El Paso MPO
El Paso MPO Archived Data Management Ceneter
border information archive data
archive requests
archive status
CBP Administration
ISP
El Paso Regional Traveler Information
archive requests
archive status
traveler archive data
El Paso MPO
El Paso MPO Archived Data Management Ceneter



Functional Areas and Enabling Technology Alternatives

As noted in the information flow figures, a regional traveler information system works in close coordination with a regional traffic management system and together they have several components that serve different functional areas as indicated below:

- Technologies for traffic data collection: inductive loop detectors, license plate matching, test or probe vehicle, weigh-in-motion sensors, video cameras, laser scanning detectors, aerial survey, GPS, or wireless communication device (cell phone, Bluetooth device, passive RFID, active RFID, dedicated short range communications device, etc.);
- Algorithms for incident detection, real-time travel-time estimation;

- Technologies for travel-time information dissemination and/or dynamic route guidance: dynamic message sign, 511, GPS navigation, broadcast radio or commercial/citizens' band (CB) radio, or wireless communication device; and
- Technologies for collecting customer feedback and traveler information use statistics for system improvements.

Some of the above functions have been discussed in the previous section under individual technology applications. A tradeoff comparison of several of the above automated data collection technologies can be found in the 2002 Battelle study for the FHWA.[89]

Current State of Condition and Future System Requirements

As shown in Figure F.4.5, the City of El Paso in coordination with Texas Transportation Institute (TTI) is maintaining a Regional Mobility Information System Version 1.0,[90] which performs: 1) network surveillance, speed detection and other traffic data collection using cameras and pavement embedded sensors on major highways; 2) traffic data archiving for developing travel-time algorithms; 3) travel-time estimation on a limited number of highway segments; and 4) traffic information dissemination using message signs and highway advisory radio (HAR). In summary, the El Paso region has a broadcast traveler information system and a basic interactive traveler information through Internet access that provides static travel-time estimates based on archived travel-time data. As of May 2007, the 511 system, wireless communications, and in-vehicle systems for traveler information were not deployed in the El Paso region.[91]

There are ongoing efforts by TTI[92] and the City of El Paso to: 1) fully measure border crossing times using RFID technology for trucks and Bluetooth technology for cars at the Bridge of the Americas, including wait time prior to the primary CBP inspection booth and the secondary state safety inspection for regular, FAST and SENTRI vehicles; and 2) expand and integrate border crossing time information with the regional traffic database.

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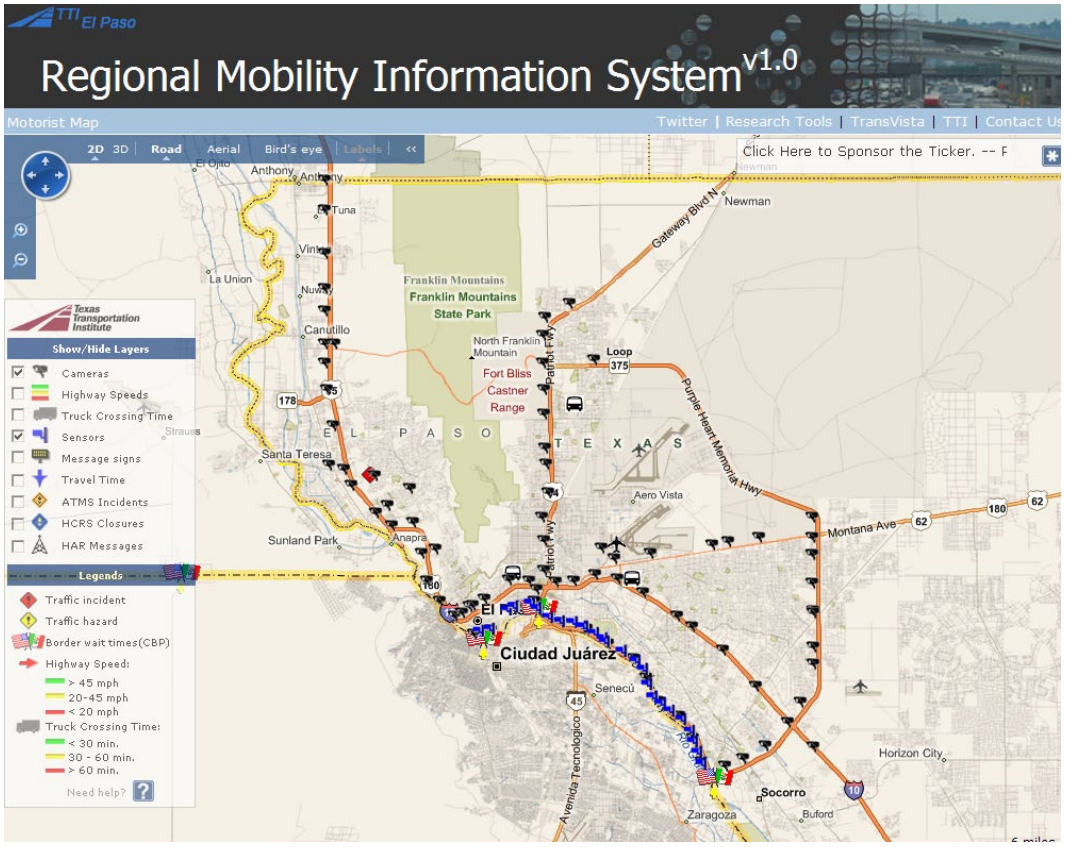
[89] Battelle, Assessment of automated data collection technologies for calculation of commercial motor vehicle border crossing travel time delay, report submitted to Office of Freight Management and Operations, FHWA, April 2002.

[90] http://www.eptraffic.com/ (last accessed on November 27, 2010).

[91] Research and Innovative Technology Administration. Tracking the deployment of the integrated metropolitan intelligent transportation systems infrastructure in El Paso: FY06 results, May 2007.
http://www.itsdeployment.its.dot.gov/download.asp (last accessed on November 29, 2010).

[92] Information provided by TTI.

Figure F.4.5 Screenshot of El Paso's Regional Mobility Information System



Source: http://www.eptraffic.com/ (last accessed on November 28, 2010).

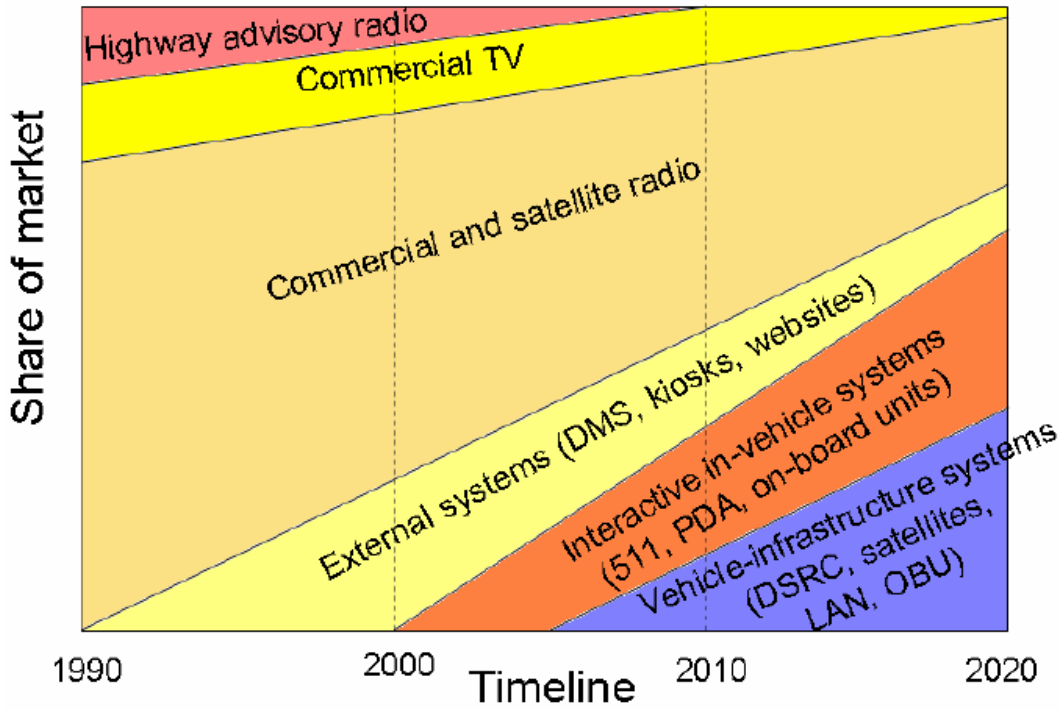
In order for a future traveler information system (also referred to as Advanced Traveler Information System or ATIS) to meet the regional needs, the following system requirements have to be incorporated by the City of El Paso, TxDOT, and NMDOT:

- **SR1-ATIS**. Travel-time estimates and route guidance should be obtained in real-time and their accuracy and reliability should be validated;
- **SR2-ATIS**. Traveler information should be as complete as possible, and thus include information on border crossing times; and
- **SR3-ATIS.** Traveler information dissemination technologies deployed for traveler information system and dynamic route guidance should be effective.

Potential Deployment Strategies

According to the researchers at the University of Texas at Austin,[93] the technology involved in a traveler information system is evolving, as shown in Figure F.4.6 below. These trends in the enabling technologies can be said to hold true in a wider ITS context. It implies that intelligence is likely to be built into future vehicles and roadside infrastructure, and wireless communications will play a more dominant role in ITS. Within the next 10 years, more than one-half of the users are likely to make customized and personalized access traveler data requests.

Figure F.4.6 Evolution of ATIS Technology and Trends



Source: Center for Transportation Research, University of Texas at Austin report on implementation issues and strategies for deployment of traveler information systems in Texas, August 2006.

[93] Center for Transportation Research, University of Texas at Austin, *Implementation issues and strategies for deployment of traveler information systems in Texas*, report submitted to TxDOT, August, 2006.

As the safety applications (the most critical market force) of in-vehicle and dedicated short-range, communications-based systems become more robust, the demand for intelligent vehicles would most likely grow, while also becoming more affordable due to increased vehicle production and available brands. Therefore, traveler information applications based on in-vehicle and dedicated short-range communication technologies would gradually replace the existing forms of collecting data and disseminating traveler information.

Corresponding to the system requirements identified for the traveler information system, a list of projects and deployment strategies were prepared as indicated in Table F.4.3 below. The table supports the following ideas: 1) the new concepts for traveler information system need not be deployed till the technologies supporting them have reached maturity; 2) the transition between technologies for traveler information should be smooth; and 3) in order to keep the deployment costs low, use of similar studies conducted in a regional context, should be preferred.

Table F.4.3 List of Potential Projects and Deployment Strategies for Traveler Information System With/Without Route Guidance

Service Requirement Code	Description of Service Requirement	Early Win Solutions (< 5 years)	Technology Transition Solutions (3-5 years)	Long-Term Solutions (> 5 years)
SR1- ATIS	Travel-time estimates and route guidance should be obtained in real-time and their accuracy and reliability should be validated.	Project E-1: Assess accuracy and reliability of real-time travel-time information and route guidance through use of the regional mobility information system (HAR, dynamic message signs (DMS) and TxDOT 511 system). Expected Outcome(s): HAR broadcast, DMS displayed and TxDOT 511 system communicated travel-time information and route guidance quality will be verified. Deployment Strategies: (a) Traffic data collection using test vehicle, license plate matching, ITS probe vehicle, or automatic vehicle identification; and (b) Simulation-based assessment using dynamic traffic assignment algorithm(s). Assessment Criteria: (a) Change in travel time; (b) Variation in time of arrival; and (c) Guided route differential cost and quality Project E-2: Conduct a ground truth study to validate the accuracy and reliability of real-time travel-time information provided by a select list of private information service providers (ISPs) in the El Paso region. Expected Outcome(s): Private ISP(s) that best serve the purpose will be identified. Deployment Strategies: Traffic data collection using same methods as Project E-1. Selection Criteria for ISPs: a. Ease of integration with regional ITS architecture; and b. Long-term service support.	Project T-1: Assess accuracy and reliability of commercially available dynamic route guidance devices by popular vendors. Expected Outcome(s): Commercial-off-the-Shelf (COTS) route guidance technology products that best serve the purpose will be identified. Deployment Strategies: Traffic data collection using equipped vehicle Assessment Criteria: (a) Cost of Equipment; (b) Route (re)planning speed; (c) Guided route differential cost and quality; (d) Tracking accuracy. Project T-2: Evaluate travel-time estimation and dynamic route guidance algorithms for Connected Vehicle and wireless communications-based vehicle-infrastructure systems. Expected Outcome(s): Algorithms that work best with Connected Vehicle and wireless communications technology products will be identified. Deployment Strategies: Use of validated and calibrated Connected Vehicle and wireless communications-based simulation test-beds. Desired Algorithm Characteristics: a. Capable of real-time estimation; b. Captures driver behavior reasonably well; c. Applicable to a wide range of traffic; conditions and driver compliance rates; and d. Easy to implement.	Project L-1: Conduct a field operational test (FOT) for accuracy and reliability of real-time travel-time information and route guidance using Connected Vehicle and wireless communications. Expected Outcome(s): Connected Vehicle and wireless communications-based estimated travel-time information and route guidance quality will be verified. Deployment Strategies: Traffic data collection using test vehicle, license plate matching, ITS probe vehicle, or automatic vehicle identification. Assessment Criteria: (a) Change in travel time; (b) Variation in time of arrival; and (c) Guided route differential cost and quality

Service Requirement Code	Description of Service Requirement	Early Win Solutions (< 5 years)	Technology Transition Solutions (3-5 years)	Long-Term Solutions (> 5 years)
SR2- ATIS	Traveler information should be as complete as possible, and thus include information on border crossings.	Project E-3: Expand RFID-based commercial vehicle tracking for travel-time measurement at the BOTA and establish similar systems at Ysleta-Zaragoza international bridge crossing and Santa Teresa border crossing for measuring border crossing performance. Expected Outcome(s): Complete information on border crossing times will be available. Deployment Strategies: Continue ongoing efforts by TTI. Project E-4: Integrate real-time travel-time, border crossing time, road condition, weather, and services information into a single traveler information system. Expected Outcome(s): Comprehensive regional traveler information system will be available. Deployment Strategies: Build interfaces between different travel-related information providers and elements of the El Paso regional ITS architecture.	Project T-3: Prepare a phase out plan for regional mobility information system based on automatic vehicle identification and TxDOT 511 system. Expected Outcome(s): Plan document for smooth transition from the existing traveler information technologies to Connected Vehicle and wireless communications-based traveler information will be achieved. Deployment Strategies: a. Infrastructure inventory matching between existing and future technology options; and b. System design plan to avoid loss of operations.	Project L-2: Deploy applications providing existing and new forms of traveler information using Connected Vehicle and wireless communications. Expected Outcome(s): Real-time, route-specific information on mobility, safety, fuel consumption, road condition, weather, and services will be provided to travelers. Deployment Strategies: ITS engineering and system design and Integration with regional ITS architecture.

Service Requirement Code	Description of Service Requirement	Early Win Solutions (< 5 years)	Technology Transition Solutions (3-5 years)	Long-Term Solutions (> 5 years)
SR3- ATIS	Traveler information dissemination technologies deployed for traveler information system and dynamic route guidance should be effective.	Project E-5: Conduct market research analysis for traveler information dissemination. Expected Outcome(s): a. Customer (or Traveler) ratings on the existing traveler information dissemination technologies will be collected; and b. Customer requirements for Connected Vehicle and wireless communications-based traveler information system will be built. Deployment Strategies a. Market Segmentation; b. Customer satisfaction surveys; and c. Customer engagement. Project E-6: Invest in low-cost developments of existing traveler information system technologies to improve customer satisfaction. Expected Outcome(s): Low-cost system changes will be made that will target existing traveler information system areas with low customer ratings. Deployment Strategies: ITS engineering and system design and Integration with regional ITS architecture.	Project T-4: Carry out market promotions for Connected Vehicle and wireless communications-based traveler information dissemination. Expected Outcome(s): Travelers will be made aware of the incremental benefits of Connected Vehicle and wireless communications-based traveler information dissemination over existing technologies. Deployment Strategies: Media.	Project L-3: Carry out performance analysis of Connected Vehicle and wireless communications-based traveler information dissemination. Expected Outcome(s): Customer ratings on the performance of the Connected Vehicle and wireless communications-based traveler information dissemination will be reported. Deployment Strategies a. Market Segmentation; and b. Customer satisfaction surveys.

Expected Benefits and Costs

The purpose of this section is not to exactly evaluate all the projects listed as technology solutions, but rather provide general benefits and costs of the implementation of the system components under the initial and final phases of the traveler information and route guidance technology service development. The unit costs for the components of a traveler information system as found in the ITS deployment costs database[94] are attached in Section F.7 , for reference.

"Early Win" Solutions

The 2008 update of the deployed intelligent transportation systems strategies[95] found that drivers who use route-specific travel-time information, instead of areawide traffic advisories, can improve on-time performance by 5 to 13 percent. The percentage of general travelers using traveler information is typically low, but it rises to a very high value during periods of severe weather, emergencies, or special events. This would likely be the same for the commercial vehicle users.

Regional 511 deployments, in particular, have been very successful in other parts of the country, with customer satisfaction ranging between 68 and 92 percent. 511 systems in metropolitan areas cost between $1.5 million to $2.0 million to design, implement, and operate the first year.

Given that most of these systems exist in the El Paso region, there are a few possibilities to achieve incremental benefits while incurring incremental costs to improve the quality of traveler information for commercial border crossing travelers. These were suggested as the "early win" solutions. Of them, two important ones are: 1) completing border crossing information; and 2) evaluation of DMS for route guidance.

Border crossing information is useful in improving on-time reliability, better trip planning, and reducing early and late arrivals.[96] It also has a positive impact on the supply chain of manufactured goods to markets. In a 2007 report,[97] TTI made preliminary cost estimates for each RFID measuring location at a given POE for two lanes of traffic as shown in Table F.4.4.

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[94] http://www.itscosts.its.dot.gov/ (last accessed on November 28, 2010).

[95] Intelligent transportation systems benefits, costs, deployment and lessons learned: 2008 Update. Research and Innovative Technology Administration, U.S. Department of Transportation, September 2008.

[96] Texas Transportation Institute, Expansion of the border crossing information system. Report UTCM 08-30-15, U.S. Department of Transportation, March 15, 2009.

[97] Texas Transportation Institute, *Measuring Border Delay and Crossing Times at the U.S.-Mexico Border*, Task 3 Report, Office of Freight Management and Operations, Federal Highway Administration, September 2007.

Table F.4.4 Approximate Costs of RFID System Measuring Location Setup and Installation, TTI

Cost Component	Cost
Tag/Transponder Reader Equipment*	$6,000
Mounting Structure and Installation**	$12,000
Communications Device(s)***	$2,000
Electronic Equipment (Solar Kit and Central Computer)	$6,000
Electronic Equipment Installation	$5,000
Total Cost	$31,000

Note: *Assumes that one Encompass 2 Reader and two 915 MHz antennas will be installed at each measuring location.

**Assumes that no overhead signs are present to hold readers and antennas. If TTI is permitted to install equipment on existing structures, this cost would decrease significantly.

***Assumes cellular (wireless) technology will be used to transmit data from reader to onsite computer.

Source: Measuring border delay and crossing times at the U.S.-Mexico border, TTI Report, 2007.

The cost did not include any information dissemination or processing fees. According to TTI, four such readers would completely measure the border crossing times and subcomponents of it, that is the wait time before the first inspection booth, the time taken for secondary CBP security inspection and the time taken for secondary state safety inspection. Thus, the cost per border crossing deployment in 2007 dollars was approximately, $1.24 million.

Speaking of the use of DMS for route guidance,[98] in Houston, real-time travel-time information posted on DMS influenced drivers' route choice. In a TxDOT and TTI web survey, 85 percent of respondents indicated that they changed their route based on the information provided. Of these respondents, 66 percent said that they saved travel time as a result of the route change. Overall, drivers were primarily interested in seeing incident and travel-time information. DMSs can have environmental benefits as well. Evaluation of freeway DMS integrated with incident management in San Antonio, Texas,[99] found fuel consumption reduced by 1.2 percent; integrating the DMS with arterial traffic control systems could save 1.4 percent.

[98] http://www.oti.dot.gov/rti/practices/houston_chicago.htm (last accessed on November 28, 2010).

[99] ITS Lessons Learned, http://www.itslessons.its.dot.gov.

Long-Term Solutions

In August 2010, candidate application concepts[100] for dynamic mobility applications using Connected Vehicle were submitted. Two freight application concepts make use of real-time traveler information and freight-specific data for: dynamic routing, adaptive signal control along corridors to favor freight movement, and load-matching (minimize bobtail truck trips). In addition, one of the concepts will make use of telemetry data to identify incidents to improve response and clearance times. A third freight concept also makes use of real-time traveler information and freight information for pickup and delivery management. Therefore, many new applications for border crossing commercial vehicles are likely to result by deployment of Connected Vehicle-based technologies.

Based on a cost-benefit analysis discussion,[101] also held in August 2010, there are high upfront costs to Connected Vehicle technologies primarily due to: 1) power and telecom equipment costs; and 2) application development and onboard equipment for vehicles. Regarding the costs of the technology service, some of the difficulties in estimation are as follows: 1) an accurate estimate of the cost of the onboard unit is important, since the unit cost will be multiplied by number of vehicles using the traveler information system; 2) the vendor prices should remain anonymized, so the values used for cost-benefit may represent an alliance or larger groups of vendors; and 3) there is a tradeoff between privacy and safety that is associated with Connected Vehicle applications. It is difficult to assign costs to the potential loss of privacy and a reduction in the likelihood of an accident. Crashes are a relatively rare event.

Fleet Security and Freight Information Management System

We noted in the previous sections that the cargo, the cargo manifest, C-TPAT certification and driver identification need protection and secure handling, especially at border crossings. For the purposes of security monitoring and to facilitate real-time electronic information sharing between the shippers, the carriers, the Federal agencies, including the CBP and the intelligence, and the state agencies, centralizing these functions in the form of a fleet security and freight information management center is a good alternative.

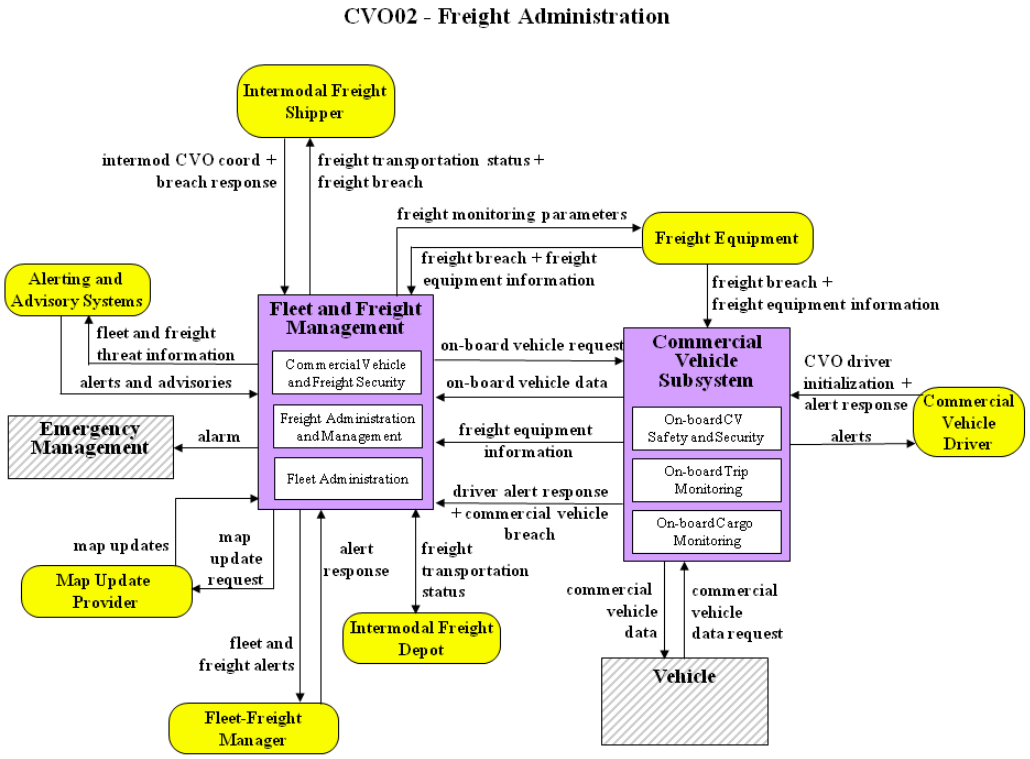
The functions described above can be understood in terms of the market packages for freight administration and commercial vehicle administration as

[100] http://www.itsdocs.fhwa.dot.gov/intellidrive/app_template/DMAcandidateAppsSummaryAug.htm (last accessed on November 28, 2010).

[101] IntelliDrive℠ safety workshop: Cost benefit analysis discussion, http://www.its.dot.gov/meetings/cost_benefit_analysis.htm (last accessed on August 27, 2010).

defined by the Iteris-developed National ITS Architecture[102] and shown in Figure F.4.7and Figure F.4.8.

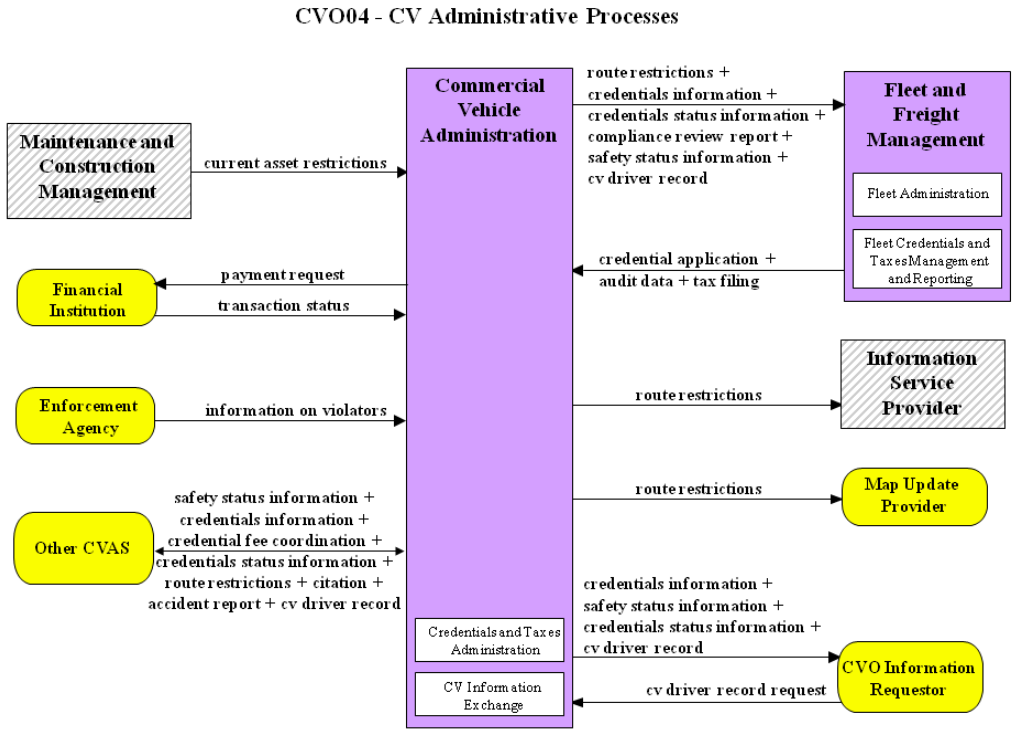
Figure F.4.7 Freight Administration Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gcvo02.htm (last accessed on November 28, 2010).

[102] http://www.iteris.com/itsarch/ (last accessed on November 28, 2010).

Figure F.4.8 Commercial Vehicle Administration Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gcvo04.htm (last accessed on November 28, 2010).

User Context and Ability to Meet Regional Needs

The study "user" as defined before is valid for this technology service alternative as well.

The fleet security and freight information management system is expected to meet the regional border security needs and assist the CBP by greatly improving visibility of the supply chain and providing information assurance. The efficiency needs are met by having faster security processing times with the help of electronic devices for information exchange. Optionally, the freight information management center can act as a one-stop solution for freight mobility solutions, such as freight tracking and information support on the border crossing condition (in the absence of a border crossing time measurement system as part of the El Paso's regional mobility information system).

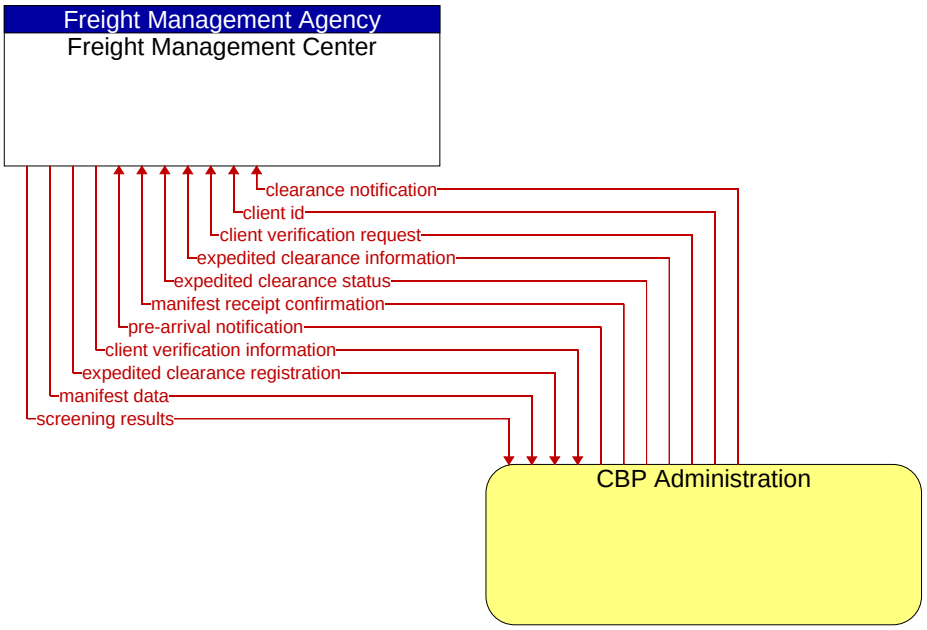
Stakeholders and Desired Information Flows

The key stakeholders for a fleet security and freight information management system are the study "users" (e.g., members of the C-TPAT), the fleet security, and freight information management agency, the CBP administration, vendors for telecommunication, roadside infrastructure and electronic devices, and software developers. Similar to the traveler information system, the members of

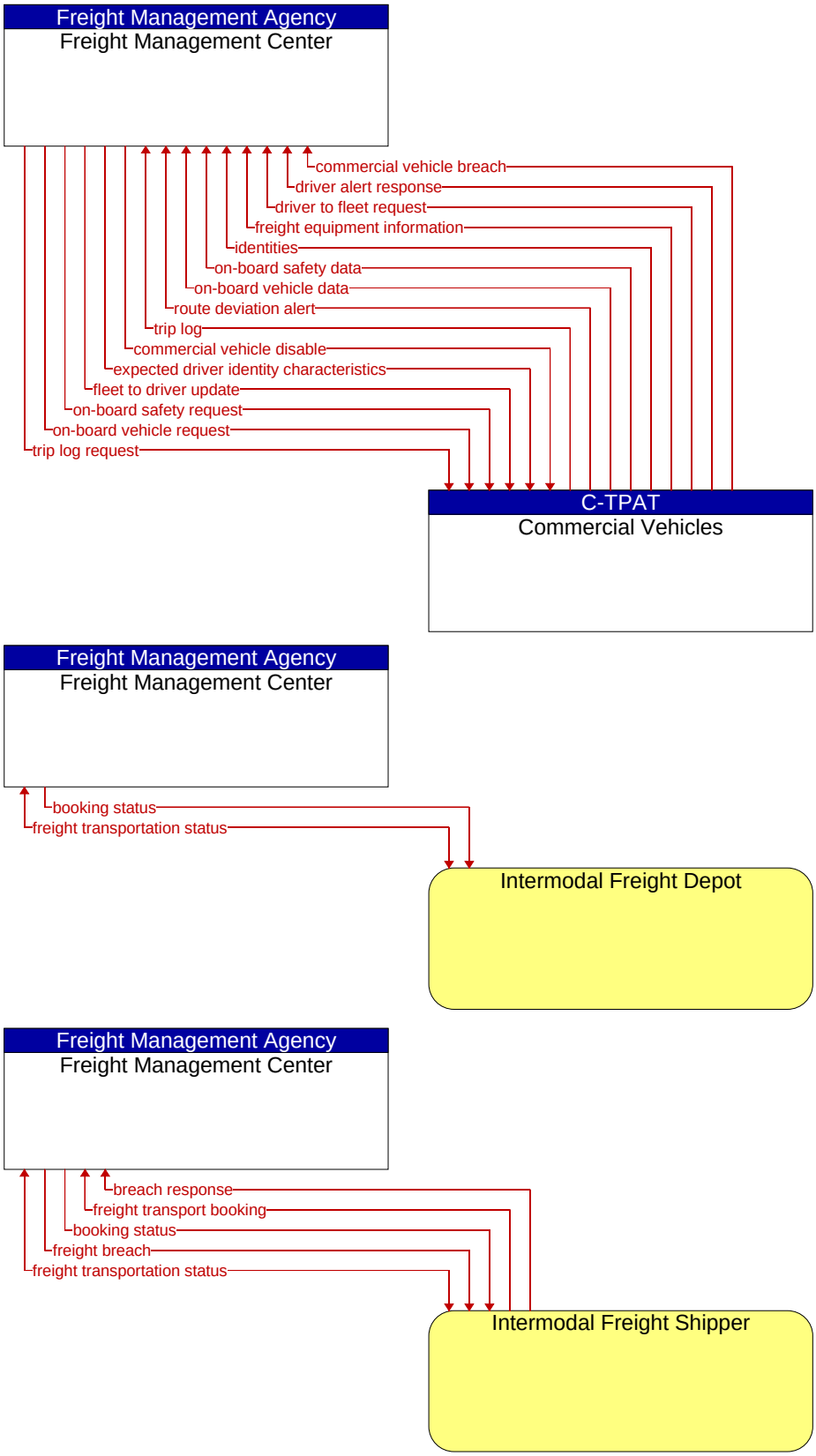
the C-TIP program and public officials of the cities of El Paso and Juárez also can be part of the stakeholder group.

Based on a sketch planning Regional ITS Architecture developed using the National ITS Architecture's Turbo Architecture software Version 5.0[103] developed by Iteris, the desired information flows between the various entities of a fleet security and freight information management system are shown in Figure F.4.9 below.

Figure F.4.9 Key Interface Diagrams for Fleet Security and Freight Information Management System



[103] http://www.iteris.com/itsarch/html/turbo/turbomain.htm (last accessed on November 27, 2010).


Freight Management Agency
Freight Management Center
commercial vehicle breach
driver alert response
driver to fleet request
freight equipment information
identities
on-board safety data
on-board vehicle data
route deviation alert
trip log
commercial vehicle disable
expected driver identity characteristics
fleet to driver update
on-board safety request
on-board vehicle request
trip log request
C-TPAT
Commercial Vehicles
Freight Management Agency
Freight Management Center
booking status
freight transportation status
Intermodal Freight Depot
Freight Management Agency
Freight Management Center
breach response
freight transport booking
booking status
freight breach
freight transportation status
Intermodal Freight Shipper

Functional Areas and Enabling Technology Alternatives

There are several aspects to the fleet security and freight information management system, including:

- **Securing cargo and tracking.** Electronic seals, AVL technologies (GPS, active RFID);
- **Secured cargo manifest submittal.** ACE secure data portal;
- **Securing supply chains by data fusion and information sharing.** In-house software capabilities (e.g., LiveLogistics of SecureOrigins), facilitation in C-TPAT certification; and
- **Border crossing condition information support.** Real-time electronic reporting of border wait times using tracking data.

Current State of Condition and Future System Requirements

Currently, there is no common freight center managing the border crossing commercial vehicle traffic. It is mostly self-managed by the freight shippers and freight depots. The C-TPAT certification (done on a voluntary basis) and the border security inspections are the only mechanisms to ensure the cargo security. The secure ACE data portal provides an opportunity for freight managers of individual shippers to communicate the cargo and driver information with the CBP prior to the cargo arrival. On the other hand, the Texas Commercial Vehicle Information Systems and Networks (CVISN) program implements Texas Commercial Vehicle Information Exchange Window (CVIEW) System that allows safety information exchange of intrastate and interstate snapshots within state and connection to the Federal program named Safety and Fitness Electronic Records (SAFER) system. Lack of centralized international land border trade process monitoring makes it difficult to identify threats due to risky supply chains.

SecureOrigins (in partnership with TransCore ITS and Transtelco) was recently awarded the contract to implement this first-of-its-kind demonstration project called "Secure Border Trade" (SBT). A description of the border security solutions provided by this locally headquartered (in El Paso, Texas) company was discussed in the previous section.

The goal of the SBT system is to assure that the complex processes involved in the movement of commerce across the international border are working together to optimize commerce. The overall purpose of SBT is to heighten security, increase participation in trusted shipper programs, promote economic development, and facilitate border trade efficiency by enhancing collaboration between maquiladoras, customs brokers, transporters, and border security personnel. The project aims to achieve these goals by increasing the efficiency and security of goods crossing the U.S.-Mexico border by providing visibility of the goods movement throughout the supply chain.

This is a multipartnered, comprehensive technology demonstration that will develop and demonstrate a state-of-the-art integrated security and management system for the secure and efficient movement of commercial vehicles at land-based POEs in the Paso del Norte Trade Corridor.

The demonstration will require streamlined business processes and technology integration to assure monitoring facilitation. Interoperability with existing U.S. DOT and Homeland Security systems is a prime objective. If this is a successful demonstration, it will serve as a model for all land POEs on the U.S.-Mexico and U.S.-Canada borders.

Due to strong similarities of this demonstration project to the technology service alternative functional areas, we draw our future fleet security and freight information management system requirements (also referred to as FSFIMS) upon the demonstration project objectives:

- **SR1-FSFIMS.** Interoperability between the existing and anticipated border crossing programs for fleet security and freight information exchange through technology should be achieved; and
- **SR2-FSFIMS.** A real-time fleet security and freight tracking system capable of fusing data over the supply chain of a border crossing freight movement should be developed.

Potential Deployment Strategies

Corresponding to the system requirements identified for the fleet security and freight information management system, a list of projects and deployment strategies were prepared as indicated in Table F.4.5 below.

Table F.4.5 List of Potential Projects and Deployment Strategies for Fleet Security and Freight Information Management System

Service Requirement Code	Description of Service Requirement	Early Win Solutions (< 5 years)	Technology Transition Solutions (3-5 years)	Long-Term Solutions (> 5 years)
SR1-FSFIMS	Interoperability between the existing and anticipated border crossing programs for fleet security and freight information exchange through technology should be achieved.	Project E-1: Conduct a demonstration project that adapts and integrates proven technologies to create a fleet security and freight information system that is interoperable with existing and anticipated programs such as FAST, C-TPAT, ACE, and CVISN. Expected Outcome(s): (a)Identification of opportunities and hurdles to interoperability; and (b) A prototype fleet security and freight information exchange system. Deployment Strategies: (a) Make a list of information exchanges, including e-manifest, driver and vehicle identification, IFTA, IRP and HUT credentials; (b) Design flow architecture and communications between ITS systems, including on-board system, ACE portal, electronic credentialing, and Texas CVIEW.	Project T-1: Install tested software and hardware for information exchange between FAST, C-TPAT and ACE stakeholders. Expected Outcome(s): Interoperability between FAST, C-TPAT, and ACE stakeholders will be achieved. Deployment Strategies: Select suitable software and hardware developer and integrator.	Project L-1: Install software and hardware for CVISN program's safety information exchange while archiving safety history data on the carriers, commercial vehicles and their drivers, and integrate with the FSFIMS. Expected Outcome(s): CVISN also will become interoperable with the already developed FSFIMS. Deployment Strategies: ITS engineering and system design and Integration with regional ITS architecture.
SR2-FSFIMS	A real-time fleet security and freight tracking system capable of fusing data over the supply chain of a border crossing freight movement should be developed.	Project E-2: Conduct a pilot study on a test supply chain using a real-time security and tracking system by fusing plant security, vehicle security, tamper-resistant sealing, and applying continuous real-time tracking systems. Expected Outcome(s): Risk assessment of supply chain, tracking accuracy, and other opportunities and hurdles. Deployment Strategies: Use of supply chains of non-C-TPAT and C-TPAT certified firms as test and control cases, respectively.	Project T-2: Install tested software and hardware for fleet tracking system and integrate with the FAST program. Expected Outcome(s): A real-time freight security and tracking system will become operational. Deployment Strategies: Select suitable software and hardware developer and integrator.	Project L-2: Develop an Connected Vehicle and wireless communications-based security and tracking system. Expected Outcome(s): An upgraded real-time freight security and tracking system will become operational. Deployment Strategies: ITS engineering and system design and Integration with regional ITS architecture.

Note: IFTA = International Fuel Tax Agreement license, IRP = International Registration Plan, and HUT = Highway User Tax.

Expected Benefits and Costs

The general benefits and costs of the implementation of the system components under the initial and final phases of the fleet security and freight information management technology service development are discussed below. The unit costs for the components of a freight security and freight information management system as found in the ITS deployment costs database are attached in F.7, for reference.

"Early Win" Solutions

The Secure Border Trade demonstration project is a key contributor to seeing "early wins" with respect to the fleet security and freight information management. As stated in F.4, the demonstration project aims to bring public agencies, shippers, carriers, and border crossing services closer to each other. It is achieved by introducing additional technology-based systems and flows of information. There is likely to be a high positive economic impact due to the increased interoperability and benefits in terms of supply chain visibility. We discuss two important border crossing technology-based improvements: 1) electronic credentialing; and 2) vehicle tracking.

Based on a survey of 38 interstate motor carriers,[104] it was found that electronic credentialing allowed trucks to be placed into service an average of 3.5 days sooner than paper-based systems. The time value of increased fleet utilization is single-most important benefit of the electronic credentialing. In addition, one-stop licensing and permitting reduces the labor needed to obtain licenses and permits.

New York developed an Internet-based electronic credentialing system, called One-Stop-Credentialing and Registration (OSCAR), as a proof-of-concept demonstration that provided the following functions: 1) credential application forms accessible via the Internet; 2) IRP credentialing; 3) IFTA credentialing; 4) HUT credentialing; and 5) Single State Registration System (SSRS) credentialing. The total project cost was $577,910. It is of importance to note that software development was the highest cost, of about 74 percent.

In 2001, the FHWA released a solicitation for a cost sharing cooperative agreement to test solutions for improving the efficiency of intermodal freight operations. The solicitation called for solutions to improve asset tracking, increase cargo visibility, and develop a Freight Information Highway (FIH). In 2002, a team of transportation and logistics companies (American Presidents Line, Union Pacific Railroad, PAR ALMS and Transentric) deployed a prototype FIH for tracking intermodal freight and exchanging data across different modes,

[104]Brown et al., Final Report: Economic Analysis and Business Case for Motor Carrier Industry Support of CVISN, U.S. Department of Transportation, October 2007.

agencies, and locations. Benefits from an Internet-based information system for tracking cargo from point-to-point were realized by increasing the efficiency of modal shifts from rail to truck, reducing errors in data entry and shipment mishandling, reducing customer service and tracking costs, and reducing penalties and delays. Table F.4.6 indicates the benefits:

Table F.4.6 Benefits of Tracking-Based Freight Information Highway (FIH)

Benefits Component	Adjusted Evaluation of Estimated Benefit per Shipment	FIH Return of Investment Benefit per Shipment
Increased Modal Shift from Truck to Rail	$17.05	$40.91
Reduced Emergency Transloads	$0.00	$10.66
Reduced Inventory Carrying Costs and Outages	$0.00	$29.25
Improved Collaboration, Reduced Data Entry and Shipment Mishandling	$9.00	$9.00
Reduced Customer Service and Tracking Costs	$1.20	$1.20
Reduced Systems Integration Costs	$1.16	$1.16
Reduced Penalties and Delays	$0.25	$0.25
Total Benefits	$28.66	$92.43

Source: Jensen, M., Evaluation of the Intermodal Freight Technology Working Group Asset Tracking and "Freight Information Highway" Field Operational Test Final Report, U.S. Department of Transportation, Federal Highway Administration, September 2003.

In essence, the estimated benefits for shippers using an integrated shipment, equipment, and freight status information system equate to a 6.2-percent reduction in shipment costs.

In the period from August 2002 to August 2004, a HAZMAT Safety and Security Field Operational Test was conducted to assess commercially available, off-the-shelf technology that could be readily deployed in the near term to enhance the safety and security of HAZMAT transportation operations. The cost ranges of in-vehicle equipment supported by existing satellite, terrestrial, or hybrid technologies are as follows: 1) basic in-vehicle tracking equipment: $429 to $995 per vehicle; 2) advanced in-vehicle tracking equipment (multiple sensors): $1,290 to $2,275 per vehicle; 3) installation costs: $75 to $300 per vehicle; and 4) monthly service fees: $10 to $50 per vehicle, depending on the type of wireless communications required (terrestrial communications were less expensive than satellite).

According to the Border Crossing/Entry Data of the Bureau of Transportation Statistics,[105] the number of border crossing truck trips through the El Paso region border crossings was obtained to be about 644,300 in 2009. As cited in the National Cooperative Highway Research Program (NCHRP) Report 505,[106] assuming about 52 crossings per vehicle per year for trucks crossing the U.S.-Mexico border, we obtain an estimate of the number of trucks registered through the El Paso region border crossings as about 12,400 trucks annually. Assuming the first year penetration of the tracking technology to be about 10 percent in the El Paso region, the number of tracking equipment to be procured would be about 1,240 trucks. Thus, the total cost of tracking technology for the assumed truck fleet could range between $640,000 (low-end or basic) to $3,260,000 (high-end).

In addition, RFID electronic seal costs based on a demand of 1,240 trucks and units costs ranging between $8 (low-end, disposable) and $360 (high-end, reusable) (See Appendix B), results in an additional cost of $10,000 to $450,000.

Long-Term Solutions

One of the strong reasons why Connected Vehicle and wireless communications are good option for a fleet security and freight information management system is that the Connected Vehicle program's smart roadside initiative[107] is aimed at developing standards, protocols and architecture that would enable interoperable operations across the country and appropriate data privacy requirements. Hence, it is directly aligned with one of the system requirements. Secondly, due to its ubiquitous nature, the technology would make vehicle and equipment tracking and security monitoring a minor issue. The benefits and costs discussion is similar to the previous section.

Advanced Roadside Inspection System

Although the security inspections at the El Paso region POEs have been expedited due to implementation of the FAST program, the secondary safety inspection by the Texas DPS at these POEs are still carried out mostly manually. The instrumentation of safety inspection facility is completed only up to weigh-in-motion technology.

A combination of FMCSA's international border crossing (IBC) electronic screening (E-Screening) and on-board commercial vehicle operations freight

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[105] http://www.transtats.bts.gov/bordercrossing.aspx (last accessed on November 28, 2010).

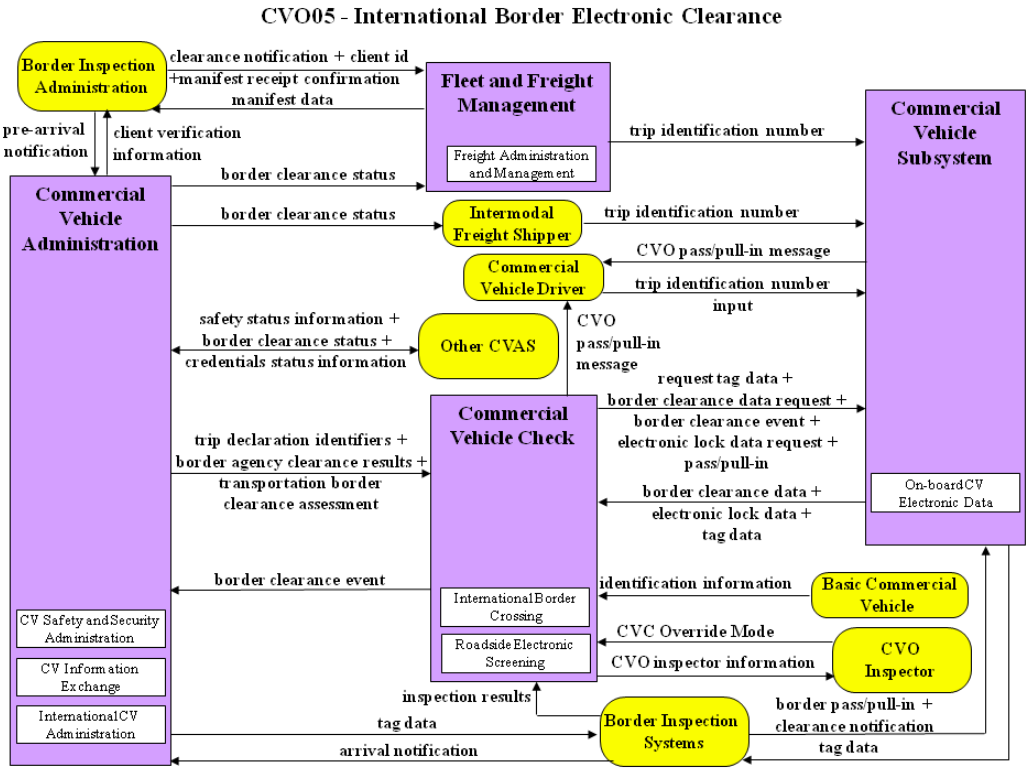
[106] Harwood et al., Review of trucks characteristics as factors in roadway design, NCHRP Report 505, Transportation Research Board of the National Academies, 2003.

[107] http://www.intellidriveusa.org/508/Library/technical/commercial-vehicles/Smart%20Roadside%20White%20Paper%20Final%20April%202010.htm (last accessed on November 28, 2010).

safety and security system would make a good alternative to address efficiency issues while ensuring safety of the border crossing commercial vehicles. The E-screening system can be further enhanced to a real-time wireless roadside inspection (as discussed in the previous section).

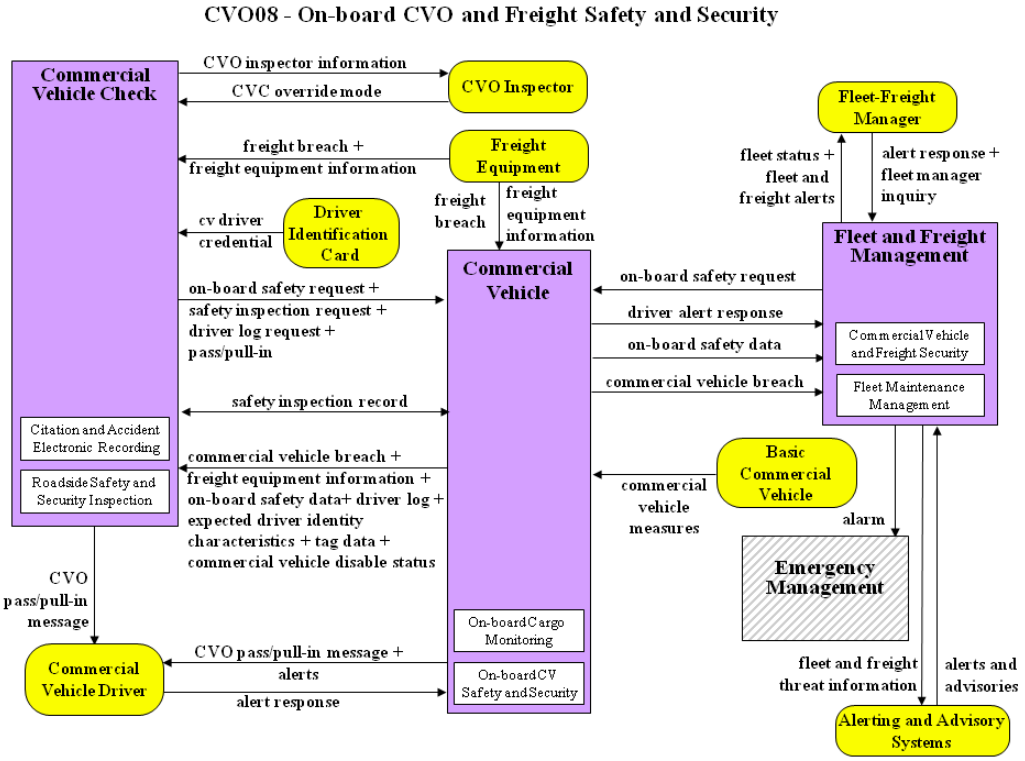
Typical market packages for these systems as defined by the Iteris developed National ITS Architecture as shown in Figure F.4.10 and Figure F.4.11.

Figure F.4.10 International Border Electronic Clearance Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gcvo03.htm (last accessed on November 28, 2010).

Figure F.4.11 On-board CVO and Freight Safety and Security Market Package in National ITS Architecture



Source: http://www.iteris.com/itsarch/html/mp/gcvo08.htm (last accessed on November 28, 2010).

User Context and Ability to Meet Regional Needs

The "user" as defined for the traveler information service alternative is valid for this alternative as well.

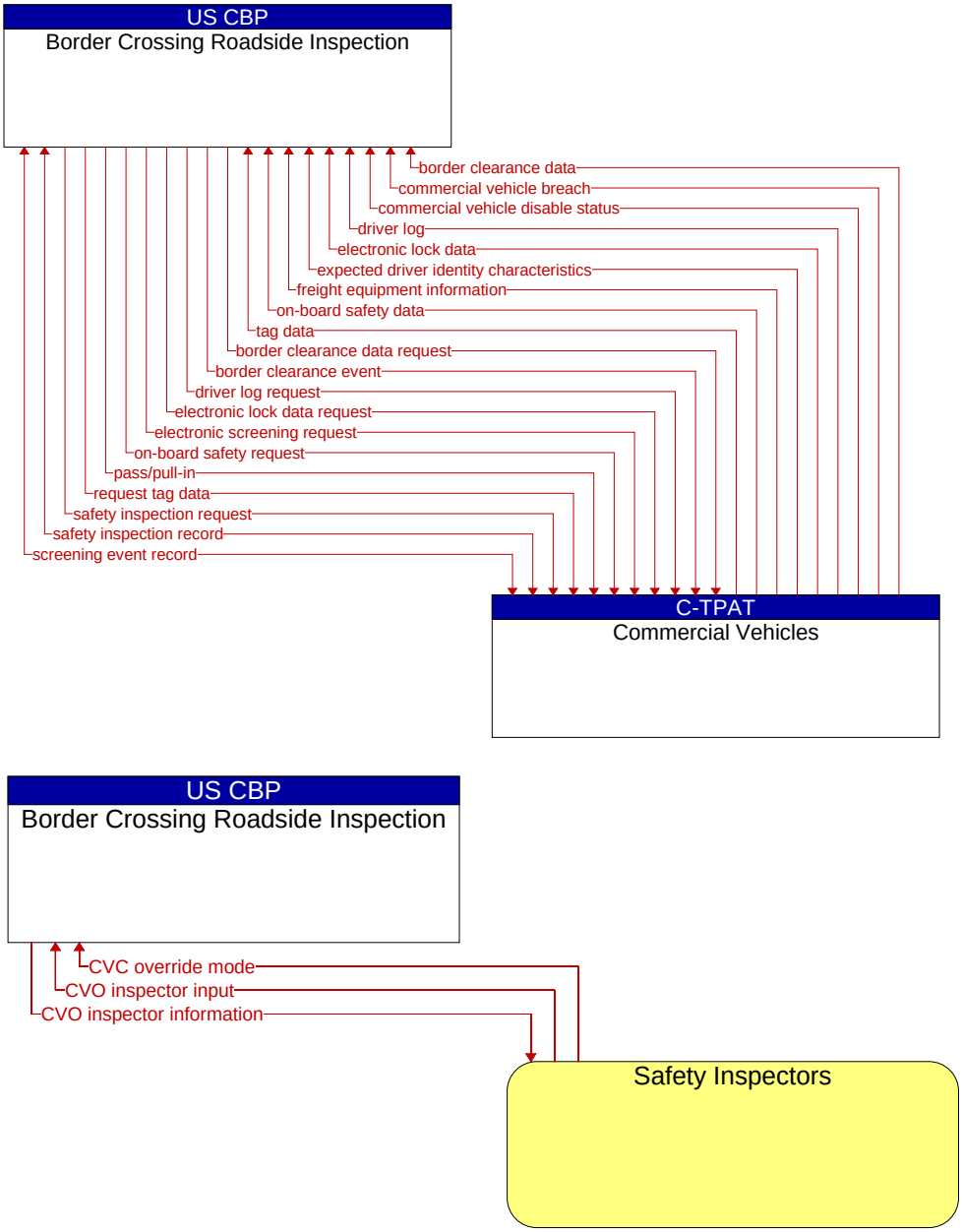
The combined E-screening and on-board freight safety system is expected to reduce the frequency of manual inspection significantly, thus the efficiency needs are met. The data on freight security and safety carried by the on-board unit is comprehensive, including condition of lock or electronic seal, temperature, leakages, tire pressure, brakes, etc., and it is highly convenient to communicate such truck performance data and driver records with the inspection booths, hence the security and safety needs are met.

Stakeholders and Desired Information Flows

The key participants in an advanced roadside inspection system are the study "users", the CBP administration, the C-TPAT (or a consortium of shippers and freight transport firms), vendors for wireless communication devices and electronic devices, and software developers.

The main interactions in the context of an advanced roadside inspection system are shown using interface diagrams in Figure F.4.12 below.

Figure F.4.12 Key Interface Diagrams for Freight Management Center



Functional Areas and Enabling Technology Alternatives

The advanced roadside inspection concept can consist of the following system components:

- Electronically transferring truck safety and security information: E-Screening technologies (RFID, on-board unit based on DSRC); and
- Driver identification using electronic driver licenses and passports: RFID badges, E-Passports, Border Crossing Card.

Current State of Condition and Future System Requirements

As described in A.1, a RFID technology-based study of international border crossing E-Screening completed at Santa Teresa POE found satisfactory results. Another pilot study by Texas DPS is underway at the BOTA, under which RFID tags have been distributed to select trucking companies, with the purpose of expediting the safety inspection system.

Based on the above we identified the following system requirements for advanced roadside inspection system (also referred to as ARIS) as follows:

- **SR-ARIS.** An E-screening roadside inspection system for clearing commercial vehicles based on correct and complete safety and credentials status information should be established.

Potential Deployment Strategies

Corresponding to the system requirements identified for the advanced roadside inspection system, a list of projects and deployment strategies were prepared as indicated in Table F.4.7 below.

Table F.4.7 List of Potential Projects and Deployment Strategies for Advanced Roadside Inspection Systems

Service Requirement Code	Description of Service Requirement	Early Win Solutions (< 5 years)	Technology Transition Solutions (3-5 years)	Long-Term Solutions (> 5 years)
SR-ARIS	An E-screening roadside inspection for clearing commercial vehicles based on correct and complete safety and credentials status information should be established.	Project E-1: Design an E-screening algorithm that minimizes the errors and gives full information on safety and credentials status. Expected Outcome(s): Safety and credential status inspection using E-screening is correct and complete. Deployment Strategies: Match the vehicle, trailer and driver identification information by using corroborate data such as the CBP collected information. Project E-2: Deploy RFID-based E-screening roadside inspection system at all El Paso region POEs. Expected Outcome(s): RFID-based E-screening system is available. Deployment Strategies: ITS engineering and system design and Integration with Texas CVIEW ITS System and regional ITS architecture.	Project T-1: Conduct a pilot study on E-screening system based on Connected Vehicle and wireless communications and commercial vehicle on-board equipment for safety and security. Expected Outcome(s): On-board equipment that serves the purpose best will be selected. Deployment Strategies: Test system with select market on-board equipment products and select truckers.	Project L-1: Deploy an E-screening system based on Connected Vehicle and wireless communications and commercial vehicle on-board equipment for safety and security. Expected Outcome(s): Connected Vehicle and wireless communications-based E-screening system is available. Deployment Strategies: ITS engineering and system design and Integration with Texas CVIEW ITS System and regional ITS architecture.

Expected Benefits and Costs

The general benefits and costs of the implementation of the system components under the initial and final phases of the advanced roadside inspection technology service development are discussed below.

"Early Win" Solutions

Based on the same survey of 38 interstate motor carriers[108] as discussed before, it was found that electronic screening produced operating cost savings per bypass of $8.68 for interstate motor carriers. Annual net benefit per transponder-equipped truck was estimated at $1,169.

A 2002 study[109] used a crash avoidance probability model to determine safety impacts of electronic screening techniques and found that promoting compliance with commercial vehicle safety inspections could prevent thousands of truck accidents each year. The authors noted that the results depended on the level of deployment and integration.

Electronic screening systems using automated vehicle identification (AVI) devices and weigh-in-motion (WIM) scales installed upstream from a fixed-site weigh station enable enforcement personnel to identify high risk carriers, and allow certain approved vehicles to avoid stopping at weigh stations.

Signage, workstations, roadside telecommunications are the additional support infrastructure. The majority of the cost for electronic screening is borne by state agencies, and costs can range broadly depending on the level of infrastructure.

A study[110] conducted in the mid-continent transportation corridor of the United States indicated the cost to deploy roadside electronic screening equipment is about $150,000 for minimal infrastructure to $780,000 for high-end deployments per station. This includes AVI readers, WIM scales and equipment, computer workstations, communication costs, and annual operation and maintenance cost. It is believed that the high-end scenarios are more likely to be deployed.

The cost to motor carriers would be much less, requiring purchase of electronic transponders at a price of about $50 per vehicle. Using again 1,240 trucks annually (that is, assuming 10 percent of trucks equipped with transponders), the

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[108] http://www.itsbenefits.its.dot.gov (last accessed on November 28, 2010)

[109] Orban, John E., et al., Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative: Volume I – Final Report, U.S. Department of Transportation, March 2002.

[110] Maze, T., and C. Monsere, Analysis of a multistate corridor deployment of intelligent transportation systems for commercial vehicle operations, paper presented at the Sixth World Congress Conference on ITS, Toronto, Canada, November 1999.

cost to motor carriers is about $62,000, much less compared to cost of the e-screening facility.

Long-Term Solutions

Most of the safety defects identified in inspections could be effectively monitored with on-board equipment and inspected wirelessly. Table F.4.8 below shows the most frequent types of safety violations leading to Out of Service (OOS) citations for motor carrier drivers, or their vehicles. With the exception of load securement, these criteria can be electronically monitored.

Table F.4.8 Most Frequent Causes of Out of Service (OOS) citations

Driver Violations	Percent Driver Out-of-Service Violations	Vehicle Violations	Percent Vehicle Out-of-Service Violations
Logbook	40.0%	Brakes	41.2%
Hours of Service	28.7%	Lighting	16.6%
Commercial Drivers' License	19.4%	Tires	9.4%
		Load Securement	15.7%
Total	88.1%	Total	82.9%

Source: http://www.intellidriveusa.org/benefits/com-vehicles.php (last accessed on November 28, 2010)

Given the above facts, there is tremendous potential for wireless roadside inspection based on the Connected Vehicle program. The typical data collected by a smart roadside system is shown in Table F.4.9 below.

Table F.4.9 Typical Data transmitted to central Smart Roadside system

Application / Data	E-Screening	Truck Size & Weight	Wireless Roadside Inspection	Truck Parking	Environment*	Smart Freight Mobility*
Transponder ID	■	■	■	■		
USDOT Number	■	■	■			
License Plate Number	■	■	■			
Weight (e.g, static scale, WIM, self-weight)	■	■	■			
SAFER Carrier Snapshot (safety & credentials data)	■	■	■			
SAFER Vehicle Snapshot (safety & credentials data)	■	■	■			
Pass/Fail Data (screening decision)	■	■	■			
Truck Size & Weight Pass/Fail Data	■	■	■			
WRI Results	■	■	■			
Truck Dimensions		■	■	■		
Driver Identification		■	■			
Driver History		■	■			
Tractor ID (VIN)			■			
Shipment ID			■			
Trailer ID(s)			■			
Driver Log (Hours of Service)			■	■		
Vehicle Measures -Brakes			■			
Vehicle Measures - Tires			■			
Vehicle Measures - Location			■			
Vehicle Status - Lighting			■			
Vehicle Status - Safety Belts			■			
Parking Space Data				■		
Parking Space Availability		■		■		
** Data Under Analysis*						

Source: http://www.intellidriveusa.org/508/Library/technical/commercial-vehicles/Smart%20Roadside%20White%20Paper%20Final%20April%202010.htm.

F.5 Technology Implementation

Based on the results of the previous sections, and starting with a comparison of the benefits, costs and utilities of the three technology service alternatives presented in Section F.4, this section provides a realistic, near-term, and achievable border freight mobility technology implementation plan for the El Paso region. A key element of this plan is selecting the appropriate elements from the technology service alternatives that can be controlled and deployed at a regional level, and that also can result in achieving significant benefits within a relatively short period of time.

More specifically, this section is intended to provide TxDOT and the El Paso region with a high-level blueprint that can support near-term design and implementation of a ***Border Freight Traveler and Cargo Information System*** that can be designed, tested, and deployed within the next two to four years.

Comparative Analysis of the Technology Service Alternatives

Table F.5.1 provides a high-level comparative analysis of the costs and benefits of the three Technology Service Alternatives, stratified by cost, travel-time benefits, safety-security benefits, long-term service support, technology usability and scalability, institutional complexity, and deployment feasibility in the El Paso region. These high, medium, and low ratings were based on a synthesis of the following:

- Results of the Section 4.0 assessments;
- Results of the literature review conducted for this planning document (i.e., research studies, benefits assessments, concepts of operation);
- Results of the stakeholder interviews conducted in the El Paso region;
- Results of technical discussions held with technology project leaders, including the Texas Transportation Institute, SecureOrigins, the City of El Paso, and the FHWA Office of Freight Management and Operations;
- Results of the available cost data collected on the technologies (see Appendix B);
- The current status of U.S. DOT-related programs that may impact the deployment of these technology services (e.g., C-TIP, Connected Vehicle, Smart Roadside); and
- Cambridge Systematics staff expert opinion based on conducting multiple research studies, assessments, tests, and evaluations of analogous technologies over the past decade.

Table F.5.1 Comparative Analysis of the Technology Service Alternatives

Technology Service Alternative	Level of Cost of Investment, Operations and Maintenance	Travel-Time Benefits (Savings and Reliability)	Improvement in Level of Safety and Security	Long-Term Service Support	Technology Usability and Scalability	Level of Institutional Complexity	Feasibility to Deploy at a Regional Level
Traveler Information System With/Without Dynamic Route Guidance	◒	●	○	◒	◒	○	●
Fleet Security and Freight Information Management System	●	○	●	◒	●	◒	○
Advanced Roadside Inspection System	◒	◒	◒	●	●	●	◒

Low ○, Medium ◒, High ●

The following conclusions can be developed and supported from this comparative analysis:

- In assessing which of the technology service alternatives could realistically be deployed regionally in a short period of time, the Traveler Information System technologies are demonstratively more achievable than the other service alternatives. The key factors supporting this are:
  - The benefits to freight mobility in crossing the border would be the most significant here of all the service alternatives, with reductions in border delay time and improved travel-time reliability the key major benefits.
  - The level of institutional complexity is significantly reduced here in that these technologies can be deployed with minimal coordination with CBP and other Federal and state agencies associated with border processes.
  - The technical feasibility to deploy this system in the El Paso region should be low in risk; in fact, TTI, Secure Origins, TxDOT, the City of El Paso, and FHWA already have deployed or currently are testing prototypes of most of the core enabling technologies that would support this service alternative. Additionally, dynamic mobility applications could be added later in the deployment after the results and open-source software development package for C-TIP is made available by the FHWA.

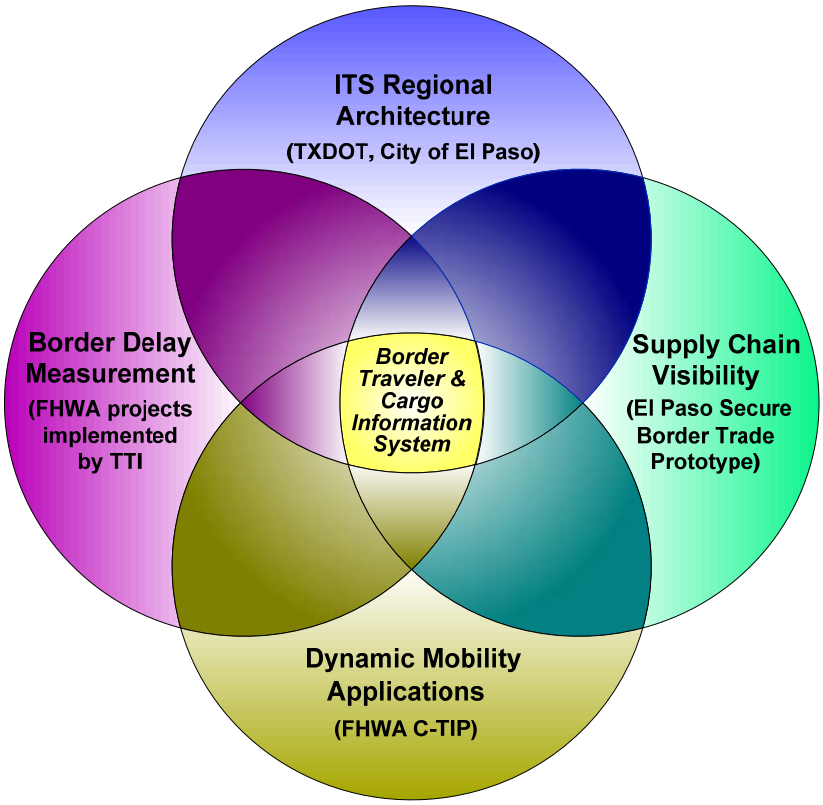
  - While the traveler information system will require significant upfront costs to deploy, once deployed the operations and maintenance costs are expected to be reasonable.

- The Fleet Security and Freight Information Management System technology service alternative – in particular, the security functions and technologies – would involve significant daunting challenges to deployment related to the necessity of coordination at the institutional level with CBP and FMCSA, and also at the system level with FAST, ACE, IBC, and CVISN. The operational security aspects of this system also would need to be coordinated in detail with DHS. Therefore, in relation to the security component of this service alternative, it is recommended that these technologies be developed separately at the Federal level, and should not be incorporated into the near-term implementation of this project.
  - One key nonsecurity function of this service alternative that could be deployed in the El Paso region in the near-term would be the supply chain information technology component. In particular, the SecureOrigins LiveLogistics system, currently in the operational testing phase in the El Paso border region, could potentially be deployed in a manner that would provide key supply chain information (e.g., electronic manifests, pickup and arrival locations, times and reservations, cargo sensor/RFID polling of trailer/container contents, etc.).
- The Advanced Roadside Inspection System is a viable technology service alternative that could be deployed in the near term. However, FHWA is about to proceed with a 2.5-year, $3 million field operational test of Smart Roadside technologies, which will in turn support the development of future electronic roadside inspection technologies under the U.S. DOT Connected Vehicle program. Based on this, and given that any such system would need to be consistent with U.S. DOT's processes and systems, it is recommended that any potential El Paso border region deployment of advanced roadside inspection systems be tabled for several years until these U.S. DOT programs and processes are more fully developed.

Candidate System Overview

Based on the results of the comparative analysis, as presented in Figure F.5.1, four program/technology elements can be integrated to develop a near-term system which would be focused on providing border information to travelers, commercial vehicles, fleet managers, manufacturers, maquiladoras and others. Key functions and components of these programs would be integrated to form a "system of systems" approach for achieving a near term capability for the El Paso region to support reductions in commercial vehicle travel-time and improved supply chain efficiency for cross-border freight transportation logistics.

Figure F.5.1 Elements of the Border Traveler and Cargo Information System



The advantage of this approach is that these projects can leverage the technologies currently being developed and deployed by the public and private sectors, including the El Paso Regional ITS, the TTI-developed border crossing information system, and the emerging border logistics information technologies being developed by Secure Origins with the LiveLogistics system. When combined with RFID tags on trucks that measure travel times, along with DMS and TxDOT 511 systems, these systems can be integrated to form a system that can successfully provide information to border travelers well in advance of the key decisions they make concerning travel decisions and routing, potentially resulting in decreases in border congestion and improvement in air quality. Furthermore, when the FHWA's C-TIP dynamic mobility technologies are integrated into this system, additional benefits in travel-time reduction and associated benefits can be realized. The following provides some addition information on each of the four major components of this concept:

- **El Paso ITS Regional Architecture.** The architecture provides the basis by which the static traffic sensors and communication devices are fielded to support the traveler information functions. The architecture also provides for traveler information disseminations through standard means, such as dynamic message signs, highway advisory radio, and web sites. The

architecture also can serve as the basis by which TxDOT and the City of El Paso can deploy additional regional ITS sensors to provide the full regional coverage needed to support travel-time predictions and rerouting functions associated with the future dynamic mobility applications.

- **Border Delay Measurement**. This component is based on a system, using ITS and RFID sensors, that currently is being developed by TTI for the City of El Paso. It would serve as an enabling system to support border delay measurement at each of the three commercial crossings. This includes the Regional Mobility Information System Version 1.0, as well as the set of projects to fully measure border crossing times using RFID technology for trucks at the Bridge of the Americas, including wait time prior to the primary CBP inspection booth and the secondary state safety inspection for regular, FAST and SENTRI vehicles. Moreover, it includes the integration of these functions by TTI into a border crossing time information with the regional traffic database.
- **Supply Chain Visibility.** This component is based on a system that currently is undergoing operational testing by SecureOrigins in the El Paso region. Through the use of RFID, sensors and an intelligent IT system, the LiveLogistics system will provide freight forwarders, 3PLs, and logistics staff with real-time supply chain status information such as detailed cargo information, predicted shipment arrival times, disruption information, and remediation options.
- **Dynamic Mobility Applications (DMA).** This component would leverage the near-future development and release of DMA applications for commercial vehicles that currently are being tested under the FHWA C-TIP program in Kansas City. This will provide a capability for a truck driver, though a software application deployed on his/her SmartPhone or other device, to receive real-time alternative routing recommendations based on congestion and traffic information collected by the system as well as complex predictive algorithms in the system software.

The primary expected benefits of this "Border Traveler and Cargo Information System" would be largely three-fold:

1. Travel-time reductions through improved information available well upstream of key commercial driver decision points (e.g., the driver could divert to another commercial crossing to avoid congestion) through multiple sources, including dynamic message signs, cell phone alerts, Smart Phone Application alerts, Internet alerts (e.g., accessed by dispatchers). Additional benefits of highly accurate estimates of border delay times at each crossing include improved travel-time reliability and customer satisfaction.
2. Further improvement of travel-time reductions through the implementation of cutting-edge dynamic mobility applications (DMA) technologies. These technologies, which can reside on Smart Phones or in-vehicle devices, would

allow for real-time rerouting of trips for commercial vehicle drivers based on real-time congestion information.

3. Greater supply chain efficiency in terms of cross-border freight movements for maquiladoras and others. For example, for a warehouse receiving goods, the ability to obtain in real-time the location, cargo information, and predicted time-of-arrival of cross-border freight shipments could greatly aid in scheduling and planning for avoidance of loading dock and facility truck queues.

Implementation Plan Guidance

Table F.5.2 provides recommended planning guidance to TxDOT, the City of El Paso, and others concerning how an implementation of the Border Traveler and Cargo Information System could potentially be achieved by 2015. This table provides a specific list of recommended actions and processes that TxDOT and others may wish to implement to facilitate deployment of the Border Traveler and Cargo Information System. These implementation actions will be considered, refined, and documented within the Port of Entry Plan Final Report, when completed.

Table F.5.2 Border Traveler and Cargo Information Implementation Plan Overview

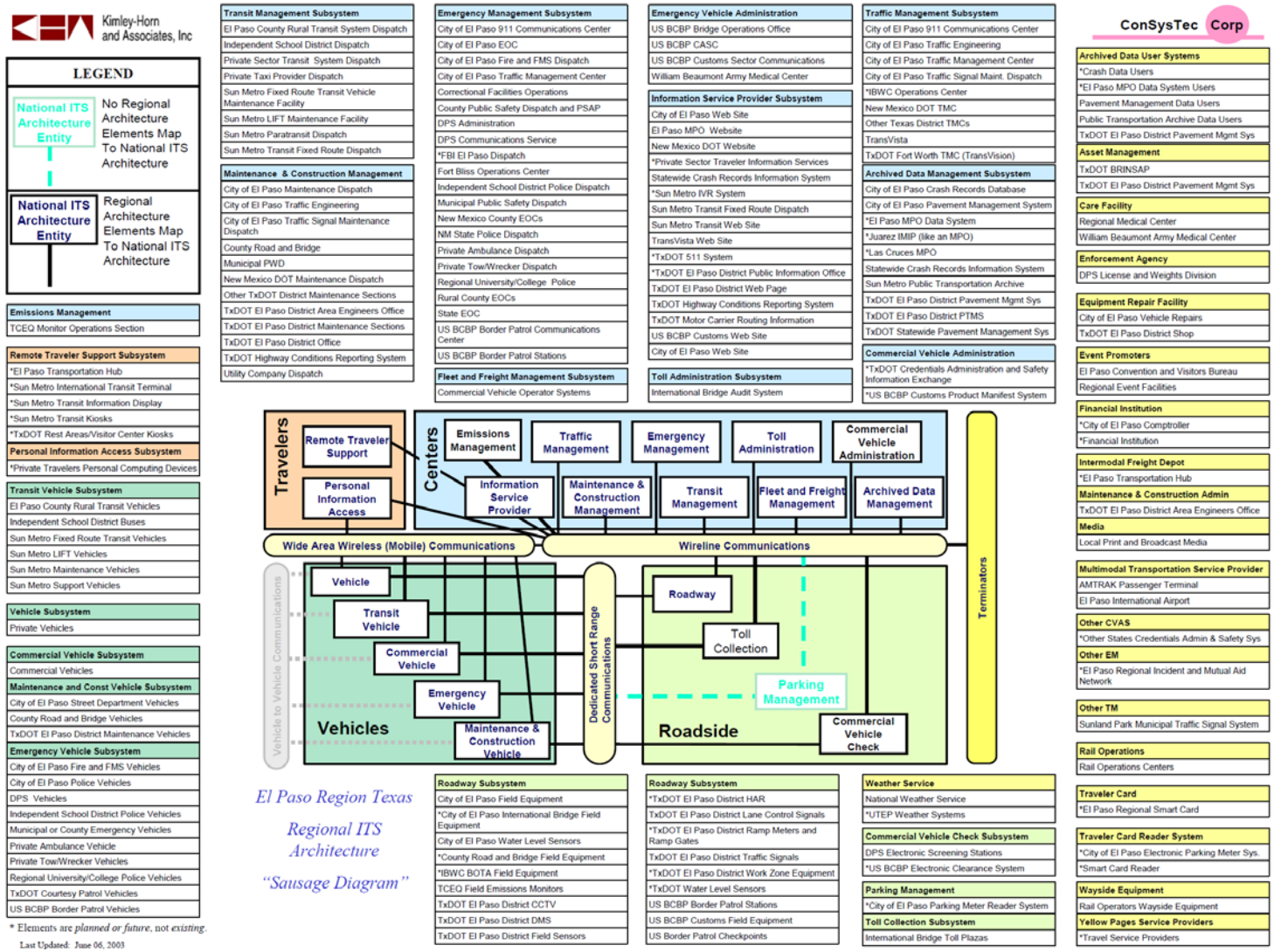
	General Program Elements	Implementation Approach	Recommended Actions to Facilitate Implementation
Phase I 2011 to 2013	• Alert and diversion information provide on Dynamic Message Signs, TxDOT 511 and Highway Advisory Radio • Assess reliability and accuracy of commercially available travel-time information • Expand RFID-based truck tracking for travel-time measurement – deploy at all 3 commercial crossings • Deploy Integrated border travel-time and mobility information system • Market research and implementation on expanded traveler information to cover more areas • Conduct supply chain testing using a real-time tracking system and fusing of cargo information	• Integrate three distinct systems to achieve an operational capability for a Border Freight Traveler and Cargo Information System: – El Paso Regional ITS (including city of El Paso and TxDOT elements) – TTI RFID Border Delay System (currently under development) – Secure Origins Supply Chain Information (based on elements of current Operational Test)	• Develop a Steering Committee in early 2011 that includes the key public and private stakeholders and champions of the three distinct systems • Work with border industry partners to develop appropriate supply chain information output from the system • Assess, develop and implement and integration approach: – Develop an overall Concept of Operations – May require some significant technical changes to the three projects – Will likely require an additional funding source • Develop Business Plan and guidance for long-term operations, maintenance and upgrades to the system
Phase II 2013 to 2015	• Evaluation of Dynamic Route Guidance (DRG) technologies • Develop DRG and wireless technology algorithms that can facilitate border crossing DRG applications	• Expand the Border Freight Traveler and Cargo Information System to include Dynamic Route Guidance Applications: – Based on FHWA-developed C-TIP Applications and Software (C-TIP Operational Test currently underway in Kansas City)	• Work with FHWA to develop a C-TIP Dynamic Mobility Application (DMA) test project for El Paso region covering border-specific dynamic routing – Based on FHWA-developed C-TIP Applications and Software package (available in 2012) – Apply for U.S. DOT DMA funding under Connected Vehicle Program • Deploy DMA prototype in 2013; expand and operationalize across the El Paso border region in 2014-15

Technical Appendices

F.6 Appendix. Regional ITS Architecture of El Paso MPO

The "sausage" diagram and elements of the existing regional ITS architecture of El Paso MPO, developed by Kimley-Horn and Associates, Inc. in association with ConSysTec Corp in 2003, is shown in Figure F.6.1.

Figure F.6.1 Elements of Existing Regional ITS Architecture of El Paso MPO



Source: http://www.consystec.com/texas/web/elpaso/images/sausage.pdf (last accessed on November 29, 2010).

F.7 Appendix. Unit Costs for Technology Service Components

The costs of equipment for the technology service alternatives were identified from the costs database of the ITS Deployment Tracking Project, ITS Joint Program Office, U.S. DOT, as shown in Table F.7.1 to Table F.7.9

Table F.7.1 Equipment Cost for Information Service Provider (ISP)

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Basic Facilities, Comm. for Large Area – ISP	IS019		5745 (1995)	574-862 (1995)	For population >750,000 (stand-alone). Based on purchase of building rather than leasing space. Communications includes communications equipment internal to the facility such as equipment racks, multiplexers, modems, etc.
Information Service Provider Hardware	IS001	5	18-27 (2004)	0.4-0.5 (2004)	Includes two servers and five workstations. O&M is estimated at 2 percent; could be higher for responsive and preventative maintenance.
Systems Integration	IS017	20	88-108 (1998)		Integration with other systems.
Information Service Provider Software	IS002	20	273-547 (1995)	13.7-27.3 (1995)	Includes database software (COTS) and traffic analysis software.
Map Database Software	IS003	2	10-29 (2005)		Software is COTS.
Information Service Provider Labor	IS004			277-396 (1995)	Three staff. Salary cost are fully loaded prices and include base salary, overtime, overhead, benefits, etc.
FM Subcarrier Lease	IS005			113-226 (1995)	Cost is per year.
Hardware Upgrade for Interactive Information	IS006	5	8-12 (2004)	0.16-0.24 (2004)	Includes one server and two workstations. O&M is estimated at 2 percent; could be higher for responsive and preventative maintenance.
Software Upgrade for Interactive Information	IS007	20	249-497 (1995)	12-25 (1995)	Trip planning software (includes some development costs).
Added Labor for Interactive Information	IS008			158-238 (1995)	Two staff. Salary cost are fully loaded prices, including base salary, overtime, overhead, benefits, etc.
Software Upgrade for Route Guidance	IS009	20	249-497 (1995)	12-25 (1995)	Route selection software. Software is COTS.
Map Database Upgrade for Route Guidance	IS010	2	99-199 (1995)		Map database software upgrade.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Information+Service+Provider+(ISP) (last accessed on November 29, 2010).

Table F.7.2 Equipment Cost for Roadside Information

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Roadside Message Sign	RS010	20	33-50 (1995)	2-2 (1995)	Fixed message board for HOV and HOT lanes.
Wireline to Roadside Message Sign	RS013	20	6-8 (1995)		Wireline to DMS (0.5 mile upstation).
Dynamic Message Sign	RS015	10	41-101 (2005)	2.0- 5 (2005)	Low capital cost is for smaller DMS installed along arterial. High capital cost is for full matrix, LED, 3-line, walk-in DMS installed on freeway. Cost does not include installation.
Dynamic Message Sign Tower	RS016	20	28-136 (2005)		Low capital cost is for a small structure for arterials. High capital cost is for a larger structure spanning three to four lanes. DMS tower structure requires minimal maintenance.
Dynamic Message Sign – Portable		14	15.9-21 (2005)	0.5-1.6 (2005)	Trailer mounted DMS (three-line, 8-inch character display); includes trailer, solar or diesel powered, and equipped with cellular modem for remote communication and control. Operating costs are for labor and replacement parts.
Highway Advisory Radio	RS017	20	15-36 (2005)	0.6-1 (2005)	Capital cost is for a 10-watt HAR. Includes processor, antenna, transmitters, battery back-up, cabinet, rack mounting, lighting, mounts, connectors, cable, and license fee. Super HAR costs can exceed $9K additional. Primary use of the super HAR is to gain a stronger signal.
Highway Advisory Radio Sign		10	4-8 (2005)	0.22 (2005)	Cost is for a HAR sign with flashing beacons. Includes cost of the controller.
Roadside Probe Beacon	RS020	5	4-6 (2001)	0.4- 0.6 (2001)	Two-way device (per location).
LED Count-down Signal		10	0.261-0.361 (2001)		Costs range from low (two 12x12-inch dual housing unit) to high (16x18-inch single housed unit). Signal indicates time remaining for pedestrian to cross, and a walk or don't walk icon. Count-down signals use low 8-watt LED bulbs, which require replacement approximately every five to seven years.
Pedestrian Crossing Illumination System		5	22.8 – 35 (2003)	2.2 – 3 (2001)	The capital cost range includes cost of equipment and installation. Equipment includes fixtures, four lamps per lane for a three lane crosswalk, controller, pole, and push button activator. Installation is estimated at 150 percent to 200 percent of the total equipment cost. Capital cost would be greater if the system included automated activation of the in-pavement lighting system. O&M is approximately 10 percent of the equipment cost.
Variable Speed Display Sign			3.0 – 4.0 (2001)		Low range is for a variable speed limit display system. High range includes static speed sign, speed detector (radar), and display system.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Roadside+Information+(RS-I) (last accessed on November 29, 2010).

Table F.7.3 Equipment Cost for Vehicle On-Board

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Communication Equipment	VS001	7	0.2-0.4 (1995)	0.004-0.008 (1995)	Wireless data transceiver.
In-Vehicle Display	VS002	7	0.03- 0.1 (1995)	0.001-0.001 (1995)	In-vehicle display/warning interface. Software is COTS.
In-Vehicle Signing System	VS003	7	0.11- 0.27 (1995)	0.002-0.005 (1995)	Interface to active tag reader, processor for active tag decode, and display device for messages.
GPS/DGPS	VS004	7	0.2-0.3 (1995)	0.003-0.01 (1995)	Global Positioning System/Differential Global Positioning Systems.
Route Guidance Processor	VS006	7	0.07-0.10 (1995)	0.001-0.002 (1995)	Limited processor for route guidance functionality.
Electronic Toll Equipment	VS008	7	0.03-0.1 (1995)		Active tag interface and debit/credit card interface.
Software, Processor for Probe Vehicle	VS020	7	0.05-0.15 (1995)	0.001-0.003 (1995)	Software and processor for communication to roadside infrastructure, signal generator, message generator. Software is COTS.
Toll Tag/Transponder		5	0.021 (2004)		Some toll agencies require users to pay a refundable deposit in lieu of purchasing a tag. The user is charged the cost of the tag if the tag is lost.
In-Vehicle Navigation System		7	2.1 (1998)		COTS product that includes in-vehicle display and supporting software.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Vehicle+On-Board+(VS) (last accessed on November 29, 2010).

Table F.7.4 Equipment Cost for Commercial Vehicle On-Board

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Electronic ID Tag	CV001	10	0.4-0.7 (1995)	0.01-0.015 (1995)	Includes ID tag, additional software and processing, and database storage. Software is COTS.
Communication Equipment – CV	CV002	10	1.1-2.1 (1995)	0.007-0.012 (1995)	Commercial vehicle communication interface and communication device (cell-based radio).
Central Processor and Storage	CV003	10	0.2-0.3 (1995)	0.004-0.01 (1995)	Equipment on board for the processing and storage of cargo material.
GPS/DGPS – CV	CV004	10	0.4-1.5 (2004)	0.10-0.5 (2004)	GPS for vehicle location. Capital cost depends on features of unit. O&M cost includes annual service fees.
Driver and Vehicle Safety Sensors, Software	CV005	10	0.7-1.5 (1995)	0.03-0.05 (1995)	Additional software and processor for warning indicator and audio system interface, and onboard sensors for engine/vehicle and driver. Software is COTS.
Cargo Monitoring Sensors and Gauges	CV006	10	0.11-0.23 (1995)	0.011-0.023 (1995)	Optional on-board sensors for measuring temperature, pressure, and load leveling.
Electronic Cargo Seal – Disposable			0.008-0.021 (2003)		Cost for a disposable radio frequency identification (RFID) E-seal that provides a complete and accurate audit trail of seal status during transport. Low is for passive, and high is for active E-seal communications.
Electronic Cargo Seal – Reusable			0.029-0.36 (2002)		Cost for a reusable radio frequency identification (RFID) E-seal that provides a complete and accurate audit trail of seal status during transport. Low is for passive, and high is for active E-seal communications. Depending on vendor, some E-seals may incur a monthly service charge.
Autonomous Tracking Unit			0.29-0.7 (2003)	0.120-0.3 (2003)	Chassis or container mounted unit that tracks location and condition of assets (cost for on-board sensors not included). Higher priced units provide greater functionality, such as polling of location information and increased quantities of sensor data. Annual service charges include the communications link between unit and data center, and information services.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Commercial+Vehicle+On-Board+(CV) (last accessed on November 29, 2010).

Table F.7.5 Equipment Cost for Personal Devices

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Basic PDA	PD001	7	0.1- 0.3 (2004)		Personal digital assistant. Personal digital assistant. O&M estimated at 2 percent of capital.
Advanced PDA for Route Guidance, Interactive Information	PD002	7	0.3-0.5 (2004)		Personal digital assistant with advanced capabilities (route guidance, interactive).
Modem Interface, Antenna for PDA	PD003	7	0.12-0.2 (1995)	0.003-0.003 (1995)	Modem interface and separate antenna for wireless capability.
PDA with Wireless Modem		2	0.2-0.5 (2003)	0.10-0.2 (2001)	Personal digital assistant with wireless modem. O&M based on monthly subscriber rate plans of 50 Kbytes (low) and 150 Kbytes (high).
GPS/DGPS	PD005	7	0.12-0.14 (2001)	0.002-0.003 (2001)	GPS/DGPS. O&M estimated at 2 percent of capital cost.
GIS Software	PD006	7	0.1-0.15 (1995)	0.005-0.008 (1995)	Additional GIS/GUI capability.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Personal+Devices+(PD) (last accessed on November 29, 2010).

Table F.7.6 Equipment Cost for Freight Management Center

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Fleet Center Hardware	FM001	10	6-8 (2004)	0.12-0.16 (2004)	Costs include three workstations. O&M estimated at 2 percent of capital cost.
Fleet Center Software, Integration	FM002	20	214-497 (1995)		Includes processor and integration. Software is COTS.
Fleet Center Labor	FM003			534-653 (1995)	Labor for five staff. Salary costs are fully loaded prices, including base salary, overtime, overhead, benefits, etc.
Software for Electronic Credentialing, Clearance	FM004	20	80-179 (1995)		Includes electronic credential purchase software, database and management for trip reports, and database management for preclearance. Software is COTS.
Software for Tracking and Scheduling	FM005	20	10-34 (2004)	4-10 (1995)	Vehicle tracking and scheduling. Software is COTS.
Vehicle Location Interface – FM	FM006	20	10-15 (1995)		Vehicle location interface from FMS to TMS.
Software Upgrade for Fleet Maintenance	FM007	20	20-40 (1995)	0.4-0.8 (1995)	Processor/software upgrade to add capability to automatically generate preventative maintenance schedules from vehicle mileage data. Software is COTS.
Integration for Fleet Maintenance	FM008	20	99-199 (1995)	2-4 (1995)	Integration with other systems.
Software Upgrade for HAZMAT Management	FM009	20	20-40 (1995)	0.4-0.8 (1995)	Vehicle tracking and scheduling enhancement. Software is COTS.
Hardware Upgrade for HAZMAT Management	FM010	5	2-3 (2004)	0.04-0.05 (2004)	Includes one workstation. O&M estimated at 2 percent of capital cost.
Electronic Cargo Seal Reader			0.2-1.2 (2002)		Unit cost depends on quantity purchased. Low cost is for handheld reader. High cost is for fixed reader. Cost will be significantly increased if reader is equipped with additional security features.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Fleet+Management+Center+(FM) (last accessed on November 29, 2010)

Table F.7.7 Equipment Cost for Commercial Vehicle Electronic Credentialing /Administration

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Computer network server for EC		4	5.0-36.5 (2004)		Each.
Personal computer (desktop or laptop) for EC administration		4	1.2-2 (2005)		Each.
Supplies and materials for EC outreach, internal and external publicity, training, other deployment support			1.3-27.2 (2003)		Per state, consumables for publicity, training, and other deployment support.
Bar code readers for law enforcement for EC			0.3-0.5 (2004)		Each.
EC software purchased for back-end admin		5	41.4-76.6 (2004)		Per state, for database management and data processing or reporting.
EC software purchased for front-end interface		5	75-273 (2005)		Per state, for user interface and data entry. Depending on the functionality of the interface being developed, the cost could be much higher or much lower than the range shown.
State employee labor for new EC software development			81-280 (2005)		Per state. For states also reporting hours, FTEs ranged from about 0.2 to 2.6 FTE. Depending on the functionality of the system being developed, the dollar cost could be much higher or much lower than the range shown.
State employee labor for new EC hardware configuration			2.9-14.4 (2003)		Per state, after original hardware installation.
Contractor labor for new EC software development			180-1083 (2003)		Per state. For states also reporting hours, FTEs ranged from about 1 to 3 FTE. Depending on the functionality of the system being developed, the cost could be much higher, or much lower than the range shown.
Contractor labor for new EC hardware			3.8-7.4 (2004)		Per state, after original hardware installation.

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
configuration					
Labor for existing (legacy) credentialing system interface and/or modification			13.9- 46.3 (2004)		Per state, includes state employees, contractors, vendors. For states also reporting hours, FTEs ranged from about 0.1 to 0.4 FTE.
Labor for EC training			6.0-14.4 (2003)		Per state cost to state agency. Examples: Start-up workshops, training and publicity materials for administrators, law enforcement, and PRISM carriers.
Other start-up labor costs			12.0-48 (2003)		Per state, includes CVISN system architect, EC feasibility study; OS/OW permitting, program queries, IFTA/IRP program staff, maintenance, miscellaneous A&E, hardware, software, planning and facilitation, training and travel.
Membership fees paid to IRP Clearinghouse (annual)				9.1-17.0 (2004)	Per state, fees set by clearinghouse pro rata, based on registered power units per state.
Annual fees to IRP EC admin (back-end)				12.8-73.5 (2003)	Per thousand accounts, for third-party administrator (e.g., VISTA, Polk).
Annual fees to IRP EC admin (front-end)				5.7-33 (2004)	Per thousand accounts, for third-party administrator (e.g., VISTA, Polk).
Recurring costs for EC outreach				0.6-1.2 (2004)	Per thousand accounts. Outreach includes marketing, promotional, attendance at trade shows, advertising, booklets.
State employee annual labor IRP credentialing				50-178 (2005)	Per thousand accounts, for legacy system (pre-CVISN) labor.
Contractor annual labor for IRP credentialing				6.9-18.5 (2004)	Per thousand accounts, for legacy system (pre-CVISN) labor.
Membership fees paid to IFTA Clearinghouse				1 (2005)	Per state, fees set by clearinghouse.
Annual fees to IFTA EC admin (back-end)				12.5-37.5 (2004)	Per thousand accounts, for third-party administrator (e.g., VISTA, Polk).
Annual fees to IFTA EC admin (front-end)				8.0-13.6 (2004)	Per thousand accounts, for third-party administrator (e.g., VISTA, Polk).

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
State employee annual labor IFTA credentialing				15.0-21.5 (2004)	Per thousand accounts, for legacy system (pre-CVISN) labor.
Vendor annual labor for IFTA credentialing				1-20.8 (2004)	Per thousand accounts, for legacy system (pre-CVISN) labor.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Commercial+Vehicle+Electronic+Credentialing+(EC)/Administration (last accessed on November 29, 2010).

Table F.7.8 Equipment Cost for Commercial Vehicle Safety Information Exchange

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Computer network server for SIE		4	4-16.6 (2004)		Each, includes mobile servers used in roadside enforcement.
Desktop personal computer for SIE		4	1-1.3 (2004)		Each, includes computers used at roadside check stations.
Laptop personal computer for SIE		3	2.0- 2.7 (2004)		Each.
Portable printer for mobile enforcement		4	0.2- 0.3 (2004)		Each.
Wireless modem for vehicle and/or roadside use		3	0.5-0.9 (2003)		Each.
Supplies and materials for SIE outreach, training			6.4 (2004)		Per state, consumables for publicity and other deployment support.
Router for SIE		5	3.3-8 (2004)		Each.
T1 Lines for SIE		5	3-30.7 (2004)		Each line.
SIE software purchased off the shelf			6.2-20.7 (2004)		Per state.
State employee labor for new SIE software development			21-132 (2005)		Per state (e.g., CVIEW (Commercial Vehicle Information Exchange Window). For states also reporting hours, FTEs ranged from about 0.2 to 2 FTE).
State employee labor for new SIE hardware configuration			6-5.8 (2004)		Per state.
Contractor labor for new SIE software development			52.1-196.7 (2004)		Per state. Depending on the functionality of the system being developed, the cost could be much higher or much lower than the range shown.

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Labor for existing (legacy) SIE system interface			81-280 (2005)		Per state, includes state employees, contractors, vendors.
Labor for training for SIE system deployment			4.6-8.2 (2004)		Per state.
Telephone and Internet annual service charges for SIE				0.5-40.9 (2004)	Per state.
Wireless communication annual charges for SIE				26.6-63.4 (2004)	Per state.
State employee annual labor for SIE				22.0-72.9 (2004)	Per state.
Contractor annual labor for SIE				16.2-46.3 (2004)	Per state.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Commercial+Vehicle+Safety+Information+Exchange+(SIE) (last accessed on November 29, 2010).

Table F.7.9 Equipment Cost for Commercial Vehicle Electronic Screening

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Computer network server dedicated to ES		5	6.6-8.6 (2004)		Each.
Desktop PC dedicated to ES		5	1.8-2 (2005)		Each.
Laptop personal computer dedicated to ES		4	2.0 (2004)		Each.
Mainline (highway speed) WIM scale		10	50.9-212.3 (2004)		Each. Depending on the functionality of the equipment deployed, the cost could be much higher or much lower than the range shown. Some states reported equipment cost only; others reported installed cost, with accessories (e.g., signs, loop detectors, w
Sorter lane (ramp speed) WIM scale		12	83.0-207.6 (2003)		Each.
ES transponder purchased by state for free distribution		5	0.01-0.04 (2004)		Each.
ES transponder purchased by state for resale		4	0.03-0.04 (2004)		Each.
Automated vehicle identification (AVI) equipment/system		10	42-84 (2004)		Each.
ES telecom. equipment (upstream to weigh station)		20	0.8-28.7 (2004)		Per state (e.g., fiber optic cable).
Electronic sign for weigh station		20	10.2-41 (2004)		Each (e.g., Open/Closed, directional arrows, or dynamic message signs).

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Loop detector for weigh station		20	1-5 (2005)		Each.
Upgrade of fixed-site weigh station for ES (excluding items listed above)			37.4-67.9 (2004)		Each. Some states reported building modifications, counters, cabinets, wiring, HVAC, structural changes to static scale building, highway poles, and bases.
One-time start-up fees paid to ES admin			17.0 (2004)		Per state (e.g., PrePass or Norpass).
Supplies and materials for ES outreach and publicity			0.6-2.6 (2004)		Per state.
ES software purchased off the shelf			0.5-4 (2004)		Per state.
State employee labor for ES software development			13.9-34 (2004)		Per state.
State employee labor for new ES hardware configuration			6-5.8 (2004)		Per state.
Contractor labor for ES software development			214.1-217.5 (2004)		Per state.
Contractor labor for new ES hardware configuration			150.4-218.7 (2004)		Per state.
Labor for existing (legacy) system interface			34-34.7 (2004)		Per state, includes state employees, contractors, vendors.
Labor for training associated with ES system deployment			4.2-23.1 (2004)		Per state.

Unit Cost Element	IDAS #	Life Years	Capital Cost $K, 2009 Dollars (Source Year)	O&M Cost $K/year, Dollars (Source Year)	Description
Annual payments made to ES admin				16 (2005)	Per state (e.g., PrePass or Norpass).
Annual maintenance cost for mainline WIM scale				44.2-108.7 (2004)	Each. Depending on the functionality of the equipment being maintained, the cost could be much higher or much lower than the range shown.
Annual maintenance cost for sorter-lane WIM scale for ES				8.5-30.6 (2004)	Each.
Annual costs for marketing, outreach, publicity, etc.				0.6-6.4 (2004)	Per state.
State employee annual labor for ES, higher-volume state				57.9-193 (2004)	Per state, volume based on relative numbers of carriers, vehicles, and inspections.
State employee annual labor for ES, lower-volume state				6-6.9 (2004)	Per state, volume based on relative numbers of carriers, vehicles, and inspections.

Source: http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCostsAdjusted?ReadForm&Subsystem=Commercial+Vehicle+Electronic+Screening+(ES)+(Preclearance) (last accessed on November 29, 2010).

G. Bridge Management White Paper

G.1 Introduction

This scan provides an overview of the range of strategies employed to manage border crossing transportation facilities at the U.S./Canadian border and at the U.S./Mexican border. The experience of other states described in this report as well as the overall Texas experience is intended to inform potential opportunities for public-private partnerships or private sector involvement at border crossings owned by the City of El Paso. It describes some of the advantages and disadvantages of varying arrangements and highlights key considerations concerning the governance structure of border crossing facilities.

This scan provides brief descriptions of existing border crossing facilities, including details of various governance structures and divisions of operational and managerial responsibilities. For a range of management strategies, we sought to determine the allocation of responsibility for the following management and operations activities:

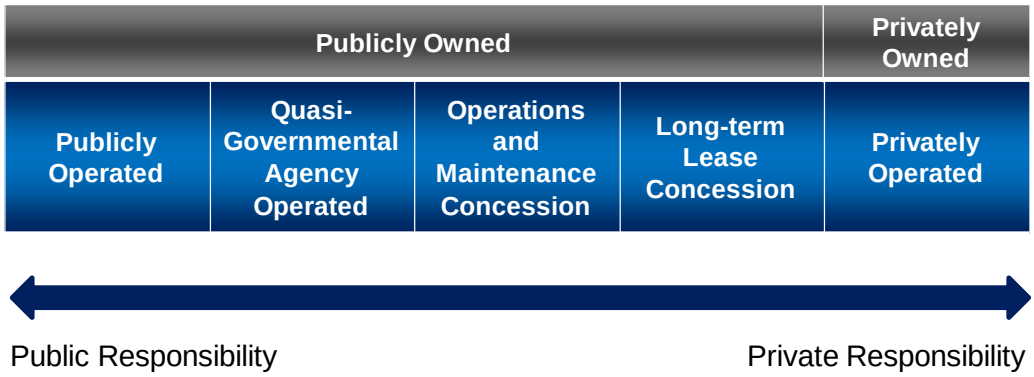
- Managing traffic operations (e.g., reducing congestion, incident management) with nearby facilities and with Federal partner agencies;
- Collecting tolls and setting toll rates;
- Performing maintenance activities;
- Managing the roadway approach networks;
- Determining when capacity expansions or other safety enhancements are necessary; and
- Coordinating with Customs and Border Protection (CBP), General Services Administration (GSA), and other Federal agencies as well as Canadian and Mexican partners.

Where available, we obtained this information for existing border crossings from publically available resources and from interviews with representatives of these facilities. The following sections describe the range of management strategies employed at border crossings across the U.S. and are intended to serve as an informative resource as the City of El Paso considers the future of its three City-owned crossing facilities and the potential application of a public-private partnership (P3) or private sector involvement.

G.2 Overview of Border Crossing Management

There is a range of potential management strategies that public agencies could use to manage and operate their border crossings (Figure G.2.1). At one end of the spectrum are ports of entry owned and operated by a governmental agency, such as the state department of transportation (DOT) or the local city or county in which the crossing is located. This arrangement is common among many of the Texas-Mexico border crossings, as well as many facilities at the northern and southern borders. At the other end of the spectrum are crossings exclusively owned and operated by a private entity. There are several notable examples of publicly owned and operated facilities in the U.S. In the middle of the spectrum are a handful of various legal agreements or P3 arrangements put in place to manage and operate the crossings(s) on behalf of a public owner. For example, quasi-governmental legal authorities are created through a binational compact of Federal charter specifically to manage and operate the crossings, although ownership is retained by the public. Short or long-term concessions split responsibilities for operations and maintenance between a private sector firm and the public owner.

Figure G.2.1 Spectrum of Port of Entry Operations and Management Arrangements

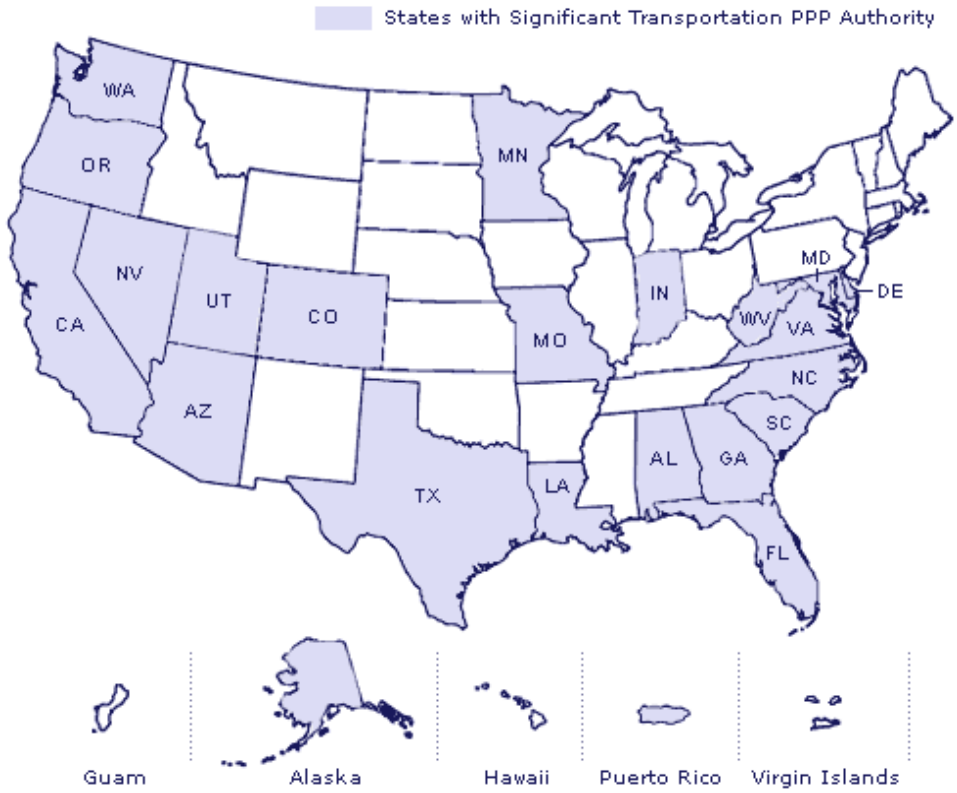


It is important to note, however, that our scan of existing crossings found very limited utilization of P3s as a method for managing and operating existing border crossing facilities. As described in the sections that follow, the State Route 11 example in California and the Detroit Windsor Tunnel provide the closest approximations of existing innovations at border crossings, though these are technically not P3 arrangements. Instead, P3s are more likely to be employed at greenfield sites, which are projects that involve a P3 arrangement to build new infrastructure. For example, Michigan is proposing to build a new bridge, the Detroit River International Crossing, on the U.S./Canada border through the use of a P3 (described in more detail below). While there are remarkably few examples today of border crossings that are publicly owned and privately operated, this may change over time as new border crossing facilities come on

line or when contract agreements sunset at existing facilities and need to be renegotiated.

While P3 arrangements at existing border crossings are uncommon, there currently are 25 states and one territory in the United States that have enacted statutes that grant agencies statutory permission to enter into P3 agreements (Figure G.2.2). All of the U.S./Mexico border states have enabling legislation in some capacity, with the exception of New Mexico. On the U.S./Canada border, only Washington State and Minnesota have P3 enabling legislation. Such uneven ability to entertain P3s proposals coupled with the General Services Administration's (GSA) preference for owning ports of entry may have implications for the future application of P3s at the two borders.

Figure G.2.2 States with Significant Transportation P3 Authority
2008



Source: U.S. Department of Transportation Federal Highway Administration, Public Private Partnerships, retrieved from http://www.fhwa.dot.gov/ipd/p3/.

G.3 Profiles of Publically Owned and/or Operated Crossings

The following are illustrative examples of border crossing facilities that are controlled by a state agency (e.g., DOT) or by either the local city or county in which they are located, as is the case with many of the Texas crossings described below. Both northern and southern states with border crossings engage in this common type of management strategy.

Blue Water Bridge, Michigan

As shown in Figure G.3.1, Michigan has four border crossings into Canada, three of which are located in southeast Michigan. Though the Detroit Windsor Tunnel and the Ambassador Bridge are in close proximity of each other, the Blue Water Bridge (Port Huron) remains within competitive distance of these bridges.

Figure G.3.1 U.S./Canada Border Crossings in Michigan

Source: Canada-U.S. Transportation Border Working Group (TBWG).

The Blue Water Bridge border crossing is owned and operated by the Michigan DOT. The bridge provides an international crossing between Port Huron, Michigan and Point Edward, Ontario. To construct the bridge, a State Bridge Commission was legislatively formed in 1935 and was empowered with selling bonds that would be retired with toll revenue within 30 years. The enabling legislation assumed that each respective government would be responsible for the highway system feeding into it and for operation of its part of the bridge. As a result, ownership and responsibility for the bridge is split between the Michigan DOT and the Canadian Federal government (via the Blue Water Bridge Authority, which was created by an Act of Parliament and is under control by the Federal government). Toll and inspection plazas (e.g., customs, immigration) are located on each side of the border.

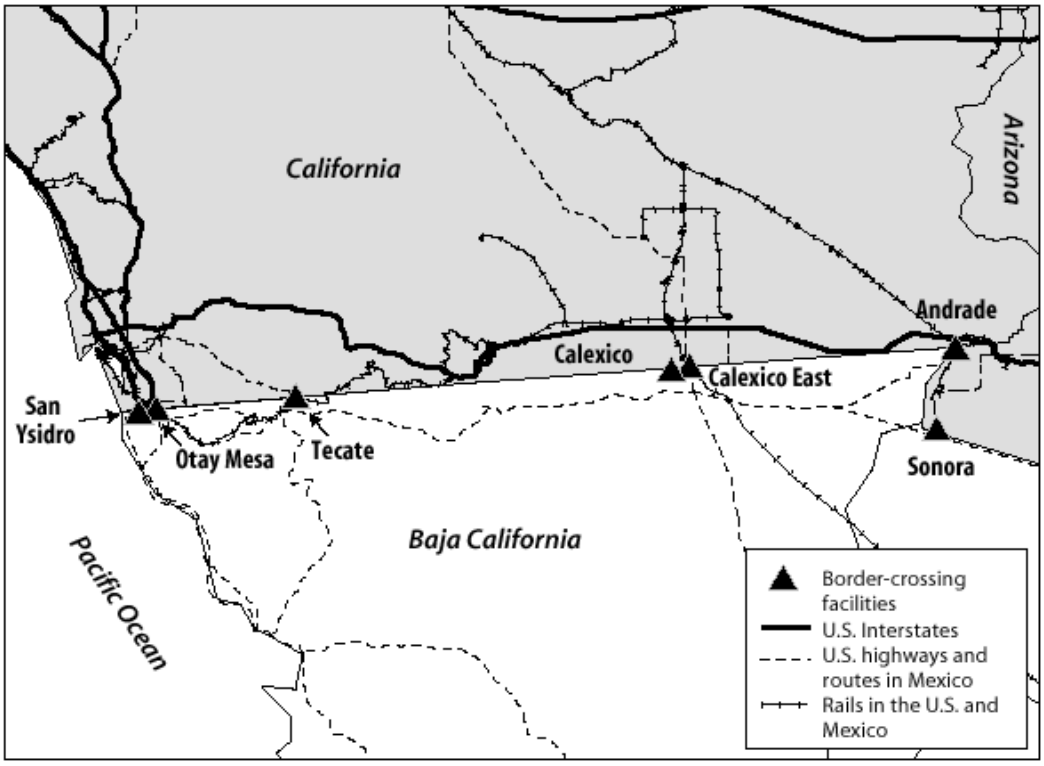
The State Bridge Commission was disbanded in the mid 1960s and all its functions were transferred to the Michigan DOT. A second bridge was constructed in the mid 1990s to accommodate increased traffic and future demand. The second bridge was similarly financed using bonds supported by toll revenues. Extensive coordination between the DOT and the Canadian government was required to complete the second span. Michigan DOT staff are now responsible for managing and operating the U.S. portion of the bridge.

Approach to Otay Mesa East, California

There are six existing port of entry locations in California (see Figure G.3.2 below), none of which operate as toll facilities. However, the California DOT (Caltrans) is moving forward with building a new four-lane highway (State Route 11) to facilitate access to a new port of entry border crossing, known as the Otay Mesa East Port of Entry. The highway will be 2.5 miles and located off the State Route 125/ State Route 905 interchange in Otay Mesa, San Diego and in close proximity to the existing Otay Mesa Port of Entry.

In cooperation with the Federal Highway Administration (FHWA), Caltrans is responsible for designing and constructing the new highway facility and the U.S. General Services Administration (GSA) for the new port of entry. Legislative action was required to give toll financing powers to the San Diego Association of Governments (SANDAG) in order to finance the highway project. As enacted, the law explicitly prohibits leasing the toll road to a private-sector entity, which eliminates potential for a toll concession procurement or public-private partnership. All toll revenues will be used to retire bonds, for operating the facility (e.g., administration, toll collection), and for capital improvements.

Figure G.3.2 U.S./Mexico Border Crossings in California



Source: U.S. Department of Transportation

Texas

There are 24 international bridges open for vehicular crossing between the U.S. and Mexico located along the Texas border (Figure G.3.3). As shown in Table G.3.1, the majority of Texas border crossings are owned and operated by cities, with only four crossings owned and operated at the county level. There also are four privately owned border crossings and five owned by the Federal government.

For the city/county-owned Texas-Mexico border crossings listed in Table G.3.1, maintenance and traffic management operations are performed in-house. Each city or county bridge department or associated "Bridge Board" is responsible for setting tolls. Toll rates are determined based on revenue comparison with other border cities and approved by their respective City Councils or County Commissioners. As noted in Table G.3.1, traffic management techniques vary slightly based on operator. Operators of multiple bridges (Cameron County, City of Laredo, City of Eagle Pass and City of El Paso) have the ability to divert traffic to other crossings when congestion occurs at a particular bridge. Personnel from the local police department, traffic safety department, or in-house security employees assist with traffic diversion and constructing barricades, if necessary. Operators also are responsible for improvements and

expansion at the crossings. In partnership with CBP, the city/county agencies identify potential improvement projects and are responsible for implementing the projects.

Figure G.3.3 U.S./Mexico Border Crossings in Texas

Source: Texas Comptroller of Public Accounts and TxDOT.

Table G.3.1 City/County Ownership of Texas-Mexico Border Crossings

Border Crossing	Owner/Operator	Notes
Veterans International Bridge at Los Tomates	Owner: Cameron County and City of Brownsville Operator: Cameron County International Bridge System	The "Cameron County International Bridge System" is the official name given to the county department responsible for bridge operations.
Gateway International	Owner: Cameron County Operator: Cameron County International Bridge System	
Free Trade	Owner: Cameron County (50 percent), City of San Benito (25 percent), and City of Harlingen (25 percent) Operator: Cameron County International Bridge System	Traffic diversion rare. Personnel direct traffic when necessary.
Pharr-Reynosa International Bridge on the Rise	Owner: City of Pharr Operator: City of Pharr	Recently installed 2 mobile units to the west of toll booths to manage increased traffic flows.
McAllen-Hidalgo-Reynosa	Owner: City of McAllen Operator: City of McAllen	Traffic diversion unnecessary.
Anzaldúas International	Owner: City of Hidalgo, City of McAllen, and City of Mission Operator: City of McAllen	
Roma-Ciudad Miguel Alemán	Owner: Starr County	
Juárez-Lincoln	Owner: City of Laredo Operator: Laredo International Bridge System	The "Laredo International Bridge System" is the official name given to the city department responsible for bridge operations. The Laredo International Bridge System works closely with the Traffic Safety Department to reroute traffic in case of holiday or known events. They also put up electronic message signs if rerouting is expected.
Gateway to the Americas	Owner: City of Laredo Operator: Laredo International Bridge System	
World Trade Bridge	Owner: City of Laredo Operator: Laredo International Bridge System	
Laredo-Colombia Solidarity	Owner: City of Laredo Operator: Laredo International Bridge System	
Camino Real International	Owner: City of Eagle Pass Operator: Eagle Pass Bridge System	The Eagle Pass Bridge System is the official name given to the city department responsible for bridge operations.

Border Crossing	Owner/Operator	Notes
Eagle Pass Bridge I	Owner: City of Eagle Pass Operator: Eagle Pass Bridge System	The police department assists in diversion of traffic when necessary. Use of barricades and personnel, not electronic messaging system.
Del Río-Ciudad Acuña	Owner: City of Del Rio Operator: City of Del Rio	
Ysleta-Zaragoza	Owner: City of El Paso Operator: City of El Paso	
Good Neighbor	Owner: City of El Paso Operator: City of El Paso	
Paso Del Norte	Owner: City of El Paso Operator: City of El Paso	

Source: Adapted from TxDOT's *2010 Texas-Mexico International Bridges and Border Crossings Existing and Proposed*, and interviews with City/County owners.

G.4 Profiles of Publicly Owned, Quasi-Governmental Operated Crossings

Quasi-governmental authorities are a common management strategy for publicly owned crossings at both the northern and southern borders. These facilities are largely operated by a legal entity created through a binational compact or Federal charter specifically to manage and operate the crossing(s). Ownership of the actual facility is retained by the public, such as a state DOT.

New York

New York Buffalo and Fort Erie Public Bridge Authority

The Peace Bridge is a large international toll crossing facility connecting Buffalo, New York and Fort Erie, Ontario (see Figure G.4. below). Tolls are collected one-way only when crossing from the United States into Canada, with the majority of revenues collected from commercial tolls. The bridge was originally constructed, owned, and operated by a private sector firm known as the Buffalo and Fort Erie Public Bridge Company. After the Company experienced financial difficulties, the Buffalo and Fort Erie Public Bridge Authority was created as a public benefit corporation in 1933 through an international compact entered into by the State of New York, with the consent of the United States Congress, and by the Government of Canada. The organizing legislation creating the Authority enabled it to purchase the assets and rights of the Company, take title to the Peace Bridge, and serve as the successor in interest to the original Company.

For over 75 years the Authority has served as an owner, operator, and landlord for Customs and Immigration on both the Canada and U.S. side of the border, duty free stores, commercial operators, and communication conduits. As a binational toll bridge operator for the entire length of the bridge, the Authority earns revenue and incurs expenses in both the U.S. and Canada. The Authority does not possess taxing power, but it has utilized its bonding authority. Until July 1, 2020, or once all bonds issued by the Authority have been retired (whichever is later), the title to the properties and assets of the Authority will be transferred over to the State of New York and Canada. All bond obligations (principal and interest and any other agreement with bond holders) lie with the Authority and are not a debt of the State of New York or the government of Canada.

The Peace Bridge is the only border crossing controlled by the Authority. The Board of Directors governs the Authority and is comprised of an equal number of representatives from the U.S. and from Canada. In addition to its tolling power, the Authority is authorized to acquire and dispose of property and also has limited power of eminent domain to acquire surrounding property on the U.S. side only for a capacity expansion project, which currently is underway.

Both the U.S. and Canadian governments recognize the Authority's exclusive franchise of the bridge, which prohibits the construction of bridges for a similar purpose without the Authority's consent within six miles of the Peace Bridge.

Figure G.4.1 U.S./Canada Border Crossings in New York

Source: Canada-U.S. Transportation Border Working Group (TBWG).

Niagara Falls Bridge Commission

The Niagara Falls Bridge Commission was originally conceived to finance, construct, and operate the Rainbow Bridge and later assumed responsibilities for the Whirlpool Rapids (Lower) Bridge and the Lewiston-Queenston Bridge, which like the Peace Bridge serves a high volume of commercial traffic. As shown in Figure G.4., these bridges are part of a system of bridges connecting the

Buffalo/Niagara Falls area, with Ontario, Canada. The Lewiston-Queenston connects two communities: the Town and Village of Lewiston, New York, with the Village of Queenston in the Town of Niagara-on-the-Lake, Ontario. This bridge serves both commercial and personal vehicles. The Rainbow Bridge connects the tourist districts of Niagara Falls, N.Y., with Niagara Falls, Ontario and largely serves personal vehicles. The Whirlpool Bridge connects the commercial zones and downtown districts of Niagara Falls, N.Y., with Niagara Falls, Ontario, and is reserved for subscribers to NEXUS.[111]

The Commission was established in 1938 by a congressional Joint Resolution and by a private, not for profit public benefit corporation licensed as an Extra Provincial Corporation by the Province of Ontario. Like the New York Buffalo and Fort Erie Public Bridge Authority, a Board of Directors comprised of an equal number of representatives from the U.S. and from Canada govern the Commission. The Commission also can issue Federal (U.S.) tax-exempt bonds.

The Commission owns and operates all facilities, including leased space by private-sector tenants (e.g., commercial brokers, duty free stores) and buildings for Customs and Immigration functions on both the Canada and U.S. side of the border. The Commission will cease operations and the bridges will be transferred to the State of New York and the Province of Ontario once all Bridge Revenue Bonds are retired.

In New York, there have been discussions about consolidating the two entities (Buffalo and Fort Erie Public Bridge Authority and Niagara Falls Bridge Commission) that govern the State's border crossings. Given that the institutional framework already is established, New York could easily consolidate bridge activities should it choose to. To date there has been no active movement toward such a merger, however.

Sault Ste. Marie Bridge (International Bridge) Authority, Michigan

The State Of Michigan created the International Bridge Authority (IBA) in 1935 and the Canadian Parliament created the St. Mary's River Bridge Company (SMRBC) in 1955 to construct the International Bridge to connect Sault Ste. Marie, Ontario with Sault Ste. Marie, Michigan (shown in Figure G.3.1). The bridge was financed by two series of bonds – the first to be paid off in 1983 and the other in 2000. Both the U.S. and Canadian sides of the bridge were operated by the IBA, until the final bonds were retired in 2000. After that the two governments agreed to form a new entity, known as the Sault Ste. Marie Bridge Authority (SSMBA), to jointly manage and operate the bridge on behalf of the

[111] NEXUS is designed to expedite the border clearance process for low-risk, pre-approved travelers into Canada and the United States. More information available at: http://www.cbsa-asfc.gc.ca/prog/nexus/menu-eng.html

Michigan DOT and the SMRBC. A copy of the intergovernmental agreement for the International Bridge is provided in Section G.7. The SSMBA is specifically responsible for:

- Approving bridge tolls,
- Operating budgets and business plans,
- Developing rules for the use of the bridge and related properties,
- Approving property purchases and capital investments, and
- Providing oversight of investments of the bridge reserve fund.

The GSA owns the plaza property and buildings used by the various border inspection agencies, but the bridge is owned by the SSMBA.

From an administrative standpoint, the IBA is a division of the DOT, but all decision-making authority is vested with the Authority. The IBA is staffed with over 30 dedicated staff from the DOT. The IBA is responsible for operating and maintaining the bridge under the direction of the SSMBA Board of Directors. Large, complex projects associated with the bridge are contracted to the private sector, but routine maintenance activities are completed by the IBA. In addition, all toll collections are handled by IBA staff. All toll revenues are then recycled into IBA-related activities. Specific responsibilities related to port of entry operations and management are broken out as follows:

- IBA staff and management are responsible for determining routine maintenance and repair and a private consulting and engineering firm is retained on a renewable three-year contract to conduct annual visual inspections of the International Bridge and report on the findings and recommendations;
- IBA staff are responsible for conducting routine maintenance and repairs (e.g., small projects, snow plowing) and larger projects are contracted to the private sector;
- SSMBA Board of Directors sets the toll rates based on analysis and recommendations of the IBA;
- IBA is responsible for managing all transportation assets (e.g., roadway approach networks) between the U.S. and Canadian port of entry; and

IBA staff and management are responsible for determining when toll plaza expansions or improvements are necessary also has retained an engineering consultant to asset with asset managing of the bridge structure.

In this Michigan example, transitioning over to a new quasi-governmental entity once all bonds were retired was a natural evolution of bridge management. In essence, the decision-making function was separated from the performance of day-to-day operational activities. The IBA retained responsibility for implementing decisions, but the new framework called for a separate decision-making entity. The transition was largely administrative in nature and, since the

management framework was in place, disruptions were minimal. Overall, continued binational coordination in support of integrating activities across the entire length of the bridge has proved mutually beneficial to both governments.

New Mexico Border Authority, New Mexico

The New Mexico Border Authority was legislatively created as a state agency administratively attached to the State Economic Development Department. Authority board members are appointed by the Governor and confirmed by the State Senate. The Board sets all policy direction and staff are employed by the Authority, not the Economic Development Department.

New Mexico's three border crossing facilities (Figure G.4.2) are Federally owned by the GSA and the roadway approaches are owned by the New Mexico DOT. However, the Authority provides a statutory framework through which the State can "design, finance, construct, equip, and operate port facilities necessary to ensure the timely, planned, and efficient development of the border area between New Mexico and the Mexican State of Chihuahua."[112] The Authority is empowered to "initiate, develop, acquire, own, construct, and maintain border development projects"[113] and can charge and collect tolls and issue revenue bonds. Currently, the primarily role of the Authority is to oversee the development and promotion of State's international ports of entry located at Santa Teresa, Columbus, and Antelope Wells. For example, in August 2010, the Authority signed a $1.23 million grant agreement with the Economic Development Administration (EDA) to conduct a rail feasibility study for a potential public-private partnership rail crossing near the Santa Teresa-Jeronimo port of entry.

[112] New Mexico Statute, Article 27 Section 58-27-2. Legislative purpose.

[113]New Mexico Statute, Article 27 Section 58-27-10. Powers and duties of authority.

Figure G.4.2 U.S./Mexico Border Crossings in New Mexico

Source: New Mexico Border Authority

Arizona Port Authorities

Port authorities in the State of Arizona operate as nonprofit organizations comprised of representatives from the public and private sectors. They include the Douglas International Port Authority (DIPA), the Greater Yuma Port Authority, Inc. (GYPA), and the Greater Nogales and Santa Cruz County Port Authority. They assist in the cooperative regional efforts in their jurisdictions to enhance the regional economic development and work to promote the effective and efficient port of entry operations.

Arizona's seven border crossings with Mexico are owned and operated by GSA (see Figure G.4.3 below) and connect to state owned highways operated by the Arizona DOT.

http://www.gsa.gov/portal/content/103891

Figure G.4.3 U.S./Mexico Border Crossings in Arizona

Source: Arizona Department of Transportation (ADOT)

G.5 Profiles of Privately Owned and/or Operated Crossings

A smaller subset of border crossing facilities are owned exclusively by a private sector firm or are managed and operated by a private sector firm on behalf of a public sector client. The three border crossings in Michigan described below provide examples of a privately owned and operated bridge, a publicly owned and privately operated tunnel, and a proposed P3 greenfield bridge. Aside from these three examples, our nationwide scan revealed remarkably few examples of privately managed, publicly owned border crossings from which to compile lessons learned.

Michigan

Ambassador Bridge

The Ambassador Bridge is a major international border crossing, connecting Detroit, Michigan in the U.S. with Windsor, Ontario in Canada (shown in Figure G.3.1). The bridge is privately owned by the Detroit International Bridge Company, which received approval through Acts of both the Congress of the United States and Canada's Parliament to build, own, and operate the Ambassador Bridge in perpetuity. Since 1929, the bridge has transformed into the one of the world's busiest international border crossings.

The Detroit International Bridge Company has moved forward with plans to enhance bridge capacity through the construction of a privately financed second span backed by future toll revenues. The proposed span would be six lanes wide and located parallel to the existing bridge. The original bridge would remain in place and would serve as a relief for overflow traffic and for maintenance vehicles and special events. All environmental assessment documents have been completed and, while the project is financially viable (through private investment), it faces strong opposition on the Canadian side due to adjoining roadway connectivity issues and on the U.S. side due to longstanding political and legal issues. A competing proposal, known as the Detroit River International Crossing is described below.

Detroit River International Crossing

The Detroit River International Crossing (DRIC) project is a proposed bridge connecting Detroit, Michigan and Windsor, Ontario located about two miles south of the Ambassador Bridge. The study was undertaken through the Canada-U.S.-Ontario-Michigan Border Transportation Partnership, which was comprised of the U.S. Federal Highway Administration, Transport Canada, the Ontario Ministry of Transportation, and the Michigan Department of Transportation. The study was initiated to explore potential border crossings to meet increased long-term demand, improve system connectivity and operations and processing capability, and provide a crossing option in the event of

incidents, maintenance, congestion, or other disruptions. The study looked at other potential border crossings as well as twinning the Ambassador Bridge.

The project would be a public-private partnership between Canada, the U.S., Michigan, Ontario, and a future private partner. Unlike the Ambassador Bridge, the DRIC border crossing would be publicly owned. Though private sector participation is envisioned for the project, its role will depend on the type of procurement model used (e.g., design/build/operate/maintain). The Final Environmental Impact Statement has been completed and a bill currently is being debated in the state legislature that would permit the Michigan DOT to enter into public-private partnerships. If passed, the DRIC project could move forward. While the DRIC project has more governmental support than the proposal to twin the Ambassador Bridge, there are concerns about its financial viability without taxpayer intervention. Legislation did not pass the 2010 session, but is likely to be resurrected in the next session.

Detroit-Windsor Tunnel

The Detroit-Windsor Tunnel is an underwater vehicular tunnel that connects the downtowns of Detroit, Michigan and Windsor, Ontario. The tunnel is one mile long from portal to portal and provides two lanes of traffic that move traffic (mainly passenger, not commercial) in opposite directions. The tunnel opened to the public in 1930 after being privately financed, constructed, and owned. In 1990, after 60 years, ownership of the Canadian portion of the Detroit-Windsor Tunnel was transferred to the City of Windsor and the U.S. portion to the City of Detroit. The entire length of the tunnel and plazas are managed and operated by the Detroit Windsor Tunnel, LLC, which has a long-term lease on the facility until 2020. The Detroit Windsor Tunnel LLC, performs and is responsible for all of the following functions:

- Scheduling and performing maintenance activities;
- Setting toll rates;
- Managing the roadway approach networks;
- Deciding when expansions or other improvements are necessary;
- Coordinating all operations (special events, daily traffic management, incident management, emergency response with nearby facilities (Ambassador Bridge and Blue Water Bridge) and with key partners, (e.g., sports venues, Federal, municipal, state, and provincial agencies); and
- Coordinating inspection lane availability on-site with CBP and Canada Border Services Agency (CBSA).

Through a joint operating agreement with the City of Windsor, the Detroit Windsor Tunnel, LLC receives a management fee and is responsible for all tunnel management and operations. The City of Windsor and the company share in tunnel expenses and revenues. A separate joint operating agreement exists

with the City of Detroit, where the company pays a lease fee to the City in exchange for the right to collect and keep all toll revenue. All tunnel expenses are borne by the Detroit Windsor Tunnel, LLC.

While the respective cities own the roadway approaches to the tunnel, the Detroit Windsor Tunnel, LLC has stepped in to complete engineering and construction activities to improve the roadways. These activities are mutually beneficial and are conducted in close coordination with the cities. The Detroit Windsor Tunnel, LLC also is responsible for coordinating at the Federal and District level for all customs and immigration activities and with Federal agencies when undertaking all major enhancement projects.

G.6 Discussion

As described above, there are very few U.S. case studies of P3 agreements implemented at border crossings from which to draw lessons. Similarly, when looking beyond border crossings, our earlier memorandum (dated December 20, 2010) identified only two U.S. examples of roadway concessions for leasing existing assets.[114] P3s are complex arrangements and, given the unique security and coordination issues involved with border crossings and the limited experience of implementing P3s in these situations, the apparent knowledge gap exposes the public sector to potential risk. As the City of El Paso considers the possibility of releasing a request for information (RFI) related to privatizing some or all of their border crossing bridges, it may prove beneficial to assemble a core team of transportation finance experts to assist the City in drafting the RFI language.

As previously noted, P3s are not appropriate for every project. Similar objectives may be achieved by making changes to existing management structures. From the examples above, a binational agency with authority to operate the length of an entire crossing (e.g., International Bridge in Michigan) may be a model approach. With this approach, ownership remains with the public entities, but day-to-day management and operations on both sides of the border are consolidated, potentially capturing significant cost-efficiencies. This type of a management structure reduces the redundancies of having separate crossing operations since fewer resources are needed to operate the entire facility. Moreover, the extent to which planning activities must be coordinated between governments is reduced because the quasi-governmental agency operates off the same "business plan."

[114] Memorandum dated December 20, 2010 submitted to the City of El Paso, "Relevant PPP RFQ/RFPs for El Paso, Texas."

G.7 Intergovernmental Agreement for the International Bridge

Sault Ste. Marie, Ontario and Michigan

INTERGOVERNMENTAL AGREEMENT

for the

INTERNATIONAL BRIDGE

Sault Ste. Marie, Ontario and Michigan

Acting under the authorities cited in this Agreement, the St. Mary's River Bridge Company (SMRBC) and the Michigan Department of Transportation (MDOT) agree as follows:

I
HISTORY

Following earlier agreements, on January 15, 1960 MDOT and SMRBC entered into an agreement for the construction and operation of an international bridge between Sault Ste. Marie, Michigan and Sault Ste. Marie, Ontario. The bridge was completed and opened to traffic in October, 1962 and, until September 1, 2000, was held and operated by the International Bridge Authority under the terms of that agreement and 1954 PA 99, MCL 254.221 et seq. Construction of the bridge was financed by the sale of revenue bonds, the last of which was retired by September 1, 2000. The original agreement provided that, upon retirement of the bonds, the portion of the bridge within Ontario would be disposed of as directed by the proper authorities in Canada and the portion of the bridge within Michigan would be disposed of as directed by the proper authorities in the United States of America. Under 1954 PA 99 *supra,* the portion of the bridge in Michigan was conveyed to MDOT. In accordance with Order in Council P.C. 2000-1166 of July 28, 2000, the portion of the bridge in Ontario was conveyed to SMRBC. Since the effective date of the original version of this agreement, September 1, 2000, the Bridge has been administered, operated, repaired, and improved by the International Bridge Administration under the operational and policy supervision of the Joint International Bridge Authority (JIBA), both of which were created by the original version of this agreement. SMRBC and MDOT subsequently negotiated revisions to the 2000 Intergovernmental Agreement which revisions are incorporated into this revised Intergovernmental Agreement (Agreement).

II
PURPOSE

This Agreement confirms and continues the partnership that has been formed between SMRBC and MDOT for the continued management and operation of the Bridge as a single entity. It also establishes the Sault Ste Marie Bridge Authority (SSMBA), replacing the former JIBA as the legal entity to provide operational and policy direction for the management and operation of the Bridge by an administrative unit within MDOT, the International Bridge Administration.

III
PARTIES

Section 1. SMRBC was created by an Act of the Parliament of Canada known as An Act to incorporate St. Mary's River Bridge Company, 1955 S.C.c.64. In accordance with Order in Council P.C. 2000-1166 of July 28, 2000, SMRBC assumed ownership of the portion of the Bridge in Ontario upon retirement of the bonds. SMRBC is empowered by virtue of the said Act, and, prior to the effective date of this Agreement will be empowered by an Order in Council, to enter into this Agreement.

Section 2. MDOT is an agency of the State of Michigan, which holds ownership of the portion of the Bridge in Michigan, and is authorized to enter into this Agreement, by 1954 PA 99, MCL 254.221 et seq.

IV
DEFINITIONS AND PROVISIONS

When used in this Agreement the following words and terms have the following meanings unless the context clearly indicates a different meaning or intent:

Section 1. "Bridge" includes the existing international bridge structure, approaches, entrance plazas, toll houses, administration, storage and other buildings and facilities and all equipment therefor, and may include buses and terminal facilities, together with all property, property rights, easements and interests which were conveyed by the International Bridge Authority to SMRBC and MDOT upon retirement of the bonds or subsequently acquired with Bridge Revenue.

Section 2. "Bridge Manager" is an MDOT employee assigned as part of the IBA to perform duties as described in this Agreement.

Section 3. "Bridge Revenue" includes all funds held by the International Bridge Authority upon its dissolution, and all toll receipts, income from leases, licenses or any other source which is attributable to the use or disposition of any portion of the Bridge during the period of this Agreement, including, without limitation, interest or other money received on account of investments and the proceeds of insurance received in the event of damage or destruction of any portion of the Bridge. If funds are provided to the International Bridge Administration (IBA) by gift or grant, those funds shall constitute Bridge Revenue except as otherwise provided in the terms of the gift or grant.

Section 4. "Capital Improvement" means a project, other than repair or routine maintenance, that is intended to extend the life of the Bridge. The substantial repainting and redecking of the Bridge are Capital Improvements. To constitute a Capital Improvement, at the time that a project is approved by SSMBA total estimated project costs within a single country, including the cost of any environmental assessment, design, engineering and other related costs, must exceed $500,000. The planned construction of a new administration building is not a Capital Improvement. The Owners may consent in writing to the treatment of any given undertaking as a Capital Improvement. The Owners may also consent in writing to decrease or increase the

$500,000 dollar measure of Capital Improvements. Capital Improvements are subject to approval by the Owner that must bear their cost. The contracting process for the Capital Improvement is within the control of that Owner, subject to full coordination with SSMBA and IBA.

Section 5. The "International Bridge Administration" (IBA) is a distinct administrative entity created within MDOT as provided in the Urban Cooperation Act of 1967, 1967 Ex Sess PA 7, MCL 124.501 et seq and this Agreement.

Section 6. "Operating Expenditures" are all expenditures for the purposes described in this Agreement, other than Owners' Expenditures, funded with Bridge Revenue. They include the cost of any activities that would normally and reasonably be considered as associated with the operation, repair, improvement, administration and normal maintenance of the bridge, excepting those included in Owners' Expenditures. Operating Expenditures include depreciation of any vehicle, equipment, machinery or toll device. Operating Expenditures include the cost to construct a new administration building when approved by SSMBA and any other cost incurred for the bridge that has been designated in writing by both Owners as an Operating Expenditure.

Section 7. "Owner(s)" refers to SMRBC and MDOT.

Section 8. "Owners' Expenditures" are expenditures for (1) Capital Improvements, (2) the acquisition of title, with the consent of the Owner that would be required to bear the cost, to any additional real property (3) taxes or assessments levied on the Bridge, including payments to construct, maintain, or operate customs facilities if such costs are assessable against the Bridge, (4) compensating the members of SSMBA for their services, (5) compensating representatives of an Owner for services rendered for the Bridge, (6) compensating an Owner for expenses incurred in fulfillment of an Owner's rights and responsibilities under this Agreement, or (7) expenses arising out of the operation or administration of the Bridge that must be borne in the jurisdiction of one Owner but which may not be borne in the jurisdiction of the other Owner. An Owner may consent to designating items that would otherwise be Operating Expenditures as its Owner's Expenditures. The Owners may consent in ~~a~~ writing to share the cost of specific projects under subsections (1) or (2) of this section.

Section 9. "Owner's Reserve Account" means a financial account created and maintained for each Owner, as provided in Article XI, section 3, to be used solely for Owners' Expenditures as provided in this Agreement. Each Owner may designate how and by whom its Owner's Reserve Account will be invested and managed and may elect to take direct control over the investment of its Owner's Reserve Account consistent with the laws in the country of the Owner.

Section 10. SSMBA is a separate legal entity constituted by the Owners to oversee the operation of the Bridge, providing operational and policy direction to the Bridge Manager, and for implementation by the IBA, as provided in this Agreement. SSMBA is a corporate public body as provided in section 7 of the Urban Cooperation Act of 1967, MCL 124.507, with the powers set forth in this Agreement.

V

SAULT STE MARIE BRIDGE AUTHORITY

Section 1. SSMBA is a board consisting of eight persons, with four representatives of each Owner. SMRBC shall appoint its representatives. MDOT's representatives shall be appointed in accordance with its governing legal requirements. Subject to exercise of the power of removal and replacement under Article V, section 2, the persons serving as members of JIBA on the effective date of this Agreement remain as members of SSMBA, continuing for the terms for which they were last appointed.

Section 2. Owners' representatives shall serve for such periods as may be designated at the time of appointment; they serve at will, subject to removal or replacement at the discretion of the appointing authority.

Section 3. Corresponding powers of appointment shall be exercised by any successor or assignee to whom the power of appointment is transferred under the governing legal requirements for that Owner.

Section 4. The members of SSMBA will serve without compensation from Bridge Revenue but their reasonable expenses will be paid or reimbursed from Bridge Revenue. Such expenditures will be consistent with prevailing standards for governmental officials. Insofar as consistent with the laws and practices of its jurisdiction, an Owner may elect to compensate a member of SSMBA for services, but such compensation must be made from its Owner's Reserve Account or other funds provided by the Owner.

Section 5. SSMBA shall periodically elect a chairperson and a vice-chairperson, one from among the Michigan members and one from among the Canadian members. The offices shall alternate between Michigan and Canadian members. The terms of office shall be provided in the bylaws of SSMBA.

Section 6. SSMBA may annually establish appropriate performance measures for the Bridge Manager to achieve in the ensuing fiscal year and annually evaluate the success of the Bridge Manager in achieving those measures.

VI
INTERNATIONAL BRIDGE ADMINISTRATION

Section 1. Under the provisions of the Urban Cooperation Act of 1967 *supra*, IBA was created in the year 2000 as a separate administrative entity within MDOT with the powers specified in the original agreement. Those powers are, in part, revised by this Agreement.

Section 2. Consistent with Article XII, IBA shall be comprised of employees of MDOT assigned to carry out the responsibilities of IBA as provided in this Agreement and the policies and operational directions of SSMBA.

Section 3. A Bridge Manager who is accountable to SSMBA as described in this Agreement, shall oversee the day-to-day operation and administration of IBA, including supervision of the employees assigned to IBA. The Bridge Manager shall carry out the decisions of SSMBA and consistent with doing so, shall take operation and policy direction from the SSMBA Chair, insofar as the Chair is carrying out the decisions of SSMBA, in performing the responsibilities of the Bridge Manager.

Section 4. In lieu of assigning full time employees to perform particular functions, MDOT may assign employees to perform services for IBA on a part-time or limited term basis, and the cost of doing so represents a proper charge on Bridge Revenue. IBA may request the services of employees or representatives of either Owner, including entities affiliated with an Owner or its government, and the cost of those services represents a proper charge on Bridge Revenue. No such charge against Bridge Revenue shall be made unless both the need for the service and the extent of the service provided is documented. The costs charged shall not exceed the direct costs actually incurred by the Owner or its representative, plus a reasonable amount for overhead, which charge shall be subject to approval by SSMBA.

Section 5. The Bridge Manager shall annually report to SSMBA and the Owners his or her success in achieving the performance measures established by SSMBA for the Bridge Manager to achieve in the preceding fiscal year.

VII
POWERS AND DUTIES OF SSMBA

Section 1. SSMBA shall provide the following operational and policy direction to the Bridge Manager in carrying out the responsibilities of the Bridge Manager:

A. Approval, on behalf of the Owners, of the long-range plans, annual five-year business plan, the annual budgets for the Bridge, or amendments thereto, the scope, structure and content of which are also subject to approval by SSMBA;

B. Approval of the making of any Operating Expenditure or the incurring of any obligation in respect thereof, to be paid with Bridge Revenue, involving a sum of $50,000.00 or more in U.S. currency for any transaction, or group of interdependent transactions, except expenditures or obligations that are specifically set forth and approved in a provision of an approved budget and designated as requiring no further approval of SSMBA, or where otherwise necessitated by an emergency to the extent that the expenditure or obligation must be incurred before it is possible to convene a meeting of SSMBA;

C. Approval of the general directions provided to the engineering consultant for the preparation of the annual report to be filed by the consultant under Article VIII, section 7 of this Agreement - no substantial change shall be made to those approved directions without the approval of SSMBA;

D. Approval of the annual report to be filed by the engineering consultant under Article VIII, section 7 of this Agreement - SSMBA may exercise its discretion to approve or disapprove elements of the consultant's recommendations;

E. Approval of the appropriate level of reserves for the operation, maintenance, repair and improvement of the Bridge;

F. Approval of the periodic adjustment of tolls in U.S. currency, so as to allow for the continued operation, maintenance and repair of the Bridge, including major and structural repairs, and the provision of adequate reserves;

G. Approval of the amounts of coverage, the risks, the terms and conditions and the deductibles of the property and liability insurance to be obtained by IBA with respect to the Bridge, and the companies to provide such insurance coverage;

H. Approval of the independent certified accountant designated to perform and provide an audit under Article XIII, section 7 of this Agreement;

I. Approval of guidelines which IBA shall follow in the investment of Bridge Revenue and reserve funds in the United States and Canada, consistent with prevailing standards for investing public funds, provided that each Owner may designate how its Owner's Reserve Account will be invested, consistent with laws in the country of the Owner governing such investments. Unless both Owners give written consent to follow alternative standards for prudent and conservative investment of Bridge Revenue and reserve funds, investment of Bridge Revenue and reserve funds shall, at a minimum, comply with the guidelines and shall conform to the legal requirements applicable to investments made by the Owners.

J. Approval of the acquisition of any real property with Bridge Revenue, other than from an Owner's Reserve Account, or the sale, lease, or other disposition, with consent of the Owner in whose name the real property is titled, of any real property of the Bridge;

K. Establishment of advisory working groups or committees;

L. Making of any other decision or the taking of any other action as the Owners may both direct, in writing, on matters that materially affect the Bridge;

M. Adoption of bylaws to govern the procedure of SSMBA;

N. Approval of rules for the use of the Bridge;

O. Revision of any of the dollar thresholds set forth in this Agreement for the approval of matters by SSMBA, except where authority to approve a revision is conferred on the Owners;

P. Directing the Bridge Manager to prepare long-range plans for the Bridge;

Q. Providing any other policy or operational direction as SSMBA may determine is necessary.

Section 2. SSMBA, or designated members of SSMBA, shall participate with MDOT in evaluating the performance of the Bridge Manager. If SSMBA determines that the Bridge Manager is failing to satisfactorily perform his or her assigned duties, and adopts a resolution directing MDOT to do so, MDOT shall replace the Bridge Manager in a timely manner not exceeding 90 days, in accordance with this section. If SSMBA directs MDOT to replace the Bridge Manager, or the position of Bridge Manager otherwise becomes vacant, a four-person panel comprised of one SSMBA member appointed by each Owner and one other representative of each Owner shall by consensus, identify and recommend a replacement for appointment by MDOT in accordance with applicable civil service standards and procedures. Both Owners shall act with due diligence and without undue delay to have a vacancy filled. MDOT may appoint an acting Bridge Manager to serve only until a permanent replacement can be appointed in accordance with this section. SSMBA may review and disapprove the acting Bridge Manager at its next meeting, in which event MDOT shall replace the acting Bridge Manager.

Section 3. A quorum is constituted for meetings of SSMBA, and decisions are to be made, by the participation of a sufficient number of member representatives of each Owner as provided in this section. Unless an Owner gives written direction to the contrary with regard to its representatives to account for vacancies or absences, at least three member representatives of each Owner must participate to constitute a quorum and must vote in the affirmative for a decision to be made by SSMBA. To account for vacancies or absences, an Owner may direct that less than three of its member representatives participate to comprise a quorum and may direct that less than three of its member representatives be required to vote in the affirmative for a decision to be made by SSMBA. The duly authorized and signed written direction of the Owner shall be filed with IBA.

Section 4. SSMBA shall meet at least once in every quarter, in Ontario or in Michigan. The Director of MDOT may designate an Operational Adviser to attend all meetings of SSMBA and participate in the discussions, but not as a member and without voting privileges. SMRBC may designate a non-member Owner's representative to attend all meetings and participate in the discussions of SSMBA, but without voting privileges. Meetings may also be conducted by telephone conference call, video-conferencing or other means which may become available through technological advancement, so long as provision is made for public attendance at one or more of the locations. A representative of IBA shall prepare minutes of the meetings. Copies of the draft and approved minutes shall be distributed to the Owners and members of SSMBA. All meetings of SSMBA shall be open to the public except that a meeting, or portion of a meeting, may be closed to the public if the closure is authorized by the law of the site of the meeting and if the closure would not be contrary to the law applicable to similar meetings of a federal body in Canada or the law of Michigan.

VIII
POWERS AND DUTIES OF IBA

Section 1. In addition to the powers and responsibilities specifically set forth in this Agreement, acting under the supervision of the Bridge Manager, IBA shall exercise the powers granted to

MDOT under 1954 PA 99 *supra*, to administer, operate, repair, and improve the Bridge, all of which shall be exercised in accordance with the decisions and direction of SSMBA as provided in this Agreement, and under the supervision of MDOT exercising its authority as employer. Under the laws of the State of Michigan, MDOT is the employer of the employees assigned to IBA and retains the authority to supervise its employees in accordance with the laws of the State of Michigan, specifically including the rules and regulations of the Michigan Department of Civil Service, provided that in doing so, MDOT shall respect the decisions of SSMBA in the exercise of SSMBA's powers as set forth in this Agreement. Unless otherwise compelled by law, no amendment to the powers of IBA under 1954 PA 99, made subsequent to the effective date of this Agreement and that is contrary to the terms of this Agreement, shall be implemented unless first approved by SSMBA.

Section 2. The Bridge Manager shall annually submit budget and business plans to SSMBA for review, revision, and approval, in accordance with Article VII of this Agreement.

Section 3. The Bridge Manager and IBA shall carry out the budget and business plans approved by SSMBA.

Section 4. IBA may lease or acquire property, dispose of property, make purchases, enter into contracts, and make payments in furtherance of its responsibilities under this Agreement. When required under Article VII, IBA shall obtain approval from SSMBA. Purchases shall be made and contracts shall be awarded in the name of IBA. Ownership of real property in Michigan shall be held by MDOT and ownership of real property in Ontario shall be held by SMRBC, for use by IBA. Real property acquired with Bridge Revenue may be sold only with approval of SSMBA and the Owner in whose name the property is titled.

Section 5. IBA shall administer the assets and expend Bridge Revenue on the Canadian side of the Bridge in compliance with the laws of Canada, the Province of Ontario, and this Agreement. IBA shall administer the assets and expend Bridge Revenue on the Michigan side of the Bridge in compliance with the laws of the United States, the State of Michigan, and this Agreement.

Section 6. IBA shall provide for the investment of reserves and surplus funds consistent with the terms of this Agreement and the policies of SSMBA. If an Owner so elects, the Owner may directly invest and administer its Owner's Reserve Account, in lieu of IBA doing so.

Section 7. IBA shall retain an engineering consultant to advise IBA and SSMBA on structural, maintenance and repair needs to preserve and improve the Bridge, after first securing approval of SSMBA, in accordance with Article VII of this Agreement. The consultant shall file an annual report with IBA and SSMBA. Unless otherwise agreed by SSMBA under Article VII, section 1.C, IBA shall maintain and repair the Bridge in accordance with the recommendations of the consultant.

Section 8. IBA shall enter into contracts in Michigan and Ontario, in its own name, in furtherance of this Agreement, after first securing the approval of SSMBA to the extent required by this Agreement.

Section 9. Competitive bidding/selection procedures are to be used for purchasing and contracting, except (a) as otherwise necessary in emergencies, and (b) as permitted by SSMBA in furtherance of the public interest.

Section 10. IBA shall maintain reserves, or functionally equivalent arrangements (a) for future maintenance, repair, or improvement needs of the Bridge, and (b) for the fulfillment of any liabilities or obligations arising out of the performance of this Agreement that will remain after the expiration or termination of this Agreement.

Section 11. IBA has the power to sue and be sued.

Section 12. In the event that SSMBA is unable to reach agreement on a matter involving the continued administration and operation of the Bridge, the Bridge Manager and IBA staff shall continue the day-to-day administration and operation of the Bridge insofar as necessary to continue service and preserve the integrity of the Bridge, within the operational and performance guidelines adopted by SSMBA, until agreement is reached by SSMBA or this Agreement is terminated or expires.

IX
TRANSITION

Section 1. All real and personal property and any other assets that were conveyed to MDOT or SMRBC upon the retirement of the bonds and dissolution of the predecessor International Bridge Authority, shall be used and managed by IBA in furtherance of its responsibilities under this Agreement.

Section 2. All valid and enforceable contracts and obligations of the predecessor International Bridge Authority have been, or shall be, assumed by IBA.

Section 3. The personnel of IBA shall remain employees of MDOT, assigned to IBA, subject to MDOT's management discretion over its employees, as provided in this Agreement.

X
TOLLS

Section 1. The level of tolls charged for crossing the Bridge, in United States currency, will be periodically adjusted as approved by SSMBA. Tolls will be set at a level sufficient to meet all projected Operating Expenditures and Owner's Expenditures, including such reserves as may be necessary or appropriate for those purposes, unless both Owners consent to tolls being set at a lower level. The tolls will be separately established in the currency of Canada so as to achieve equivalency with United States currency under prevailing official currency exchange rates. IBA shall make periodic adjustments to account for changes in the exchange rates, as provided in section 3 of this Article. Optional one-time charges for cards or devices purchased by users to expedite their passage through the toll collection facilities, or improve the efficiency of toll payment, are not themselves tolls.

Section 2. Public hearings shall be held before any toll is increased in United States currency. No less than three public hearings shall be held before the effective date of the change. Two of the hearings shall be held within five miles of the Bridge, one in Michigan and one in Ontario. One hearing shall be held in Lansing. This requirement does not apply to adjustments made to reach or maintain currency equivalence. If a toll increase is to be phased in over multiple years, the notices of public hearings shall include both the total amount of the increase and the shortest schedule within which each step of the increase may be implemented. If justified by revenue and expenses, the implementation schedule may later be lengthened by SSMBA without additional public hearings, but it may not be shortened without additional public hearings.

Section 3. Effective on April 1 and October 1 of each year IBA shall adjust the level of the tolls in Canadian currency to achieve equivalence with currency of the United States as provided in this section. The adjustment will be based on the average daily official exchange rate for the six-month period preceding March 1 or September 1, respectively. Adjustments shall be made if the toll rate inequality between that average daily exchange rate, and the exchange rate then in effect, is equal to at least five cents for regular-fare passenger vehicles, in the currency of either Canada or the United States. The adjustment shall be made to the nearest nickel, rounded as may be necessary for administrative efficiency.

XI
DEDICATION AND DIVISION OF REVENUE

Section 1. All Bridge Revenue shall be dedicated to, and used exclusively for, the cost of operating, repairing, improving and administering the Bridge, and for such reserves as are allowed under this Agreement.

Section 2. The costs incurred by IBA in carrying out its responsibilities under this Agreement shall be paid from Bridge Revenue as provided in this Agreement. Except as otherwise set forth in this Agreement, the Bridge is to be financially self-supporting.

Section 3. At the end of each fiscal year for the Bridge and six months thereafter, beginning with the end of the first fiscal year after the effective date of this Agreement, a semi-annual distribution of one-half of all revenue not spent, set aside, or encumbered for the making of Operating Expenditures, shall be divided equally between the Owners and deposited by IBA in the Owners' respective Owner's Reserve Accounts. The distributions shall be made not later than sixty days after each semi-annual distribution date. If both Owners so direct in writing, the first distribution shall be made sooner or later than that schedule to accommodate the making of Owner's Expenditures or the need to prudently liquidate investments needed for the distribution. IBA may make expenditures from an Owner's Reserve Account only with the prior written consent of the Owner. Funds in the Owner's Reserve Accounts shall be used solely for Owners' Expenditures and may be administered by either IBA or directly by the Owner at the Owner's discretion. An Owner may allow use of a portion of its Owner's Reserve Account for any other bridge purpose and may condition such allowance on the future replenishment of the funds by IBA, other Owner or other source. An Owner may defer or waive a semi-annual distribution, in whole or in part, to facilitate the proper maintenance and improvement of the bridge.

Section 4. Owners' Expenditures are the financial obligation solely of the Owner in whose country or jurisdiction the need for the expenditure arises and in which the work is to be performed, to be paid from the Owner's Reserve Account or such other funds as the Owner may obtain for that purpose. Each Owner shall provide such funds as may be needed for Owners' Expenditures or Operating Expenditures, to ensure the continued and unimpaired operation of the Bridge insofar as permitted by law.

Section 5. Subject to disapproval by SSMBA, IBA may accept gifts and grants from any source.

Section 6. If compelled by law, Bridge Revenue in an Owner's Reserve Account may be expended to pay taxes and assessments levied on the Bridge as provided in Article XIII, section 8. The other Owner may make a corresponding expenditure, or matching expenditure for Bridge purposes, within its jurisdiction, from its Owner's Reserve Account subject to applicable law.

XII
EQUAL EMPLOYMENT AND CONTRACTING

Section 1. Approximately one-half of the employees of IBA will be residents of Canada and one-half will be residents of the United States.

Section 2. Canadian and American candidates will be given an equal opportunity to compete for Bridge management and operating positions whenever a vacancy occurs. An MDOT employee may be appointed to serve on an interim basis until a vacancy can be filled.

Section 3. Insofar as practical, and consistent with the goal of obtaining the best quality materials, services and performance at the most favorable price, contracting opportunities will be provided so as to avoid an imbalance in the award of contracts to contractors on the Michigan side or the Ontario side of the Bridge.

XIII
GENERAL PROVISIONS

Liabilities

Section 1. The Bridge is to be operated on a not-for-profit basis and the activities of IBA under this Agreement constitute governmental functions.

Section 2. In accordance with section 5(o) of the Urban Cooperation Act of 1967, MCL 124.505, liabilities arising from the administration, operation, repair, or improvement of the Bridge shall be satisfied solely from Bridge Revenue, except as otherwise provided in this Agreement.

Section 3. Except as otherwise provided in this section, any claim arising from the administration, operation, repair, or improvement of the Bridge shall be made against IBA in the Michigan Court of Claims, or other Michigan court having jurisdiction over the claim, and not

against the Owners or SSMBA. A claim arising out of SMRBC making an Owner's Expenditure shall be filed against SMRBC in a Canadian court having jurisdiction against SMRBC. A claim arising out of MDOT making an Owner's Expenditure shall be filed against MDOT in the Michigan Court of Claims, or other Michigan court having jurisdiction over the claim. If IBA is the contracting party for such an SMRBC or MDOT Owner's Expenditure, a claim based on that contract shall be filed against IBA in the Michigan Court of Claims and the costs shall be borne as provided in section 4 of this Article.

Section 4. If a claim is filed against IBA, an Owner or SSMBA, or an agent or employee thereof, which arises out of the administration, operation, repair, or improvement of the Bridge, the reasonable cost of defending IBA, Owner or SSMBA, or an agent or employee thereof, and any settlement or final judgment shall be paid from the following sources in the following order of priority: (a) from insurance insofar as insurance protection is available, (b) from Bridge Revenue insofar as insurance protection is not available, and (c) from payments to be made by the Owners on a equal, or 50/50 basis, insofar as neither insurance protection nor Bridge Revenue is available, to the extent permitted by law. If the Owners are required to make a payment under this section 4, they shall be reimbursed from future Bridge Revenue. Nothing in this provision shall require the payment of any sum from Bridge Revenue, or from payments by the Owners, for a defense, judgment or settlement attributable to a claim against an agent or employee, that is not otherwise payable by an Owner, except to the extent provided for under the terms of his or her employment or provided for by law. For purposes of this section 4, the word "agent" refers to an employee of SMRBC, or the State of Michigan, whose activities on which the claim is based were in the performance of services for the Bridge, and does not refer to an independent contractor. To the extent that a claim is attributable to the making of an Owner's Expenditure, the cost of defending the claim and paying any settlement, judgment or related expense, shall be borne by the Owner to which the Owner's Expenditure is attributable, to the extent that those costs are not covered by insurance, and may be paid from the Owner's Reserve Account.

Insurance

Section 5. Insurance to protect against damage to the Bridge structures and assets shall be maintained by IBA as approved by SSMBA under Article VII, section 1. G and this section 5. The cost of such insurance shall be treated as an operating expense. Subject to direction by SSMBA as provided in Article VII, section 1. G and this section 5, IBA shall also purchase and maintain workers' compensation insurance and shall purchase and maintain such other insurance as may be necessary for the benefit of itself, the Owners and SSMBA, and their agents and employees to protect against claims or liabilities arising out of the performance of this Agreement. IBA, SSMBA, SMRBC, MDOT and their successors, agents and employees shall be named as insured parties in those insurance policies to protect against claims or liabilities arising out of the performance of this Agreement, to the extent that such insurance is reasonably available. The purchase of insurance must be approved by SSMBA which reserves the right to specify the coverage, risks, terms and conditions, deductibles, or companies. Upon being directed by SSMBA, IBA shall promptly purchase such insurance policies. Subject to the requirements of this section 5, if it would result in a savings of Bridge Revenue, IBA may enter into cooperative or combined insurance arrangements with other Michigan or Canadian toll bridges or facilities, or use other advantageous insurance opportunities, with the approval of SSMBA. For purposes of this section 5, the word "agent" refers to an employee of SMRBC, or

the State of Michigan, whose activities on which the claim is based were in the performance of services for the Bridge, and does not refer to an independent contractor. The Owners may agree in a writing filed with IBA to increase, decrease, or waive the insurance requirements of this Agreement, insofar as permitted by governing law. Each Owner retains the right to separately place and maintain insurance related to their respective Bridge facilities, as an Owner's Expenditure.

Records and Audits

Section 6. The official records of SSMBA and the books and records of IBA shall be maintained at the offices of IBA and made available to the public to the extent and in the manner provided by Michigan law for the records of state agencies. In addition, a duly authorized representative of an Owner has the right to access and make copies of official IBA and SSMBA records and to obtain information from IBA and SSMBA, to the extent necessary to ascertain compliance with this Agreement.

Section 7. Financial statements and accounts for Bridge Revenue, assets, liabilities, and expenditures shall be established and maintained separate and distinct from other MDOT statements and accounts. IBA shall maintain financial and other appropriate records of all of its activities in accordance with generally accepted accounting principles. IBA shall maintain sufficient original and detailed records to enable SSMBA, an Owner, or an independent certified accountant to verify the receipt and disposition of all Bridge Revenue. If directed by SSMBA, IBA shall maintain additional records of its activities, as SSMBA may determine are necessary to fully and accurately document and verify the receipt of all Bridge Revenue, and the expenditure, investment or other disposition of all Bridge Revenue. Annually, an audit of all investments and of the financial statements and accounts of IBA shall be performed by an independent certified accountant, approved by SSMBA and submitted to IBA and SSMBA.

Taxes and Assessments

Section 8. Taxes or assessments levied on the Bridge shall be paid by the Owner that is in the same country as the entity that levied the tax or assessment, and payment must be made from that Owner's Reserve Account or other funds available to the Owner, and not otherwise from Bridge Revenue. IBA or an Owner, as appropriate, may in good faith contest the propriety or amount of any tax, levy, or assessment on the Bridge. If such taxes or assessments are paid from Bridge Revenue that has been transferred to an Owner's Reserve Account, directly by one Owner to or for a governmental entity, an equal sum may be paid by the other Owner, from its Owner's Reserve Account, to or for a governmental entity within its jurisdiction, or for other Bridge purposes within its jurisdiction.

Successors and Assigns

Section 9. Because the Owners are creations under Canadian or Michigan law, a successor or assignee for either Owner may be designated under amendment or exercise of those laws. This Agreement shall be binding on the Owners or their successors or assignees.

Termination

Section 10. Either Owner may terminate this Agreement by giving written notice to the other Owner at least 1 year before the effective date of the termination. A notice of termination may be withdrawn with the consent of both Owners. The Owners may also agree to extend the one year period to allow additional time for negotiations or to effectuate an efficient transition.

Term

Section 11. Subject to exercise of the power of termination, this Agreement shall remain in effect until September 30, 2017, and is automatically renewed for successive ten-year periods thereafter unless, one year prior to the renewal date, an Owner gives written notice to the other Owner that it elects not to renew the Agreement.

Notice

Section 12. A written notice under Article XIII, sections 10 and 11, is effective on the latter of the date that it is delivered to the principal office of IBA, and to the principal office of the other Owner. In lieu of personal delivery to an Owner, such a written notice may be sent by certified or registered mail, return receipt requested, postage prepaid, to the principal office of the other Owner, in which case the notice will be deemed to have been delivered to that Owner three business days after the notice was mailed. The mail delivery systems of both the United States and Canada must be in normal operation on a given day for that day to be considered a business day.

Owner's Consent or Agreement

Section 13. The consent or agreement of an Owner, as permitted by this Agreement, may be effected by filing with the principal office of IBA a writing signed by a duly authorized representative of the Owner expressing that consent or agreement. A copy of that consent or agreement shall also be mailed to the principal office of the other Owner.

Distribution of Assets upon Expiration or Termination

Section 14. When this Agreement is allowed to expire, or if this Agreement is terminated, that portion of the land and bridge structure in Michigan shall be the property and subject to the management and control of MDOT and that portion of the land and bridge structure in Ontario shall be the property and subject to the management and control of SMRBC and are not subject to the remainder of this section.

The first priority for use of the remaining properties and funds, including the Owner's Reserve Accounts, will be to provide any needed funding for the reserve account required by Article VIII, section 10(b) of this Agreement to ensure the fulfillment of obligations to current or former personnel and meet any other liabilities or obligations of MDOT or IBA as a result of having managed and administered the Bridge. The intent of that requirement is to ensure that MDOT is not required to bear more than its 50% share of liabilities incurred, but not yet paid or fully funded, during the period that the Bridge was maintained by the International Bridge Authority or IBA up to the date of the expiration or termination of this Agreement. An equal sum shall be

drawn from each Owner's Reserve Account, if those funds are needed to fund the reserve account required by Article VIII, section 10(b) of this Agreement.

After provision is made for the payment of liabilities, the Owners shall equally divide the buildings, equipment, other personal property acquired with Bridge Revenue, or their values, and remaining funds, except that the remainder of the Owner's Reserve Accounts shall not be divided equally, but shall be the property of the respective Owners.

For purposes of achieving an equal distribution of assets and liabilities, buildings, equipment and other personal property will be valued at 50% of the total of their fair market value and book value, and that value, after providing for liabilities, shall be equally divided between the Owners. Each Owner is entitled to receive the actual equipment and other personal property constituting 50% of that overall value, insofar as feasible. The intent of this section is to ensure that, setting aside the land, bridge structure itself, and the remainder of an Owner's Reserve Account, the remaining value of the property be divided equally between the Owners as provided in this section.

Insofar as possible, computer software acquired with Bridge Revenue will be made available for use by both Owners. The Owners shall cooperate with the intent of maximizing each Owner's efficient and cost-effective ability to thereafter maintain and operate the portion of the Bridge within that Owner's jurisdiction.

Arbitration

Section 15. Promptly after notice is given under section 10 or 11 of this Article that this Agreement will be terminated or not renewed, the Owners shall undertake good faith negotiations to agree upon the distribution of assets as provided in section 14 of this Article. If agreement is not reached within three months after the notice is given, either Owner may notify the other that it is initiating binding arbitration. Each Owner may then appoint one arbitrator and those two arbitrators shall appoint a neutral third arbitrator, the three of whom shall comprise the Arbitration Panel. If an Owner fails to appoint an arbitrator within forty-five days after being given notice of the appointment by the initiating Owner of an arbitrator, the initiating Owner may appoint a second arbitrator, the two of whom shall appoint a third neutral arbitrator and they shall comprise the Arbitration Panel.

The Arbitration Panel shall meet at such times and places, and may require the submission by the IBA or the Owners of appraisals and other information, as it may determine necessary. Once arbitration proceedings are initiated, the Owners should continue to negotiate in an effort to agree upon all or part of the disputed issues concerning distribution of the property. The Arbitration Panel shall proceed with dispatch to render an informed and fair determination of any remaining disputed issues on the distribution of property, as provided in section 14 of this Article, so that the decision may be implemented by the effective date of the termination or expiration of this Agreement. The Panel shall determine its rules of procedure so as to provide a fair and expedient presentation of any evidence and/or argument needed to resolve disputed issues. Decisions shall be made by the affirmative vote of at least two members of the panel.

Unless both Owners consent, the Arbitration Panel has no jurisdiction to decide any issue other than the value and distribution of the property, as provided in section 14 of this Article. The

decision of the Arbitration Panel is final and binding on both Owners; the Owners expressly waive any right to resort to the courts, except as may be necessary to enforce the decision of the Arbitration Panel. The Arbitrators shall receive compensation for their services in accordance with customary and prevailing rates, along with their reasonable and necessary expenses. The Owners shall share the costs of the Arbitration Panel equally, which costs may be paid from funds available to the IBA, or directly by the Owners.

Third Party Beneficiaries

Section 16. This Agreement is not intended to create any rights in any persons other than the parties to this Agreement and their successors and assignees.

Effective Date

Section 17. This Agreement shall not go into effect until this Agreement is approved by the Governor of the State of Michigan, the United States Secretary of State, an Order in Council approving this Agreement is executed by the Governor in Council in Canada, as provided in Article III, Section 1 of this Agreement, and SMRBC is established as a Subsidiary Crown Corporation of FBCL. Subject to fulfillment of those conditions, this Agreement is effective April 1, 2007 or on such later date as the last of the required conditions is fulfilled.

By:

Kirk T. Steudle
Director
Michigan Department of Transportation

Dated: APRIL 11, 2007

Witness:

Vanessa Blaxton

By:

James L. McIntyre
President
St. Mary's River Bridge Company

Dated: April 4, 2007

Witness:

Lorie Bottos

H. Project Screening and Scenario Development – Screening Tables and Project Schematics

H.1 Master List of Potential Solutions

One primary outcome of our initial public and stakeholder outreach activities (focus groups, public meetings, and stakeholder interviews) conducted early in the Operations Plan development process was to establish a comprehensive set of project solutions and evaluation criteria for subsequent screening. We compiled all of the ideas identified by stakeholders and the public throughout this process, as well as recommendations from other ongoing border mobility improvement initiatives and other recent studies, to develop a "master list" of potential solutions. A summary of our public involvement activities, including the identification and discussion of potential solutions, is provided in Appendix B.

The complete master list of proposed solutions provided in this Appendix includes more than 100 unique solutions, ranging from projects affecting the physical condition or capacity of the transportation infrastructure, to operational strategies that could improve how the transportation system is utilized, to potential policy changes that would address how the crossings are managed. Organized by port of entry, the following tables include a description of each potential solution as well as some additional background and contextual information. It also classifies each solution as short-term (0 to 5 years), medium-term (5 to 10 years), or long-term (greater than 10 years) based on high-level implementation timeline assumptions.

Table H.1.1 Master List of Proposed Solutions – General Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Extend commercial operating hours or allow 24-hour commercial operations at one or more bridges	Possible permutations for 24-hour operations: 1. All commercial POEs 24-hours 2. Zaragoza only 3. Santa Teresa only 4. BOTA only 5. Tornillo only 6. Santa Teresa and Zaragosa 7. BOTA and Zaragosa 8. Santa Teresa and Tornillo	Short Term	Crossing Management	REDCO Maquila Interview, June 24, 2010 Delphi, August 2010 Operations Plan Focus Groups, May 2010	As the region grows, the industry will grow with it. This will make it necessary to use all the capability available at the bridges, even at hours that are now not customary. Participants suggested making at least one of the region's ports of entry open to commercial traffic 24-hours a day, six days per week (Monday – Saturday). Twenty-four-hour availability is ideal as it allows better utilization of equipment as trucks/tractors can cycle. However, security must be assured. Some participants expressed a preference for the 24-hour commercial POE to be Zaragoza (current commercial operations are 6am – midnight). Unfortunately the pilot on 24 hour service was canceled due to economic downturn and reduced volumes. A temporary or trial 24-hour commercial operating period is not likely to have an effect on logistics patterns. The industry will need a long-term commitment to 24-hour operations before making changes throughout the entire logistics chain.
Prioritize adequate staffing at the ports of entry	Possible permutations for fully staffing front line officers during periods of high demand: 1. At all existing booths at all crossings 2. Zaragosa only (3 pedestrian, 12 POV, 9 commercial) 3. BOTA only (4 pedestrian, 14 POV, 6 commercial) 4. Paso Del Norte only (4 pedestrian, 11 POV) 5. BOTA and PDN 6. BOTA and Zaragosa	Short Term	Crossing Management	PDN Model Port Commercial and Passenger Subcommittees Operations Plan Focus Groups, May 2010	While the trade community supports increased staffing, we also request more information sharing from CBP regarding the allocation of current staffing. We understand that much of this must be kept classified so as not compromise the security of our ports, but surely enough information can be shared that will help the trade community become more effective advocates on behalf of CBP. We also understand that the critical issue for port staffing is available front line officers not just allocated port staffing. The Model Port concept should provide sufficient staffing so that the CBP officer also can have a level of quality of life to predict his or hours of work and to be able to receive sufficient training and oversight to operate at a high level of efficiency as well as competency. A Model Port will never be able to achieve objectives with an under trained and overburdened staff. CBP should work with stakeholders on a regular basis to detect and address training and/or staffing deficiencies. Having said that, it often appears to the trade community that staff resources are not efficiently utilized, and that level of service is compromised.
Create incentives for personnel to facilitate trade, in addition to such incentives that exist for interdiction	Recommend that CBP investigate possible methodologies to incentivize and reward inspectors for facilitating trade and legitimate travelers. Inspectors should receive recognition for achieving a certain percentage of secondary inspection referrals that result in some sort of enforceable action. Furthermore, inspectors who have a low percentage of secondary referrals that result in enforcement action should receive further training. RFID based system to measure trick crossing time will help develop these incentives and metrics.	Short Term	Crossing Management	PDN Model Port Secured Manufacturing Subcommittee; REDCO Maquila Interview, June 24, 2010 Operations Plan Focus Groups, May 2010	The trade community fully recognizes the need for CBP to interdict people and cargo that could cause our country harm. Unfortunately, facilitation often takes a backseat to enforcement, especially among the front line primary lane inspectors at the land borders, where inspectors are rightly recognized by CBP leadership for interdicting drug shipments or illegal immigrants. We fully understand the importance of border security, especially in light of the drug-related violence that has gripped Mexico. We believe as Commissioner Bersin has testified that that facilitation and enforcement must be efficiently achieved. Focus group participants alluded to the strength of the CBP union. However, they suggested that skill, competency, productivity, and efficiency should replace seniority as the criteria for promotions.
Design secure dual-inspection point pilot program to streamline commercial inspections	Working with Mexican Aduanas, CBP would examine cargo upon arrival in Mexico, rather than subjecting shipments to duplicate inspections, one upon exit from the United States and another upon arrival in Mexico.	Medium Term	Crossing Management	PDN Model Port Commercial Subcommittee Operations Plan Focus Groups, May 2010	Outbound inspections along the southern border have a severe impact to trade and traffic in border communities. Most international bridges were not designed to accommodate southbound inspections, however, the infrastructure for inspections is available at the Mexican ports of entry.
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	FMCSA and DPS perform the same truck/trailer inspection. Personnel savings and a more efficient inspection could be achieved if the inspection were performed once. Recommend a Model Border Port should have DPS perform the inspection and FMCSA can use the results.	Medium Term	Crossing Management	PDN Model Port Commercial Subcommittee Operations Plan Focus Groups, May 2010	The focus group participants felt that many of the security programs in place lead to instances where different security and inspection efforts overlap or override each other.
Privatize the region's ports of entry		Medium Term	Crossing Management	Operations Plan Focus Groups, May 2010Operations Plan Public Meetings, June 2010	Under privatized management, the focus group participants envisioned a private company owning the bridge and then selling shares to businesses in the region. Where the City of El Paso currently owns the bridge, the company could establish an arrangement to compensate the City for the lost revenue.
Conduct southbound inspections at the point of debarkation (unloading) rather than at the border	Rather than requiring that all southbound inspections occur within the existing footprint of the POE, push the inspection point into Mexico at the point of debarkation (point of unloading).	Medium Term	Crossing Management	Operations Plan Focus Groups, May 2010	Since the existing POEs were not designed for southbound inspections, the participants suggested that these inspections be conducted several miles into Mexico, away from the border. Jersey barriers or other traffic control devices could be used to keep the commercial vehicles secure before screening.
Improve customer service signage at land ports of entry	CBP should provide signage at each port as to the filing of a complaint, how to request review by a supervisor, locations of public transportation, notices from the City, and the severe consequences of any misrepresentations to a CBP officer.	Medium Term	Crossing Management	PDN Model Port Passenger Subcommittee	This change could reduce errors by the public, the time associated with processing violations by CBP, and provide useful information to legitimate visitors.

Improvement	Description	Timing	Type	Source	Notes/Background
Add Ombudsman to Establish Customer Service and Professionalism Training Standards and Metrics	(1) Customer service and professionalism must be a core element of the CBP training program. (2) CBP should partner with the private sector to develop and sustain such programs. (3) Metrics to measure the customer service performance of CBP Officers should be included in this new program. (4) Designate a public information officer for each port. (5) Design and publish complaint process for passenger and commercial customers.	Short Term	Crossing Management	PDN Model Port Commercial and Passenger Subcommittees	While CBP officials are first and foremost law enforcement officers, however, security and customer service are not mutually exclusive. CBP announced recently it has begun a new professionalism program to improve customer service training for CBP officers.
Consolidate entry/export documents for commercial shippers	Require shippers to present only one document that would serve as both an entry and an exit document. Obtain Canadian document as template.	Short Term	Crossing Management	PDN Model Port Commercial Subcommittee	Mexican Aduanas already has mapped out all but one of the data elements that would be required to integrate entry/exit information with the U.S. Mexico has indicated a willingness to work with the United States to accomplish this goal. This will improve efficiency and enhance data sharing between both countries.
Improve access to and training of immigration subject matter experts at the ports of entry	Ports should maintain subject matter experts (SME) regarding immigration processing. If staffing is insufficient of such SMEs, then there should be 24/7 hotline for both CBP officers and the public when addressing port admission issues, especially when access to counsel at the ports is so limited. The CBP customer service number does not provide SMEs.	Medium Term	Crossing Management	PDN Model Port Passenger Subcommittee	Secondary processing by line officers is problematic due to the paucity of those remaining at the ports of entry with immigration law expertise. Manufacturing plants apply those specially trained to certain product lines and USCIS does so as well. CBP should do the same to enhance efficiency, security, as well as legal compliance.
Improve C-TPAT program self-reporting and readmission guidelines	Participant companies who self-report a possible breech in their security should be given the benefit of the doubt. These companies have been vetted by CBP and have been given the agency's seal of approval. Shippers deserve a clear understanding of what will happen to their C-TPAT status if they self-report. Specifically, CBP should commit to completing a postincident report within a predictable timeframe. We recommend no more than 10 business days.	Short Term	Crossing Management	PDN Model Port Commercial SubcommitteeOperations Plan Focus Groups, May 2010	The Customs-Trade Partnership Against Terrorism (C-TPAT) program is a great example of industry and CBP working together to advance trade facilitation and enforcement. For some C-TPAT participating companies, however, the program could place them in morally ambiguous positions that could undermine C-TPAT's success. For example, a C-TPAT carrier that uses the FAST lane for the majority of its border crossings would be barred from using FAST while the analysis is being conducted. That carrier's customers, however, could simply move their business to another carrier with FAST access, especially when it is unclear when there will be some resolution to the original carrier's case. As a result, a carrier that stands to suffer significant harm to its business might be very reluctant to self-report. Finally, if the postincident analysis indicates that a company should be removed from C-TPAT, that company should be given a clear understanding of when it can reapply for readmission to the program. We've heard anecdotes of companies who've been removed from the program who simply reorganize under a different name and then apply for C-TPAT admission. Hopefully a clearer readmission process would lead to fewer instances of companies seeking to game the system.
Improve transparency of SENTRI admission and revocation guidelines	We recommend a regular review of admission and revocation requirements/guidelines for SENTRI processing. A single customs or immigration violation that occurred many years ago should not result in failure to qualify. Requirements should weigh security risk, time since violation, and severity of violation. CBP should be more transparent as to its decisions to revoke participation in the project, including the establishment of a meaningful administrative review process. We request that CBP work with stakeholders to create transparency as to requirements, as well as the review process.	Short Term	Crossing Management	PDN Model Port Passenger Subcommittee	An improvement in the clarity of guidelines related to SENTRI enrollment will increase participation in SENTRI. Increased SENTRI enrollment will allow CBP to focus limited resources on illegal travel and facilitate the movement of low-risk people.
Increase the number of ATF personnel in the region	Minimize the number of interdictions at the ports by increasing ATF's intelligence gathering capabilities in the region.	Medium Term	Crossing Management	PDN Model Port Secured Manufacturing Subcommittee Operations Plan Focus Groups, May 2010	Will improve port efficiency by lowering the number of interdictions at the primary inspection lanes. UPDATE: PDN Model Port Subcommittee removed this item from their list of recommendations, citing that this already is being implemented.
Streamline immigrant visa admission process	Those holding recently issued immigrant visas issued by the U.S. Consulate in Cd. Juárez, should only be processed for an I-94 admission. There should be no fingerprint intake or application process for the creation of the I-551 resident alien card at the port of entry. Data for card creation should be transmitted directly by CBP to the USCIS card facility post CBP admission confirmation.	Short Term	Crossing Management	PDN Model Port Passenger Subcommittee	The largest immigrant visa processing post in the world for the United States is in Cd. Juárez. Immigrant visa processing is time consuming and an additional major burden on CBP inspectors, which is unique along the border. Any process to reduce the processing timeframe would free staff for other uses.
Evaluate tolling/pricing solutions	Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Short Term	Pricing	Operations Plan Focus Groups, May 2010	Focus group participants recognized that BOTA is the only bridge on the U.S.-Mexico border that does not charge a toll. They suggested that charging a toll may help distribute traffic across the other bridges in the region. They also recognized that charging a toll would require an amendment to the Chamizal Treaty, which stipulates that the BOTA operates as a toll-free facility.

Improvement	Description	Timing	Type	Source	Notes/Background
Pilot an empty truck fee program	Pilot an empty truck fee program for trucks not enrolled in trusted programs that make multiple daily trips across the border	Short Term	Pricing	Accenture Draft Report, March 2008	Empty trucks consume capacity available to loaded trucks. Limiting access to loaded trucks during peak hours or charging a fee for empty trucks would discourage empty truck movements during peak periods and encourage trucks to be value-added in both directions.
Expand C-TPAT benefits and enrollment	Have joint CBP and stakeholder enrollment fairs to increase enrollment. C-TPAT could expand its benefits by allowing expedited SENTRI as well as consular processing for employees of certified companies. In addition, CBP could provide a point of contact for expedited review of admission related issues concerning such employees as well as a preregistration process for I-94 issuance and a data notice option through C-TPAT database for departure confirmation by the company of such employees. Employees eligible initially could be limited to professionals, managers, and executives. In addition, employees with six months or more of employment with the C-TPAT certified employer also could be included. Dependents (spouses and unmarried children under 21) also could be considered for the program. All applicants would also have to meet the admissibility requirements set forth in the Immigration and Nationality Act, as amended. Employee eligibility could be established by referral to the company's registration on file with DOS and available to the inspector through CCD.	Medium Term	Supporting Activity	PDN Model Port Commercial and Passenger SubcommitteesREDCO Maquila Interview, June 24, 2010	Approximately 67.4 percent of importers using El Paso's ports of entry are C-TPAT certified. An increase of enrollment to 80 percent through targeted marketing and enrollment fairs should be pursued. Increased C-TPAT enrollment will allow CBP to focus limited resources on illegal trade and facilitate the movement of low-risk goods. DHS has been considering various methodologies to expand the benefits of C-TPAT certification to encourage greater participation in the program. In addition, DHS has worked on consolidating various frequent traveler programs tied to facilitating the entry of frequent low risk travelers to the United States through air, land, and sea ports of entry. The goal being to have one standard enrollment process as well as program benefits. Thus, the nexus of immigration and trade issues becomes more evident. This background supports efforts to further integrate DHS and DOS programs to provide for an extension of a new offshoot from the C-TPAT program as well as from the Nexus and SENTRI programs to the benefit of low-risk international travelers. It is important to recognize that this expansion is further facilitated by the availability of the CCD to CBP inspectors at ports of entry as well as the enrollment of visa applicants in the USVISIT system maintained by DHS. In addition, those companies enrolled in C-TPAT are provided access via the Internet to confirm whether other service providers/manufacturers/carriers, etc. are C-TPAT certified through the Status Verification Interface (SVI). Enhanced access to such a database could be provided to interested agencies to help audit status compliance in the program. The same type of centralized access for confirmation of status could be provided to interested agencies based on the new procedures to be implemented by CBP as to the Nexus and SENTRI programs' centralization of enrollment. Possible Benefits – C-TPAT certification serves as a basis for participation of certain carriers and shippers in the FAST lanes at certain international ports of entry. It does not, however, have any linkages to the admission of employees of such certified companies. The program also provides no benefits to such employees in consular and port processing. Expanding C-TPAT benefits also would include reducing the crossing times using the FAST lanes. Interviewees for the Operations Plan indicated that sometimes the normal line is faster than the FAST lane. They indicated that companies spend a lot of money for C-TPAT, but are seeing little benefit.
Expand SENTRI enrollment to 50,000	Develop and implement strategies in conjunction with the El Paso/Juárez community to increase SENTRI enrollment from the current level of approximately 28,000 to a target of 50,000.	Short Term	Supporting Activity	PDN Model Port Passenger Subcommittee Operations Plan Focus Groups, May 2010	An increase in SENTRI enrollment to a target of 50,000 should be pursued through a variety of strategies, including enrollment fairs and reduced fees where possible. We recommend also that CBP explore alternative methods of payment beyond credit/debit cards. Increased SENTRI enrollment will allow CBP to focus limited resources on illegal travel and facilitate the movement of low-risk people.
Use Intelligent Transportation Systems (ITS) and/or dynamic message signs (DMS) on the bridges and approaches to alert drivers of lane closures, crossing times, and lane assignments	ITS and DMS technologies could help to reduce weaving issues and alert drivers of lane closures and crossing times	Short Term	Technology	Operations Plan Focus Groups, May 2010 Accenture Draft Report, March 2008	Build on CBP's existing web-based reporting of open lanes and current wait times, as well as POE operators' traffic cameras that provide web-based video feeds of congestion conditions. Alerts on congestion within the system could help travelers make informed decisions about route select prior to beginning a trip.
Implement queue monitoring technology	Implement technology that allows CBP to monitor queue length to determine when to staff additional booths	Medium Term	Technology	Operations Plan Maquila Interviews, July 2010	
Implement non-invasive inspection technology for cargo	Make use of available technology, such as gamma ray x-rays, to conduct non-invasive inspections of 100 percent of commercial traffic.	Medium Term	Technology	REDCO Maquila Interview, June 24, 2010 Delphi, August 2010 Operations Plan Focus Groups, May 2010	During interviews, many stakeholders insisted on the use of 21st century technology as a basic tool to help keep pace with demand without compromising security. Freight carriers indicated a preference for implementing a technological solution to inspect 100 percent of containers/tractors and eliminate the human factor. Inspections need to be in areas that cannot be compromised (currently have had situation get by a check point and then have a load contaminated with contraband). They indicated that C-TPAT and FAST are NOT sufficient and being C-TPAT can make you a target for criminals as loads are audited less and the crooks know the C-TPAT system well.
Implement technologies to improve metrics for tracking crossing times for commercial trucks and passenger vehicles (POV)	Implement a pilot program using an RFID-based system to measure truck crossing times and a mobile device signal detection technology (Bluetooth) to measure POV crossing times	Short Term	Technology	PDN Model Port Light Rail/Infrastructure Subcommittee	Truck crossing times measured by this approach provides a completely different measure than wait times relayed by CBP. Wait times do not include inspection time, while crossing times encompass the entire entry/exit process. For POVs, a growing number of Bluetooth enabled devices are carried by the driver/passenger and/or are incorporated into the vehicle itself. In this approach, signal readers capture the signal and obtain a unique MAC address of the device and send it to a central database. Central database will collect addresses from several readers, match and determine travel time between fixed positions. More accurate data collection will enhance CBP's efforts to make process improvements, as well aid in more effective resource allocation.
License plate recognition technology	Interoperable technology for license plate recognition and FAST/SENTRI tags that could be used at all of the region's POEs	Medium Term	Technology	Operations Plan Focus Groups, May 2010	

Improvement	Description	Timing	Type	Source	Notes/Background
Implement pilot tracking project to include intelligent devices (GPS, RFID) for monitored crossings	$3.1 M in funding has been secured through the El Paso MPO to equip 30 tractors/trailers with state-of-the-art intelligent transportation system devices. The devices will secure cargo and transmit key data into a central repository where the data will be analyzed by intelligent software agents (ISA). The data captured from the onboard components with which the trucks are to be equipped is combined with data captured about the cargo, truck, driver, weather conditions and traffic conditions before being transmitted to a central ITS center, which will monitor (and as required), track and control the movement of each vehicle. The unique aspect of this system is that this function will be automated through the use of ISAs which automatically analyzes all the information collected and determines if an event, or combination of events, has occurred for which an alert should be issued. Need to determine appropriate number or percent of daily traffic of trucks and trailers to make it a valid pilot.	Short Term	Technology	PDN Model Port Secured Manufacturing Subcommittee	With this technology, a human operator responds only to the exceptions (alerts) rather than attempting to track each vehicle all of the time. Because of the speed at which the ISAs function all of this can be performed in real time. Maquila operators agreeing to participate in the program will have their own designated transportation carriers for the border area. These carriers will need to agree to share data not previously used in transport efforts. Research has found that once the carriers understand the project, most will be very willing to participate. However, equipping trucks and trailers that will operate in the El Paso/Juárez region is essential to the success of the effort and will require the cooperation of both heavy-duty fleet vehicle operators and maquila owners. As the largest concentration of maquila operators in the world, software and communication systems that are specifically adapted to meet the needs of our local industries will help to insure their long term viability which is essential to the economic health or our region. The El Paso County SBTDP helps assure the region's continuing leadership role in the evolving international trade landscape and is the perfect test-bed for developing and applying technologies to ensure a secure maquiladora industry here and elsewhere.
Automate I-94 processing	Create public/private partnership to pay for the machines described herein: 1) Post adjudication by the CBP officer of admissibility, the applicant could be instructed to pay the $6.00 fee via an ATM like machine located in the waiting area and return with the receipt for payment to I-94 issuing officer. This ATM like machine could accept a debit or credit card and the USVISIT tracking number could be read via the machine readable zone on the I-94. If too complex, the use of the ATM machine could be reduced to just intake of the I-94 number and the $6.00 fee. This automation of the I-94 would free up administrative support for other tasks. 2) For those foreign nationals enrolled in the SENTRI program, a GOES kiosk could be provided to document not only the receipt of the $6.00 fee but also the issuance of the typical GOES receipt in lieu of an actual I-94 for a default six month admission as to those requesting B1 or B2 admissions. Hence, an application of a "paperless" I-94 in the land environment to those registered in SENTRI or Nexus or FAST.	Short Term	Technology	PDN Model Port Commercial and Passenger Subcommittees	The issuance of the I-94 at the land border and the payment of the $6.00 fee can take hours. In some cases, the support staff required to take in the $6.00 fee is not available for whatever reason. We believe the cash intake process using support staff person can feasibly be replaced with a variety of options.
Automate and improve process for return of I-94 upon departure at land ports of entry	We encourage simultaneous testing of various exit process technologies and solutions, including – creation of a public/private partnership to establish a pilot program at El Paso's land border to install mechanisms similar to those used by certain air carriers to scan and receive I-94s to document departure at the ports. This would confirm the individual's departure in real time. Another option is to coordinate with the U.S. State Dept. to allow appointments at the Application Support Centers in Mexico for the return of the I-94 and the input of data into U.S. VISIT documenting timely departure.	Medium Term	Technology	PDN Model Port Passenger Subcommittee	The return of the I-94 upon departure is cumbersome and lacks consistency as well as accuracy. I-94s returned at the land border are sent to London, KY for input and there is no efficient or dependable means for those departing at the land border to make sure that their timely departure is properly recorded. This issue is extremely important as to the visa voidance provisions of INA §222(g), which invalidates visas upon an overstay. Exit technologies are being tested in the passenger vehicle environment by CBP, but apparently the technology on biometric confirmation of departure is still problematic. This solution is an interim measure.

Improvement	Description	Timing	Type	Source	Notes/Background
Improve immigration-related information available on-line	CBP should create a more detailed web site for each of its ports of entry so that admission related data is more readily available to the public. While the FAQ section of cbp.gov is helpful, the data related to customs issues is far more detailed than that related to immigration issues. CBP inspection data should be readily available to the public.	Medium Term	Technology	PDN Model Port Passenger Subcommittee	CBP should clearly post numbers at the ports of entry and on-line for the public to file complaints and compliments. Currently, the CBP customer service number is not even available on weekends.
Convert bridges to one-way pairs	Potential permutations: 1. BOTA southbound/Zaragosa northbound 2. Zaragosa southbound/BOTA northbound	Medium Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Expand use of designated inspection lanes for certain passengers and pedestrians	Possible permutations: 1. Add DCL lanes to BOTA; 2. Develop capability to transition between standard and DCL lanes as demand requires; 3. Provide FAST lane at all commercial crossings; 4. Provide designated lane for U.S. citizens; 5. Provide designated lane for travelers in possession of an I-94 or I-94W.	Medium Term	Traffic Engineering and Infrastructure	PDN Model Port Passenger SubcommitteeOperations Plan Focus Groups, May 2010	Based on crossing volumes, consider whether implementation of U.S. citizen lanes in passenger vehicle lanes could potentially expedite inspection times. The same could be considered for those already in possession of an I-94 or I-94W. The vast majority of land border crossers are either U.S. citizens or nonimmigrant visa holders. Segmenting the inspection lane population is typically used in the air environment and has been suggested in the past for the land border. Although SENTRI card holders may typically go through a SENTRI lane, they also should be considered for this segregated inspection lane option when not using the SENTRI lane.
Provide designated commuter lanes at all ports of entry	Rather than funneling all SENTRI travelers through Zaragoza and Stanton, add DCL lanes on the other bridges as well. This will be particularly important as participation in the SENTRI program increases.	Short Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Provide variable designated lanes during peak periods	For example, designate a lane for FAST vehicles during the morning peak period (6am – 9am), then open the lane for everyone during the rest of the day	Short Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Implement contra-flow lanes during peak periods	The use of contra-flow lanes during peak periods would provide additional capacity in the peak direction.	Medium Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Designate a port of entry for the exclusive use of commercial vehicles (or further limited to FAST participants)	Focus group participants noted that the existing arrangement of mixed commercial and passenger traffic flow at the border crossings is inefficient. They suggested designating bridges for a specific type of traffic – commercial or non-commercial. Example: 1. BOTA non-commercial, Zaragoza commercial only.	Short Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	Focus group participants were interested in a port of entry dedicated to commercial traffic. This may require the conversion of an existing bridge or the construction of a new facility. This can be complemented by the designation of truck-only routes that lead to/from the port of entry. However, stakeholders indicated the importance of providing flexible bridge options, allowing the ability to have alternative routes for emergencies, security and contingency plans (flooding, bridge closings due to violence, bomb scare, etc.). The shipper community stressed the importance of this for the safety and security of their employees, their drivers, and the public in general.
Support pilot demonstration of the Universal Freight Shuttle	Electricity-powered, monorail system to move freight both north and southbound; incorporates "inspect in motion" technologies	Long Term	Traffic Engineering and Infrastructure	PDN Model Port Light Rail/Infrastructure Subcommittee Operations Plan Focus Groups, May 2010	Relieves congestion from ports; environmentally responsible; can operate 24/7. Since the monorail will be elevated, transportation of goods will be done in a secure environment. The monorail loading and unloading terminals can be placed anywhere within the city. Infrastructure is not needed at the ports of entry. As many have stated, the driver is the weakest link when it comes to cross-border shipments. The Universal Freight Shuttle eliminates the need for drivers to actually cross the border.
Construct new loop road to connect Stanton, BOTA, and Zaragoza.	Construct a new loop road that connects the three ports of entry at Stanton, BOTA, and Zaragoza.	Long Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Construct a new port of entry in the region	In the long term, focus group and public meeting participants anticipate that the El Paso region will need another border crossing location to accommodate demand. Recognizing the time it takes to plan, build regional consensus and support on both sides of the border, and construct new infrastructure, stakeholders suggest the process should begin now.	Long Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010 Operations Plan Public Meetings, June 2010	The freight community has identified the area between BOTA and Zaragoza as a preferred location for a new port of entry given its proximity to the Border Highway and existing industry. They suggested that this new bridge should directly connect the industrial areas of eastern Juárez to the Border Highway in order to bypass residential neighborhoods. However, the neighborhoods in the vicinity of Yarbrough are strongly opposed to the construction of a new bridge in the area. The Mayor of Socorro has expressed interest in placing a new border crossing location in Socorro.
Pursue feasibility study to encourage passenger light rail across port of entry		Short Term	Traffic Engineering and Infrastructure	PDN Model Border Port Committee	

Table H.1.2 Master List of Proposed Solutions – Santa Teresa Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Extend commercial operating hours	Extend hours or allow 24-hour commercial operations	Short Term	Crossing Management	REDCO Maquila Interview, June 24, 2010 Delphi, August 2010 Operations Plan Focus Groups, May 2010	As the region grows more, the industry will grow with it. This will make it necessary to use all the capability available at the bridges, even at hours that are now not customary. Twenty-four-hour availability is ideal as it allows better utilization of equipment as trucks/tractors can cycle. However, a temporary or trial 24-hour commercial operating period is not likely to have an effect on logistics patterns. The industry will need a long-term commitment to 24-hour operations before making changes throughout the entire logistics chain.
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	FMCSA and DPS perform the same truck/trailer inspection. Personnel savings and a more efficient inspection could be achieved if the inspection were performed once. Recommend a Model Border Port should have DPS perform the inspection and FMCSA can use the results.	Medium Term	Crossing Management	PDN Model Port Commercial Subcommittee Operations Plan Focus Groups, May 2010	The focus group participants felt that many of the security programs in place lead to instances where different security and inspection efforts overlap or override each other.
Route all oversize/overweight trucks through Santa Teresa	Require that all oversize/overweight traffic utilize the Santa Teresa crossing. (Note: verify that this is not already implemented).	Short Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010 Operations Plan Public Meetings, June 2010	Focus group participants suggested that distributing more truck traffic to Santa Teresa would help to make the whole system work better. One public meeting participant explained that heavy machinery already is required to use the Santa Teresa port of entry (required when vehicle weight exceeds 80,000 pounds or when dimensions restrict the use of other bridges). He mentioned that the heavy machinery industry is beginning to move toward the Santa Teresa POE as a result.
Artcraft/I-10 interchange improvements	Invest in improvements at Artcraft/I-10 rather than extending Redd Road across the river. Improvements include four lane overpasses at Westside and Upper Valley with ramps connecting to each street, as well as constructing direct connection ramps from the westside of Artcraft to IH-10.	Long Term	Traffic Engineering and Infrastructure	Upper Valley Traffic Study (2009) Save the Valley Neighborhood Association	Artcraft/I-10 interchange currently is under stress and will only get worse; currently only one dedicated turn lane to I-10 South; Forecasted and current truck and private vehicle traffic on Artcraft closely resembles the traffic experienced on Americas/Joe Battle; Port of entry and industrial growth in Santa Teresa, New Mexico are expected to rival that of the Zaragoza POE; UP refueling yard also expected to become an intermodal yard in the future. See page 146 of the Upper Valley Traffic Study for a summary of proposed Artcraft Road. improvements (estimated at $75 million).
Construct grade-separations/access control between Santa Teresa POE and I-10	Facilitate faster travel times by constructing grade-separations on the access road between the Santa Teresa POE and I-10.	Long Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	Santa Teresa access via Artcraft Road and the Domenici Highway is approximately 12 miles in length with numerous traffic signals.
Develop strategic development plan for the area surrounding Santa Teresa	Develop a coordinated strategic development plan on both sides of the border adjacent to and along the approach to Santa Teresa.	Long Term	Traffic Engineering and Infrastructure	REDCO Maquila Interview, June 24, 2010	Without coordination between the two cities, the areas around Santa Teresa will be populated and the approaches to the POE will be constrained like all the other bridges. Instead of being a relief POE, Santa Teresa will become another problem for the region.

Table H.1.3 Master List of Proposed Solutions – Paso Del Norte/Stanton Street Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Potential permutations: 1. Increase tolls during peak periods 2. Dynamically increase tolls up to some specified maximum based on real-time traffic flows.	Medium Term	Pricing	Operations Plan Focus Groups, May 2010	
Add traffic signals in the downtown area	Add traffic signals in the downtown area	Short Term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 2 (page 156). This was the lowest ranking alternative for this crossing because work group participants felt that pedestrians would not obey the signals and that traffic signals would only slow the movement of traffic even further.
Add a pedestrian phase to the signal at 6th Avenue and El Paso Street.	Add a signal at 6th Avenue and El Paso Street with pedestrian phases as a mechanism to create a break in pedestrian traffic to help facilitate vehicular traffic movement.	Short Term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 7 (page 155-156 and Figure 44). Work group participants for the RJRA study felt that pedestrians would ignore the signal and that a police presence at this intersection would be a better solution or a refinement to the alternative. However, RJRA recommended this as a low cost, short-term improvement that can be applied easily and exclusively of other alternatives and then, depending on the results, can be eliminated if the results are not favorable.
Provide a pedestrian mall along El Paso Street	Implement a pedestrian mall along El Paso Street and reroute traffic to Santa Fe Street and use bollards to restrict access to cross street traffic	Short Term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 8 (Figure 45). This was the top-ranking alternative for this crossing. The study (page 154) found that it is a good alternative to implement and address the issue of the heavy pedestrian traffic at the Paso del Norte Crossing and the heavy pedestrian traffic patronizing the local merchants on El Paso Street It also is a potential economic development strategy for the City of El Paso. This alternative also addresses the traffic operations at the intersection of El Paso Street and 6th Avenue Alternative 8 provides quick access to an arterial roadway not presently accessed from the border crossing, and provides a connection from the crossing to Santa Fe Street via the railroad parking lot.
Provide a pedestrian pick-up/drop-off area	Implement a pedestrian pick-up/drop-off area located on the railroad parking lot with access from Santa Fe Street. This alternative utilizes a cul-de-sac for ingress and egress to Santa Fe Street.	Short Term	Supporting Activity	RJ Rivera Study, June 2008 Operations Plan Focus Groups, May 2010	Included in the RJRA study as Alternative 9 (page 155 and Figure 46). This alternative addresses the pedestrian issue involved at the intersection of El Paso Street and 6th Avenue by giving the pedestrians waiting to be picked up a quick exit via Santa Fe Street It also helps alleviate the parking issue and congestion atmosphere created by vehicles parked and waiting to pick-up pedestrians crossing the bridge.
Stanton Street and 9th Avenue intersection improvements	Improve the intersection at Stanton Street and 8th Avenue by removing the pedestrian pick-up, redesigning the raised median/island, and reassign lane assignments, alleviating the "forced right-turn" that directs traffic into the toll booth.	Short Term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 10 (page 155 and Figure 47). This alternative may be implemented on its own or combined with Alternatives 8 or 9.
Improve loop road to directly connect the Border Highway and Paisano Drive	Presently, there is not direct connection between Cesar Chavez Border Highway and Paisano Drive. A direct connection would improve cross-border traffic access to the western areas of the El Paso metropolitan area	Long Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	

Table H.1.4 Master List of Proposed Solutions – Bridge of the Americas Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Extend commercial operating hours	Extend hours or allow 24-hour commercial operations	Short Term	Crossing Management	REDCO Maquila Interview, June 24, 2010 Delphi, August 2010 Operations Plan Focus Groups, May 2010	As the region grows more, the industry will grow with it. This will make it necessary to use all the capability available at the bridges, even at hours that are now not customary. Twenty-four-hour availability is ideal as it allows better utilization of equipment as trucks/tractors can cycle. However, a temporary or trial 24-hour commercial operating period is not likely to have an effect on logistics patterns. The industry will need a long-term commitment to 24-hour operations before making changes throughout the entire logistics chain.
Limit commercial vehicles at BOTA to empties southbound and FAST northbound	All other commercial vehicles must use an alternate POE	Short term	Crossing Management	City of El Paso (Said debrief), June 2, 2010	Limiting northbound commercial vehicles to FAST only would require an amendment to the Chamizal Treaty.
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	FMCSA and DPS perform the same truck/trailer inspection. Personnel savings and a more efficient inspection could be achieved if the inspection were performed once. Recommend a Model Border Port should have DPS perform the inspection and FMCSA can use the results.	Medium Term	Crossing Management	PDN Model Port Commercial Subcommittee Operations Plan Focus Groups, May 2010	The focus group participants felt that many of the security programs in place lead to instances where different security and inspection efforts overlap or override each other.
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Potential permutations: 1. Toll BOTA at same rate as PDN and Zaragosa 2. Increase tolls at BOTA during peak periods 3. Dynamically increase tolls up to some specified maximum based on real-time traffic flows.	Medium Term	Pricing	Operations Plan Focus Groups, May 2010	Focus group participants recognized that BOTA is the only bridge on the U.S.-Mexico border that does not charge a toll. They suggested that charging a toll may help distribute traffic across the other bridges in the region. They also recognized that charging a toll would require an amendment to the Chamizal Treaty, which stipulates that the BOTA operates as a toll-free facility.
Pilot an empty truck fee program	Pilot an empty truck fee program for trucks not enrolled in trusted programs that make multiple daily trips across the border and/or limit empty trucks to off-peak hours.	Short Term	Pricing	Accenture Draft Report, March 2008	Empty trucks consume capacity available to loaded trucks. Limiting access to loaded trucks during peak hours or charging a fee for empty trucks would discourage empty truck movements during peak periods and encourage trucks to be value-added in both directions.
Improve Paisano signal timings on approach	By synchronizing the traffic signals, traffic would flow through the corridor unimpeded by unnecessary stop indications thereby improving overall mobility and reducing travel times.	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 10 (see Figure 52).
Close Stevens Street access to the southbound IH-110 ramp	This alternative would make Stevens Street a dead-end street thereby preventing additional traffic from queuing along the southbound frontage road. More importantly, closing Stevens Street would eliminate the cut-through traffic from Copia Street that utilize the residential streets to access the BOTA Crossing.	Short term	Supporting Activity	RJ Rivera Study, June 2008 City of El Paso, May 2010	Included in the RJRA study as Alternative 7 (see Figure 49). This recommendation also is reflected on the City of El Paso's proposed bus route concept drawings "BOTA_BUS_ROUTES.pdf" and "BOTA_BUS_ROUTES_I-110.pdf"
Prevent crossover movements from IH-110 main lanes to frontage road	Construct a cable barrier along the median between southbound IH-110 and the frontage road to prevent vehicles from crossing onto the frontage road over the raised median.	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 9 (see Figure 51).
Chamizal neighborhood traffic calming and residential parking permits	Parking permits for residential residents, if enforced, would redirect all the commercial vehicles that use the side streets as free parking lots to the more appropriate commercial thoroughfares of Paisano, Copia, Alameda and I-54 where they can be regulated, accommodated and taxed if necessary. Traffic calming curbs at neighborhood street intersections would slow legitimate traffic as it moves through the neighborhoods on its way to the BOTA, thereby making the streets safer for children, pedestrians, bikes, and residents. They also would be an easy way for the City to give the neighborhood instant identity and revitalization support.	Short term	Supporting Activity	E-mail from Stephen Porras to Beto O'Rourke, July 1, 2010	

Improvement	Description	Timing	Type	Source	Notes/Background
Prevent cut-through/u-turning traffic on Cypress Avenue and San Marcial Street	Install traffic calming devices (center medians) on Cypress Avenue between Paisano and San Marcial to prevent commercial trucks from using the street for u-turns on Paisano Dr.	Short term	Supporting Activity	Bowie High School Public Meeting, June 2010	
Placement of larger turning radius for vehicular access to inspection booths	Placement of larger turning radius for vehicular access to inspection booths.	Long Term	Supporting Activity	PDN Model Port Light Rail/Infrastructure Subcommittee	
Improve pedestrian facilities, including sidewalks, drop off/pick up area, and pedestrian/vehicle interactions	Improve pedestrian facilities, including sidewalks, drop off/pick up area, and pedestrian/vehicle interactions	Short term	Supporting Activity	City of El Paso (Said debrief), June 2, 2010PDN Model Port Light Rail/ Infrastructure Subcommittee	Existing sidewalks are not adequate for pedestrians. There is no good passenger drop-off area. Pedestrians have to cross the approach, often walking between queued trucks and passenger vehicles.
Variable message signs	Install ITS devices to redirect traffic to the Ysleta Crossing (commercial traffic) and the downtown bridges (passenger traffic) if the bridge is heavily congested or has long wait times.	Short term	Technology	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 6 (see Figure 48).
Convert bridges to one-way pairs	Potential permutations: 1. BOTA southbound/Zaragosa northbound 2. Zaragosa southbound/BOTA northbound	Medium Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	
Designate or reassign lanes at the intersections of IH-110 and Paisano Dr.	This alternative would improve the signing and markings that designate lane assignments thereby providing motorists the opportunity to move to the lane that corresponds with the direction they wish to go. It is intended to prevent last-minute lane changes and unsafe driving maneuvers.	Short term	Traffic Engineering and Infrastructure	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 8 (see Figure 50).
Passenger and commercial vehicle traffic circulation reconfigurations – Eastbound Paisano	From eastbound Paisano, signs will direct trucks to use right lane only and jersey barriers will separate commercial vehicles from passenger vehicles. Trucks will use the channelized right turn lane to enter the POE. Passenger vehicles will stay left, making the right turn onto the POE approach at the signalized intersection. Turnaround access will be provided prior to entering Mexico for any passenger or commercial vehicles that accidently enter the wrong queue.	Short term	Traffic Engineering and Infrastructure	City of El Paso	See aerial plot for traffic reconfigurations. Signal timings will have to be reworked. This improvement is intended to reduce passenger/commercial vehicle weaving on the approach.
Passenger and Commercial vehicle traffic circulation reconfigurations – Westbound Paisano	From westbound Paisano, signs will direct commercial vehicles to use the right lane only. Passenger vehicles will stay left. Staying in their respective lanes, commercial and passenger vehicles will turn left onto the POE approach at the signalized intersection with IH-110.	Short term	Traffic Engineering and Infrastructure	City of El Paso	See aerial plot for traffic reconfigurations. Signal timings will have to be reworked. This improvement is intended to reduce passenger/commercial vehicle weaving on the approach.
Passenger and Commercial vehicle traffic circulation reconfigurations – Southbound U.S. 54	Passenger vehicles bound for Juárez will use Exit 20B toward IH-110 which connects to the POE approach via an underpass below the Paisano/IH-110 intersection. Commercial vehicles will be required to use Exit 20A toward Paisano Dr. On Paisano, trucks will stay in the right lane and turn left onto the POE approach at the signalized intersection with IH-110.	Short term	Traffic Engineering and Infrastructure	City of El Paso	See aerial plot for traffic reconfigurations. Signal timings will have to be reworked. This improvement is intended to reduce passenger/commercial vehicle weaving on the approach. Note that the turning radii under the overpass are not adequate for trucks.
Passenger and Commercial vehicle traffic circulation reconfigurations – Southbound IH-110	From I-10, passenger vehicles will use the left lane and merge onto the IH-110 underpass below Paisano. Commercial vehicles will stay in the right lane that ultimately intersects with Paisano, and pass through the two signals to enter the POE approach	Short term	Traffic Engineering and Infrastructure	City of El Paso	See aerial plot for traffic reconfigurations. Signal timings will have to be reworked. This improvement is intended to reduce passenger/commercial vehicle weaving on the approach.

Improvement	Description	Timing	Type	Source	Notes/Background
Passenger and Commercial vehicle traffic circulation reconfigurations – General	Improve southbound approaches to BOTA to alleviate bottlenecks. Place Jersey barriers at BOTA to avoid commercial and passenger vehicular weaving.	Short Term	Traffic Engineering and Infrastructure	PDN Model Port Light Rail/Infrastructure Subcommittee	Current layout of U.S. highways for southbound movements across BOTA into Juárez require weaving of trucks and cars to properly align with border inspection facilities in Mexico. All truck traffic must use right lanes in Mexico and passenger vehicles use left lanes. Southbound traffic accesses BOTA from 3 different highways. Trucks and cars in each of the three highways must weave over a short travel distance to align with Mexico inspection facilities. The proposed work would reduce truck and passenger vehicle weaving by creating dedicated truck lanes for two of the southbound highways. The third highway requires more infrastructure investment which cannot accomplished within the short or medium term. Those potential improvements are being studied for long range recommendation.
Widen IH-110 southbound exit from one lane to two	Diverge from one lane to two leading to POE approach	Short term	Traffic Engineering and Infrastructure	City of El Paso (Said debrief), June 2, 2010	
SENTRI Dedicated Commuter Lane	Use one existing northbound lane dedicated for use as a northbound commuter lane.	Medium Term	Traffic Engineering and Infrastructure	El Paso MPO, April 2010 PDN Model Port Light Rail/Infrastructure Subcommittee Operations Plan Focus Groups, May 2010	See aerial map prepared by El Paso MPO (improvement shaded in orange). This improvement will require a modification to the Presidential Treaty. Look at the three improvements on map individually and collectively to determine short and long-term needs. The PDN Model Port Committee indicated that there currently are 28,000 SENTRI registrants in the El Paso/Juárez area, and this additional infrastructure will advance us to their regional goal of 50,000 within 18 months of implementation of this new lane.
Placement of ramp from BOTA for access to Border Highway West	Construct a connector ramp from BOTA to access Cesar Chavez Border Highway West. At present, drivers leaving BOTA cannot go west.	Long term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010PDN Model Port Light Rail/ Infrastructure Subcommittee	
Bus route option I	From Alameda, route turns south on Grama, serves a proposed passenger drop-off area/park-and-ride at the northwest quadrant of Paisano and IH-110 interchange (TxDOT ROW), and then heads back north to Alameda via Copia.	Short term	Traffic Engineering and Infrastructure	City of El Paso, May 2010	See "BOTA_BUS_ROUTES.pdf" for aerial map. The City has indicated that TxDOT has committed to allowing this land to be used. TxDOT to model this? (based on 6/22/2010 meeting with City). Consideration must be given to where pedestrians will cross Paisano and the pedestrian facilities available. This bus stop location is likely to be opposed by residents of the adjacent neighborhood.
Bus route option II	Following a west-to-east route along Paisano, maintain a bus stop at the southeast quadrant of the Paisano and IH-110 interchange. This land currently is a USA and City of El Paso drainage easement (joint use agreement). Route then continues eastbound on Paisano.	Short term	Traffic Engineering and Infrastructure	City of El Paso, May 2010	See "BOTA_BUS_ROUTES.pdf" for aerial map. TxDOT to model this? (based on 6/22/2010 meeting with City)
Bus route option III	This route would use the eastbound Paisano exit ramp at IH-110 to make a stop at the southwest quadrant of the Paisano and IH-110 interchange (TxDOT-owned road easement on the northern edge of Chamizal Memorial Park). The route then heads northbound on IH 110.	Short term	Traffic Engineering and Infrastructure	City of El Paso, May 2010	See "BOTA_BUS_ROUTES_I-110.pdf" for aerial map. TxDOT to model this? (based on 6/22/2010 meeting with City)
Bus route option IV	This route would follow IH 110 to Paisano before making a quick right turn on Copia, followed by a left onto San Antonio to serve the proposed passenger drop-off area/park-and-ride at the northwest quadrant of Paisano and IH-110 interchange (TxDOT ROW). The route continues northbound on Grama to Alameda.	Short term	Traffic Engineering and Infrastructure	City of El Paso, May 2010	See "BOTA_BUS_ROUTES_I-110.pdf" for aerial map. TxDOT to model this? (based on 6/22/2010 meeting with City). Consideration must be given to where pedestrians will cross Paisano and the pedestrian facilities available. This bus stop location is likely to be opposed by residents of the adjacent neighborhood.
Expand POE booths	Expand the number of passenger and commercial vehicular inspection booths;	Long term	Traffic Engineering and Infrastructure	El Paso MPO, April 2010 PDN Model Port Light Rail/Infrastructure Subcommittee	See aerial map prepared by El Paso MPO (improvement shaded in blue). This improvement will require a modification to the Presidential Treaty. Look at the three improvements on map individually and collectively to determine short and long-term needs. (From the PDN Model Port Committee) Bridge of the Americas (BOTA) was originally constructed in 1967 and was substantially improved in 1996. Additional inspection booths were incorporated in 2005. BOTA is the most heavily utilized port infrastructure in the El Paso region. In 2009, BOTA handled over 4.35 M passenger vehicles (38 percent of regional total) and almost 317,000 commercial truck crossings (46 percent of regional total).

Improvement	Description	Timing	Type	Source	Notes/Background
Bridge infill	Fill the gap between the northbound and southbound spans to add two travel lanes in each direction. In the northbound direction, the additional lanes would provide additional storage length for passenger vehicles in queue.	Long term	Traffic Engineering and Infrastructure	El Paso MPO, April 2010; Gensler Report, April 2009 PDN Model Port Light Rail/Infrastructure Subcommittee	See aerial map prepared by El Paso MPO (improvement shaded in green). This improvement will require a modification to the Presidential Treaty. Look at the three improvements on map individually and collectively to determine short and long-term needs. Gensler Report estimates bridge infill costs at $17.4 million and anticipates difficult construction and protracted schedule.
Reconfigure BOTA to accommodate in-bond traffic	Configure BOTA to allow direct entry to Mexican customs from the U.S. compound without having to use city streets. This would help to alleviate some of the burden at Zaragoza	Long term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	At present, all in-bond commercial traffic must go through Zaragoza (several hundred trucks on a daily basis). At Zaragoza, if a commercial vehicle in the U.S. compound is turned away and must return to Mexico, it can do so within the footprint of the compound itself.

Table H.1.5 Master List of Proposed Solutions – Ysleta-Zaragoza Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Extend commercial operating hours	Extend hours or allow 24-hour commercial operations	Short Term	Crossing Management	REDCO Maquila Interview, June 24, 2010 Delphi, August 2010 Operations Plan Focus Groups, May 2010	As the region grows more, the industry will grow with it. This will make it necessary to use all the capability available at the bridges, even at hours that are now not customary. Twenty-four-hour availability is ideal as it allows better utilization of equipment as trucks/tractors can cycle. However, a temporary or trial 24-hour commercial operating period is not likely to have an effect on logistics patterns. The industry will need a long-term commitment to 24-hour operations before making changes throughout the entire logistics chain.
Allow Mexican Aduanas staff to inspect in-bond vehicles on U.S. soil	Allow Mexican Aduanas staff to inspect in-bond vehicles on U.S. soil	Medium term	Crossing Management	City of El Paso (Said debrief), June 2, 2010	Currently all in-bonds must use Zaragoza. See suggested improvement for reconfiguring BOTA to accommodate in-bond traffic as well.
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	FMCSA and DPS perform the same truck/trailer inspection. Personnel savings and a more efficient inspection could be achieved if the inspection were performed once. Recommend a Model Border Port should have DPS perform the inspection and FMCSA can use the results.	Medium Term	Crossing Management	PDN Model Port Commercial Subcommittee Operations Plan Focus Groups, May 2010	The focus group participants felt that many of the security programs in place lead to instances where different security and inspection efforts overlap or override each other.
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Potential permutations: 1. Increase tolls during peak periods 2. Dynamically increase tolls up to some specified maximum based on real-time traffic flows.	Medium Term	Pricing	Operations Plan Focus Groups, May 2010	
Use old BSIF location for commercial vehicle staging and queuing	Reuse the old Border Safety Inspection Facility (BSIF) location for commercial vehicle queuing. ROW currently owned by TxDOT. Trucks would be staged at this site and allowed to proceed to the POE at a rate that would prevent trucks from queuing onto the frontage roads of LP 375.	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 6 (Figure 55).
Relocate the pedestrian pick-up area	Relocate the pedestrian pick-up area, along with the telephones, on the LP 375 eastbound frontage road and move to a new location. Convert current pedestrian pick-up area to shuttle bus stop to take pedestrians to the bus terminal proposed by Sun Metro (eliminate car pick-up).	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternatives 4 (Figure 54) and 8 (Figure 57).
Use old BSIF location for passenger vehicle parking	Reuse the old Border Safety Inspection Facility (BSIF) location for passenger vehicle parking. Add a transit stop at this location as well. ROW currently owned by TxDOT.	Short term	Supporting Activity	City of El Paso (Said debrief), June 2, 2010	TxDOT district is not opposed to this alternative. See aerial map prepared by the City of El Paso, May 24, 2010
Use DPS-owned land for secondary southbound inspections	Use the land adjacent to the southbound inspection facilities owned by DPS to conduct secondary southbound inspections.	Short term	Supporting Activity	City of El Paso (Said debrief), June 2, 2010	Pedestrian access is through the same area; therefore this alternative also would require the construction of a pedestrian overpass.
Add additional frequent traveler lanes	Possible permutations: 1. Transition lanes from standard to SENTRI and back as demand requires. 2. Convert one or more standard lanes to SENTRI 3. Transition commercial lanes from standard to FAST as demand requires. 4. Convert one or more standard commercial lanes to FAST	Short Term	Traffic Engineering and Infrastructure		
Convert bridges to one-way pairs	Potential permutations: 1. BOTA southbound/Zaragosa northbound 2. Zaragosa southbound/BOTA northbound	Medium Term	Traffic Engineering and Infrastructure	Operations Plan Focus Groups, May 2010	

Improvement	Description	Timing	Type	Source	Notes/Background
Pilot a dedicated empty truck lane	Pilot a dedicated empty truck lane at Zaragosa with non-intrusive inspection technology	Short term	Traffic Engineering and Infrastructure	Accenture Draft Report, March 2008	Empty trucks consume capacity available to loaded trucks. Limiting access to loaded trucks during peak hours or charging a fee for empty trucks would discourage empty truck movements during peak periods and encourage trucks to be value-added in both directions.
Add additional left turn lane on LP 375 approach	Add an additional left-turn lane on the LP 375 westbound frontage road for more queue length and relocate the concrete traffic barrier, which will regain the third lane on the frontage road. Allows for a left-turn lane and a left-through option middle lane.	Short term	Traffic Engineering and Infrastructure	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 7 (Figure 56).
Provide an eastbound exit ramp from the main lanes of LP 375	This alternative would direct truck traffic onto the eastbound frontage road, and allow them to utilize the turnaround onto the westbound frontage road as they proceed to the temporary Border Safety Inspection Facility (BSIF). Thisalternative would provide truck traffic an opportunity to by-pass the exit ramp west of S. Zaragosa Road and avoid the intersection of the eastbound frontage road with S. Zaragosa Road. Given geometric constraints, this improvement would require the conversion of the existing entry ramp to an exit ramp.	Short term	Traffic Engineering and Infrastructure	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 1 (Figures 42 and 43). This alternative was not advanced as one of the study's recommendations. The study found that adding an exit ramp on LP 375 at the location suggested would not work geometrically, due to the difference in grade. The study team decided to refine the alternative by moving the exit ramp further east to a location where the difference in grade was less. However, by placing it at the recommended location, the existing entrance ramp would have to be removed and, according to the traffic data collected, the entrance ramp is heavily utilized by commercial trucks accessing the eastbound main lanes.
Expand northbound bridge to increase inspection lanes	Expand existing northbound bridge to add four lanes (two FAST, one empty, one regular) for a total of eight lanes (could create dynamic lane/contra flow usage for peak period).	Long term	Traffic Engineering and Infrastructure	City of El Paso (Said debrief), June 2, 2010	Mexican Aduanas has room to increase inspection lanes and Promofront is willing to invest. Will require an amendment to the Presidential Permit. No discussions about expanding bridge on the southbound side.

Table H.1.6 Master List of Proposed Solutions – Fabens Port of Entry Improvements

Improvement	Description	Timing	Type	Source	Notes/Background
Improve signage from Ysleta POE	This alternative proposed to use conventional signing to direct traffic along SH 20 from the Ysleta Crossing to the Fabens Crossing. The signing would direct motorists to an alternative route, instead of waiting at the Ysleta Crossing during heavy traffic periods.	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 2 (Figure 59).
Design new Tornillo port of entry as a Model Border Port		Medium term	Traffic Engineering and Infrastructure	PDN Model Port Committee	
Improve signage to/from IH 10	This POE is located several miles from the interstate and the route includes several 90 degree turns. This alternative would review existing guide signs to and from the POE and add signs, as needed, to guide traffic traveling between these two points.	Short term	Supporting Activity	RJ Rivera Study, June 2008	Included in the RJRA study as Alternative 1 (Figure 58).

H.2 Initial Screening – Detailed Results

Our project screening process evaluated and rated each solution based on its ability to satisfy five criteria:

1. Extent to which the solution **optimizes the use of existing capacity** or **streamlines existing processes**;
2. Extent to which the solution **preserves security**;
3. Solution's potential to **reduce crossing times** at the border;
4. Solution's potential to **reduce total end-to-end travel time** (excluding wait/inspection times at the border); and
5. Extent to which the solution is **implementable**, based on anticipated cost, associated policy changes, or stakeholder pushback.

These initial screening criteria represent the subset of guiding principles that reflect the most important priorities of the stakeholders we talked with during our outreach efforts. Using an evaluation matrix, each solution was assigned a "high," "medium," and "low" ranking for each criterion, as well as an overall rating. The following sections provide additional explanation of these criteria, including examples of "high," "medium," and "low"-rated solutions for each. This section includes the qualitative ratings for each of the potential solutions tabulated by port of entry.

Table H.2.1 Initial Criteria Screen Results – General Port of Entry Improvements

Improvement	Project Type	Screening Criteria					Composite Rating
		Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	
Extend commercial operating hours or allow 24-hour commercial operations at one or more bridges	Crossing Management	●	N/A	●	●	○	●
Prioritize adequate staffing at the ports of entry	Crossing Management	●	●	●	N/A	○	●
Design secure dual-inspection point pilot program to streamline commercial inspections	Crossing Management	●	◒	●	N/A	○	◒
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	Crossing Management	●	◒	●	N/A	○	◒
Conduct southbound inspections at the point of debarkation (unloading) rather than at the border	Crossing Management	◒	◒	●	N/A	○	◒
Evaluate tolling/pricing solutions	Pricing	●	N/A	●	N/A	○	◒
Pilot an empty truck fee program	Pricing	●	N/A	◒	N/A	○	◒
Expand C-TPAT benefits and enrollment	Supporting Activity	●	●	●	N/A	◒	●
Expand SENTRI enrollment to 50,000	Supporting Activity	●	●	●	N/A	◒	●
Use Intelligent Transportation Systems (ITS) and/or dynamic message signs (DMS) on the bridges and approaches to alert drivers of lane closures, crossing times, and lane assignments	Technology	●	N/A	●	●	●	●
Implement queue monitoring technology	Technology	●	N/A	●	N/A	◒	●
Implement non-invasive inspection technology for cargo	Technology	●	●	●	N/A	○	●
Implement technologies to improve metrics for tracking crossing times for commercial trucks and passenger vehicles (POV)	Technology	●	N/A	◒	N/A	◒	◒
License plate recognition technology	Technology	◒	◒	◒	N/A	○	○
Convert bridges to one-way pairs	Traffic Engineering and Infrastructure	◒	N/A	●	N/A	○	◒

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Expand use of designated inspection lanes for certain passengers and pedestrians	Traffic Engineering and Infrastructure	●	●	●	N/A	○	●
Provide designated commuter lanes at all ports of entry	Traffic Engineering and Infrastructure	●	●	●	N/A	○	●
Provide variable designated lanes during peak periods	Traffic Engineering and Infrastructure	●	●	●	N/A	○	●
Implement contra-flow lanes during peak periods	Traffic Engineering and Infrastructure	◒	N/A	●	N/A	○	◒
Designate a port of entry for the exclusive use of commercial vehicles (or further limited to FAST participants)	Traffic Engineering and Infrastructure	◒	◒	◒	N/A	○	○
Support pilot demonstration of the Universal Freight Shuttle	Traffic Engineering and Infrastructure	○	●	◒	◒	○	○
Construct new loop road to connect Stanton, BOTA, and Zaragoza.	Traffic Engineering and Infrastructure	○	N/A	N/A	●	○	○
Construct a new port of entry in the region	Traffic Engineering and Infrastructure	○	N/A	◒	N/A	○	○

Rating Key:

● Rates well against initial screening criteria

◒ Partially meets the initial screening criteria

○ Does not meet the initial screening criteria

N/A Criteria not applicable

Table H.2.2 Initial Criteria Screen Results – Santa Teresa Port of Entry Improvements

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Extend commercial operating hours	Crossing Management	●	N/A	●	●	○	●
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	Crossing Management	●	◒	●	N/A	○	◒
Route all oversize/overweight trucks through Santa Teresa	Traffic Engineering and Infrastructure	●	N/A	◒	N/A	◒	◒
Artcraft/I-10 interchange improvements	Traffic Engineering and Infrastructure	◒	N/A	N/A	●	◒	◒
Construct grade-separations/access control between Santa Teresa POE and I-10	Traffic Engineering and Infrastructure	◒	N/A	N/A	●	◒	◒

Rating Key:

● Rates well against initial screening criteria

◒ Partially meets the initial screening criteria

○ Does not meet the initial screening criteria

N/A Criteria not applicable

Table H.2.3 Initial Criteria Screen Results – Paso Del Norte/Stanton Street Port of Entry Improvements

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Pricing	●	N/A	●	N/A	○	◒
Add traffic signals in the downtown area	Supporting Activity	●	N/A	N/A	○	●	◒
Add a pedestrian phase to the signal at 6th Avenue and El Paso Street	Supporting Activity	●	N/A	N/A	○	●	◒
Provide a pedestrian mall along El Paso Street	Supporting Activity	●	N/A	N/A	○	●	◒
Provide a pedestrian pick-up/drop-off area	Supporting Activity	●	N/A	N/A	○	●	◒
Stanton Street and 9th Avenue intersection improvements	Supporting Activity	●	N/A	N/A	○	●	◒
Improve loop road to directly connect the Border Highway and Paisano Drive	Traffic Engineering and Infrastructure	◒	N/A	N/A	●	◒	◒

Rating Key:

● Rates well against initial screening criteria

◒ Partially meets the initial screening criteria

○ Does not meet the initial screening criteria

N/A Criteria not applicable

Table H.2.4 Initial Criteria Screen Results – Bridge of the Americas Port of Entry Improvements

Improvement	Project Type	Screening Criteria					Composite Rating
		Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	
Extend commercial operating hours	Crossing Management	●	N/A	●	●	○	●
Limit commercial vehicles at BOTA to empties southbound and FAST northbound	Crossing Management	●	N/A	●	N/A	○	◒
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	Crossing Management	●	◒	●	N/A	○	◒
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Pricing	●	N/A	●	N/A	○	◒
Pilot an empty truck fee program	Pricing	●	N/A	◒	N/A	○	◒
Improve Paisano signal timings on approach	Supporting Activity	●	N/A	N/A	●	●	●
Close Stevens Street access to the southbound IH-110 ramp	Supporting Activity	●	N/A	N/A	●	●	●
Prevent crossover movements from IH-110 main lanes to frontage road	Supporting Activity	●	N/A	N/A	◒	●	●
Chamizal neighborhood traffic calming and residential parking permits	Supporting Activity	●	N/A	N/A	○	●	◒
Prevent cut-through/u-turning traffic on Cypress Avenue and San Marcial Street	Supporting Activity	●	N/A	N/A	○	●	◒
Placement of larger turning radius for vehicular access to inspection booths	Supporting Activity	●	N/A	N/A	○	●	◒
Improve pedestrian facilities, including sidewalks, drop off/pick up area, and pedestrian/vehicle interactions	Supporting Activity	●	N/A	N/A	○	●	◒
Variable message signs	Technology	●	N/A	N/A	●	●	●
Convert bridges to one-way pairs	Traffic Engineering and Infrastructure	●	N/A	●	N/A	○	◒

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Designate or reassign lanes at the intersections of IH-110 and Paisano Drive	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Passenger and commercial vehicle traffic circulation reconfigurations – Eastbound Paisano	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Passenger and Commercial vehicle traffic circulation reconfigurations – Westbound Paisano	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Passenger and Commercial vehicle traffic circulation reconfigurations – Southbound U.S. 54	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Passenger and Commercial vehicle traffic circulation reconfigurations – Southbound IH-110	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Passenger and Commercial vehicle traffic circulation reconfigurations – General	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
Widen IH-110 southbound exit from one lane to two	Traffic Engineering and Infrastructure	●	N/A	N/A	●	●	●
SENTRI Dedicated Commuter Lane	Traffic Engineering and Infrastructure	●	●	●	N/A	○	●
Placement of ramp from BOTA for access to Border Highway West	Traffic Engineering and Infrastructure	Yes	N/A	N/A	●	◒	◒
Expand POE booths	Traffic Engineering and Infrastructure	Yes	N/A	●	N/A	○	◒
Bridge infill	Traffic Engineering and Infrastructure	Yes	N/A	●	N/A	○	◒
Reconfigure BOTA to accommodate in-bond traffic	Traffic Engineering and Infrastructure	Yes	●	◒	N/A	○	◒

Rating Key:

● Rates well against initial screening criteria

◒ Partially meets the initial screening criteria

○ Does not meet the initial screening criteria

N/A Criteria not applicable

Table H.2.5 Initial Criteria Screen Results – Ysleta-Zaragoza Port of Entry Improvements

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Extend commercial operating hours	Crossing Management	●	N/A	●	●	○	●
Allow Mexican Aduanas staff to inspect in-bond vehicles on U.S. soil	Crossing Management	●	●	◒	N/A	○	◒
Support legislative change for state DPS inspections to serve Federal FMCSA requirements	Crossing Management	●	◒	●	N/A	○	◒
Explore pricing solutions to help reduce bottlenecks and delays during peak travel periods.	Pricing	●	N/A	●	N/A	○	◒
Use old BSIF location for commercial vehicle staging and queuing	Supporting Activity	●	N/A	N/A	◒	●	●
Relocate the pedestrian pick-up area	Supporting Activity	●	N/A	N/A	○	●	◒
Use old BSIF location for passenger vehicle parking	Supporting Activity	●	N/A	N/A	○	●	◒
Use DPS-owned land for secondary southbound inspections	Supporting Activity	◒	●	◒	N/A	◒	◒
Add additional frequent traveler lanes	Traffic Engineering and Infrastructure	●	●	●	N/A	○	●
Convert bridges to one-way pairs	Traffic Engineering and Infrastructure	◒	N/A	●	N/A	○	◒
Pilot a dedicated empty truck lane	Traffic Engineering and Infrastructure	●	N/A	◒	N/A	○	◒
Add additional left turn lane on LP 375 approach	Traffic Engineering and Infrastructure	●	N/A	N/A	◒	●	●
Provide an eastbound exit ramp from the main lanes of LP 375	Traffic Engineering and Infrastructure	◒	N/A	N/A	●	◒	◒
Expand northbound bridge to increase inspection lanes	Traffic Engineering and Infrastructure	○	●	●	N/A	○	◒

Rating Key:

● Rates well against initial screening criteria

◒ Partially meets the initial screening criteria

○ Does not meet the initial screening criteria

N/A Criteria not applicable

Table H.2.6 Initial Criteria Screen Results – Fabens Port of Entry Improvements

Improvement	Project Type	Screening Criteria: Uses Existing Capacity	Preserves Security	Reduces Crossing Times	Reduces End-to-End Travel Time	Implementability	Composite Rating
Improve signage from Ysleta POE	Supporting Activity	●	N/A	N/A	◒	●	●
Improve signage to/from IH 10	Supporting Activity	●	N/A	N/A	○	●	◒

Rating Key:

● Rates well against initial screening criteria ◒ Partially meets the initial screening criteria ○ Does not meet the initial screening criteria N/A Criteria not applicable

H.3 Conceptual Layouts and Schematics

To facilitate the modeling of the traffic engineering and infrastructure scenarios, we have compiled conceptual layouts and schematics of the proposed solutions from a variety of sources.

Table H.3.1 List of Figures

Solution Scenario	Figure Number
Bridge specialization – route all southbound commercial traffic through BOTA	H.3.1
Construct grade-separations/between Santa Teresa POE and I-10 (Artcraft Road)	H.3.2, H.3.3
Improve loop road that connects Stanton/PDN, BOTA, and Ysleta-Zaragoza POEs	H.3.4
Add an additional left-turn lane on the LP 375 westbound frontage road (Ysleta-Zaragoza POE)	H.3.5
Reconfigure southbound lane assignments/traffic circulation patterns on BOTA approach (Paisano, U.S. 54, and IH-10).	H.3.6
Complete BOTA bridge infill between northbound and southbound spans to add two travel lanes in each direction	H.3.7

Figure H.3.1 Bridge Specialization Scenario – Route All Southbound Commercial Traffic Through BOTA

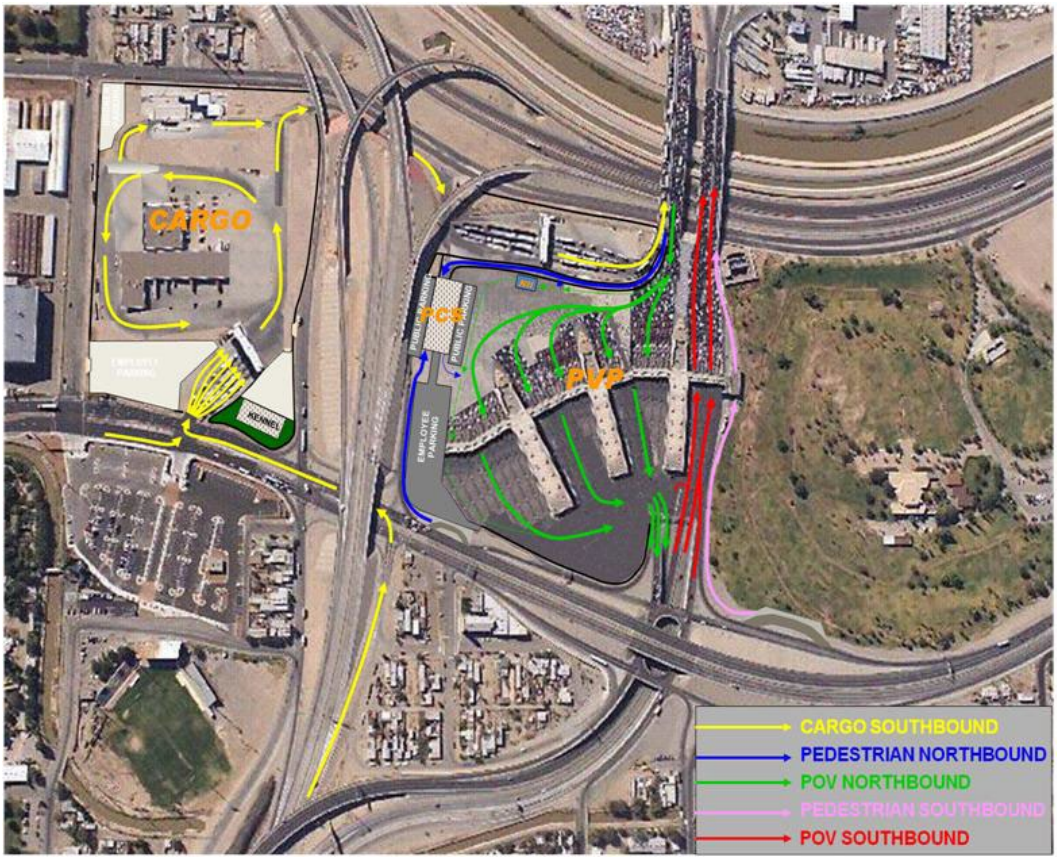
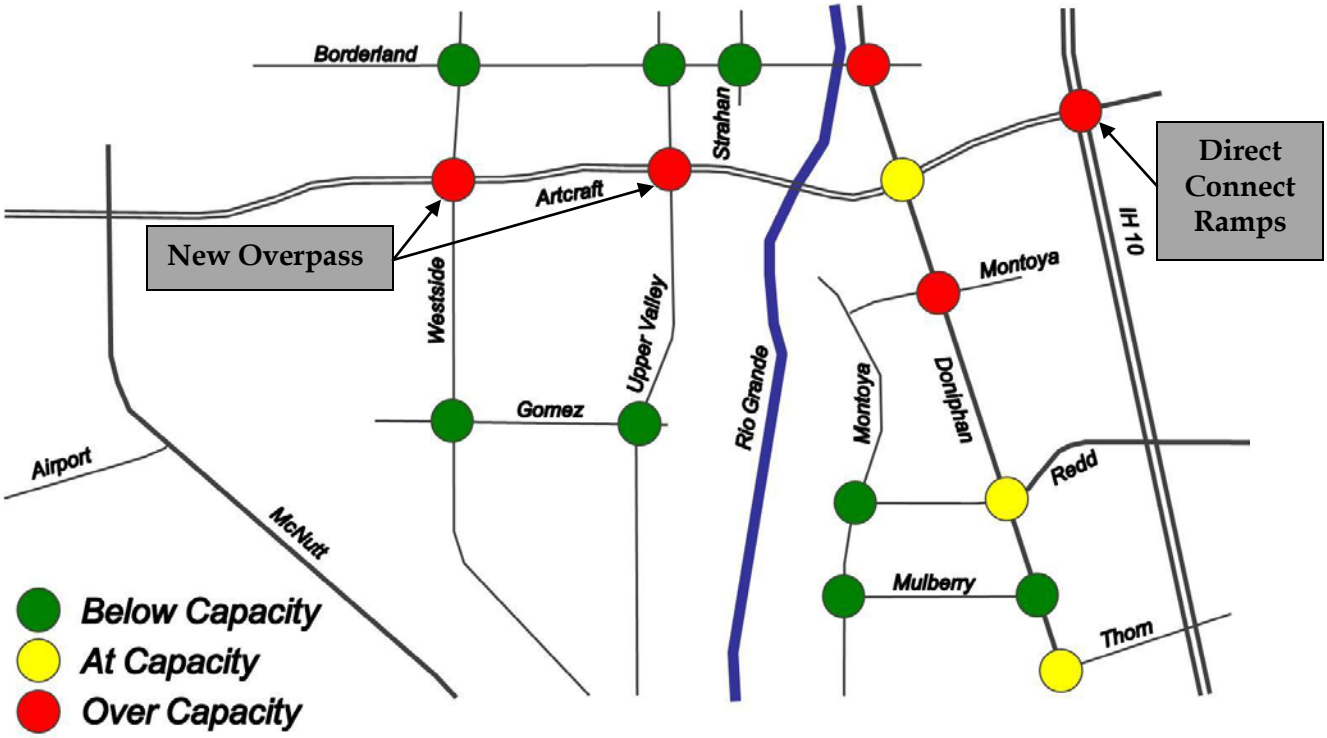
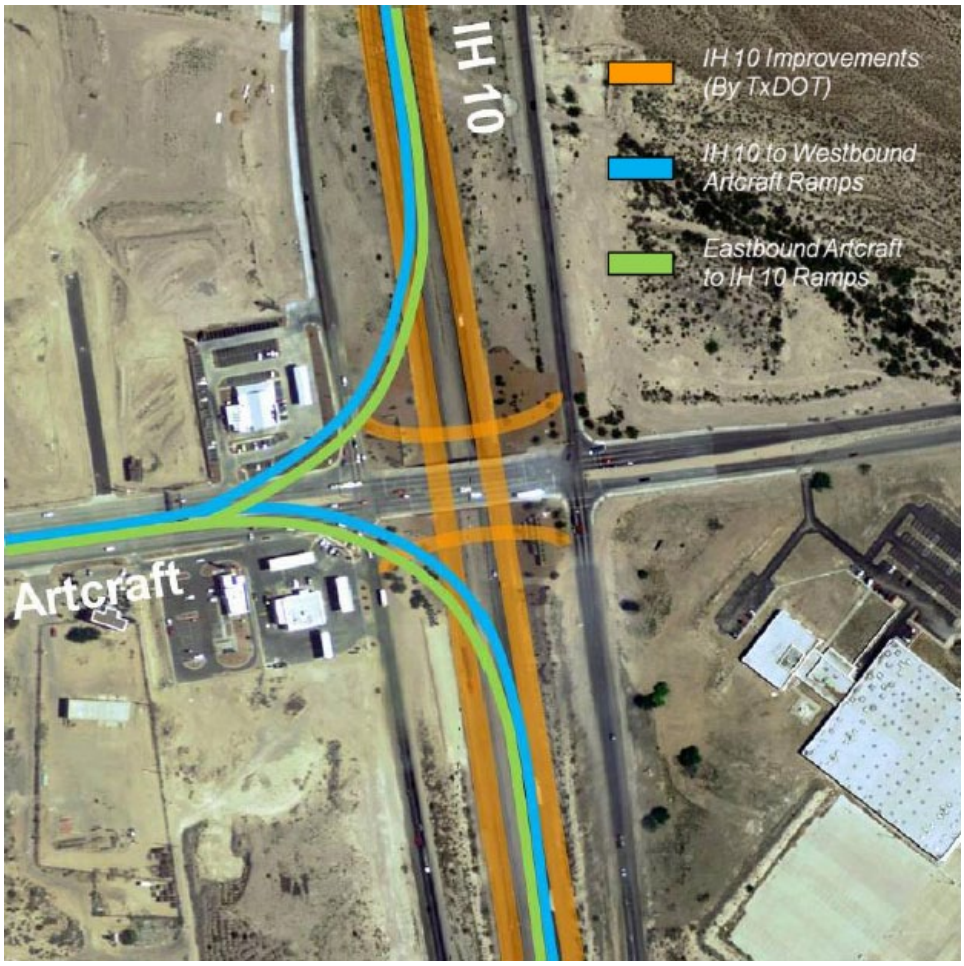


Figure H.3.2 Construct Grade-Separations/Between Santa Teresa POE and I-10 (Artcraft Road)



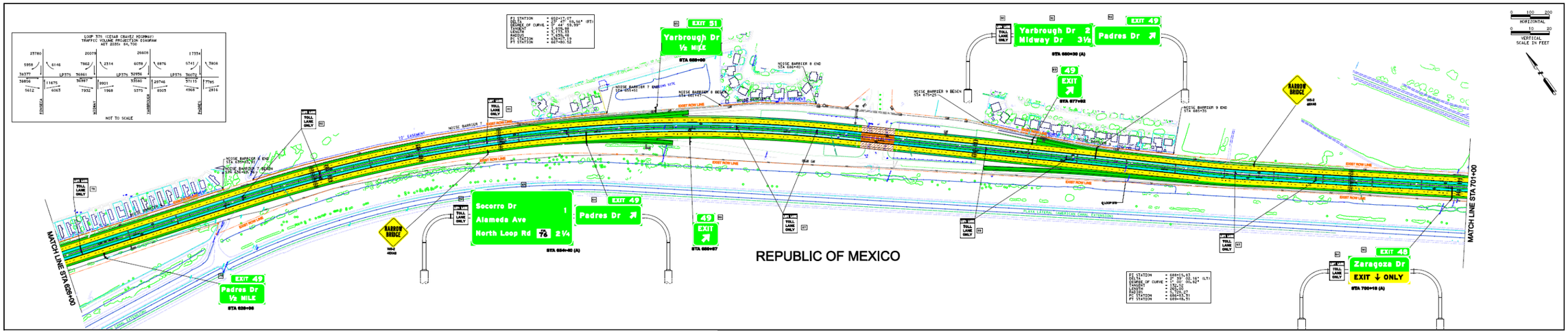
Source: Walter P Moore, *Upper Valley Traffic Study*, Prepared for the City of El Paso, December 2008.

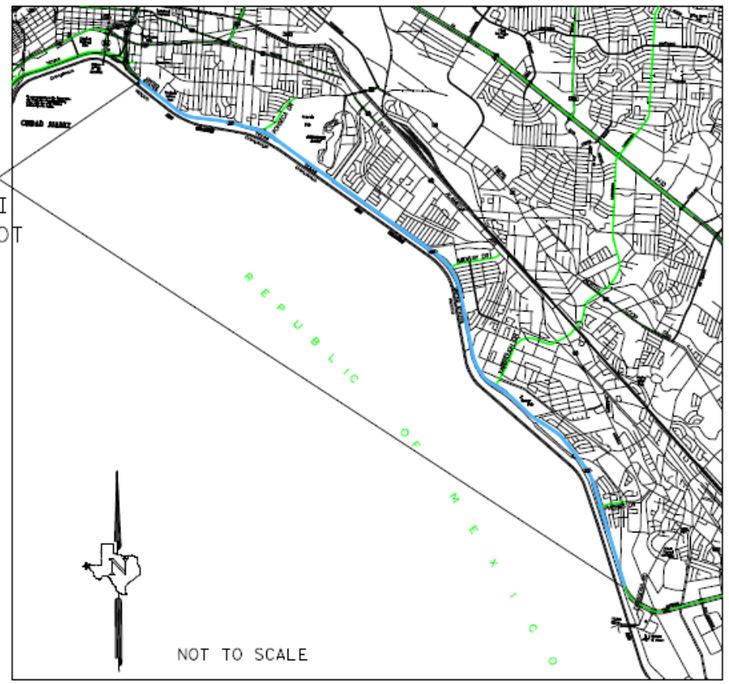
Figure H.3.3 Construct Grade-Separations/Between Santa Teresa POE and I-10 (Artcraft Road)



Source: Walter P Moore, Upper Valley Traffic Study, Prepared for the City of El Paso, December 2008.

Figure H.3.4 Improve Loop Road that Connects Stanton/PDN, BOTA, and Ysleta-Zaragoza POEs (Example Design Schematic)





PROJECT LOCATION

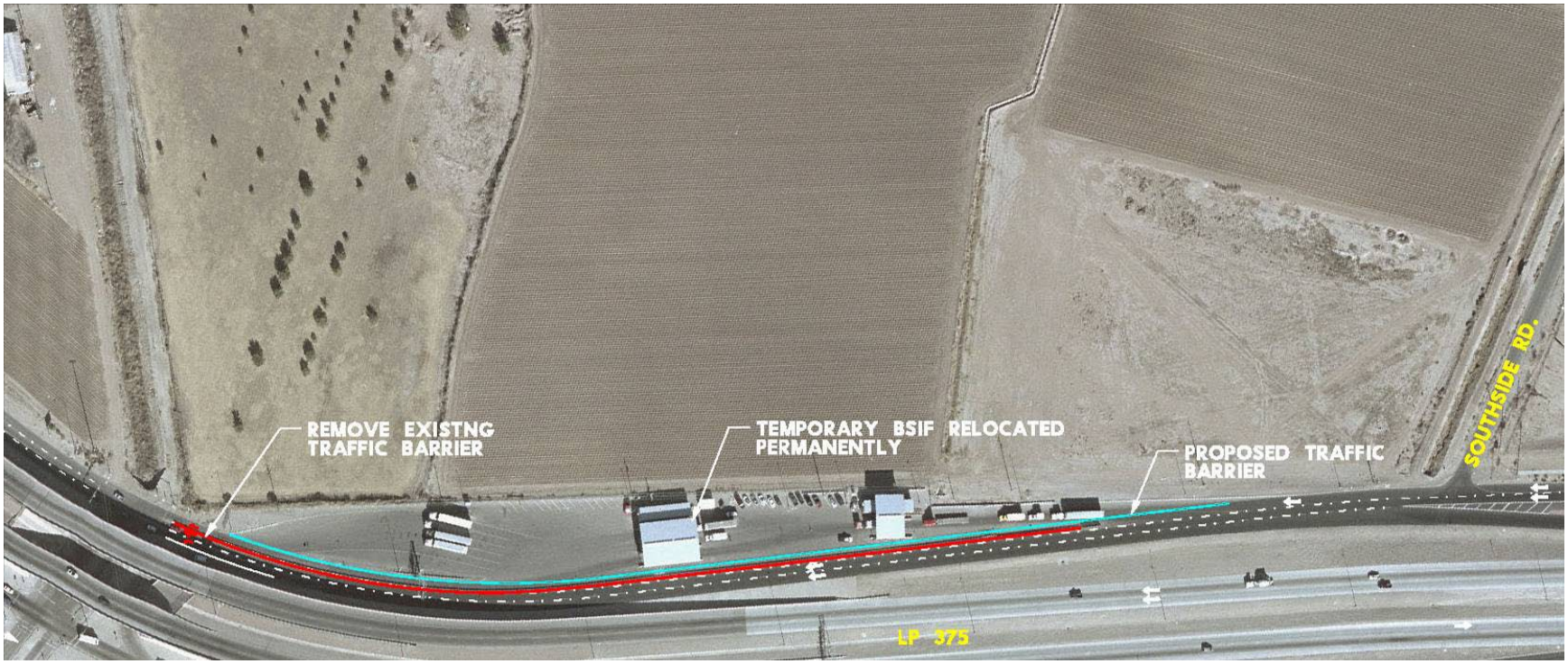
FROM: APPROX. 0.04 MI EAST OF US 54 (PATRIOT FWY) INTERCHANGE
TO: APPROX. 0.02 MI WEST OF ZARAGOZA RD (INTERNATIONAL BRIDGE) INTERSECTION
CSJ: 2552-04-029

LEGEND (PROPOSED CONSTRUCTION)

- LIMITS OF RDWY
- NON-TOLL LANES
- EXPRESS TOLL LANES
- NOISE BARRIERS
- PROPOSED BRIDGE WIDENING
- EXISTING BRIDGE STRUCTURE
- EXISTING DYNAMIC COMPACTION AREA
- GUIDE SIGN
- LARGE SIGN
- ELECTRONIC TOLL COLLECTION (ETC)
- INTELLIGENT TRANSPORTATION SYSTEM (ITS)
- EXIST ITS CONDUIT
- SAFETY ILLUMINATION
- HIGH MAST ILLUMINATION

Source: From design schematics developed by HNTB, November 2010

Figure H.3.5 Add an Additional Left-Turn Lane on the LP 375 Westbound Frontage Road (Ysleta-Zaragoza POE)



Source: RJ Rivera Associates, Inc., *Border Crossing Travel Time Study*, June 2008.

Figure H.3.6 Reconfigure Southbound Lane Assignments/Traffic Circulation Patterns on BOTA Approach

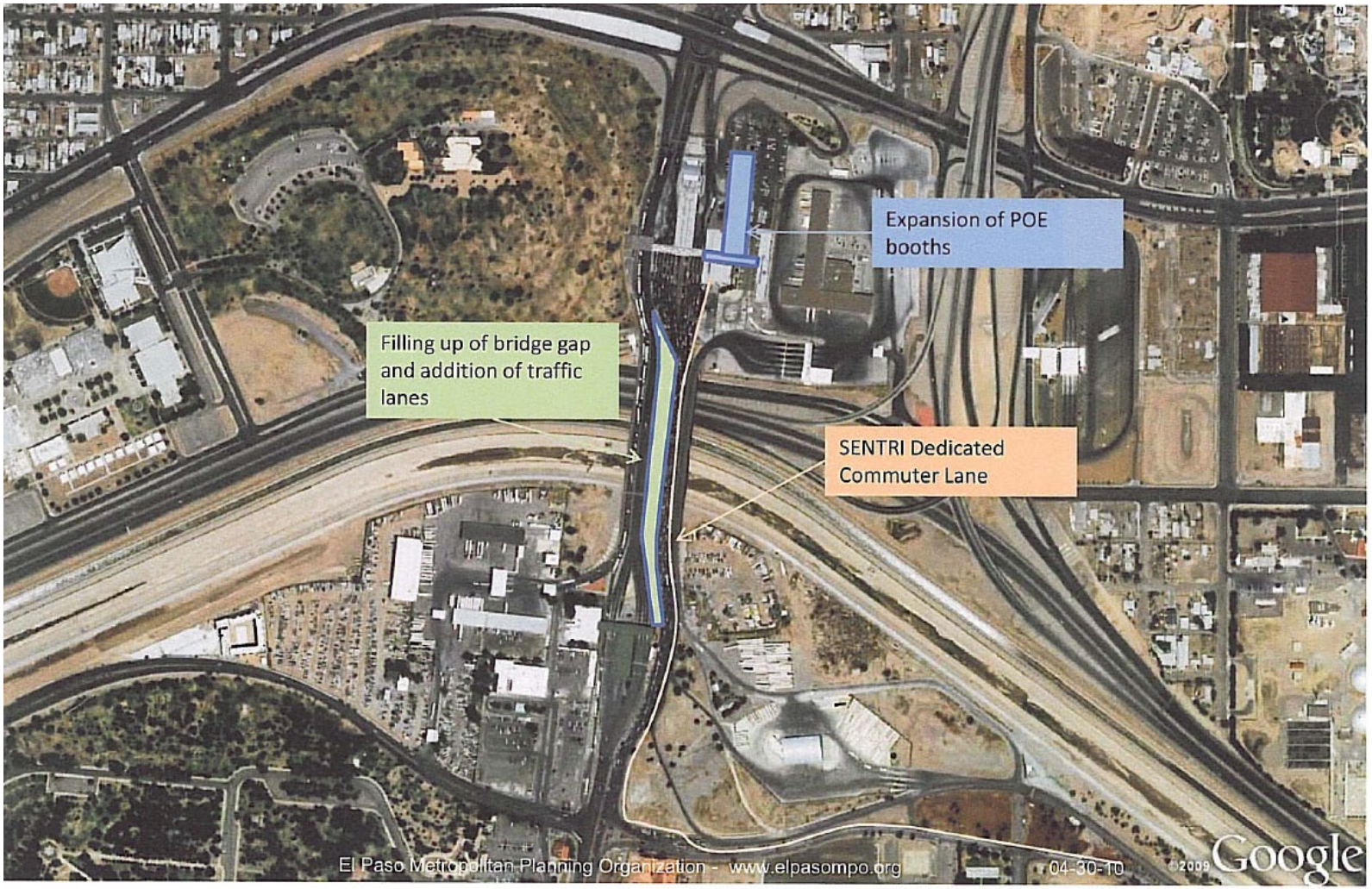
Explanation of southbound lane assignments/traffic circulation patterns on BOTA approach[115]

Queuing that occurs at the BOTA inspection facility for vehicles going southbound into Mexico is partly attributed to the weaving of commercial and passenger vehicles in the Paisano Dr. and IH-110 area. This vehicular interference is caused by commercial trucks trying to merge into their designated right lanes and passenger vehicles into their designated left lanes. This problem is further compounded by empty and loaded trucks that are in the wrong lane as they approach the Mexican Aduana commercial inspection facility. Upon reaching the Mexican Aduana inspection booths, the trucks try to access the correct lane and in the process back up the truck and passenger traffic.

In an effort to avoid queuing that backs up into IH-110 and onto the IH-10/U.S. 54 interchange, this proposed solution would realign southbound trucks during afternoon peak hours to go straight on the IH-110 southbound ramp approaching the Mexican Aduana facility so that they are forced to be on the right two lanes. Trucks would have to exit on the southbound IH-110 ramp and would be restricted from going under the Paisano Dr. interchange on IH-110. Passenger vehicles remaining in this southbound ramp would only be allowed to turn right into Paisano Dr. (U.S. 62) going west. Passenger traffic going south from IH-110, Paisano Dr. east and westbound, would be required to stay in the left two lanes. There would be signs or messages before and at the Paisano Drive intersection for empty and drayage trucks to be in their designated lanes so as not to enter in the wrong lane and for passenger traffic entering Mexico to stay on the left lanes.

[115] El Paso Metropolitan Planning Organization, *El Paso Bridge of the Americas Port Improvement Project Proposal Report*, October 8, 2008.

Figure H.3.7 Complete BOTA Bridge Infill between Northbound and Southbound Spans



Source: El Paso MPO, April 2010