

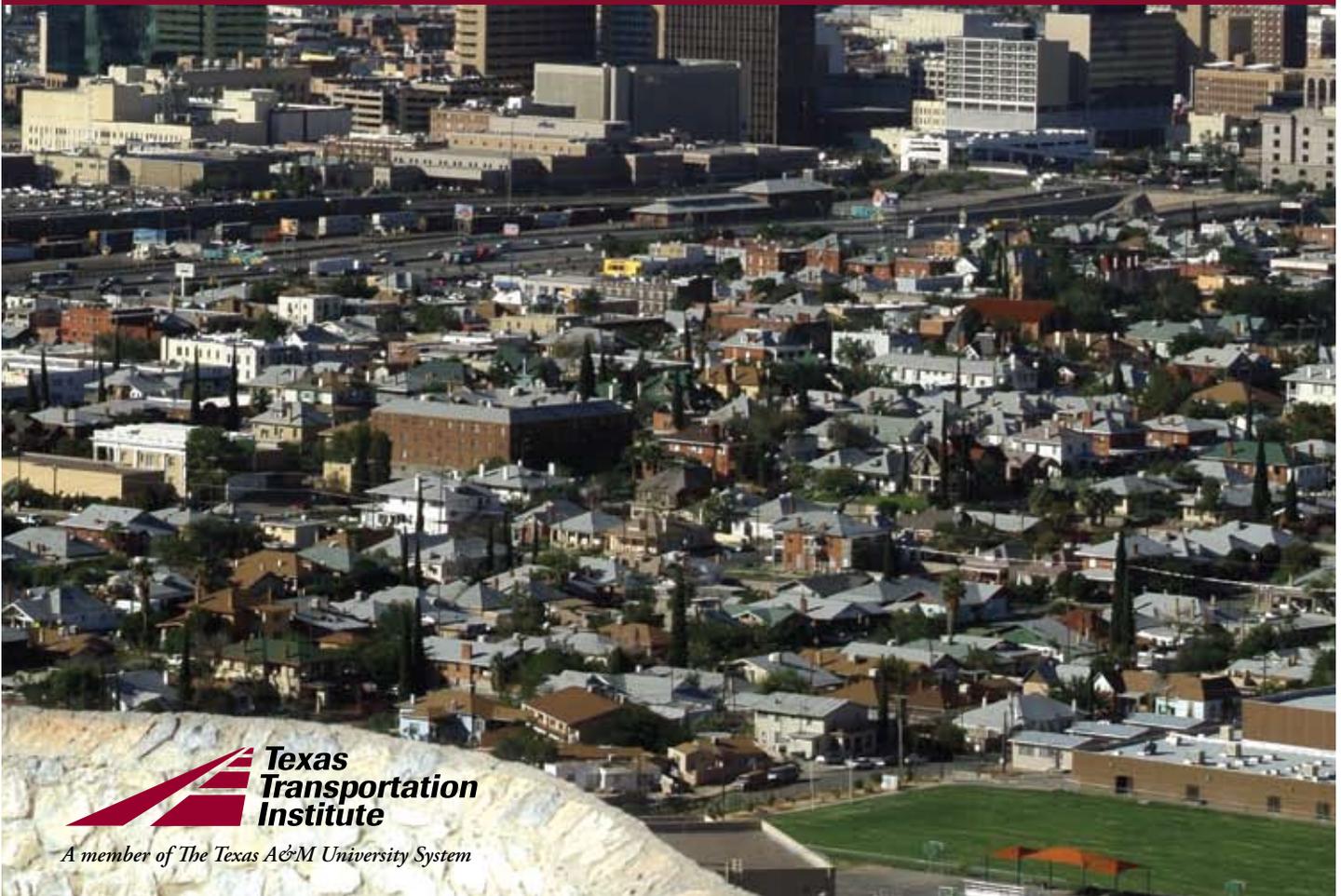


PROGRESS REPORT

**The Center for International Intelligent
Transportation Research**

El Paso, Texas

Faster. Smarter. Safer.



**Texas
Transportation
Institute**
A member of The Texas A&M University System



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INTRODUCTION

The Center for International Intelligent Transportation Research

As economies become more global, the challenges faced by international urban centers like El Paso become more daunting. These challenges drive the innovation and discovery that are at the heart of the work of the Center for International Intelligent Transportation Research (CIITR). The Center seeks to:

- Maintain and improve mobility in the face of growing traffic and shrinking resources.
- Increase border-crossing efficiency without compromising security.
- Reduce vehicle emissions to meet air quality standards and protect public health.

In each of these missions, the CIITR is committed to faster, safer and smarter movement of people and goods. In achieving this CIITR will enhance the quality of life for the Paso Del Norte Region and develop solutions that can be successfully applied in other U.S. and international border environments.

Advancements in border crossing efficiency
will reduce delays and promote the safe,
efficient and secure movement of both goods
and people across the U.S.-Mexico border and
throughout the region.

BORDER CROSSING EFFICIENCY PROJECTS

**> El Paso County Secure Border Trade
Demonstration Project**

*Increases monitoring of vehicles and cargo across the
entire supply chain.*

**> Developing Consistent Methodology to
Measure Economic Impacts of Border Delay**

*Defines the methodology for quantifying border
delay impacts.*

> Economic Impact Analysis of Border Delay

Assesses the economic repercussions of border delays.

**> Commercial Border Crossing Process and
Technology**

*Develops performance measures for border
crossing efficiency.*

> Measuring Commercial Vehicle Border Crossing Time

*Collects border crossing time data and estimates
performance measures in real time.*

**> Identifying the Potential of Bluetooth®
Technology for Collecting Passenger Vehicle
Crossing Times**

*Studies how this widely used technology can cost-effectively
measure and monitor border crossing times.*

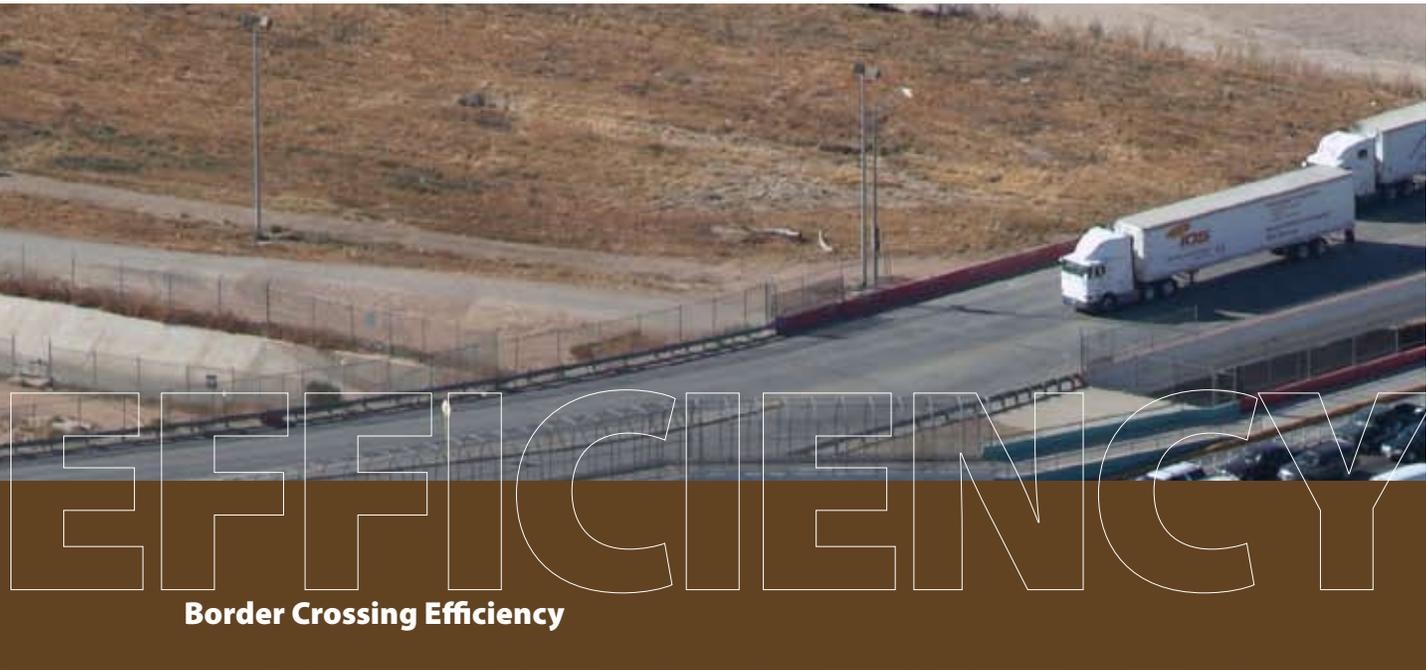
> Commercial Border Crossing Information System

*Examines how border crossing time and performance
information can be effectively communicated.*

**> Feasibility of Cross Border Freight Shuttle
Operations**

*Tests the feasibility of an automated container transport
concept in the border environment.*

EFFICIENCY



EFFICIENCY



El Paso County Secure Border Trade Demonstration Project

The El Paso County Secure Border Trade (SBT) Demonstration Project is a three-year effort funded with Coordinated Border Infrastructure (CBI) funds administered by the Federal Highway Administration (FHWA) through TxDOT. As part of this \$3.6 million project, the County of El Paso has requested TTI's CIITR to assist with the implementation of a Technology Monitoring System for the project, a requirement from FHWA.

The SBT Demonstration Project is aimed at extending the monitoring of vehicles and cargo away from the border by providing more information across the entire supply chain and providing software-enhanced analysis of data.

The project relies on a collection of systems that include video communications, protocols for truck loading, electronic locking systems and a central monitoring facility. These systems will allow each vehicle to be tracked along a designated route from the moment the door is closed and the truck leaves the secure sites in Mexico until the truck arrives at the border and then again until the truck reaches its destination. The focus of the information gathered and analyzed at this site is to provide a more transparent and comprehensive vision of selected border activities and crossings.

El Paso County will be engaging a contractor to integrate system components and implement the project. As part of the Technology Monitoring System required by the project, TTI's support to the county consists of development of the contractor scope of work and assistance with the technical evaluation of contractor proposals; as well as quality assurance, review and monitoring of contractor deliverables. This support includes a concept of operations, system requirements, system development and implementation, system verification and validation, and facilitation of communications with stakeholders throughout the project.

>> RETURN ON INVESTMENT

CIITR is providing the County of El Paso with a 20 percent match against a federally funded \$300,000 contract between the county and TTI to provide technology monitoring assistance. The immediate return on investment for this project is the \$300,000 contract and the support provided to the county to secure federal funding for this \$3.6 million project.



Developing Consistent Methodology to Measure Economic Impacts of Border Delay

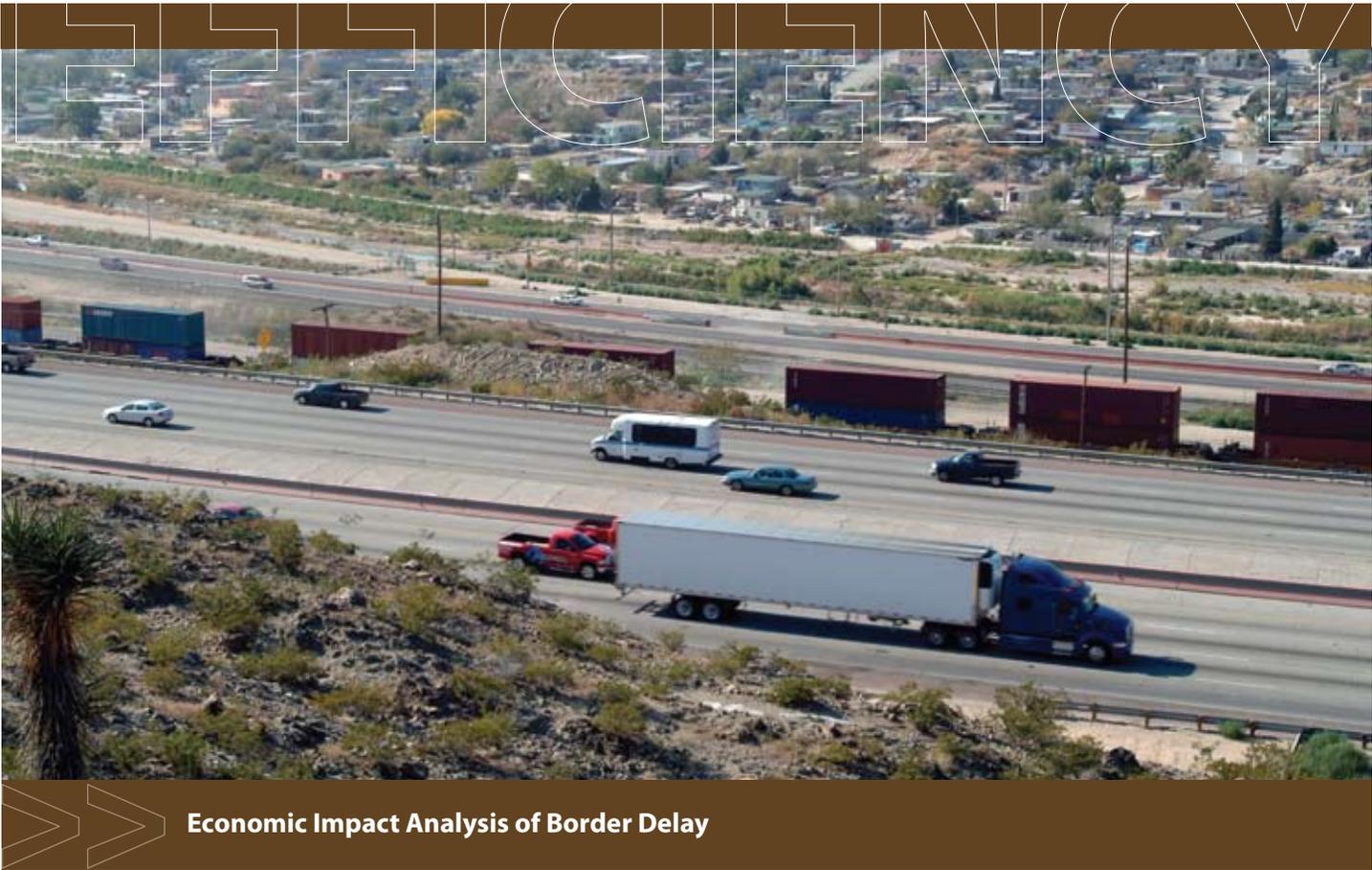
Although the problem of congestion at international border crossings is easily observed, there is a need to accurately measure the economic impact of that congestion at commercial and passenger vehicle crossings. This study's objective is to define the methodology for quantifying the impact of border delays at a Texas ports of entry. The methodology produced through this project will be used as a framework to measure the economic impacts of border delay times on the shipping and trade industry. It also will serve as a means to quantify the environmental impact of border congestion and delays.

In addition to improving efficiency, this effort produced the benefit of a stronger working relationship between TTI and transportation agencies in El Paso and Ciudad Juarez, as well as members of the trade community in the El Paso area. Input from both of these

important stakeholders was used in the development of the measurement framework. Through this initiative, TTI developed a survey tool used to assess the data needs of stakeholders involved in the border crossing process in the El Paso Region.

>> RETURN ON INVESTMENT

This project laid the foundation for a more comprehensive study by the CIITR that is aimed at developing an economic model to quantify the economic impacts of border delay. This project also led to increased interest by local and federal stakeholders to expand the model to incorporate the assessment of not only commercial vehicles but also passenger vehicles and pedestrians. Researchers are seeking funding sources to further develop the economic impact model.



Economic Impact Analysis of Border Delay

Little is currently known about the economic impacts of border crossing operations and associated trade delays at the U.S.-Mexico border within the state of Texas. Texas is a gateway to international trade from Mexico, and it is important to understand the extent to which border delays create economic repercussions. Delays occur due to inspection and security procedures; however, an understanding of economic impact might provide some guidance on long-term and short-term strategies for trade facilitation without compromising security and safety at the borders. This effort is designed to examine northbound trade flows to the United States, to assess the impact of decisions on choices of points of entry, to review historical trade trends and to provide a tool to quantify the economic impacts of border delays, implementing the methodology developed in the research project, *Developing Consistent Methodology to Measure Economic Impacts of Border Delay*. Direct interaction with the maquiladora shipping community has been central to this effort.

From the responses that have been completed to date from the potential universe of 353 maquiladoras, there are preliminary indications

>> RETURN ON INVESTMENT

This effort will develop a tool to enable the translation of ports of entry delay performance metrics and economic impact of delay to shippers and manufacturers and its ripple effect on the economy. The benefit will become greater as the tool becomes integrated with recent initiatives like the Commercial Border Crossing Comprehensive Information System. Also, there is a potential for enhancement of quantification of dollar time losses and cumulative impacts on the economy from additional pressures and planning options at the ports of entry.

that wait times in trans-border operations are a concern, with costs largely being absorbed as a shipper cost. This causes preemptive peak-time and peak-season strategies to be adopted, such as increasing lead times in anticipation of larger border crossing delays. It is expected that these findings will be refined as more responses are received from the shipping community.



Commercial Border Crossing Process and Technology

The objective of this project is to assess current and planned process and technology changes throughout the commercial border crossing process in both directions. Along with defining the key elements of the border crossing activities, this project facilitated the development of performance measures that could be calculated by measuring the time it takes commercial freight to complete processing.

Each of the performance measures developed through this project could serve as a way to compare and contrast the performance of individual ports of entry along U.S. borders. These findings are directly related to measuring the overall efficiency of border crossings in both the El Paso region and all other land ports of entry throughout the nation's southern and northern borders.

Commercial freight border crossing information was collected in part through U.S. Customs and Border Protection, the Texas Department of Public Safety, the Federal Highway Administration (FHWA), and other public and private stakeholders involved in the border crossing process.

>> RETURN ON INVESTMENT

The concepts developed during this project represent the first step toward developing a standardized method to measure border port of entry performance. Clearly defined performance measures could serve as a way to analyze the impact of investments at ports of entry, enabling more informed decisions on infrastructure and operational investment.

Key performance measures developed by the project team as part of this project include:

- Travel time
- Target travel time
- 95th percentile travel time
- Total border delay
- Delay per truck trip
- Border crossing index
- Border planning index
- Border delay buffer index



Measuring Commercial Vehicle Border Crossing Time

A system that automatically, accurately, and continuously collects border crossing time data for commercial freight would allow the effects of changes in border operations and/or processes to be quantified by the many public stakeholders involved in the border crossing process. This project seeks to illustrate how a commercial off-the-shelf (COTS) technology could be used to support such a system, by demonstrating the capabilities of Radio Frequency Identification (RFID) technologies.

With assistance from the Texas Department of Public Safety, the project team was able to conduct an on-site test of RFID at the DPS Border Inspection Safety Facility at the Bridge of



>> RETURN ON INVESTMENT

The successful testing of the RFID technology to measure border crossing time and delay has led to several implementations of the technology at the BOTA in El Paso and other ports of entry. The results of this research were used to speed up the implementation of this technology, taking advantage of RFID tags already installed in trucks for other purposes, and saving the border community time and resources that would otherwise have to be devoted to the development of other technologies and applications to measure border crossing time.

the Americas (BOTA) in El Paso. This test not only showed that RFID technology could be used to measure travel times for commercial vehicles in a border crossing environment, it also proved that existing RFID tags commonly installed in trucks could be read using the equipment assembled for this project. This successful test helped the project team finalize plans to permanently install RFID readers at the BOTA for a project being coordinated by FHWA as part of its freight performance measures initiative (FRM). The test has also made possible the installation of RFID-based border crossing time measurement systems at the Pharr-Reynosa Bridge in Pharr, as well as the World Trade and Colombia-Solidarity Bridges in Laredo.



Identifying the Potential of Bluetooth® Technology for Collecting Passenger Vehicle Crossing Times

Bluetooth® technology is widely used to establish point-to-point communication between electronic devices and has recently been deployed at international ports of entry along the U.S.-Canada border to measure crossing times of passenger vehicles. However, this technology has not been used along the U.S.-Mexico border. This experiment was the first of its kind to study the feasibility of using that technology to measure border crossing time at the U.S.-Mexico border, and is part of a broader research effort by TTI to apply innovative technologies to measure passenger and

commercial vehicle crossing times along the border. This project fulfills one of the missions of the CIITR — to conduct and support state-of-the-art research and implementation activities in the areas of border issues to enhance the efficient, safe and secure movement of people and goods across the U.S.-Mexico border and within the El Paso area.

The results from this experiment confirmed that Bluetooth® technology could be used to measure crossing times of passenger vehicles at ports of entry in the El Paso region. The study found more than adequate penetration rates of matching Bluetooth®-enabled devices to estimate average crossing times of passenger vehicles. Bluetooth® technology is cheaper than other technologies such as RFID and global positioning systems (GPS). As a result of the findings of the study, El Paso-area stakeholders are considering a pilot project at the Bridge of the Americas.

As a result of this research, several new projects are underway to measure arterial and freeway travel times, mostly to verify private vendor-provided travel times in the Houston area measured by other technology.

>> RETURN ON INVESTMENT

The experiment demonstrated that Bluetooth® technology is much more cost effective than other technologies to measure crossing times of passenger vehicles at border crossings. If projects are implemented using this technology to measure and relay crossing times at border crossings, motorists will have a reliable way to choose between border crossings to reduce individual travel time. This will result in smaller queues at border crossings, decreased vehicle emissions and shorter travel times.

EFFICIENCY



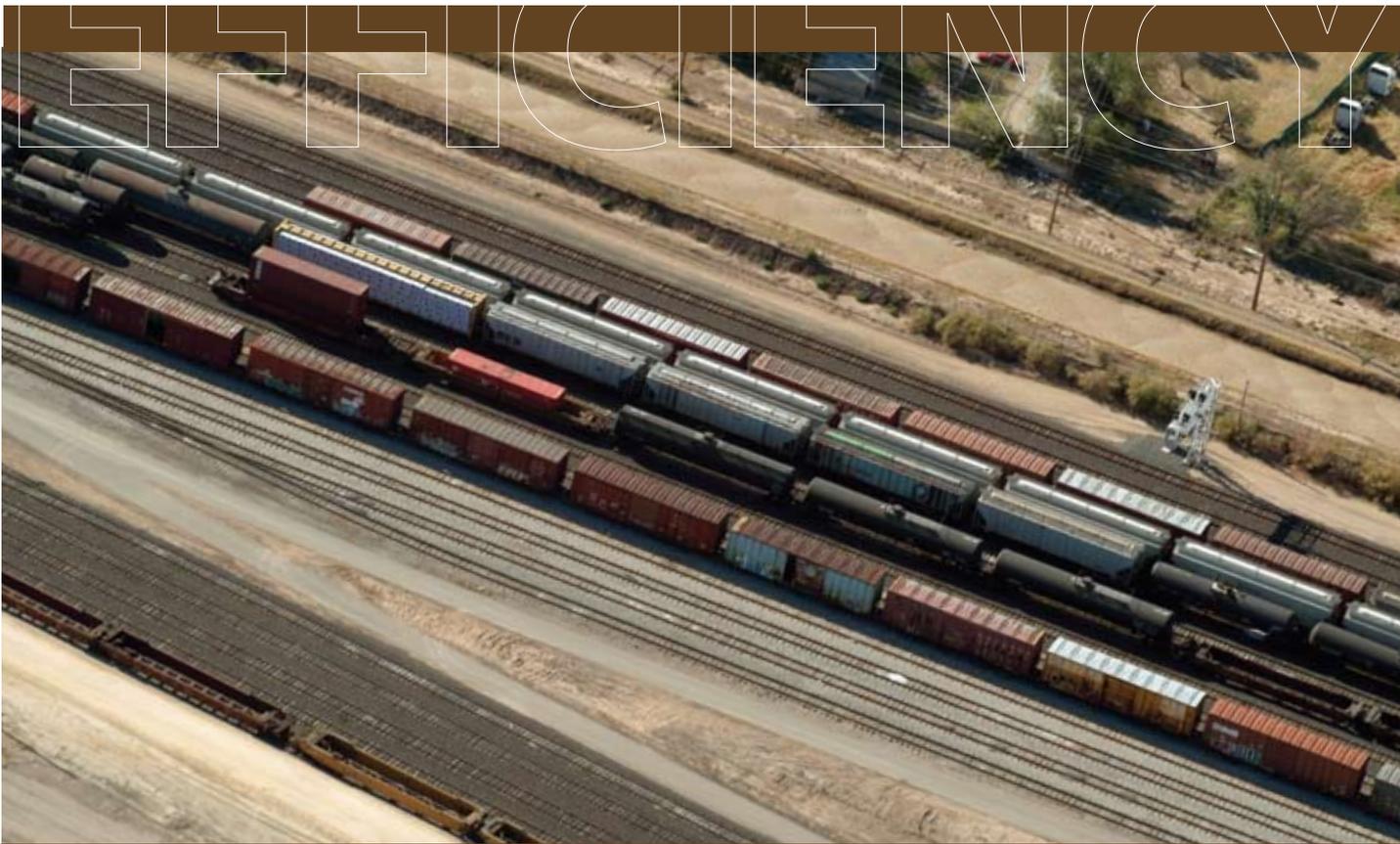
Commercial Border Crossing Information System

Information on border crossing time, truck volume and other statistics is critically important for planning and operation, but that information is difficult to obtain. This project seeks to identify how border crossing information collected from FHWA's FPM initiative and from other sources could be disseminated to various public and private stakeholders who can put that information to effective use. The objective of this project is to define the key elements that would comprise a Commercial Border Crossing Comprehensive Information System.

The end result of this project will be a method for the commercial distribution of border crossing information and statistics to interested stakeholders in a report format. The project team envisions a format similar to the "Border Barometer," which is published for the northern border by Border Policy Research Institute at Western Washington University and the Regional Institute at the University at Buffalo.

>> RETURN ON INVESTMENT

It is expected that this system will provide valuable insights to shippers, carriers, and other stakeholders who operate in a border community, enabling them to make more informed decisions on vehicle routing, which will lead to shorter waits at border crossings, associated cost savings and reduced vehicle emissions.



Feasibility of Cross Border Freight Shuttle Operations

When congestion is coupled with new and emerging homeland security requirements, the opportunity for new approaches to cross border freight transport takes on even more importance. The expected growth in international trade highlights the urgent need for innovative alternatives that reduce congestion and increase safe and environmentally sound movement of freight.

The freight movement characteristics of the El Paso–Ciudad Juarez area present an excellent opportunity to explore the implementation of TTI’s automated container transport concept—the Universal Freight Shuttle. This concept is an approach to freight transportation that addresses the limitations and constraints of the existing systems and introduces a new, hybrid system that draws attributes and strengths from both trucking and railroads and added new technological elements that will help achieve high performance and capacity levels, along with lower costs and fewer adverse impacts. The results of the study will provide a preliminary assessment of the feasibility of implementing

an automated and secure container transport system for international goods movement in the El Paso–Ciudad Juarez area. Based on the results of the preliminary assessment, researchers will develop an approach to carry out a detailed feasibility evaluation of the freight shuttle’s implementation. The study will provide information pertaining to both the logistics and institutional issues affecting changes to current practices as well as the economics, air quality benefits and land use issues impacted by transportation decisions.

>>RETURN ON INVESTMENT

The immediate return on investment for this project is a \$523,325 grant from the U.S. Department of Energy for a detailed feasibility assessment of the El Paso–Ciudad Juarez Universal Freight Shuttle Land Bridge.

Transportation operations efforts are designed to mitigate congestion, improve efficiency and accommodate growth in a region that is increasingly reliant on mobility.

TRANSPORTATION OPERATIONS PROJECTS

> Regional Transportation Data Warehouse

Develops a comprehensive archive of regional transportation data for real-time public access.

> Paso Del Norte Regional Transportation Data Consortium

Identifies the institutional framework for a cross-border regional mobility system.

> Carsharing at the Border

Determines if carsharing is a potential transportation mode for the El Paso area.

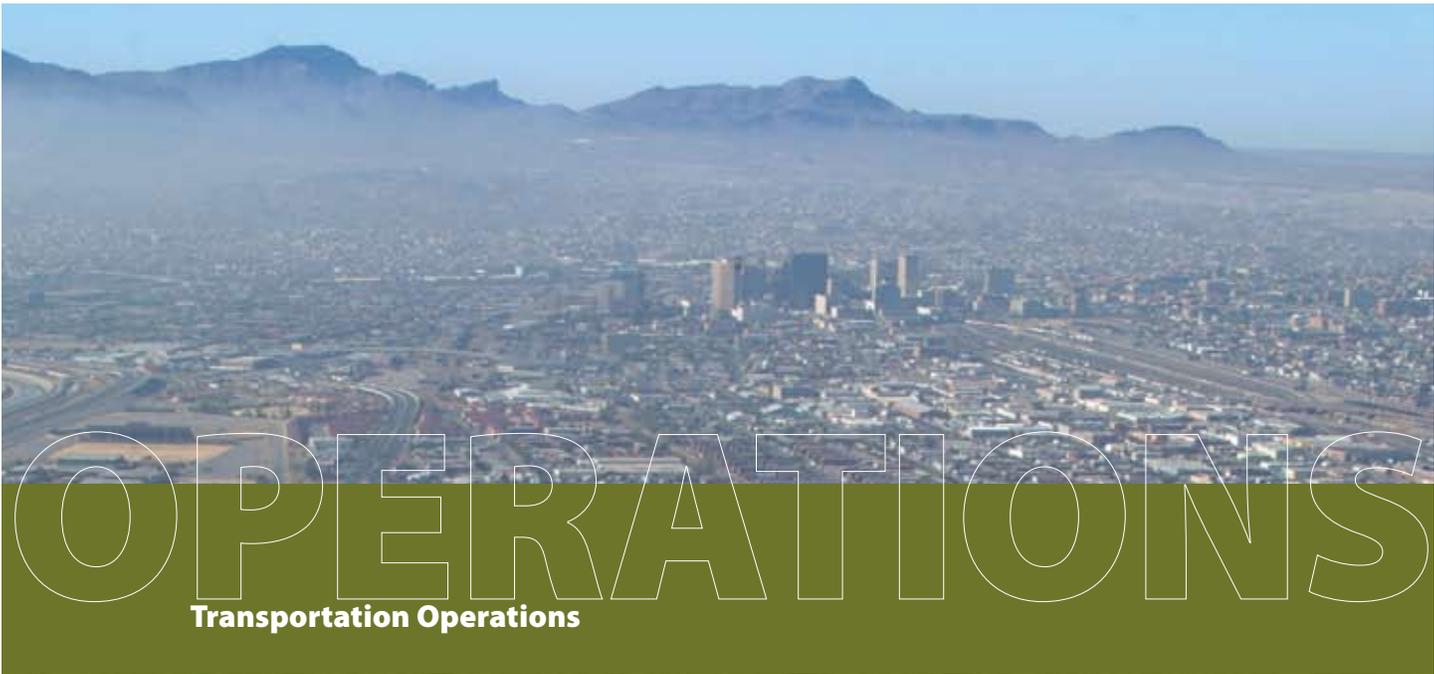
> Multiple Resolution Traffic Simulation Modeling Tools

Integrates traffic simulation tools to enhance operation and improvement of transportation networks.

>Development of Ciudad Juarez Traffic Simulation Model

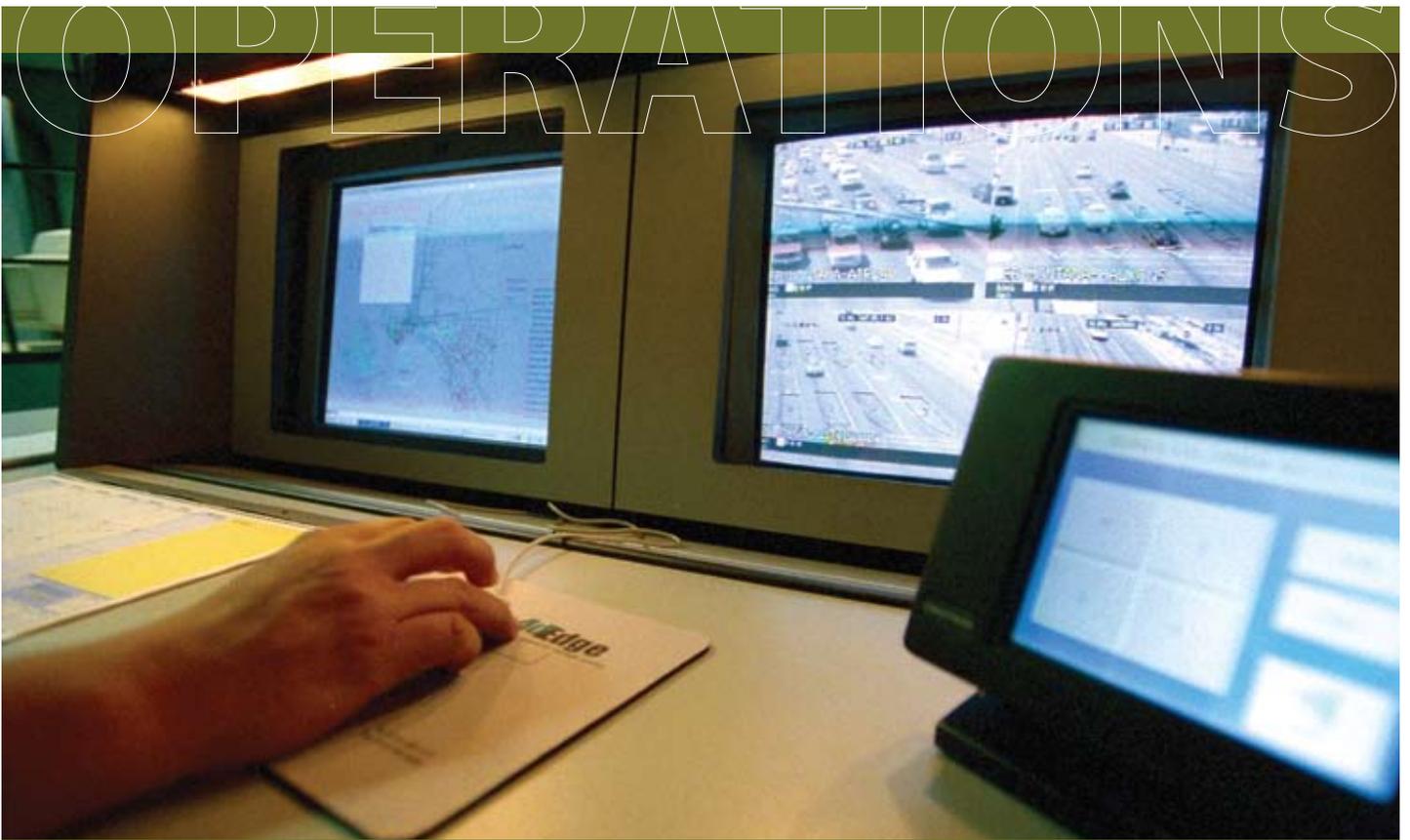
Develops a traffic simulation model to optimize commercial vehicle routes.

OPERATIONS





OPERATIONS



Regional Transportation Data Warehouse

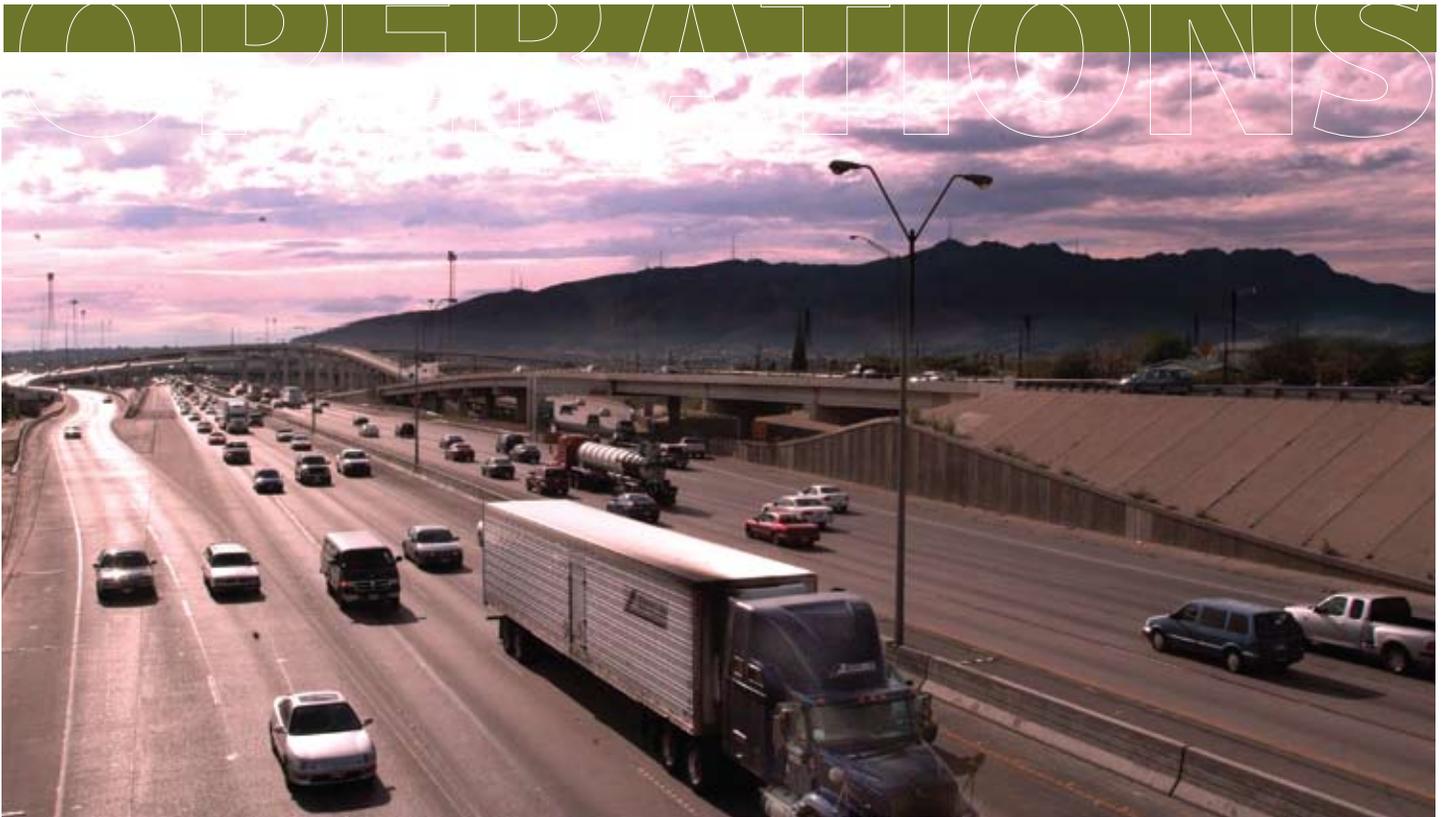
Transportation agencies in the Paso Del Norte Region understand the value of archiving Intelligent Transportation Systems (ITS) data. However, the agencies have allocated resources mostly for the deployment of ITS field devices for day-to-day transportation operation only. This effort reinforces the benefits of archiving ITS data by creating and providing the service for the region through development of the Paso Del Norte Regional Mobility Information System (PDN-RMIS), with an emphasis on cross-border traffic condition information.

PDN-RMIS processes a variety of traffic data and creates valuable pre-trip information, such as average highway speed and travel time, and shares the information with travelers through the TransVista traffic management center. The data warehouse interfaces with a map-based website (<http://ep.tamu.edu>) to view current traffic conditions in the El Paso region. Last year, border crossing-related pre-trip traveler

information and archived data were added to the website, helping commuters within El Paso and those crossing the border from Mexico to view traffic conditions at border crossings and highways using a single website.

>> RETURN ON INVESTMENT

The data warehouse developed for the El Paso region is the first in the state of Texas, proving that the El Paso region can operate roadways using 21st century technology, creating smarter highways, roadways and international ports of entry that interactively provide motorists and planners with information on current traffic conditions. A centralized warehouse of archived data not only provides a valuable tool to planners and engineers, but also significantly reduces the future cost of collecting and processing transportation data.



Paso Del Norte Regional Transportation Data Consortium

The El Paso region includes two countries (United States and Mexico), three states (Texas, New Mexico and Chihuahua), and two major cities (El Paso and Ciudad Juarez), as well as several smaller jurisdictions. In addition to each entity's (federal, state, county and local) transportation departments, each governmental entity typically has some combination of law enforcement, fire and emergency medical

services serving their jurisdictions. Public agencies responsible for transportation systems and emergency management have become more reliant on electronically collected and transmitted data to optimize their core functions and respond more effectively to incidents and emergencies. There is a growing awareness that the electronic data generated by one type of agency may have

great value to other partner agencies. Real-time access to multi-jurisdictional data, particularly in places like the El Paso–Ciudad Juarez region, can enhance system operations and allow a more coordinated response to transportation system-related incidents or emergencies.

The prototype Regional Mobility Information System (RMIS) and Data Warehouse developed by CIITR will help identify the framework for implementation of a cross-border regional mobility system. However, once the RMIS prototype is completed, there will be a need to find a permanent home for it within the interrelated jurisdictions of regional transportation agencies, the system's primary beneficiaries and users. Hence the objective of this project was twofold:

- Assess the viability of a multi-agency El Paso Regional Transportation Consortium that would serve as a home for the RMIS.
- Based on input from regional agencies and a review of best national and international practices, develop a possible institutional/organizational model for the consortium, along with an action plan for its implementation.

>> RETURN ON INVESTMENT

The project has raised awareness among stakeholders about the need to start considering what institutional structures and mechanisms will facilitate interagency coordination and data sharing in the future, as the inventory of transportation data sources across the region continues to grow. It will be within this institutional structure that the RMIS could find a permanent home.

OPERATIONS



Carsharing at the Border

Carsharing refers to a fleet of vehicles (owned by an organization) that is reserved for a group of subscribers to use when required. The users pay a subscription fee, plus the time and distance charges when they use the vehicles. On the other hand, the operator is responsible for the vehicle ownership, maintenance and insurance. Depending on the complexity of the systems, the vehicles may be picked up at and returned to any station any time without prior notice. The concept of carsharing started in Europe in the 1940s. Over the last decade, carsharing has emerged in the United States as an alternative to owning a car. Major cities in the United States such as Washington, D.C., San Francisco, Chicago, Boston and Austin have carsharing companies with growing market shares and profits. Major car rental companies such as Hertz have begun to study carsharing as their next profitable market segment. However, carsharing has not been implemented in any border city.

For the residents of El Paso, carsharing could be an attractive mode of transportation between several major trip generators such as the University of Texas at El Paso, Fort Bliss, the airport

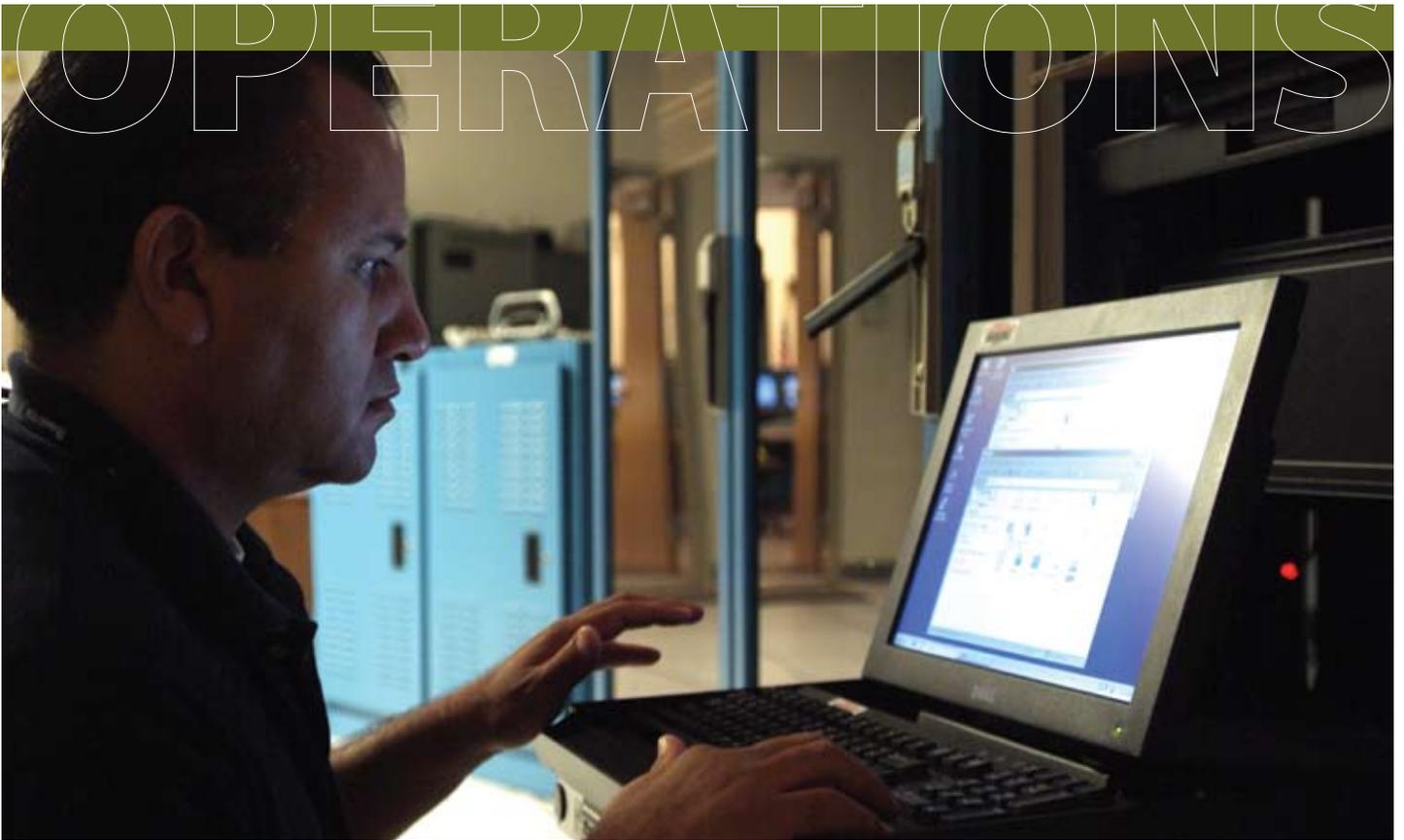
and medical centers. Carsharing could also be an attractive mode of transportation for cross border commuters who live in Juarez. Instead of spending time waiting in vehicles queuing at the border crossings (both directions), they can walk across the border and make use of carsharing vehicles in El Paso.

The objective of this project is to examine the potential and challenges of carsharing as a mode of transportation for the internal trips within the city of El Paso, for residents of El Paso as well as for drivers who commute across the border from Ciudad Juarez to El Paso. This project is performing market surveys of potential users and service providers, identifying potential base stations, and recommending an implementation model for El Paso.

>> RETURN ON INVESTMENT

If the market results are positive and the carsharing concept becomes operational, carsharing holds the potential to reduce vehicular traffic across the border in favor of pedestrian crossings, reducing emissions and traffic at the El Paso ports of entry.

OPERATIONS



Multiple Resolution Traffic Simulation Modeling Tools

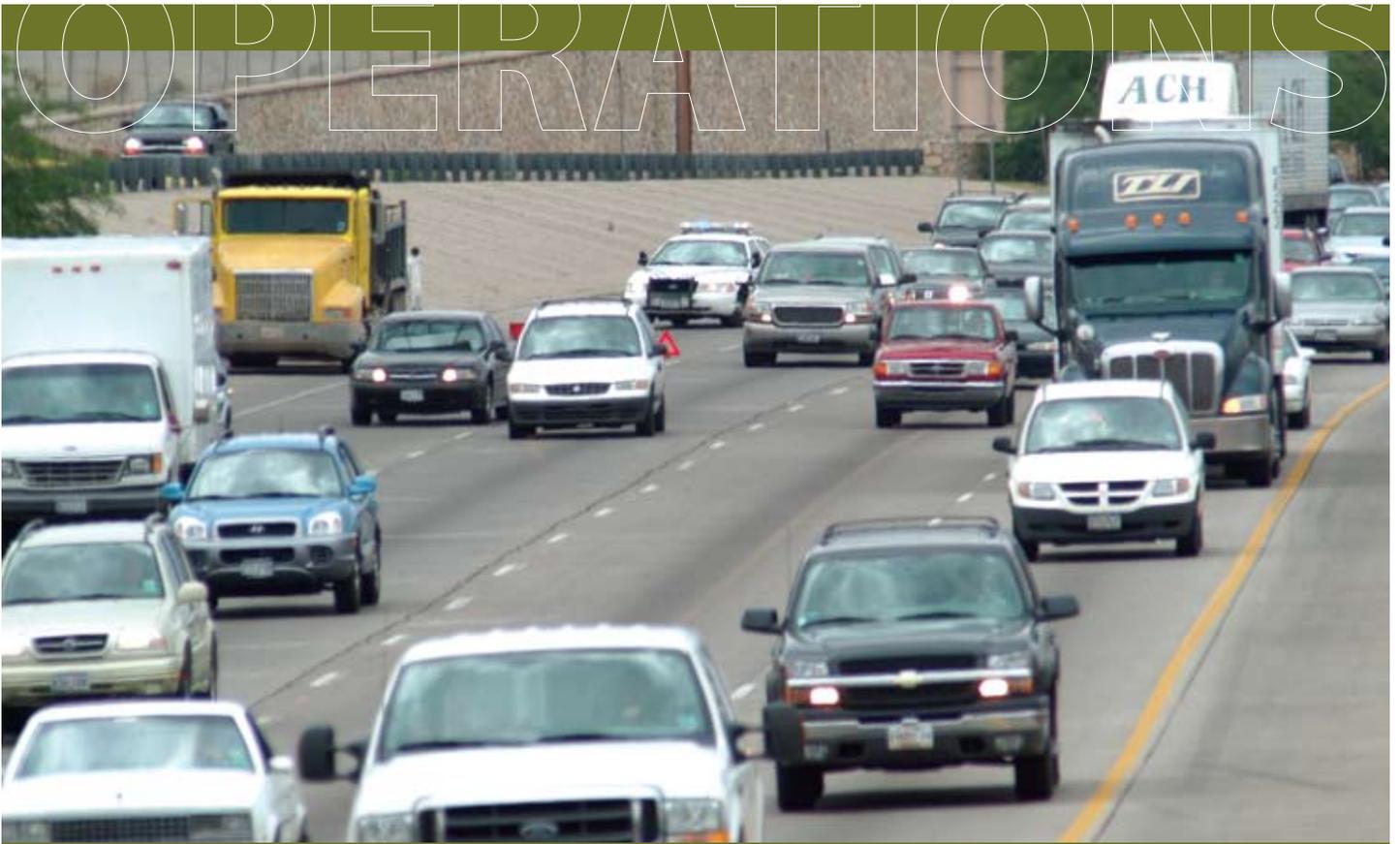
Traffic simulation modeling is becoming more prevalent in the United States, especially in border areas like the Paso del Norte region, where thousands of vehicles travel on freeways and across ports of entry each day. However, the ability to analyze traffic patterns and congestion during both peak and non-peak hours is difficult. While there are numerous traffic simulation tools on the market today, most

only analyze congestion either on system-wide conditions (mesoscopic) or by individual vehicle interactions (microscopic), limiting the ability of models to reflect traffic flow reality.

This effort integrates cutting-edge macroscopic (VISUM), mesoscopic (DynuST) and microscopic (VISSIM) traffic simulation tools for analyzing traffic at multiple resolution levels at the same time. Two different software tools will be developed to effectively integrate these various tools. This first new tool will allow researchers to quickly analyze how traffic will redistribute on freeways and surrounding neighborhoods given multiple transportation scenarios, including managed lanes, geometric design alternatives, newly constructed ports of entry and congestion caused by traffic collisions. This will assist traffic managers in ensuring the greatest possible efficiency of the roadway and freeway network in the region. The second tool will allow researchers to complete the loop between all levels of resolution when analyzing traffic patterns and congestion, achieving optimal modeling capabilities.

>> RETURN ON INVESTMENT

Regional stakeholders, including the El Paso Metropolitan Planning Organization (MPO) and TxDOT can benefit from this tool. Efforts are underway to commercialize the first tool once beta testing is complete, providing recognition to El Paso and commercialization income for CIITR. PTV America, Inc. (the developer of VISUM and VISSIM), has expressed interest in a partnership with TTI and the University of Arizona to promote the models to departments of transportation and other agencies. The second tool is still under development.



Development of Ciudad Juarez Traffic Simulation Model

A bi-national traffic simulation model has numerous short- and long-range benefits, not only for planning but also in operation of transportation infrastructure, including ports of entry. This effort will produce such a model to facilitate the planning and construction of secure and efficient ports of entry by providing an accurate estimate of traffic, freight and passenger demand. Very few studies have been performed in the area of simulation of bi-national traffic movement. The scope and objective of this particular project is to convert the travel demand model of the Ciudad Juarez area into a microscopic simulation model and later combine with a microscopic model being developed for the El Paso area. This will enable analyses and optimization of commercial freight routes from maquiladora areas in Juarez to the final destination in El Paso and back.

In 2008, the roadway network of Ciudad Juarez was developed in PARAMICS, a microscopic traffic simulation software program. The network was completed with appropriate roadway network attributes and intersection control

>> RETURN ON INVESTMENT

The developed model and calibration parameters will be used in leveraging projects being potentially funded through TxDOT's interagency contract with TTI. The objective of the TxDOT project is to model Juarez–El Paso roadway network using a mesoscopic simulation model. The bi-national model will help agencies in both countries improve existing border crossing infrastructure and roadway operations to effectively plan new infrastructure.

parameters using field data collection. In 2009, the travel demand model developed by the Juarez MPO is being converted to PARAMICS. This conversion includes aggregation and disaggregation of traffic analysis zones, calibration of roadway networks, selection of accurate peak-hour factors to convert 24-hour demand to hourly demand, and traffic flow parameters using historic and current traffic data.

Better assessments of the nature and impact of vehicle emissions will enable the region to retain eligibility for federal transportation dollars, while advancing public health priorities.

AIR QUALITY PROJECTS

> EPA SmartWaySM Applications for Drayage Trucks

Tests the effectiveness of these technologies in reducing drayage truck emissions.

> Short-Haul Heavy-Duty Vehicle Activity Estimation

Estimates the pollutant emissions of these fleets in the El Paso area.

> Air Quality Data Repository and Web Interface

Creates a common resource for air quality and emissions testing data.

> Emissions Implications and Strategies for Old Imported Light-Duty Vehicles

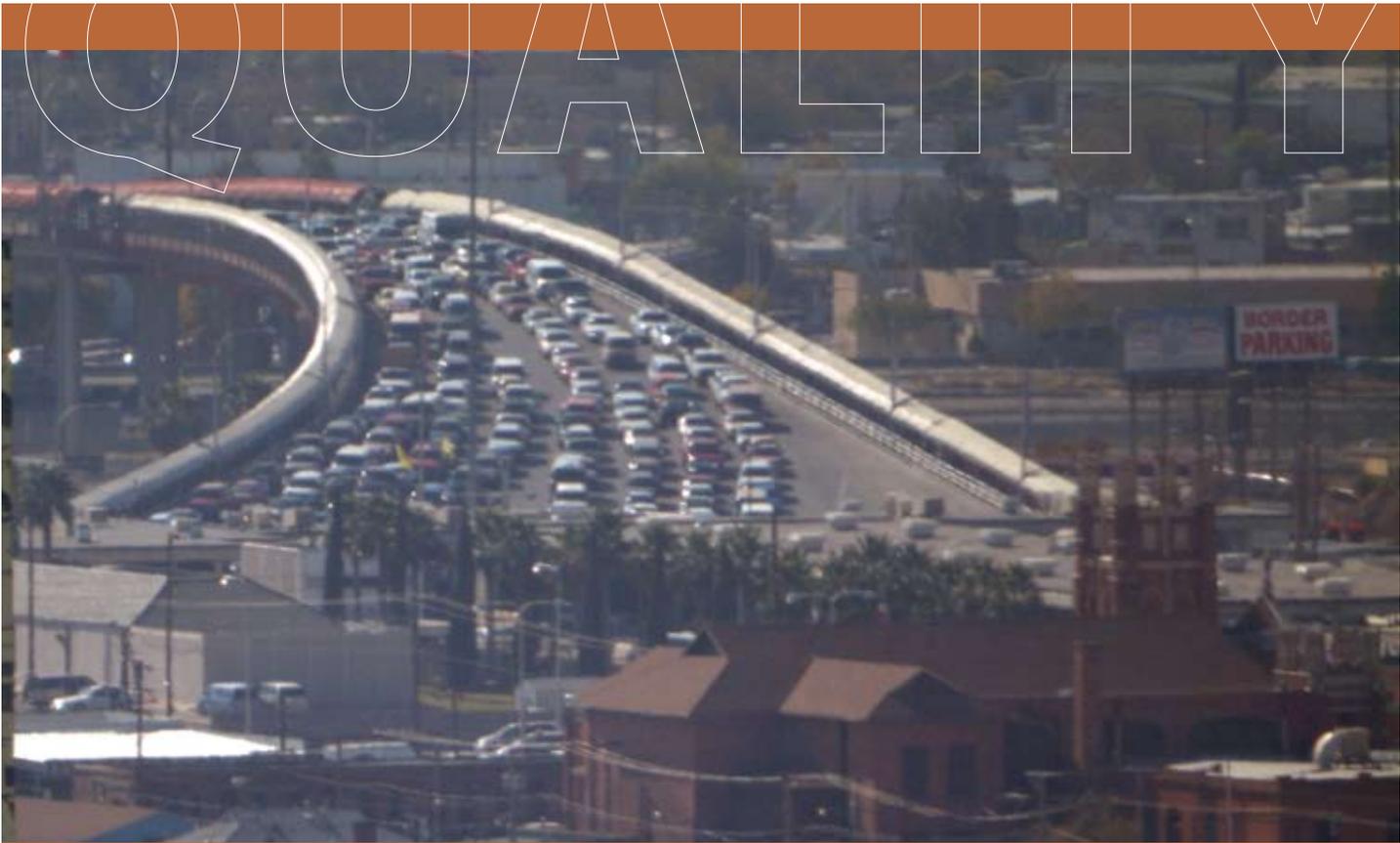
Measures emissions rates of these vehicles and proposes remedial strategies.

QUALITY



QUALITY

Air Quality



EPA SmartWaySM Applications for Drayage Trucks

Trucks cross from Mexico into the United States some 4.3 million times each year, and drayage trucks are estimated to make more than 90 percent of these trips. These short-haul vehicles spend a significant amount of time idling at border crossings and are generally older and less well maintained than over-the-road trucks. Drayage fleets, therefore, can produce significant emissions and negatively impact air quality. In El Paso, an estimated 2,500 drayage trucks in daily circulation emit 24 tons of smog-forming nitrogen oxides (NOx) per year.

>> RETURN ON INVESTMENT

This project will help identify cost-effective measures for reducing diesel emissions from drayage operations, and help air quality planners quantify the benefits from each of these low-cost strategies. The project results will help planners determine whether they should invest in promoting these strategies. In addition, drayage operators will learn about the fuel economy impacts of these strategies, and to be able to better assess whether a strategy will advance their business interests.

This project will study the availability, use and effectiveness of the Environmental Protection Agency's (EPA's) SmartWaySM technologies to reduce emissions of drayage trucks. EPA's SmartWaySM Transport program is designed to improve energy efficiency, reduce greenhouse gas and air pollutant emissions, and increase energy security in the freight sector. Most SmartWaySM Transport technologies are designed for long-haul trucking rather than the short-haul driving behavior exhibited by drayage fleets serving the U.S.-Mexico border. This study will examine the application of promising SmartWaySM strategies when applied to drayage operations. Emissions, drive cycle patterns and fuel use will be measured using a variety of technologies, including GPS and a portable emissions measurement system (PEMS).

The findings from this project will help identify which strategies are appropriate for drayage fleets and will quantify the fuel and emissions benefits from employing different SmartWaySM strategies.



Short-Haul Heavy-Duty Vehicle Activity Estimation

Short-haul vehicles are generally defined as those that do not leave the metropolitan areas that they operate in. Examples of heavy-duty short-haul fleets include transit buses, school buses, refuse trucks and dump trucks. These heavy-duty vehicles mostly run on diesel and are responsible for significant amounts of pollutant emissions.

Since short-haul fleets cover the same areas of operation on a daily basis and are usually fueled in centralized locations, they make good candidates for operating on alternative fuels for emissions reduction. This is of great significance because the El Paso region is in nonattainment of national air quality standards for particulate matter and carbon monoxide. This project was concerned with identifying the major short-haul heavy-duty fleets operating in the El Paso area, obtaining information on the fleet composition and drive cycles, and estimating pollutant emissions. Based on the findings, the most appropriate alternative fuels that can be used for such fleets were recommended.

>> RETURN ON INVESTMENT

This work can form the basis for future efforts to reduce emissions of short-haul fleets and promote improved air quality and public health in the El Paso region. The results of this research will assist in determining the commercial viability of using alternative fuels in these fleets.

Researchers identified the various short-haul heavy-duty fleets in the El Paso area, conducted surveys to determine fleet activity and estimated the emissions impact of short-haul heavy-duty vehicles in the region.



Air Quality Data Repository and Web Interface

Air quality is a topic of great importance in the U.S.-Mexico border regions, especially in the El Paso area, which is in nonattainment of national air quality standards for particulate matter and classified as being in maintenance (previously in nonattainment) for carbon monoxide. Over the past decade, researchers at TTI have conducted a wide variety of studies and projects related to transportation and air quality

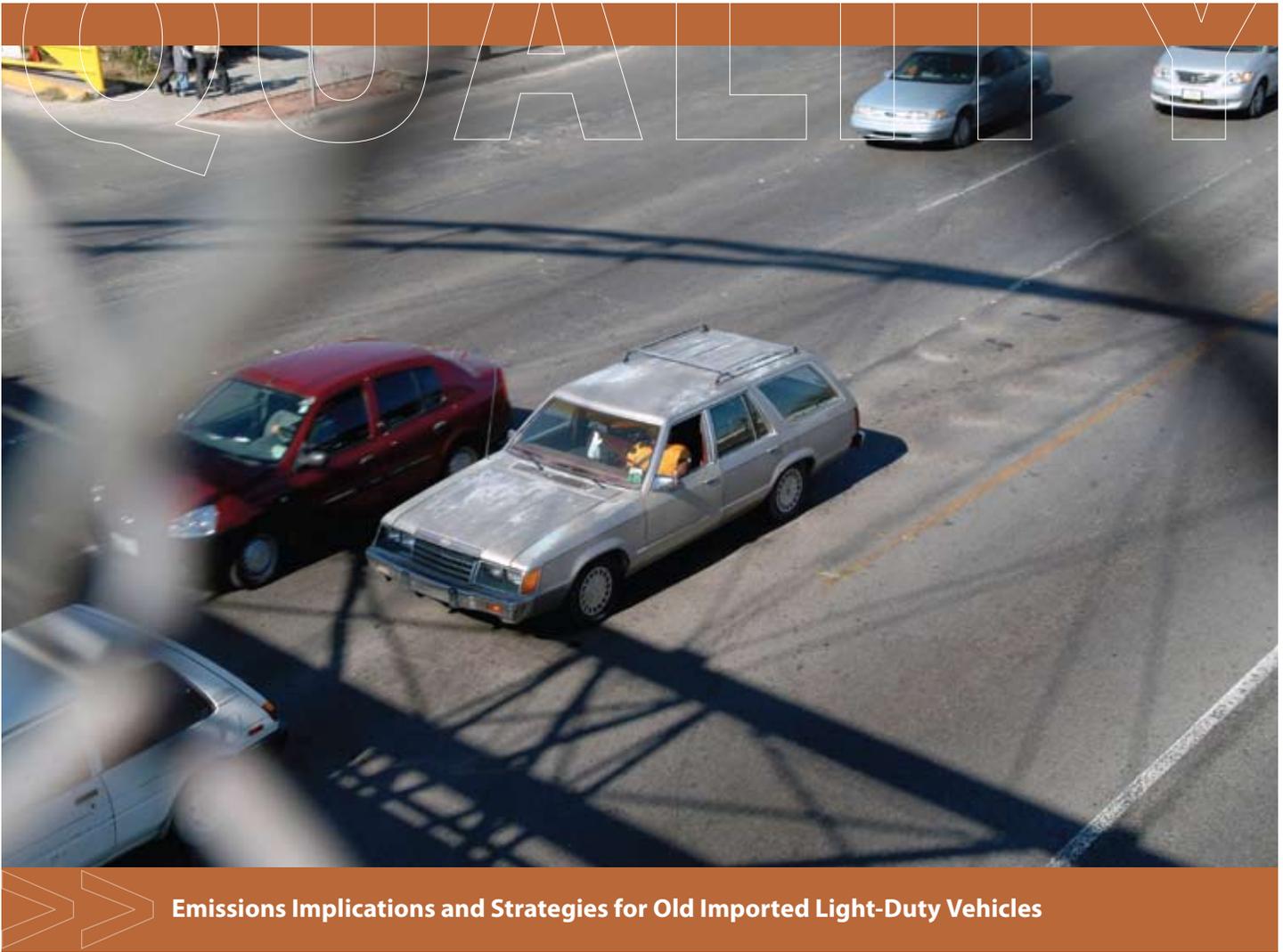
in Texas' border regions, as well as in other areas of the state. The studies include emissions testing of vehicles, studies of border crossings and truck idling, emissions inventories and air quality policy analyses.

The objective of this project is to establish a web-based data repository and interface for air quality and mobile source emissions data and research. This web resource will collect, organize and present the information. This project will help create a common database for air quality and emissions testing data, and allow stakeholders to access and use data for emissions inventories and emissions reduction strategies.

This data repository can serve as a valuable tool for agencies seeking to estimate emissions impacts and develop transportation-related strategies for air quality benefits. By maintaining a data repository, research needs can be more easily identified and research can be conducted to maximize the benefit to stakeholders and the general public.

>> RETURN ON INVESTMENT

Once this web repository is accessible to the public, it will provide useful information on border air quality, as well as air quality and emissions-related research conducted over the past decade. Local planning organizations, transportation agencies, environmental agencies, universities, students and the general public will all benefit from having the available resources organized and presented on a common web location.



Emissions Implications and Strategies for Old Imported Light-Duty Vehicles

Little is currently known about the in-use emissions impact from aged light-duty imported vehicles. More than 1 million such vehicles were imported from the United States to Mexico from September 2005 to March 2006. The maintenance levels of these vehicles are suspect, and many of them have been stripped of catalytic converters or other emissions-reducing technologies, greatly increasing their emission levels. It is estimated that a considerable number of these vehicles are still imported and a large number of them driven across the U.S. border on a daily basis by people living in Mexico and commuting to U.S. border cities for employment, business, shopping, recreational or other purposes.

This study will quantify the number and types of aged imported vehicles crossing the U.S.-Mexico border on a daily basis, estimate their emissions and quantify their emissions impact. Fleet profile, drive cycle patterns and emissions will be obtained using

>> RETURN ON INVESTMENT

This study will quantify the amount of various pollutants coming from imported vehicles and help planners assign priority levels to emission reduction efforts. The operational characteristics of emissions can help policy makers assess how these emissions can be effectively addressed.

a variety of technologies, such as GPS and PEMS. Conclusions and recommendations will be developed based on the measured emissions rates as compared with rates from other studies and certified EPA emissions rates.

This study will quantify the air quality impact of these vehicles and propose strategies for addressing these emissions. This project seeks to promote improved air quality and public health in the El Paso region and other areas along the U.S.-Mexico border.

The significant contributions of TTI's
Center for International Intelligent
Transportation Research in El Paso are
possible because of the dedication and
expertise of our partners.

PARTNERSHIPS



PARTNERSHIPS

Key Partners

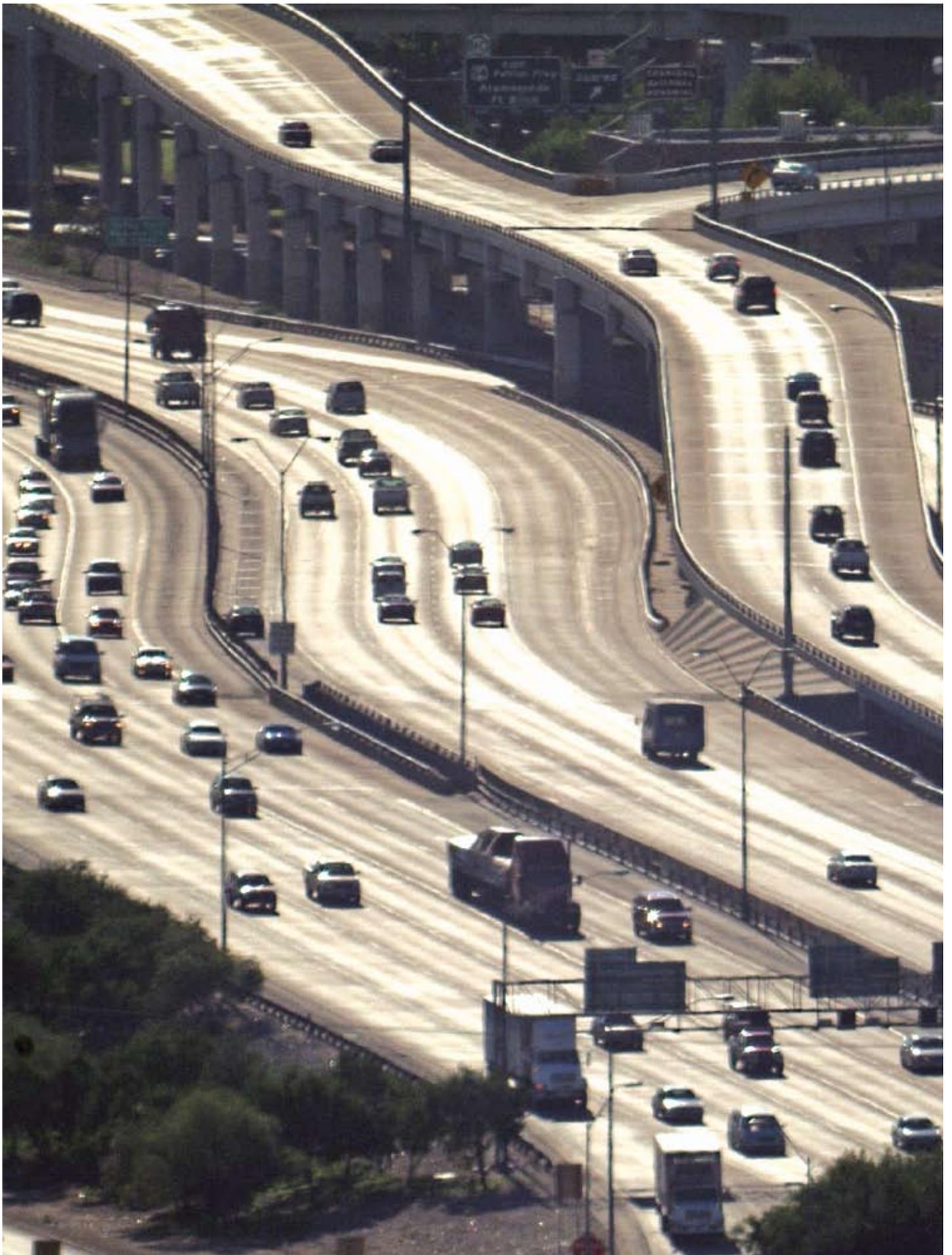




>> PARTNERSHIPS

Battelle Memorial Institute
City of Ciudad Juarez
Economic Development of Ciudad Juarez
El Paso Regional Economic Development Corporation
El Paso County
El Paso Metropolitan Planning Organization
Foreign Trade Association
Fort Bliss, United States Army
Maquiladora Association of Ciudad Juarez
Sun Metro
Texas Commission on Environmental Quality
Texas Department of Public Safety
Texas Department of Transportation
The City of El Paso
University Transportation Center for Mobility
University of Arizona with special collaboration from
PTV America, Inc.
The University of Texas at El Paso
U.S. Customs and Border Protection
U.S. Federal Highway Administration





INFORMATION



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