# FHWA Workshop

# Multi-Jurisdictional Coordination for the Greater Texas Region

**March 28–29, 2018**
**Houston, TX**

**Final Report—June 2018**

U.S. Department of Transportation
**Federal Highway Administration**

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This report reviews and highlights key content and outcomes of the Greater Texas Multi-Jurisdictional Coordination Workshop held on March 28-29, 2018 in Houston, Texas. The event was sponsored by the Federal Highway Administration's (FHWA) Office of Planning, Environment, & Realty (HEP) to examine shared regional issues of mutual concern to FHWA and transportation stakeholders in the Greater Texas Region.

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# INTRODUCTION

On March 28–29, 2018, the Federal Highway Administration (FHWA) convened a workshop in Houston, TX titled "Multi-Jurisdictional Coordination for the Greater Texas Region." The workshop brought together members of the public and private sector to discuss how they can better connect and work together to address transportation across Greater Texas. For the purposes of this workshop, FHWA defines the Greater Texas Region as comprised of Texas, Arkansas, Louisiana, and Oklahoma.

During the workshop, transportation officials and planning representatives from the four states explored ongoing research and collaboration, best practices, and opportunities to coordinate on freight planning and economic development. Towards the end of the workshop, participants discussed common needs across the jurisdictions and potential collaboration steps for the future.

## WORKSHOP BACKGROUND

Beginning in 2016, FHWA launched a series of workshops and peer exchanges in select areas to identify how FHWA, State Departments of Transportation (DOT), Metropolitan Planning Organizations (MPO), and the private sector can enhance coordination and collaboration to address transportation needs across state and metropolitan boundaries. The Multi-Jurisdictional Coordination for the Greater Texas Region workshop is part of this series of events. FHWA held prior events in Phoenix, AZ; Philadelphia, PA; Memphis, TN; Atlanta, GA; Providence, RI, Chicago, IL, and Columbus, OH.

Over the course of several months leading up to this workshop, FHWA Office of Planning staff worked closely with FHWA Division offices within the Greater Texas Region, the Houston-Galveston Area Council (H-GAC), the Association of Texas Metropolitan Planning Organizations (TEMPO), and the U.S. DOT University Transportation Center Consortium of Cooperative Mobility for Competitive Megaregions (CM2) housed at the University of Texas at Austin to identify and prioritize workshop topics tailored to the Greater Texas Region and develop the workshop agenda. The event took place over a period of one-and-a-half days, and featured a welcome session with remarks from local hosts—H-GAC, TEMPO, Texas Department of Transportation (TxDOT), and the FHWA Texas Division. This was followed by several sessions involving presentations from numerous state, local, MPO, RPO, academic, and private sector representatives, discussion of key issues raised in each session, and breakout sessions on select topics.

This document summarizes the workshop presentations discussions, and steps identified by meeting participants. Appendix A presents the workshop agenda; Appendix B contains a Greater Texas Region white paper; Appendix C lists key FHWA contacts; and Appendix D contains a list of workshop participants.

## DAY 1: PART 1—BACKGROUND/SETTING THE STAGE

James Garland, FHWA Office of Planning, opened the workshop and introduced speakers to deliver welcoming remarks.

### WELCOME AND INTRODUCTIONS

#### Peter Smith, Transportation Planning and Program Director, Texas DOT

Mr. Smith welcomed everyone to Texas on behalf of TxDOT. Over the next day and a half, participants will address several questions that are of interest to TxDOT: How do we fund multimodal investments? How do we look to the future and plan to embrace new technologies? How do we choose projects with so many competing performance measures? How do we better plan for resiliency? How do we best manage risk associated with our assets? He suggested we start with how to define shared success for the Greater Texas region. This will involve a discussion of our shared needs and priorities, which is one of the purposes of this workshop.

#### Georgi Jasenovec, Freight Operations and International Border Program Manager, FHWA Texas Division

Ms. Jasenovec said one of her key roles is to work with MPOs on international freight and border planning. TxDOT currently is updating a Texas-Mexico master plan, which is an effort that involves a great deal of coordination. The workshop agenda and expertise of the speakers is exciting, and she believes a lot will be accomplished during the event.

#### Chris Evilia, Director, Waco MPO and Chair, Association of Texas MPOs (TEMPO)

Mr. Evilia is the Director of the Waco MPO and also the Chair of TEMPO. He welcomed the participants and discussed how big the State of Texas is. The area of coverage for metropolitan Houston is equivalent to the State of Connecticut, and the Dallas-Fort Worth region adds the equivalent of the State of New Hampshire to its population every 10 years. Geographically, El Paso, TX is closer to Los Angeles than it is to Beaumont, TX. The size and distance make it more challenging for Texas agencies to connect and work together. The amount of freight activity in Texas is huge. For example, Waco experiences 50,000 trucks a day passing through the region. Waco does not receive any direct economic benefit from those flows, but does have to deal with the truck traffic. Mr. Evilia challenged the participants at the workshop to take off the hat they wear when representing their region and replace it with a hat representing the four-state Greater Texas Region and look for ways to work better together. This is especially important as public resources become scarcer. The conversation also will help us plan for the new focus on public-private partnerships in Texas.

#### Alan Clark, Transportation Director, Houston-Galveston Area Council

Mr. Clark welcomed everyone to Houston. He said that Texas is the heartbeat of our country and is one of the fastest growing states. What happens here affects the overall direction of the country. The participants have shared economic interests, cultural heritage, and similar challenges, and he looks forward to the dialogue. He thanked FHWA for holding the workshop and his staff, in particular Meagan Coughlin, for working with FHWA to put everything in place.

## STARTING THE CONVERSATION: KEY TRANSPORTATION ISSUES IN THE GREATER TEXAS REGION AND BEYOND

This session provided an overview of workshop goals and set the stage for the remainder of the event.

### James Garland, FHWA Office of Planning

Mr. Garland welcomed everyone on behalf of FHWA and articulated the purpose of the workshop: to advance the concept of multi-jurisdictional coordination (which is commonly referred to as Megaregions); connect and collaborate across public and private sectors; address common transportation and economic issues and opportunities in the Greater Texas Region; and identify next steps to implement and further multi-jurisdictional coordination.

Mr. Garland discussed the concept of megaregions, which are areas that are connected through economic interactions as well as proximity and have an extra layer of shared social, cultural, and environmental characteristics. Multi-jurisdictional planning and coordination within these broad regions provides an approach to address emerging challenges that transcend traditional borders. The benefits of this approach include enhancing economic development across jurisdictional boundaries, sharing best practices, sharing data and information, and identifying projects or services that enhance the mobility of people and goods across the broad area.

FHWA developed a map, based on research conducted by Dr. Catherine Ross at Georgia Tech, which identifies 13 megaregions, each with a defined boundary. These megaregions comprise 25 percent of the land area of the U.S., 75 percent of the population, 76 percent of the employment, 87 percent of Fortune 500 companies' revenue, and 90 percent of patents. Mr. Garland emphasized that megaregion boundaries are fluid and can be adapted to a particular issue, for example, the I-10 corridor. What is important is the framework, which identifies regions that are economically linked.

FHWA provided a Greater Texas Region white paper to attendees prior to the workshop (see Appendix B). The paper describes the region in terms of its key transportation-related characteristics and highlights the region's transportation challenges and opportunities. The Greater Texas Region is a key National Economic Center, accounting for more than 10 percent of the national Gross Domestic Product, and has abundant transportation infrastructure. The region faces some transportation challenges however, including congestion in many metropolitan areas, repair and maintenance needs, capacity constraints, and a need for additional truck parking facilities. Opportunities include current partnerships and coordination, such as the 1-10 Corridor Coalition, Future I-69 Corridor, and emergency preparedness and evacuation; transportation technology, such as smart corridors, connected and autonomous vehicles, and Intelligent Transportation Systems (ITS) applications; passenger rail; investment in transit and intercity connections; and public action.

### Q&A/Dialogue

**Question for Mr. Garland:** Mr. Clark noted that we have a process established in Federal law for planning and funding projects that looks nothing like these maps. The way we currently allocate resources is out of alignment with the concept of multi-jurisdictional coordination. We see this with corridor planning as we move from urban areas to rural areas and then outside the state. How do we address this moving forward?

**Answer from Mr. Garland:** There are many issues that extend beyond our jurisdictions and cannot be solved by one jurisdiction alone. We need to ask ourselves how we can best address these issues. One example is from four large metro areas in California that developed a megaregion compact to address issues that transcend their boundaries. At the Federal level, we need to provide incentives to make this happen, and there needs to be a champion for these efforts.

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**Question for Mr. Garland:** The geographic areas in between the defined megaregions provide infrastructure that connects the megaregions to each other. What is the plan for investing in infrastructure in these rural areas?

**Answer from Ms. Burnell:** States have the ability to designate critical roads in these areas under the Federal freight program. Agencies in these areas also need to collaborate with the state and others regarding these critical connections.

## FREIGHT PLANNING AND LOCAL LONG-RANGE PLANNING

In this session, moderated by Brandon Buckner, FHWA, the speakers focused on existing collaboration activities in the Greater Texas Region.

### Caroline Mays, Texas DOT Freight Planning and the I-10 Coalition

Ms. Mays is the Director of the Freight and International Trade Section at TxDOT. She oversees the Texas Freight Advisory Committee and the Border Trade Advisory Committee and development of the Texas Freight Mobility Plan, and is leading the development of the Texas-Mexico Border Transportation Master Plan. Freight movement is critical not only to Texas but to the rest of the Nation. When Hurricane Harvey hit Texas and halted goods movement, every single state was affected. She spoke about the I-10 Corridor Coalition, which was created by the Departments of Transportation in California, Arizona, New Mexico, and Texas. The Corridor spans more than 1,700 miles from Los Angeles to Houston, with 880 miles in Texas alone. It crosses numerous metropolitan areas that rank high nationally in employment and concentration of goods, but also have high levels of congestion and truck bottlenecks. The Corridor also is within the vicinity of several ports. The Coalition created a vision for I-10 that involves truck platooning, connected vehicles, weigh-in-motion sensors, and automated truck parking lots.

The four states in the Coalition created the I-10 Western Connected Freight Corridor Pooled Fund Study. The goal is to produce a Concept of Operations for implementing operations and technologies for safe and efficient goods movement across the Corridor to expand economic development in the West. Stakeholders have identified several freight programs to be considered for the Concept, including truck parking and reservation systems, Interstate credentialing and permitting for regular and oversize movements, roadside detection technology for safety and weight enforcement, truck platooning and other vehicle automation, and providing corridor-wide information on weather incidents and work zones. Several policy and operational practices also will be considered, including coordinating permitting practices, aligning inspection policies, collaborating on freight initiatives in state freight plans, traffic management coordination, and traffic and incident management. Ms. Mays discussed the potential outcomes of the effort, which are technological improvements, improved flow for commercial and

passenger vehicles, better policy coordination among the four states, and informed stakeholders and traveling public. The Coalition developed a four-phase roadmap and currently is in the first phase. The second phase will focus on activities to determine readiness. The states will communicate and coordinate through committees throughout the four phases.

### Q&A/Dialogue

**Comment from a participant:** It is a challenge to get companies to implement alternative fuel vehicle conversions in areas to the west of San Antonio due to the scarcity of refueling stations, particularly in rural areas. This should be addressed across state lines. It is an issue in urban areas around the country and there needs to be a change in the availability of funding for refueling stations.

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**Question for Ms. Mays:** What should local jurisdictions be doing as far as infrastructure developments to support deployment of connected and autonomous trucks?

**Answer from Ms. Mays:** The Coalition is addressing these infrastructure needs. They may not come up with definitive answers but they will help to inform the discussion.

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**Question for Ms. Mays:** What is TxDOT is doing to coordinate with districts along the corridor?

**Answer from Ms. Mays:** The level of coordination is high; TxDOT works with the districts on a daily basis.

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**Question for Ms. Mays:** Is TxDOT looking at laws and regulations that govern truck platooning?

**Answer from Ms. Mays:** Companies looking to test this idea pick places that are conducive to platooning.

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**Question for Ms. Mays:** Do oversize vehicle requirements differ from state to state along the Corridor?

**Answer from Ms. Mays:** Each state has separate vehicle size and weight laws. The Corridor study would like to see coordination between the states to prevent multiple fees and permits for trucks to pass through the different states.

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**Comment from a participant:** A lot of work is underway in Europe and other countries to study truck platooning, including impacts on the rail industry and how hours of service requirements apply to drivers who are not in the lead truck.

**Response from Ms. Mays:** These issues will require research. Companies travel as single entities as part of a platoon. Whether they are active or passive, drivers are behind the wheel, so as constituted now they are under the same hours of service requirements as if they were

not in a platoon. Drivers may have to periodically disengage from the platoon because of traffic or the capacity of the infrastructure they are driving on.

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**Comment from a participant:** Platooning is an opportunity to address aging bridges that may not be able to carry the combined weight of platooning trucks, and replace them with structures designed to a higher standard.

**Response from Ms. Mays:** We need to address all aspects of readiness, including the readiness of infrastructure.

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**Question for Ms. Mays:** Has there been any discussion about nationalizing the longer corridors like I-10 to ease the issue of coordination?

**Answer from Ms. Mays:** This has not been part of the discussion she has been involved in. The focus of the Coalition is to communicate among the member states to ensure they are working together to create efficiency throughout the corridor.

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Ms. Burnell summarized the presentation and discussion. A lot of research is needed. In addition to the I-10 Corridor we have several other corridors nationwide. Freight plans should be living documents that states update as we learn more about these issues. We will see a lot of states turn toward implementation of freight strategies in the next few years. At the same time, markets are changing quickly. States can account for these developments and changes in amended plans.

## PRIVATE INDUSTRY AND TRANSPORTATION MANAGEMENT PERSPECTIVES ON TRANSPORTATION AND GOODS MOVEMENT

In this session, moderated by Ms. Burnell, speakers from the private sector and a transportation management organization discussed their perspectives on transportation needs in the Greater Texas Region and the importance of coordinating transportation planning across boundaries.

### Priscilla Camacho, Sr. Vice President of Public Policy, Dallas Regional Chamber (DRC)

Ms. Camacho oversees the DRC's advocacy efforts for business development and economic growth in the North Texas region. With the level of growth in the State, North Texas is hitting its tipping point where traffic congestion is going to cause issues with business growth.
Ms. Camacho talked about Propositions 1 and 7, which diverted funding to the State Highway Fund with the stipulation that the funds cannot be used for toll roads. Thus, projects that relied on these funds are stalling. The congestion affects not only passengers but freight movement and commerce as well. The region needs options beyond highways to move goods. She urged participants to reach out to their local Chambers for information and to be part of the conversation. Elected officials are asking members of the business community where they stand on these issues. This is only helpful if the business interests have information and are engaged.

### Dinah Massie, Executive Director, Houston TranStar

Ms. Massie discussed Houston TranStar, which provides transportation management and emergency management in the greater Houston region to keep motorists informed and make roads safer. The organization is a joint effort by the City of Houston, Harris County, Metropolitan Transit Authority of Harris County (METRO) and TxDOT. More than one thousand closed circuit television cameras monitor highways on a daily basis and provide information along evacuation routes as far away as Galveston to Dallas to the north (240 miles) and points west toward San Antonio. The organization operates a website that is used by numerous jurisdictions and private organizations as well as residents. Use of the website increased dramatically during Hurricane Harvey in August 2017 and during an ice storm in January 2018.

Ms. Massie talked about challenges as a multi-jurisdictional and multi-agency organization. People sometimes need to be convinced that collaboration is good, and it can be difficult to maintain. The organization is fairly local in its approach, but they are starting to reach out. They would like to figure out how to reach new audiences, such as fleets, who could benefit from their travel information as well as provide valuable information, and would like to see the private sector sit down with TxDOT to talk about what they see on the network.

### Brenda Mainwaring, Assistant Vice President Public Affairs, Union Pacific Railroad (UP)

Ms. Mainwaring manages UP's activities in seven states, including UP's interchange points with Mexico. She expressed her appreciation for participating in the workshop because it's not often that the private sector gets to talk with so many public sector stakeholders at one time. She believes that there is a general lack of understanding of the railroad industry, which has a sincere desire to overlay the needs of the industry with the needs of communities. The industry has a high level of pride due to the role of rail in developing the west. UP recognizes there is limited ability to shoehorn more transportation infrastructure into dense metropolitan areas such as Houston.

Railroads spent $64.9 billion in 2015 to operate, maintain, and grow their rail networks. This is all private sector money. UP spends more per year on capital improvements than all but six states. They are not constrained by the same kinds of politics or long range planning requirements as public sector projects. They have a five-year planning timeframe, and things can change quickly in these five years. They are not going to publicly discuss how and where they make investments; this is a competitive industry and in some cases there are anti-trust provisions that prevent them from discussing details. This is the real challenge for public-private partnerships (PPP)—how do we solve the public need for transparency versus the private need for competitively withheld information? In this regard, transportation and rail planning are inherently in conflict. But there are common interests.

UP wants to know where communities are interested in developing and will confirm if it's a preferred site. UP will not take any public money for PPPs unless there is a very clear public benefit. They want to work with communities to find these opportunities, but there is no reason to take public money without that benefit. MPOs are the perfect agency to partner with for PPPs and UP wants to work with MPOs collaboratively; UP can provide a list of projects without funding where they believe there's a public benefit, such as grade separations and bridge work.

## Q&A/Dialogue

**Question for panel:** How can we can best link transportation investments to economic development goals?

**Answer from Ms. Camacho:** Businesses need to more actively bring MPOs and public agencies to the table. For example, DRC has an infrastructure committee that addresses everything from transportation to water to technology and data issues. They are not discussing transportation in isolation. We also need to think about workforce development. DRC wants to increase manufacturing in southern Dallas. They have areas marked for potential site selection based on rail, air travel, and road travel. It would be good to know what states and MPOs have mapped out.

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**Question for panel:** How can the public sector can work with the private sector to keep up with the fast pace of innovation?

**Answer from Ms. Mainwaring:** The private sector will make it very clear to the public sector when it thinks public action is necessary. It also is important for the public sector to not get in the way of innovation. For example, no one knows where new technology is going, so creating laws during times of rapid change will limit technology advancement. In other words, sometimes the best course is “do not just do something, stand there.”

**Answer from Ms. Camacho:** With workforce development in the technology sector, higher education cannot keep up with needs. Industry has created its own training programs and tries to share that information but some universities are not receptive.

**Answer from Ms. Massie:** When there is a public safety issue, Government does need to step in and act.

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**Question for panel:** How can the public sector can engage with rail, which has been a challenge in some areas?

**Answer from Ms. Mainwaring:** UP has employees whose sole purpose is to coordinate with the public sector, work with roadway authorities, port directors, and economic development teams. The last thing they want to do is be the last party at the table and be seen as killing a plan that the community is enamored with.

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**Question for panel:** Agencies often have challenges acquiring data. Are there data sharing mechanisms, especially when public dollars are involved?

**Answer from Ms. Mainwaring:** They identify a consultant, who will aggregate the information before sending it to TxDOT.

**Answer from Ms. Camacho:** Economic development agencies are being forced, due to public information requirements, to turn over data they have related to PPPs. Efforts to provide public access to economic development data may dampen private sector efforts.

**Answer from Ms. Burnell:** Some urban freight labs, consultants, or universities are scrubbing private data before it gets passed along for Government-funded projects.

## DAY 2: PART 2—CURRENT AND NEAR-TERM INITIATIVES

### STATE PERSPECTIVES ON FREIGHT, ECONOMIC DEVELOPMENT, AND CROSS-REGIONAL COORDINATION

In this session, a member of each state DOT discussed freight, emerging technologies, and multi-jurisdictional coordination activities in their state. Brandon Buckner, FHWA Office of Planning, facilitated the session. Remarks made by each speaker are summarized below, followed by the summary of the Q&A session.

#### Oklahoma Department of Transportation (ODOT)—Dawn Sullivan

Ms. Sullivan is the Director of Capital Programs at ODOT and oversees planning, project and program delivery, rail programs, waterways, and Tribal governments coordination. She said in Oklahoma it all boils down to relationships. The state ranks 17th for size of the highway system and 4th in per capita VMT, so they have a small population to support a large transportation system. They share a 780 mile border with Texas and work closely with TxDOT on a bridge currently under construction and share data. ODOT completed a state freight plan and had a 41 member Freight Advisory Committee (FAC) with unprecedented involvement from the private sector. The key takeaway from the plan is that two thirds of Oklahoma highway freight movement is pass through. As a state with a small and mostly rural population they need Federal involvement to help address freight needs. They received a FASTLANE grant to address a major freight highway improvement that also is a freight bottleneck in a small community close to the border with Texas. Ms. Sullivan thanked Arkansas for reaching out to Oklahoma to coordinate on the I-40 Corridor project and working together to address incidents. Oklahoma and Arkansas also are working closely on the waterways system they share.

#### Texas Department of Transportation (TxDOT)—Caroline Mays

Ms. Mays discussed the transportation system in Texas. The Texas Triangle (San Antonio, Houston, and Dallas) is home to 87 percent of the population. Goods movement also is concentrated here. Freight tonnage is expected to increase from 2.2 billion tons in 2016 to 4.0 billion tons in 2045. Texas shares a border with Mexico that has 28 crossings; 80 percent of U.S.-Mexico trade crosses though Texas by rail, truck, and water. Sea ports play an important role, with 11 deep draft and 10 shallow draft ports. Congestion on Texas highways costs trucks $5 billion annually, and the state is home to six of the Nation's top 25 freight bottlenecks. Impediments to the movement of goods impedes economic development in Texas and beyond. Ms. Mays described the impacts of Hurricane Harvey on truck travel during the storm and the resulting flooding.

TxDOT collaborates widely with MPOs, ports, rail, truckers, manufacturing, and others, as well as with other states for the state freight plan and through the I-10 Corridor Coalition and along the I-69 corridor. They also coordinate extensively with Mexico on border crossings on a border master plan, border crossing and support facilities, and binational trade corridors.

### Louisiana Department of Transportation and Development (LADOTD)—Dawn Sholmire

Ms. Sholmire serves as the MPO coordinator for LADOTD. The state completed a freight plan in 2014 and finalized an update last month. The plan served as the starting point for ongoing communication with partners. Louisiana has the 10th largest highway system and the third highest bridge deck area in the U.S. The state is home to 40 ports and 17 major waterway corridors. The Port of Southern Louisiana is the largest port by tonnage in the U.S. More than one third of workers in Louisiana work in a freight-intensive industry. The key freight infrastructure challenges in the state are roadway maintenance and improvement needs, limited truck parking, highway bottlenecks, incident management, waterway maintenance and channel depth, and first and last mile and intermodal connections. The top recommendations in the freight plan are: continuation of the FAC's participation in state, MPO, and multistate coordination; leverage PPPs to fund transportation improvements; coordinate with other states on freight infrastructure improvements; update freight modal systems plans regularly; implement a framework to prioritize freight investments; refine performance measures to track implementation progress; and address the condition of special truck routes that support the energy and mining industry. The plan includes a freight project prioritization framework, established for each freight plan goal, and several implementation steps.

### Arkansas Department of Transportation (ADOT)—James Garland and Rea Donna Jones on behalf of ADOT

Mr. Garland, FHWA and Ms. Jones, Texarkana MPO, reported on behalf of ADOT. The Texarkana MPO is a bi-state organization that covers Texas and Arkansas. The Arkansas economy is tied directly to freight, and highways are the backbone. Truck volumes are expected to increase by 44 percent from 2013 to 2040, and air freight by 190 percent. Freight accounts for 43 percent of the State's economy and 50 percent of its employment. Arkansas completed a state rail plan in 2016, freight plan in 2018, and a long-range intermodal transportation plan in 2017. In the freight plan, the State used data from the National Performance Measures Research Data Set (NPMRDS) to evaluate reliability and identify problem areas in detail. The freight plan also looked in depth at commercial vehicle safety issues and truck parking. The rail plan identified several key rail issues, including intermodal terminal access, highway rail crossing safety, rail abandonment, height capacity, track maintenance, and weight capacity. The Plains Diamond Pipeline also is planned for development across the state and into Oklahoma. Arkansas is part of an Institute for Trade and Transportation Studies (ITTS) pooled fund effort to look at freight movement and infrastructure needs across nine states. Arkansas also is part of an I-40 Corridor Working Group with Oklahoma and Tennessee. The three states are jointly looking at several issues along I-40 and developing a prioritization framework and implementation strategies for advanced technology, incident management, and traveler information systems. ADOT also collaborates extensively with its metropolitan and rural areas and works closely with Texarkana MPO to coordinate Texas and Arkansas activities in the bi-state region.

### Q&A/Dialogue

**Question for panel:** Has anyone determined the economic impacts to neighboring states from freight delays during Hurricane Harvey?

**Answer from Ms. Mays:** She is not aware of any studies that address this, but a lot of work on emergency planning is now underway. We need to look at design guidelines for flood prone

areas to make sure freight is addressed. Future freight plans need to include recommendations and strategies.

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**Question for panel:** To what extent was safety addressed in the state freight plans, and what is the level of collaboration between neighboring states on the topic?

**Answer from Ms. Mays:** Texas did extensive work on safety for their plan, including analysis of crash data and design issues. For example, some exit ramps and frontage roads do not work well for trucks and some bridges are narrow.

**Answer from Ms. Sullivan:** Oklahoma looked at safety data when examining bottlenecks and found that safety issues clustered in urban areas.

**Answer from Ms. Sholmire:** Louisiana considered freight safety when developing priorities in their plan. The states did collaborate but all agreed they need to collaborate more.

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**Question for panel:** How do the state freight plans address operations and incident management?

**Answer from Ms. Mays:** Texas will do follow up work to develop a statewide plan for incidents, construction, and related topics.

**Answer from Ms. Sullivan:** Oklahoma's plan is focused on capital expenditures and does not focus on operational issues. However, this is a big focus area of the I-40 Coalition's work.

**Answer from Ms. Sholmire:** Louisiana's plan recognizes the importance of operations and incident management.

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**Comment from Ms. Mainwaring:** What states say in their freight plans is very important to industry. The plans can send a message that a state has significant freight constraints, which can hinder economic development efforts. If the freight industry sees a bottleneck in their operations they address it, but when a state freight plan lists problem areas those problems stay on the books until the next plan update.

**Follow-up from Ms. Mays:** This is a great point. The plans need to make a strong case for investments but should not make things sound too negative. They need to discuss how the state will address problems.

## MPO AND RPO PERSPECTIVES ON FREIGHT, ECONOMIC DEVELOPMENT, AND CROSS-REGIONAL COORDINATION

In this session, several MPOs and RPOs discussed freight planning, emerging technologies, and multi-jurisdictional coordination activities in their state. Mr. Garland facilitated the session. Remarks made by each speaker are summarized below, followed by a summary of the Q&A session.

### Clay Barnett, Sherman-Denison MPO

Mr. Barnett discussed the MPO's activities related to freight planning and involvement in developing the Texas freight plan. The U.S. 75/69 corridor runs through the MPO region and is the preferred route to access several metropolitan areas in states north of Texas. U.S. 75 goes from 10 lanes in the Dallas area to four lanes in the Sherman-Denison area. Because of the economic importance of the facility, the MPO has started development of a regional freight plan. The plan will develop an advisory committee, conduct a SWOT analysis, look at supply chain issues, and create implementation strategies.

### Bob Dickinson, Beaumont-Port Arthur MPO

Mr. Dickenson complimented FHWA for recognizing the importance of these issues and holding this workshop. He discussed the MPO's efforts to improve interstates in the MPO region. They are working to rebuild I-10 in Orange County; I-10 and U.S. 69 come together in Beaumont, and $350 million is needed to complete a reconstruction project in that area. There is a need to work across state boundaries and even across jurisdictions within in Texas. He provided examples of efforts to bring I-14 up to Interstate standards and working with military bases across the area.

### Vicki Eggers, Northern Oklahoma Development Authority/Northern Oklahoma Regional Transportation Planning Organization

Ms. Eggers' work addresses economic development in eight counties and regional transportation planning in 16 counties of rural northwest Oklahoma. She said her region is one of the non-shaded areas between megaregions displayed on FHWA's map. The region is home to more than 100 cities and towns and is very rural. They became a Regional Transportation Planning Organization (RTPO) in 2012. More than two-thirds of the population in the region is older, and members of the younger generation are moving to other areas to get good jobs. Economic development is a key issue, and it is critical for RTPOs to be part of this conversation. Products move through the region but there is very limited funding in these areas to maintain current transportation or develop corridors.

### Rea Donna Jones, Texarkana MPO

Ms. Jones described the Texarkana region. The area covers jurisdictions in Texas and Arkansas and is rural, but has a population of about 140,000 and is growing rapidly. Transportation funding is a major issue. With three Interstates, it experiences a lot of freight activity that puts stress on the region. Truck traffic accounts for 30 to 40 percent of the traffic on the Interstates. Texarkana also is located on hurricane evacuation routes, as there are few alternatives for travel out of the state. Collaboration is very important; they do not have enough funding to address transportation issues so they rely heavily on the states.

### Sid Martinez, Alamo Area MPO (AAMPO)

AAMPO is the MPO for San Antonio and is working closely with the Capital Area MPO in Austin (CAMPO) to enhance transportation options between the two metropolitan areas. Mr. Martinez discussed these coordination efforts. Between AAMPO and CAMPO there are four million residents and numerous counties and jurisdictions. Together, the MPOs are developing a regional strategy to enhance mobility and identify infrastructure, policy, and technology solutions. Key concerns are a lack options for direct connections, growing traffic congestion,

freight needs, and growth. Over the next two decades, the population will grow to six million and truck and rail movements will increase dramatically. The MPOs conducted a joint Board workshop to identify and agree on current problems and goals for the future. Next steps for the study include outreach to additional stakeholders, data collection and analysis, and identifying and evaluating possible solutions. A second workshop will be help in early summer.

Mr. Martinez discussed additional coordination efforts between AAMPO and CAMPO. The MPOs hold joint meetings at the staff, Executive Committee, and Board levels, and conduct joint studies and planning efforts. They have identified more potential coordination opportunities—integrated long-range plans, high-speed rail, transit services, and travel demand modeling.

### Karen Parsons, New Orleans Regional Planning Commission (RPC)

The New Orleans region is home to six Class I railroads, four interstates, four Mississippi River ports, 13 intermodal connectors, more than 21,000 miles of pipeline, and 1.4 million people. Ms. Parsons discussed the RPC's freight planning activities. The region has limited land available to address rail congestion. The abundance of water means numerous costly bridges are needed, and soil conditions results in higher costs for road maintenance and construction. They also are at an increased risk of coastal erosion from flooding. The MPO performs a lot of freight-related data collection and analysis. They compile traffic counts and speed and crash data, and added a truck component to the region's travel demand model. The MPO convenes a quarterly Freight Roundtable, and visits freight stakeholders at their places of business to discuss ongoing projects and related problems. This information is incorporated into project selection for the MPO's long-range plan and TIP. Freight planning also incorporates ITS strategies and traffic incident management. The MPO is involved in studies and road improvements for a major new airport terminal, port access, and rail line relocation.

RPC partners with the LADOTD on regional freight projects; major freight projects are on the National Highway System or are large enough that they require the State to take lead. The ability of the MPO to partner across state lines is largely limited by its jurisdictional boundaries, so multi-state coordination usually falls to LADOTD as well.

Ms. Parsons summarized the challenges of coordination from the perspective of an MPO. Planning and funding is targeted to individual jurisdictions, each with its own geographic and political challenges. This leads to separate, isolated decision-making and discourages multi-state coordination by the MPO. On top of this, current policy and funding silos limit areas of coordination. Federal, state or local policy often ignores or underfunds efforts that can ultimately improve freight flows. Intercity passenger rail is undervalued as a means to reduce interstate auto congestion, for day-to-day trips or for hurricane evacuation, which would increase capacity for truck freight. The lack of comprehensive zoning policy results in sprawl, increased travel, and congestion. Poor coordination between parish land use planning and state driveway permitting results in corridor congestion. Success is defined by project completion within each region or state, rather than by coherence of different groups across geographic areas or vertically within states. Proactive coordination is often politically difficult or fragmented unless there is a mandate. Ms. Parsons concluded by saying that we need to think about freight on a multimodal basis. FHWA has moved us in that direction.

### Cheri Soileau, Imperial Calcasieu Regional Planning and Development Comm. (IMCAL)

Ms. Soileau is the MPO director for the Lake Charles, LA region and is responsible for economic development activities in the five-parish region of Southwest Louisiana. She challenged MPOs to not say "I'm just an MPO." We are stakeholders and have a say and a role to play. The Lake Charles region is home to two interstates, the Port of Lake Charles, an airport, and several railroad routes. The LNG industry has a strong presence in the region, and the petrochemical industry across the Southeast has a strong influence on the MPO area. Hurricane Harvey showed us how interconnected our economies are and demonstrated that we need to look beyond our own borders.

### Q&A/Dialogue

**Comment from participant:** RTPO funding is inconsistent from state to state. In Texas, we spend a lot of time working with localities that are not part of an MPO, but this is not the case in all states. With Federal performance measures and performance-based planning and programming, funding is likely to increasingly go to urban areas. It is important that states continue to coordinate and plan with rural areas.

**Question for Mr. Martinez:** Are there any observations or lessons learned yet from the coordination efforts between the San Antonio and Austin MPOs.

**Answer from Mr. Martinez:** There is a lot more still to be done. These first steps are only baby steps. In the last year, the conversations have increased exponentially, and should probably expand beyond the two areas.

**Comment from participant:** The North Central Texas COG is looking into coordinating with MPOs along a key corridor. H-GAC has started coordinating with other MPOs on commuter programs to share best practices.

## THE IMPACT OF INNOVATION ON OUR TRANSPORTATION FUTURE

Egan Smith, Managing Director of the U.S. DOT Intelligent Transportation Systems Joint Program Office (JPO), talked about activities underway in the JPO, which include connected vehicle (CV) pilots in Wyoming, New York City, Tampa, and other areas. CV technology holds promise to address many freight-related problems. The CV pilots were designed to address real-world problems and therefore remain as permanent operational elements after the pilots conclude. The pilots address specific, critical needs, which will drive the deployment process, and they are large scale with multiple applications to demonstrate a variety of transferable solutions. U.S. DOT is investing heavily in demonstration projects through the pilots and several other grant programs, and has developed a deployment technical assistance program to engage early deployers and U.S. DOT as partners in problem solving. Mr. Egan also showed the U.S. DOT's autonomous vehicle (AV) website and describe the Department's AV activities.

### Q&A/Dialogue

**Question for Mr. Egan:** How will the findings of the pilot be conveyed?

**Answer from Mr. Egan:** They will work collaboratively with freight providers to convey the CV pilot findings. Providers are willing to help because it's a symbiotic relationship and they have

something to gain. The pilots also will help us better understand how CVs and non-connected vehicles will interact in the real world. The JPO is doing a lot of research on truck platooning, on both the vehicle side and the infrastructure side. He is optimistic that the technology will be successful.

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**Question for Mr. Egan:** Is the JPO still focusing on traditional ITS activities such as traffic signal coordination and 511?

**Answer from Mr. Egan:** These are very critical and the JPO still supports them and will not forget traditional ITS as they work on new technologies.

## RESEARCH AND TRENDS SPANNING LARGE NETWORKS AND GEOGRAPHIES

This session featured two speakers discussing university research on trends, mobility, equity, and other considerations in the Greater Texas Region and beyond.

### Dr. Carol Lewis, Professor, Texas Southern University

Dr. Lewis discussed research focused on creating a framework to determine purpose and need for increased travel options in the Greater Texas Region for vulnerable communities. She emphasized that when looking at mobility across the region it is critically important to continue increasing connectivity within the state and that intercity connections should link seamlessly with intracity circulation systems. For example, Houston and Austin are connected through the U.S. 290 Corridor. This connection is important, and so is the area in between. Her research is creating a tool for planners to develop purpose and need statements that support development of transportation projects for vulnerable populations. For example, they are defining a social variable to determine the need for transit based on access to jobs, health care, recreation and entertainment, and social contact, using data and current transportation options and costs.

### Dr. Ming Zhang, Professor, University of Texas at Austin

Dr. Zhang discussed a research initiative titled Cooperative Mobility for Competitive Megaregions, or CM2. He manages the CM2 effort, which is a partnership between the University of Texas at Austin and several other institutions, including Louisiana State University, Texas Southern University, and the University of Pennsylvania. Research is focused on three topic areas: regional planning and setting of transportation priorities; increasing access to opportunities that promote equity in connecting regions and communities, including urban and rural communities; and innovations in multimodal planning and modeling for high-growth regions. Efforts will address governance structures, collaborative approaches to developing solutions, changes to Federal law to promote multi-jurisdictional collaboration, airport governance, developing new metrics, improving public engagement, and impacts of transportation technology. Additional considerations include education and workforce development and technology transfer. He encouraged participants to connect with him about any of these research issues.

### Q&A/Dialogue

**Question for Dr. Lewis:** What other needs have been used in purpose and needs statements and how they have been tested?

**Answer from Dr. Lewis:** Several ideas related to developing needs have been developed but they have not yet been tested. That is what the research intends to do.

## FREIGHT, GOODS MOVEMENT, AND ECONOMIC DEVELOPMENT FROM THE PORT PERSPECTIVE

This session featured speakers from two ports in the Greater Texas Region to talk about freight and economic development issues and considerations.

### Bruce Mann, Director of Freight Mobility, Port Houston

In his role at Port Houston, Mr. Mann works with multiple jurisdictions to identify where investments are needed. The Port is responsible for 16 percent of the State's GDP and generates more than one million jobs. It is the busiest channel in the U.S. The Port of Houston Authority is a governmental subdivision chartered by the State and is governed by a seven member commission appointed by Harris County, the City of Houston, and other neighboring cities.

The Port of Houston is focused on more than their jurisdiction. Stakeholders include H-GAC, TxDOT, the City and County, numerous mayors of local jurisdictions, and others. Mr. Mann worked with stakeholders to develop a list of prioritized investment needs. The process at times has been challenging but they were able to come to agreement on a list of 30 projects. He brings awareness to the prioritized project list and works to find funding. A total of $4 billion in the port region is needed for infrastructure investment, with a $40 billion shortfall statewide for freight mobility projects. There are other ways besides investing in road networks to solve freight issues. The Port is looking at alternate technologies like Freight Shuttle, which would elevate freight traffic, allowing for more efficient flows and decreased emissions. Because competition for roadway capacity continues to increase, we also need to start thinking about incentivizing freight traffic at night.

### Jarl Pedersen, Chief Commercial Officer, Port of Corpus Christi Authority

Mr. Pedersen focuses on economic development and marketing for the Port of Corpus Christi. The Port's vision is to be the Energy Port of the Americas. The Port is number one in crude oil exports and is the fourth largest port in the U.S. by tonnage, with a $150 billion impact on the U.S. economy. Major port assets include intercoastal waterway barge access on Marine Highway M-69, an expanding highway system with I-37 and I-69, 36 miles of ship channel, 60 miles of rail tracks, and pipelines, terminals, and storage capacity. The port is an energy hub, with refineries developing in the vicinity. During Hurricane Harvey, the Port experienced high winds but did not receive damage. When Houston was unable to use refineries, Corpus Christi supplied 25 percent of the Nation's gas supply.

The Port is starting a channel improvement project to accommodate larger tankers, and is funding 10 percent of a $900 million bridge project. Several railroad improvement projects also are underway. These projects and others will improve flows and make room for future

improvements. The port has mapped out sites that would be great for industries to move into and is aiming to accommodate expected growth.

### Q&A/Dialogue

Ms. Burnell summarized the presentations. There are costs and considerations not only at the ports but over the entire transportation system and supply chain. The ports are making significant investments. It's important to think about how we can work together to coordinate these investments and how to absorb them into existing infrastructure.

**Question for panel:** How important are local roads to freight mobility, and who should have the responsibility for maintaining them?

**Answer from Mr. Mann:** The first mile-last mile roads are imperative and we should look at all funding sources to improve them, specifically finding ways to fund the development of local projects. The ports work with the state and others to communicate project needs.

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**Question for panel:** Officials in other parts of Texas do not often think of the ports and the connection with goods produced in those areas. How can the State and others communicate the value of the port?

**Answer from Mr. Pedersen:** Because the State is so large, the ports tend to be invisible. We need to continue to communicate with officials, legislators, and citizens so they take notice when they need the ports. If you are not able to move your production as a business, or the costs are high, it becomes an economic issue. The ports need to do a better job explaining this so they can receive funding to create economic opportunity. Ports do not advertise for business in the way that railroads or trucking companies do, so there is less awareness. They need a consistent message to market the important services and economic benefits they provide.

## PART 3—MOVING FORWARD

### IDENTIFYING PRIORITY NEEDS AND POTENTIAL ACTIONS

Catherine Ross facilitated discussion among small groups to identify common needs across the megaregion and brainstorm priority needs and coordination approaches. The participants broke into four small groups to discuss the following questions:

1. What projects or programs could be implemented or improved through multi-jurisdictional partnerships?
2. What partnerships currently exist that we can build on?
3. What are the common interests and common needs discussed today?
4. What action items and next steps should this group take?

## REPORT-OUTS AND KEEPING THE CONVERSATION GOING—DISCUSSION OF NEXT STEPS/ACTION ITEMS

In this session, each breakout group reported their ideas corresponding to discussion questions. Following is a summary of the groups' discussions.

## IDENTIFYING PRIORITY NEEDS AND POTENTIAL ACTIONS FOR THE MEGAREGION

What projects or programs could be implemented or improved through Multi-Jurisdictional partnerships or joint activity?

- Data sharing. Find opportunities to share data and address proprietary issues. There is a need to know what commodities are moving through the planning area and how many trucks are moving through. We lack this level of data and therefore do not have a solid understanding of needs. Involve academia as appropriate to deal with the issue of proprietary information.
- Traffic management centers in different parts of the large region do not communicate with each other. There is a need to share information about incidents on intercity and interstate connections. Related to this, agencies struggle with how to get this information out to parties that need it. Coordination is needed.
- ITS and infrastructure needs, including truck parking. ITS provides continuity between systems to allow better communication and coordination.
- Consider pooled fund studies and efforts.
- Create a forum to share experiences and best practices.
- Develop a plan to bring MPOs and ports to the table. Build upon efforts like those in Houston to involve port representatives. State DOTs can facilitate this collaboration.
- Emergency management—need a system that works across platforms and jurisdictions.
- Corridor coalitions can consider a system for corridor management from a megaregional perspective.
- Manage ITS data in a more active way across the megaregion.
- Talk to private sector as a megaregion rather than state by state.

What partnerships currently exist that we can build on?

- Rio Grande Valley in Texas—five MPOs collaborate to forecast travel demand.
- Oklahoma is considering development of one model. It would be helpful to have an understanding of needs not only within the state but of neighboring states.
- Association of Texas MPOs (TEMPO) serves as a coordination resource for the entire state of Texas with regular meetings and communication.

- RTPOs in Oklahoma meet monthly.
- Corridor Commissions are a great way to work across agencies and jurisdictions. I-40 working group is a great example.

What are the common interests and common needs discussed today?

- The need for additional funding is common to all the participating agencies.
- Need for information (freight flows).
- All participants recognize the need for coordination and partnerships.
- Find common ground and develop a unified message to speak with one voice as a megaregion.
- State DOTs do not always coordinate well among their own districts, especially when it comes to operations. We need to identify ways to communicate operational strategies. This entails a culture change within organizations. We need to talk with emergency management staff on a regular basis.
- Large metro areas in the greater Texas region are growing together, thus there is a compelling reason for enhanced collaboration.

What are possible actions this group can address?

- State freight advisory committees or commissions should be in contact with each other.
- Involve Mexican agencies to better understand freight flows through border communities.
- Create a forum to share experiences and best practices across the megaregion. Keep meeting and talking with each other to share planning activities.
- Develop performance outcomes to monitor progress in collaboration.
- Continue this workshop with a follow-on event. Look for opportunities at state or regional conferences to continue this discussion. For example, Oklahoma was invited to a Texas environmental conference. Harris County holds an annual freight conference. Continue this outreach.
- Build upon current partnerships with universities to conduct research and studies that benefit agencies in the Greater Texas region.
- Increase the exchange of information between the private and public sectors.
- Identify ways to communicate the long-term benefits of collaboration and working together.
- Each state has a freight plan but we do not know what is in our neighboring state's plan. Coordinate and review state freight plans. Create statewide freight flow maps.

- Consider e-commerce trends and data when developing plans and programs.
- Consider scenario planning on a megaregional scale.
- Identify ways to measure commodity flows while ensuring private sector needs to protect propriety information.
- The agencies that participated in this workshop have the responsibility to reach out to each other and continue the dialogue.
- Continue corridor-based discussions and extend invitations to participate to a wider set of jurisdictions and stakeholders.

## FINAL COMMENTS AND CLOSING REMARKS

During the Workshop, participants from Arkansas, Louisiana, Oklahoma, and Texas discussed freight planning efforts, ongoing collaboration, and opportunities for multi-jurisdictional coordination. Mr. Garland summarized the key takeaways from the Workshop:

- Partnerships are key and collaboration is necessary. Coordination efforts like those happening with corridor coalitions and between AAMPO and CAMPO are important.
- We need to make sure those in the white spaces between megaregions are part of the discussion.
- The public sector and the private sector plan and fund infrastructure improvements differently. The terminology and approaches are different, but there are commonalities. Both parties should be at the table.
- Educate leadership about the value of coordination on projects that go across your boundaries. Local decision-makers and officials need to take this information and make it their own.
- Engage the business community and local commerce.
- Document and test your vulnerable assets. Resiliency is important. When something happens to one area the rest of the Nation can be affected.

Ms. Mays thanked the participants and especially the students that were in attendance from Texas universities. Collaboration and relationships are the two key words from the workshop that resonated with her. She urged attendees to review the list of participants contained in the workshop folder and cultivate the relationships that are important to their work. She also emphasized that there are still others we need to talk to. For example, where are the land use people? If we're not talking to them, we'll still be talking about the same problems in the future.

Mr. Clark thanked the speakers for a great discussion and expressed his appreciation for the opportunity to collaborate with participants. He said we do not have all the answers so we need to keep talking about these issues. He welcomed the students to the transportation community

and encouraged them to share their ideas because sometimes we need others to come in and ask questions we did not think about.

Mr. Evilia also thanked everyone for the opportunity to collaborate. He challenged participants to not just leave the workshop and say “this was another nice workshop,” but to reach out to the people you met today when you work on your plans and programs. The most effective thing for your region might be a project somewhere else. It’s not always about your jurisdiction, but about the larger picture. Take advantage of the contacts made and keep working to solve problems.

## APPENDIX A: WORKSHOP AGENDA

# Multi-Jurisdictional Coordination for the Greater Texas Region FHWA Workshop Agenda

**Hosted by FHWA in partnership with the Houston-Galveston Area Council and the Texas MPO Association**

**Norris Conference Centers—Houston/CityCentre**
**Magnolia Room**
**816 Town and Country Blvd, Suite 210**
**Houston, TX 77024**
**March 28–29, 2018**

### DAY 1—Wednesday, March 28, 2018

#### Part 1—Background / Setting the Stage

**Purpose Statement:** This workshop brings together members of the public and private sector to discuss how we can better connect and work with each other to address transportation and the economy in the Greater Texas Region and neighboring states of Arkansas, Louisiana, and Oklahoma, and identify next steps for doing so.

**12:30–1:00 p.m.** **Registration and Materials Pick Up**

**1:00–1:20 p.m.** **Welcome and Introductions**
Introductions and facilitation by: James Garland, FHWA Office of Planning
- *Alan Clark*, Transportation Director, Houston-Galveston Area Council
- *Chris Evilia*, Director, Waco MPO and Chair, Texas MPO Association
- *Georgi Jasenovec*, Freight Operations and International Border Program Manager, FHWA Texas Division
- *Peter Smith*, Transportation Planning and Program Director, Texas DOT

**1:20–1:50 p.m.** **Starting the Conversation: Improving Key Transportation Issues in the Greater Texas Region and Beyond**
Overview of workshop goals and Question and Answer session.
Facilitation by: *James Garland*, FHWA Office of Planning

**1:50–2:45 p.m.** **Freight Planning and Local Long-Range Planning**
Examine current collaboration activities to build upon.
Introductions and facilitation by: Brandon Buckner, FHWA Office of Planning
Speakers:
- *Caroline Mays*, Texas DOT Freight Planning and the I-10 Coalition
- *Anna Read*, Long-Range Planning: North Central Texas Case Study with the American Planning Association

**2:45–3:00 p.m.** **BREAK**

**3:00–4:30 p.m.** **Private Industry Perspectives on Transportation and Goods Movement**
Explore freight trends, market shifts, technology deployment and challenges.
Introductions and facilitation by: *Tamiko Burnell*, FHWA Office of Operations and Freight Management
Speakers:

- *Priscilla Camacho*, Sr. Vice President of Public Policy, Dallas Regional Chamber
- *Dinah Massie*, Executive Director, Houston TranStar
- *Brenda Mainwaring*, Assistant Vice President Public Affairs, Union Pacific Railroad

**4:30–4:45 p.m.** **Summary of Day 1**
Facilitation by: *Brandon Buckner*, FHWA Office of Planning

**4:45 p.m.** **ADJOURN**

**5:30–7:00 p.m.** **After Workshop Gathering and Networking Opportunity**
Sponsored by: Houston-Galveston Area Council
Yard House, 800 Sorella Court, Houston, TX
Adjacent to the Norris Conference Center

**DAY 2—Thursday, March 29, 2018**

## Part 2—Current and Near-Term Initiatives

**8:30–8:45 a.m.** **Recap of Day 1 and Overview of Day 2**
Speakers: Brandon Buckner and James Garland, FHWA Office of Planning

**8:45–9:45 a.m.** **State Perspectives on Freight, Economic Development, and Cross-Regional Coordination**
Introductions and facilitation by: *Brandon Buckner*, FHWA Office of Planning
Speakers:

- *James Garland*, FHWA and Rea Donna Jones, Texarkana MPO, on behalf of Arkansas DOT
- *Dawn Sholmire*, Louisiana DOTD
- *Dawn Sullivan*, Oklahoma DOT
- *Caroline Mays*, Texas DOT

**9:45–10:00 a.m.** **BREAK**

**10:00–12:00 p.m.** **MPO and RPO Perspectives on Freight, Economic Development, and Cross-Regional Coordination**
Introductions and facilitation by: *James Garland*, FHWA Office of Planning
Speakers:
- *Clay Barnett*, Sherman-Denison MPO
- *Bob Dickinson*, Beaumont-Port Arthur MPO
- *Vicki Eggers*, Northern Oklahoma Development Authority RPO
- *Rea Donna Jones*, Texarkana MPO
- *Ashby Johnson*, Capital Area MPO
- *Sid Martinez*, Alamo Area MPO
- *Karen Parsons*, New Orleans Regional Planning Commission
- *Cheri Soileau*, Imperial Calcasieu Regional Planning and Development Comm.

**12:00–1:00 p.m.** **Working Lunch: The Impact of Innovation on Our Transportation Future: A Facilitated Dialogue**
Introduction by: *James Garland*, FHWA Office of Planning
Speaker:
- *Egan Smith*, U.S. DOT ITS Joint Program Office

**1:00–1:15 p.m.** **BREAK**

**1:15–2:15 p.m.** **Research and Trends Spanning Large Networks and Geographies**
Introductions and facilitation by: Brandon Buckner, FHWA Office of Planning
Speakers:
- *Dr. Carol Lewis*, Texas Southern University—Transportation Equity Issues and Collaboration in Large Regional Areas
- *Dr. Ming Zhang*, University of Texas at Austin—Consortium on Cooperative Mobility

**2:15–3:15 p.m.** **Freight, Goods Movement, and Economic Development from the Port Perspective**
Introductions and facilitation by: *Tamiko Burnell*, FHWA Office of Operations and Freight Management
Speakers:
- *Bruce Mann*, Director of Freight Mobility, Port Houston
- *Jarl Pedersen*, Chief Commercial Officer, Port of Corpus Christi Authority

**3:15–3:30 p.m.** **BREAK**

## Part 3—Moving Forward

**3:30–4:15 p.m.** **Identifying Priority Needs and Potential Actions**
Breakout groups identify common needs across the region and brainstorm priorities and coordination approaches. Discussion topics include:

- What projects or programs could be implemented or improved through multi-jurisdictional partnerships?
- What partnerships currently exist that we can build on?
- What are the common interests and needs discussed today?
- What action items and next steps should this group take?

**4:15–4:45 p.m.** **Report Outs and Keeping the Conversation Going—Discussion of Next Steps/Action Items**
Develop concrete action items to carry forward.
Facilitation by: *James Garland*, FHWA Office of Planning

**4:45–5:00 p.m.** **Closing Remarks**

- *Alan Clark*, Transportation Director, Houston-Galveston Area Council
- *Chris Evilia*, Director, Waco MPO and Chair, Texas MPO Association
- *James Garland*, FHWA Office of Planning
- *Caroline Mays*, Director, Freight and International Trade Section, Texas DOT

**5:00 p.m.** **ADJOURN**

## APPENDIX B: GREATER TEXAS REGION WHITE PAPER

The Greater Texas Region White Paper is included in the following pages.

March 2018

# Multi-Jurisdictional Coordination for the Greater Texas Region

U.S. Department of Transportation
**Federal Highway Administration**

# Greater Texas Region

*March 2018*

## INTRODUCTION

The Greater Texas Region is comprised of portions of Arkansas, Louisiana, Oklahoma, and Texas with the densest and most connected development. It includes not just the core areas of Dallas-Fort Worth, San Antonio, and Houston, but also extends to connected areas along such highways as I-10, I-20, I-30, I-35, I-37, I-45, I-49, and future Interstate 69. Boundaries in multi-jurisdictional planning are flexible since transportation and economic interactions continue across state, regional, and local boundaries. This white paper provides an overview of the "Greater Texas Region," highlighting its key characteristics, including population, employment, and transportation infrastructure.

The Greater Texas Region is one of the most populous and fastest growing National Economic Networks. Its major metropolitan statistical areas (MSAs) anchor its economic activity and generate significant transportation flows. Houston, TX is a widely recognized energy center with energy headquarters, financial institutions, and petroleum processing facilities. Dallas-Fort Worth, TX has an established financial center endowed with several large passenger and cargo airports. Houston is centrally located in national petroleum and chemical distribution networks, and the Dallas-Fort Worth region occupies the same role for machinery products.[1] New Orleans, LA is a center for maritime activity, including white-collar and blue-collar support for off-shore oil drilling and petroleum refining. New Orleans also hosts major healthcare and education institutions. Oklahoma City, OK hosts state Government, as well as major healthcare and energy corporations, among other activities. Little Rock, AR is home to several large industries, including Government, aircraft manufacturing and maintenance, and agriculture management, while San Antonio, TX hosts major companies in energy and communications among other areas.[2] Some of the additional MSAs in the region include Bryan-College Station, Killeen-Temple-Fort Hood, Tyler, and Beaumont–Port Arthur, TX; Texarkana, AR-TX; Baton Rouge, Lake Charles, Lafayette, New Orleans, and Shreveport, LA; Lawton, Oklahoma City, and Tulsa, OK; and Fort Smith and Little Rock, AR. Table 1 presents the 2015 gross metropolitan product (GMP) for each state and for the largest MSAs in each of the states.

[1] Zhang, M., Steiner, F., & Butler, K. (2007, April). Connecting the Texas triangle: Economic integration and transportation coordination. In the Healdsburg Research Seminar on Megaregions (pp. 21-36).

[2] City Data (2018). Retrieved from http://www.city-data.com/us-cities/The-South/Little-Rock-Economy.html.

*Table 1: GMP in the Four States and in some of the Largest MSAs in the Greater Texas Region*

| State | 2015 GMP (million $) | U.S. Share | MSA | 2015 GMP (million $) | U.S. Share |
|---|---|---|---|---|---|
| Arkansas | 118,677 | 0.66% | Little Rock-North Little Rock-Conway, AR | 37,213 | 0.21% |
| Louisiana | 238,075 | 1.33% | Lake Charles, LA | 15,353 | 0.09% |
| | | | New Orleans-Metairie, LA | 78,478 | 0.44% |
| Oklahoma | 188,011 | 1.05% | Lawton, OK | 4,957 | 0.03% |
| Texas | 1,611,189 | 8.99% | Houston-The Woodlands-Sugar Land, TX | 503,311 | 2.81% |
| | | | Dallas-Fort Worth-Arlington, TX | 485,683 | 2.71% |
| | | | Austin-Round Rock, TX | 119,949 | 0.67% |
| | | | San Antonio-New Braunfels, TX | 108,879 | 0.61% |
| **U.S. Total** | **17,925,143** | **100.00%** | **U.S. Total** | **17,925,143** | **100.00%** |

Source: Bureau of Economic Analysis 2015.

Several metropolitan areas rank among the largest metropolitan economies in the country. The MSA of Houston-The Woodlands-Sugar Land ranked fourth nationally in terms of gross metropolitan product (GMP) in 2015. Texas is the second largest state economy in the U.S. after California, accounting for almost nine percent of the national GDP. Texarkana, AR-TX; Lawton, OK; Lake Charles, LA; and other MSAs each account for billions of dollars of economic activity.

The Greater Texas Region boasts abundant transportation assets across modes. The Port of South Louisiana processes more tonnage than any other American port. The Port of Houston, one of the world's largest natural harbors, is the busiest port in the United States in terms of foreign tonnage, and second busiest in terms of overall tonnage.[3] The four states in the Greater Texas Region generated nearly 13 percent of the national vehicles miles traveled (VMT) in 2013, as summarized in Table 2. Arkansas, Louisiana, and Oklahoma also have higher average VMT per capita than the national average, indicating greater usage of automobile and highway infrastructure.

*Table 2: Total VMT and VMT per capita by State in and around the Greater Texas Region in 2013*

| State | Total VMT 2013 (millions) | VMT share | Estimated Population 2013 | VMT per capita |
|---|---|---|---|---|
| Arkansas | 33,493 | 1.1% | 2,958,765 | 11,320 |
| Louisiana | 47,758 | 1.6% | 4,629,284 | 10,316 |
| Oklahoma | 47,999 | 1.6% | 3,853,118 | 12,457 |
| Texas | 244,525 | 8.2% | 26,505,637 | 9,225 |
| **U.S. Total** | **2,988,323** | **100%** | **316,497,531** | **9,442** |

Source: Bureau of Transportation Statistics 2013.

## IMPORTANCE OF MULTI-JURISDICTIONAL COORDINATION

National Economic Networks are networks of urban centers and their surrounding areas connected by existing economic, social, and infrastructure relationships.[4] In an increasingly

[3] Bureau of Transportation Statistics Table 1-57: Tonnage of Top 50 U.S. Water Ports (2014).
[4] Ross, C. L. et al. (2009). *Megaregions: Planning for global competitiveness*. Island Press.

competitive global economy, it is critical to understand these economic ties and the transportation infrastructure that provides access to customers and markets. To better understand the impact of these regions and to facilitate cooperation and coordination accordingly, the Federal Highway Administration (FHWA) is sponsoring several workshops across the country. These workshops convene local, regional, state, and Federal transportation officials with the private sector to connect and discuss multimodal freight transportation, infrastructure investment, operations, and corresponding shared economic success at the regional scale. The importance of this collaborative effort is underscored by the significance of these regions both nationally and globally. National Economic Networks are economic engines and also are major destinations for and originators of travel.

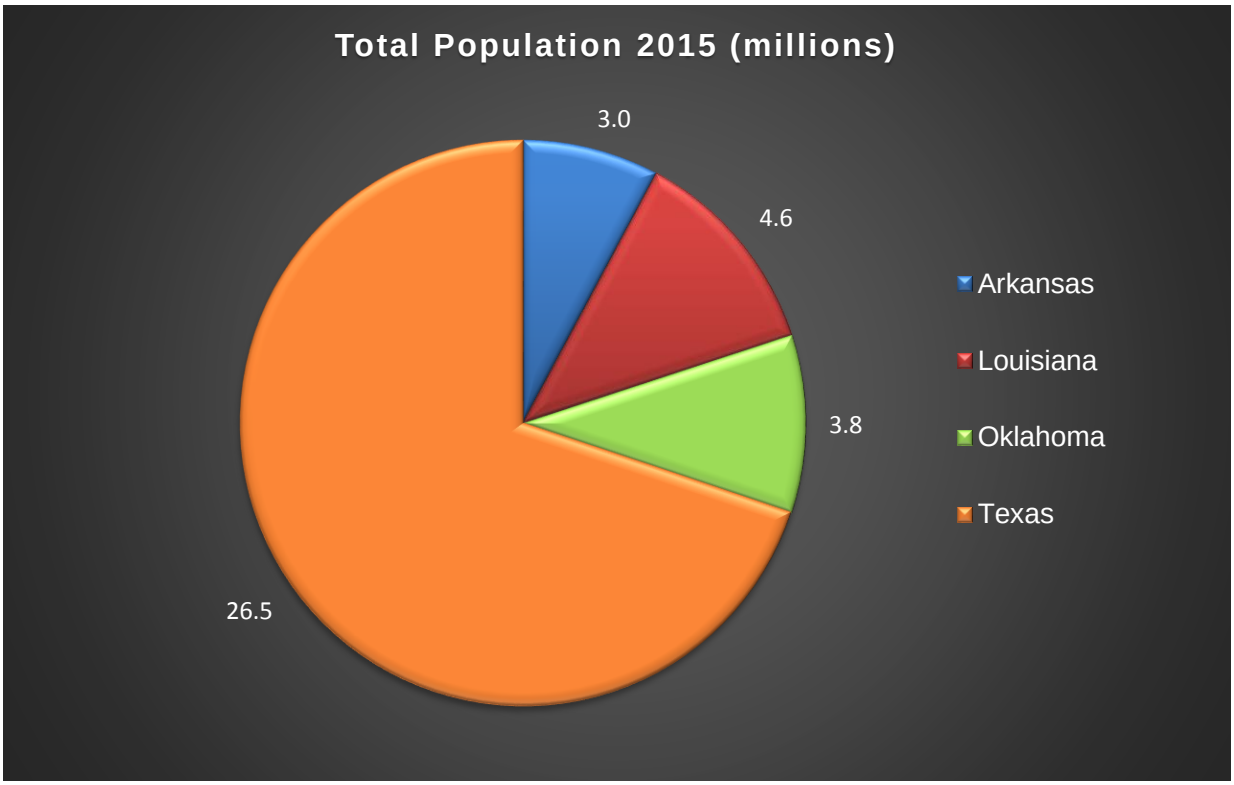
Transportation infrastructure provides mobility within and between cities and is the means for the movement of goods beyond the region. The region's ports, highways, railroads, airports, pipelines and intermodal connections will need continued investment to transport agricultural products, manufactured products and raw materials to their final destinations. Coordinated, comprehensive transportation planning ensures that the region can effectively compete in the global economy.

## POPULATION

Approximately 38 million people live in the Greater Texas Region, equal to 12 percent of U.S. population.[5] Texas is the most populous state, followed by Louisiana, Oklahoma, and Arkansas (Figure 1). Lafayette is the fastest growing city in the Greater Texas Region, with 87 percent population growth between 2009 and 2015. Texarkana and Huntsville are the second and third fastest growing cities. Texas also is home to several fastest growing metropolitan areas in the country. Five of the 10 fastest growing cities (with more than 50,000 population) in the country between 2015 and 2016 are in Texas, and the top three are all in Texas.[6] The 10 fastest growing metrpolitan areas in the Greater Texas Region are shown in Table 3. Many of them are in Texas, such as smaller areas like Pecos and Andrews and larger areas like Austin and McAllen. Lawton, OK also is among the fastest growing area in the region. The population of the Greater Texas Region is forecast to grow by more than 3.5 million people by 2030 (about 19 percent growth), raising questions about the infrastructure needed to serve the growing population.[7]

[5] American Community Survey (ACS) 5-year estimate 2011-2015.
[6] Bureau, U. C. (2017). The South Is Home to 10 of the 15 Fastest-Growing Large Cities. Retrieved August 1, 2017, from https://www.census.gov/newsroom/press-releases/2017/cb17-81-population-estimates-subcounty.html.
[7] LawnStarter. (2016). What Will the Texas Triangle Look Like in 2030? Retrieved August 1, 2017, from https://www.lawnstarter.com/fort-worth-tx-lawn-care/what-will-the-texas-triangle-look-like-in-2030.

*Figure 1: Population by State in the Greater Texas Region (2015)*




Source: American Census Survey 5-year Estimate 2011–2015.

*Table 3: Top 10 Fastest Growing Areas in the Greater Texas Region 2009 to 2015*

| Name of Area | State | Total Population 2009 | Total Population 2015 | Population Growth Rate |
|---|---|---|---|---|
| Lafayette, LA Metro Area | LA | 256,392 | 480,148 | 87.3% |
| Texarkana, TX-AR Metro Area | AR | 42,971 | 56,372 | 31.2% |
| Huntsville, TX Micro Area | TX | 63,928 | 83,735 | 31.0% |
| Pecos, TX Micro Area | TX | 11,100 | 14,179 | 27.7% |
| Andrews, TX Micro Area | TX | 13,295 | 16,775 | 26.2% |
| Midland, TX Metro Area | TX | 126,287 | 156,542 | 24.0% |
| Austin-Round Rock, TX Metro Area | TX | 1,589,393 | 1,889,094 | 18.9% |
| College Station-Bryan, TX Metro Area | TX | 203,846 | 239,096 | 17.3% |
| Lawton, OK Metro Area | OK | 112,828 | 131,643 | 16.7% |
| McAllen-Edinburg-Mission, TX Metro Area | TX | 702,697 | 819,217 | 16.6% |

Source: American Census Survey 5-year Estimate 2005–2009 and 2011-2015.

## EMPLOYMENT

The Greater Texas Region's most concentrated employment sectors are construction, trade, transportation and utilities, and Government. Table 4 summarizes the total employment by sector and their location quotients. The location quotient quantifies a region's concentration of a given economic activity based on national averages. A value greater than one indicates that the activity is more concentrated in the region than in the rest of the Nation. When the location quotient exceeds one, a region can often be assumed to export related products or services.

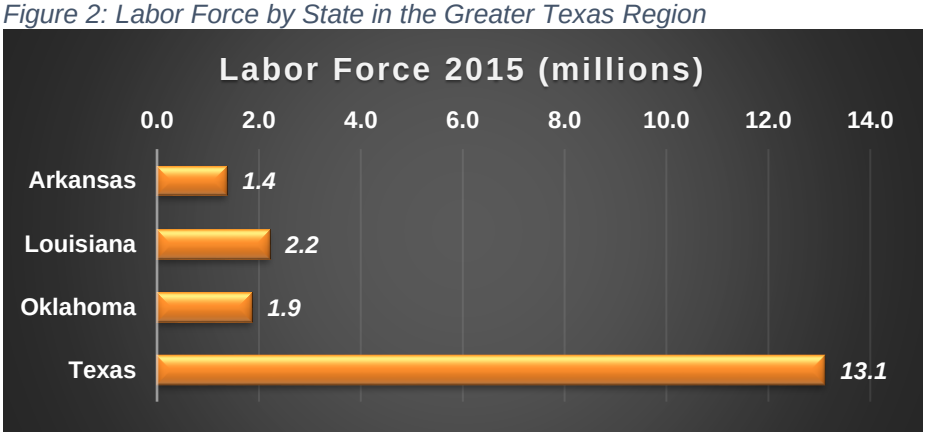
*Table 4: Greater Texas Region Employment by Sector*

| | Constr. | Manu. | Trade. | Financial | Profess. | Educ. and health | Leisure | Govern. | **Total** |
|---|---|---|---|---|---|---|---|---|---|
| Greater Texas Region (Four State) Employment (thousands) | 992 | 1,280 | 3,383 | 970 | 2,210 | 2,407 | 1,824 | 2,837 | 17,087 |
| Location Quotients (LQ) | **1.23** | 0.89 | **1.05** | 1.00 | 0.93 | 0.89 | 0.99 | **1.07** | 1.00 |

Source: Bureau of Labor Statistics, State and Metro Area Employment, Hours, and Earnings (March 2017).

The four states of the Greater Texas Region contain approximately 12 percent of the Nation's labor force, as shown by state in Figure 2. Texas has seen remarkable job growth in recent years. From 2004 to 2014, the total number of jobs in Texas increased by almost 25 percent, compared to a national average of 5 percent. Growth has concentrated mostly in relatively high-income jobs (earning more than $3,333/month), which grew by 85 percent. Conversely, middle-income jobs (between $1,251 and $3,333/month) increased by 4.4 percent, while the number of low-income jobs (less than $1250/month) decreased by 4 percent according to the Longitudinal Employer-Household Dynamics Data. Table 5 summarizes the eight sectors in Texas that grew more than 25 percent, of which the fastest growing are management, mining, and professional services.

*Figure 2: Labor Force by State in the Greater Texas Region*




Source: American Census Survey 5-year Estimate 2011–2015.

*Table 5. Fastest Growing Sectors in Texas 2004—2014*

| | **Mining** | **Constr.** | **Profess. Service** | **Manage.** | **Admin.** | **Health Care** | **Accom-modation** | **Public Admin.** | **Total** |
|---|---|---|---|---|---|---|---|---|---|
| **No. of Jobs 2004** | 150,556 | 538,705 | 471,370 | 48,350 | 547,326 | 1,074,488 | 762,957 | 285,170 | 9,019,408 |
| **No. of Jobs 2014** | 301,477 | 676,297 | 688,418 | 117,715 | 752,732 | 1,483,180 | 1,043,859 | 394,046 | 11,286,517 |
| **Change Rate 2004–2014** | 100.2% | 25.5% | 46.0% | 143.5% | 37.5% | 38.0% | 36.8% | 38.2% | 25.1% |

Source: Longitudinal Employer-Household Dynamics (LEHD) Data 2004 and 2014.

## TRANSPORTATION INFRASTRUCTURE

The Greater Texas Region has a large and developed freight and passenger transportation infrastructure across modes. Subsequent sections address major modes in more detail. Table 6 summarizes some of the key transportation facilities.

*Table 6. Partial List of Key Transportation Facilities in the Greater Texas Region*

| Partial List of Key Transportation Facilities | | |
|---|---|---|
| HIGHWAYS | | I-10, I-20, I-27, I-30, I-35, I-37, I-43, I-44, I-45, I-49, I-69 (future Interstate); Auxiliary (3-digit) Interstates omitted for brevity. |
| RAILROADS | | Freight: BNSF, Canadian National, Kansas City Southern, Union Pacific |
| AIRPORTS | | Fort Worth Alliance (AFW), Austin–Bergstrom (AUS), Dallas Love (DAL), Dallas/Fort Worth (DFW), Killeen–Fort Hood (GRK), Houston Hobby (HOU), Houston Bush Intercontinental (IAH), Little Rock (AR), New Orleans (MSY), Oklahoma City (OK), San Antonio (SAT), Shreveport (SHV) |
| WATERBORNE | | Ports of: Baton Rouge, LA; Beaumont, TX; Catoosa, OK; Corpus Christi, TX; Freeport, TX; Galveston, TX; Houston, TX; Lake Charles, LA; Matagorda, TX; New Orleans, LA; Orange, TX; Plaquemines, LA; Port Arthur, TX; South Louisiana, LA; Texas City, TX; Victoria, TX |

### Major Transportation Freight Flows

The Greater Texas Region is a large force in American transportation and freight. The region produces 24 percent of the freight value and 36 percent of the freight volume exported from the U.S., with even more passing through on its way from other origins.[8] The Greater Texas Region produces slightly more freight by value than it consumes. Truck movement accounts for 63 percent of the weight that is moved to or from the four states, followed in decreasing order by pipelines (19 percent), rail (10 percent), and water (4 percent). Goods' value per ton varies by mode as depicted in Table 7. Air carriers transport the most expensive goods.

*Table 7: Freight Movement into and out of the Greater Texas Region (2015)*

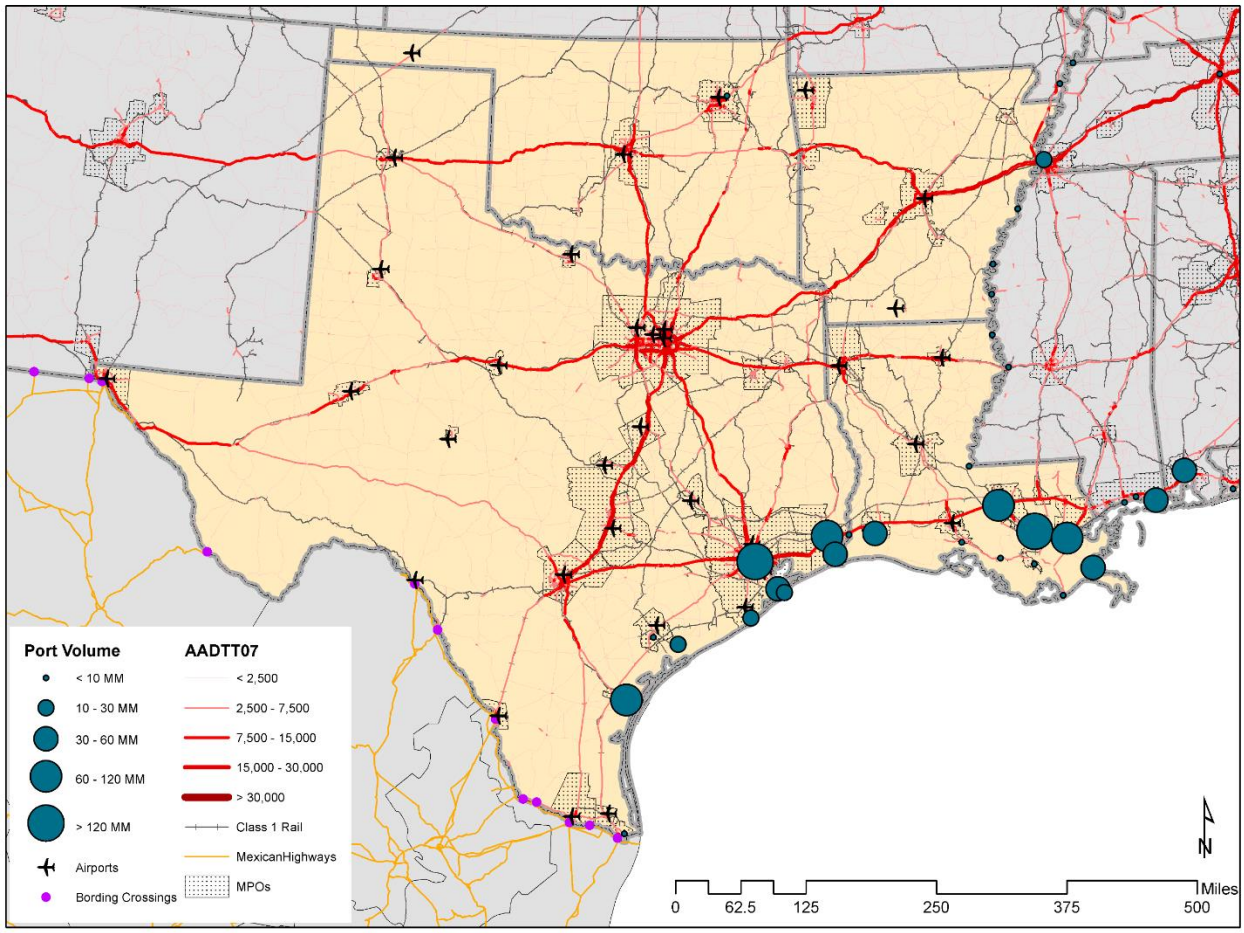
| | Greater Texas Region (Origins) | | | | | Greater Texas Region (Destination) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Truck** | **Rail** | **Water** | **Air** | **Other** | **Truck** | **Rail** | **Water** | **Air** | **Other** |
| **Tonnage (millions)** | 1,835 | 236 | 391 | 0.5 | 1,502 | 1,802 | 337 | 371 | 0.4 | 1,337 |
| **Value (billion $)** | 2,033 | 219 | 271 | 51 | 1,026 | 2,066 | 165 | 236 | 51 | 1,014 |
| **$/ton** | 1.11 | 0.93 | 0.69 | 103.08 | 0.68 | 1.15 | 0.49 | 0.64 | 125.68 | 0.76 |

Source: Calculated from Freight Analysis Framework (FAF4). 'Other' includes pipelines, multiple modes, and unknown.

[8] Calculated from Center for Transportation Analysis in Oak Ridge National Laboratory (2017). Freight Analysis Framework version 4 (FAF4). Retrieved from http://faf.ornl.gov/fafweb/Extraction1.aspx.

Freight movement in the Greater Texas Region is oriented around a large multimodal transportation network with several hubs and intermodal terminals. Interstates and other routes on the National Highway System (NHS) are the foundation of the road transportation network for both passengers and freight. Freight rail movement is built around three Class I railroads that serve the core of the region, three more Class I railroads in portions of the region, and many smaller railroads that operate spurs. The Greater Texas Region contains many large ports, both seaports and river ports. Air cargo activity concentrates in several main gateways, with Dallas/Fort Worth International Airport (DFW) and Houston's George Bush Intercontinental Airport (IAH) as the busiest by weight. *Figure 3* provides an overview of the region's transportation infrastructure.

*Figure 3: Greater Texas Region Transportation Infrastructure*




Source: Bureau of Transportation Statistics (2015) and FAF4 data (2007). AADTT07: average annual daily truck traffic in 2007. Port volume in tons.

Six national trends and challenges have been identified in the National Freight Strategic Plan (NFSP) developed by U.S. DOT.[9] These trends guide U.S. DOT's interest and efforts to help improve freight nationally. The trends include: 1) expected growth in freight tonnage; 2) underinvestment in the freight system; 3) difficulty in planning and implementing freight projects; 4) continued need to address safety, security, and resilience; 5) increased global

[9] U.S. Department of Transportation (2015). National Freight Strategic Plan. Retrieved from https://www.transportation.gov/freight/NFSP.

economic competition; and 6) the application and deployment of new technologies. Many of these trends also may be present in the Greater Texas Region's freight profile and can help guide efforts to improve freight systems.

The Fixing America's Surface Transportation (FAST) Act has provided new tools to address freight challenges. The FAST Act establishes a new National Highway Freight Program (NHFP) with the goal of improving freight movement efficiency on the National Highway Freight Network (NHFN).[10] The FAST Act creates a national policy with specific goals for the freight network's condition, safety, security, efficiency, productivity, resiliency, and reliability. NHFP funds can be used for a wide range of activies and projects that cover freight planning, analysis, and forecasting, infrastructure construction and rehabilitation, intelligent transportation system and technology deployment, and so on. The Infrastructure for Rebuilding America (NFRA) discretionary grant program (previously called FASTLANE) also provides funds to repair aging infrastructure, with 25 percent of funds reserved for rural projects.[11]

Metropolitan areas in the Greater Texas Region are tightly interwoven in a network of interregional trade, a pattern that remains when freight flows are forecasted through 2045. To illustrate, let us examine the largest trading partners of Houston, TX; San Antonio, TX; Baton Rouge, LA; and Oklahoma City, OK. Each of these large metro areas trades heavily with other core areas, as well as with the greater region for both imports and exports. For example, Baton Rouge's largest trading partners are New Orleans, Houston, and rural areas and small towns in Louisiana and Texas. San Antonio's largest import markets are non-metropolitan Texas, Houston, and Dallas-Fort Worth. The region's top five trading partners for inbound and outbound freight are shown in Table 8.

*Table 8. Top Five Trade Partners by FAF4 Regions, Forecasted through 2045*

| **Houston, TX** | | | | **San Antonio, TX** | | | |
|---|---|---|---|---|---|---|---|
| **Outbound** | | **Inbound** | | **Outbound** | | **Inbound** | |
| **Rest of TX** | 16% | **Rest of TX** | 24% | **Rest of TX** | 36% | **Rest of TX** | 26% |
| Los Angeles, CA | 11% | **Beaumont, TX** | 20% | **Houston, TX** | 22% | **Houston, TX** | 15% |
| **Beaumont, TX** | 10% | **Dallas-Fort Worth, TX** | 8% | **Austin, TX** | 13% | Corpus Christi, TX | 15% |
| New Orleans, LA | 4% | Corpus Christi, TX | 5% | Laredo, TX | 7% | **Dallas-Fort Worth, TX** | 7% |
| Corpus Christi, TX | 4% | New Orleans, LA | 4% | Corpus Christi, TX | 5% | Wyoming | 5% |
| **Baton Rouge, LA** | | | | **Oklahoma City, OK** | | | |
| **Outbound** | | **Inbound** | | **Outbound** | | **Inbound** | |
| **New Orleans, LA** | 29% | **New Orleans, LA** | 40% | **Rest of OK** | 35% | **Rest of OK** | 40% |
| **Houston, TX** | 8% | **Rest of TX** | 15% | **Rest of TX** | 7% | Denver, CO | 12% |
| **Rest of LA** | 7% | **Rest of LA** | 14% | **Houston, TX** | 5% | **Rest of TX** | 10% |
| Minneapolis-St. Paul, MN | 5% | **Beaumont, TX** | 9% | Wichita, KS | 5% | **Dallas-Ft Worth, TX** | 7% |
| MS | 4% | **Houston, TX** | 5% | Rest of KS | 4% | **Tulsa, OK** | 6% |

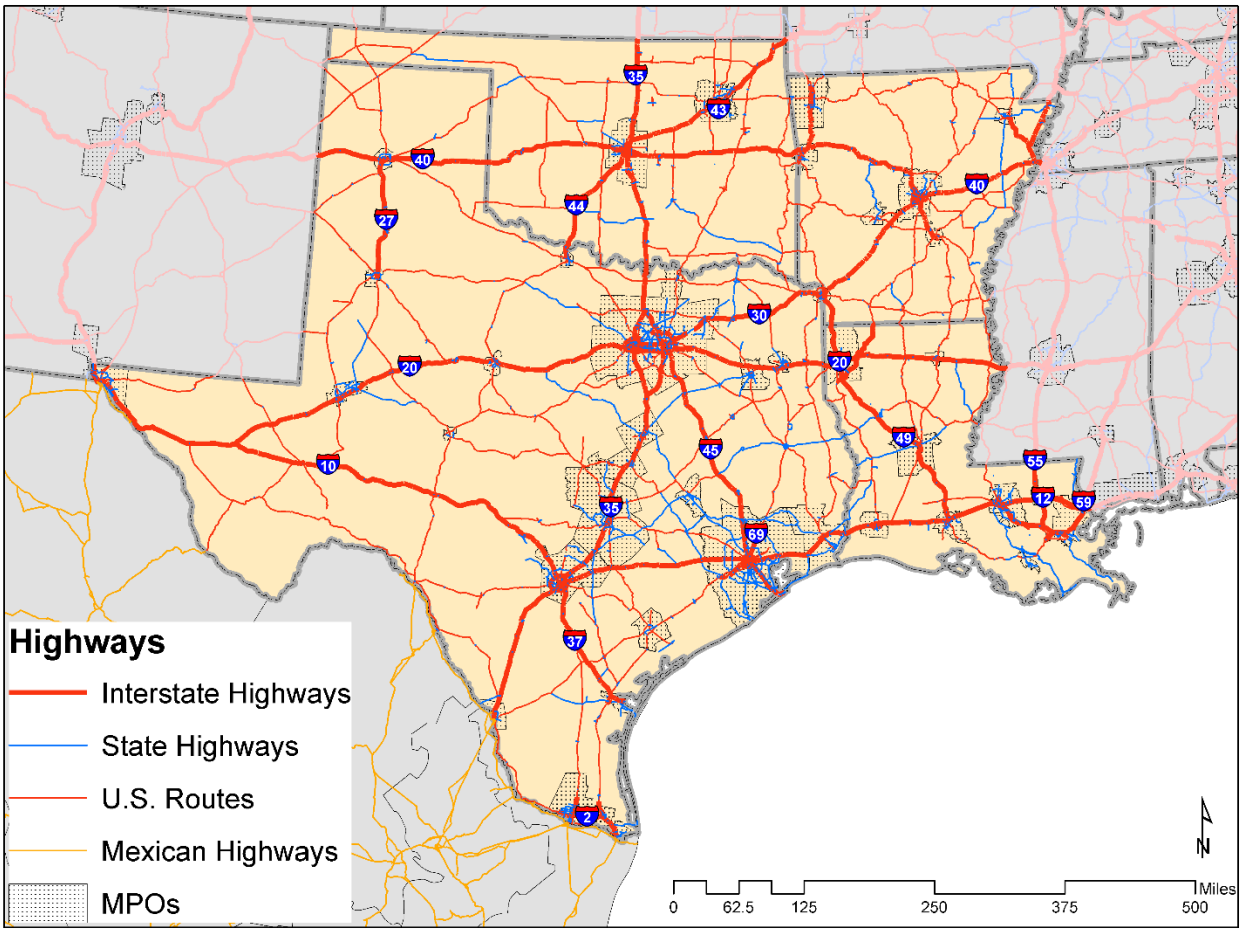
[10] National Highway Freight Program: https://www.fhwa.dot.gov/fastact/factsheets/nhfpfs.cfm.
[11] U.S. DOT (2017). Retrieved from https://www.transportation.gov/buildamerica/infragrants.

Source: FAF4.1 data with base year 2012 and forecasts up to 2045.[12,13,14]

## Highways

An extensive highway network serves the Greater Texas Region, comprised of 44,027 centerline miles of highways as part of the NHS, of which 5,992 centerline miles are Interstate Highways.[15] The Interstate Highways with the greatest truck volumes are often in large cities. For example, I-45 adjacent to downtown Dallas, TX carries an estimated 38,000 daily trucks approximately, the intersection of I-10 and I-12 in Baton Rouge carries about 62,000, and I-35 on the northeast side of San Antonio, TX caries about 30,000 daily trucks.[16] The full NHS network of Interstates, U.S. routes, and state highways is depicted in Figure 4.

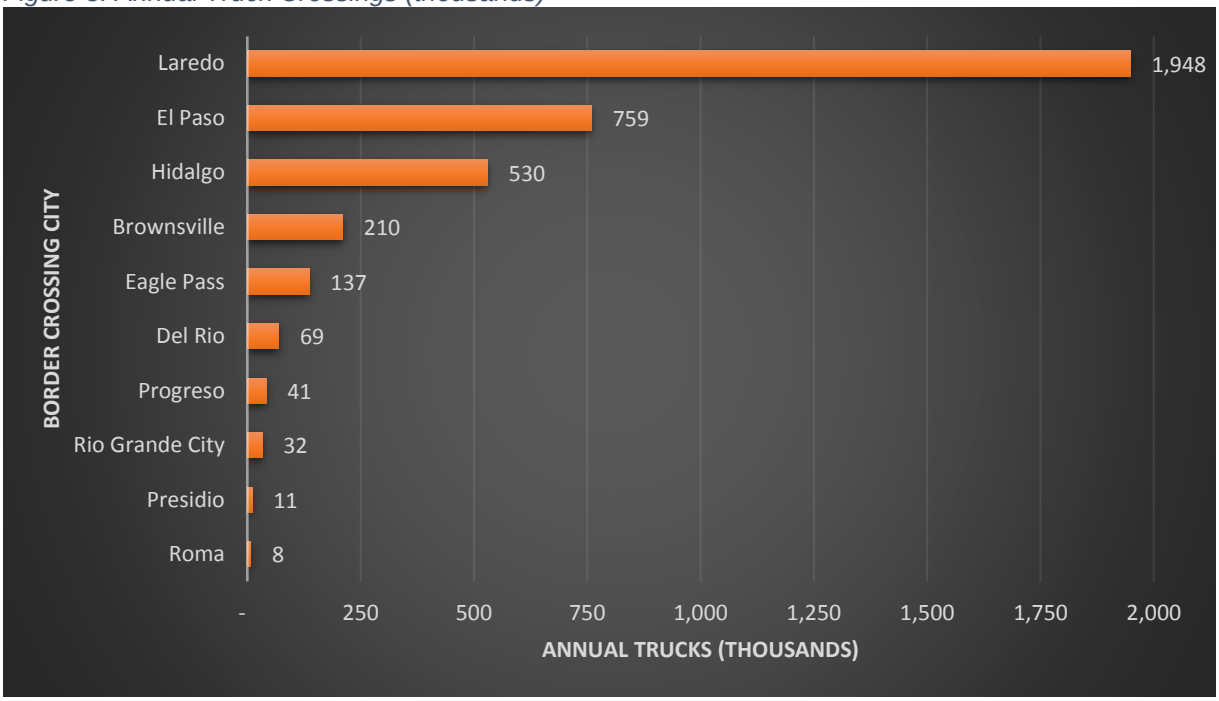
*Figure 4: National Highway System (NHS)*




[12] Federal Highway Administration (2016). Administrator's roundtable on the freight economy: New York, New York. Retrieved from https://www.fhwa.dot.gov/freighteconomy/newyork.cfm.
[13] Federal Highway Administration (2016). Administrator's roundtable on the freight economy: Bangor, Maine. Retrieved from https://www.fhwa.dot.gov/freighteconomy/bangor.cfm.
[14] Federal Highway Administration (2016). Administrator's roundtable on the freight economy: Boston, Massachusetts. https://www.fhwa.dot.gov/freighteconomy/boston.cfm.
[15] Calculations based on Freight Analysis Framework version 4 (FAF4). Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm.
[16] Ibid.

Border crossings join America's highway system with Mexico's. America's busiest truck border crossing is in Laredo, TX, handling nearly two million trucks annually in 2014. The second busiest truck crossing is in El Paso, TX, with nearly 800,000 annual truck crossings. Most of truck crossings occur on the eastern half of the Texas-Mexico border. In fact, three quarters of the truck movement between the Greater Texas Region and Mexico occurs between the states of Texas and Tamaulipas. *Figure 5* shows truck traffic Texas-Mexico border crossings.

*Figure 5: Annual Truck Crossings (thousands)*




Source: Calculated from National Transportation Atlas Database (2014).

The Greater Texas Region contains 15 of the country's top 100 freight bottlenecks, with average peak-hour traffic speeds of just 33 miles per hour (mph).[17] They are concentrated near Houston (on downtown highways, I-10, and I-45), Dallas (I-45 and I-35), Baton Route (I-10), Austin (I-35), and Fort Worth (I-35). Congestion at these bottlenecks can slow movement for the entire region because through traffic and movement through seaports and airports are affected. *Table 9* below shows the Greater Texas Region's main freight bottlenecks.

[17] American Transportation Research Institute (2017). Top 100 truck bottleneck list. Retrieved from http://atri-online.org/2017/01/17/2017-top-100-truck-bottleneck-list/.

*Table 9: Freight Bottlenecks in the Greater Texas Region (2017)*

| National Bottleneck Rank | City | Road | Peak average speed (mph) |
|---|---|---|---|
| 8 | Houston, TX | I-45 at U.S. 59 | 26 |
| 11 | Houston, TX | I-10 at I-45 | 31 |
| 12 | Dallas, TX | I-45 at I-30 | 27 |
| 13 | Houston, TX | I-10 at U.S. 59 | 31 |
| 19 | Baton Rouge, LA | I-10 at I-110 | 32 |
| 22 | Houston, TX | I-610 at U.S. 290 | 32 |
| 25 | Houston, TX | I-45 at I-610 (North) | 35 |
| 28 | Austin, TX | I-35 | 18 |
| 33 | Houston, TX | I-10 at I-610 (West) | 37 |
| 49 | Ft. Worth, TX | I-35W at I-30 | 37 |
| 59 | Houston, TX | I-610 at U.S. 59 (West) | 30 |
| 60 | Dallas, TX | U.S. 75 at I-635 | 36 |
| 65 | Houston, TX | I-45 at Sam Houston Tollway (North) | 39 |
| 82 | Houston, TX | I-45 at I-610 (South) | 36 |
| 88 | Houston, TX | I-10 at I-610 (East) | 48 |

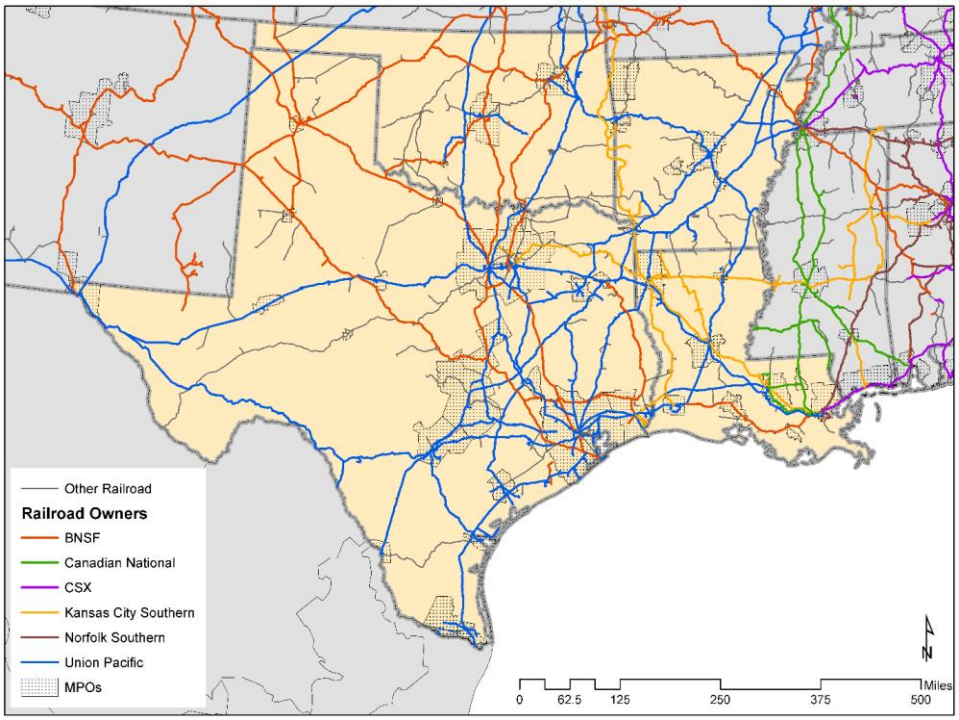
Source: ATRI (2017). Retrieved from http://atri-online.org/2017/01/17/2017-top-100-truck-bottleneck-list/.

## Railroads

Six Class I railroads serve portions of the Greater Texas Region, three of which serve many parts of the region. Union Pacific and BNSF have the largest networks, serving every state in the Greater Texas Region quite extensively. Kansas City Southern also provides service to northeastern Texas, Arkansas, Louisiana, and Oklahoma. In New Orleans, three more Class I railroads connect eastern Louisiana and New Orleans with their rail networks (i.e., CSX, Norfolk Southern, and Canadian National). To the south are the Mexican networks of Ferromex and Kansas City Southern de México, accessible through railroad border crossings in Eagle Pass, Laredo, and Brownsville, TX.[18] Figure 6 shows the entire rail network.

[18] Ferromex (2017). Where do we move freight? Retrieved from https://www.ferromex.com.mx/ferromex-lo-mueve-eng/sistema-ferromex.jsp.

*Figure 6: Class I Railroads (2015)*



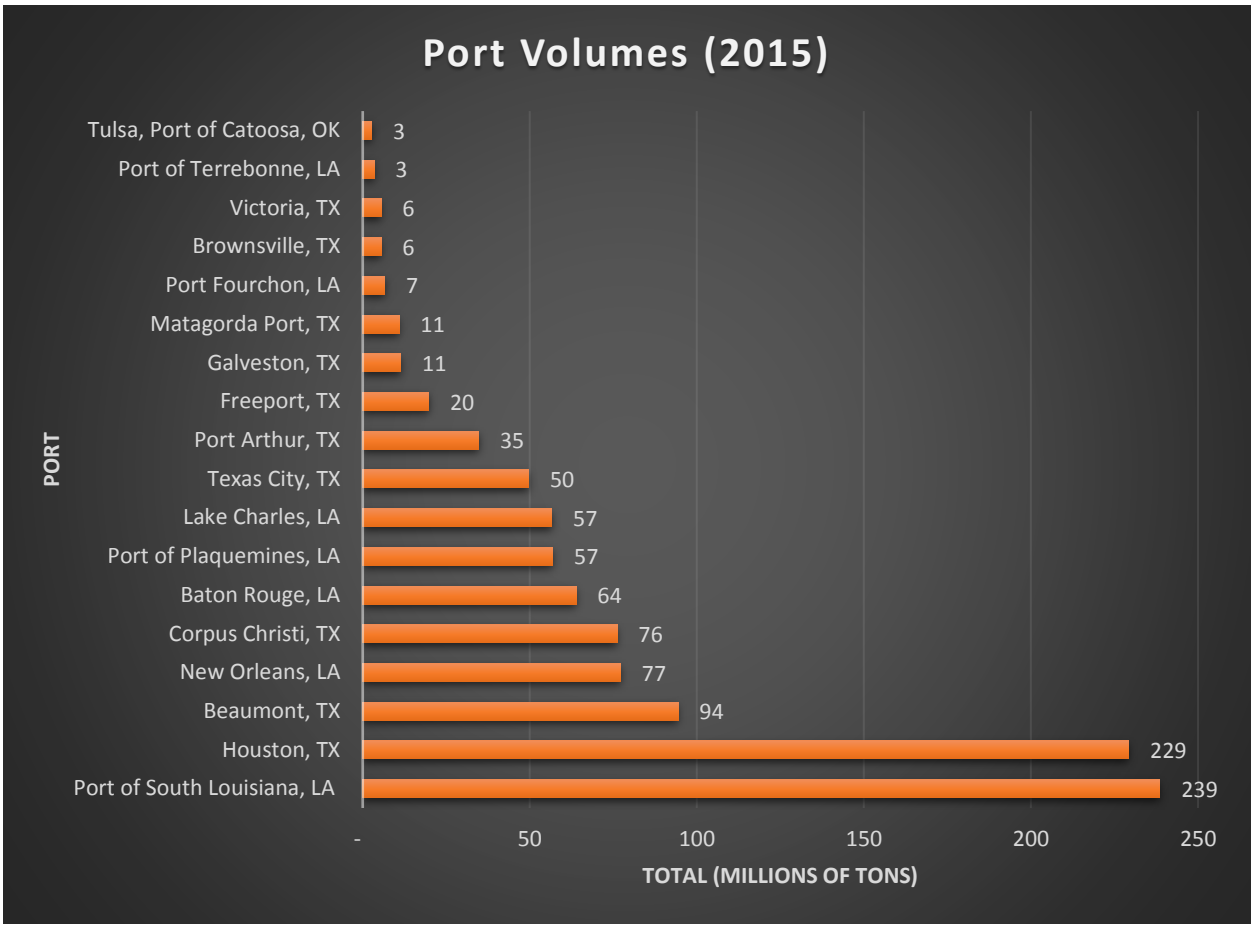

Source: Modified from Bureau of Transportation Statistics (2015).[19]

## Ports

The Greater Texas Region contains busy container, bulk, and breakbulk ports that processed over one billion tons of cargo in 2015.[20] The Port of South Louisiana extends along the Mississippi River and is the busiest port by tonnage.[21] The Port of Houston is the busiest by number of containers.[22] Houston's top trading partners are Brazil, China, and India.[23] Many of the remaining ports process vehicles and bulk commodities, such as grain, petroleum, and chemicals.[24,25] Figure 7 presents activity at the ports in the Greater Texas Region.

[19] Bureau of Transportation Statistics (2015). National Transportation Atlas Database 2015.
[20] Bureau of Transportation Statistics (2015). National Transportation Atlas Database 2015.
[21] Port of South Louisiana (2017). Retrieved from http://portsl.com/.
[22] AAPA. Port industry statistics. Retrieved from http://www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048.
[23] Inbound Logistics (2015). Retrieved from http://www.inboundlogistics.com/cms/article/top-10-us-container-ports/.
[24] Guidry, J. (2015). U.S. Navy's ro-ro docks. Retrieved from http://www.guidrynews.com/story.aspx?id=1000069287.
[25] Port of Corpus Christi. Retrieved from http://portofcc.com/about/financials/statistics/.

*Figure 7: Ports of the Greater Texas Region, Annual Throughput by Weight 2015*



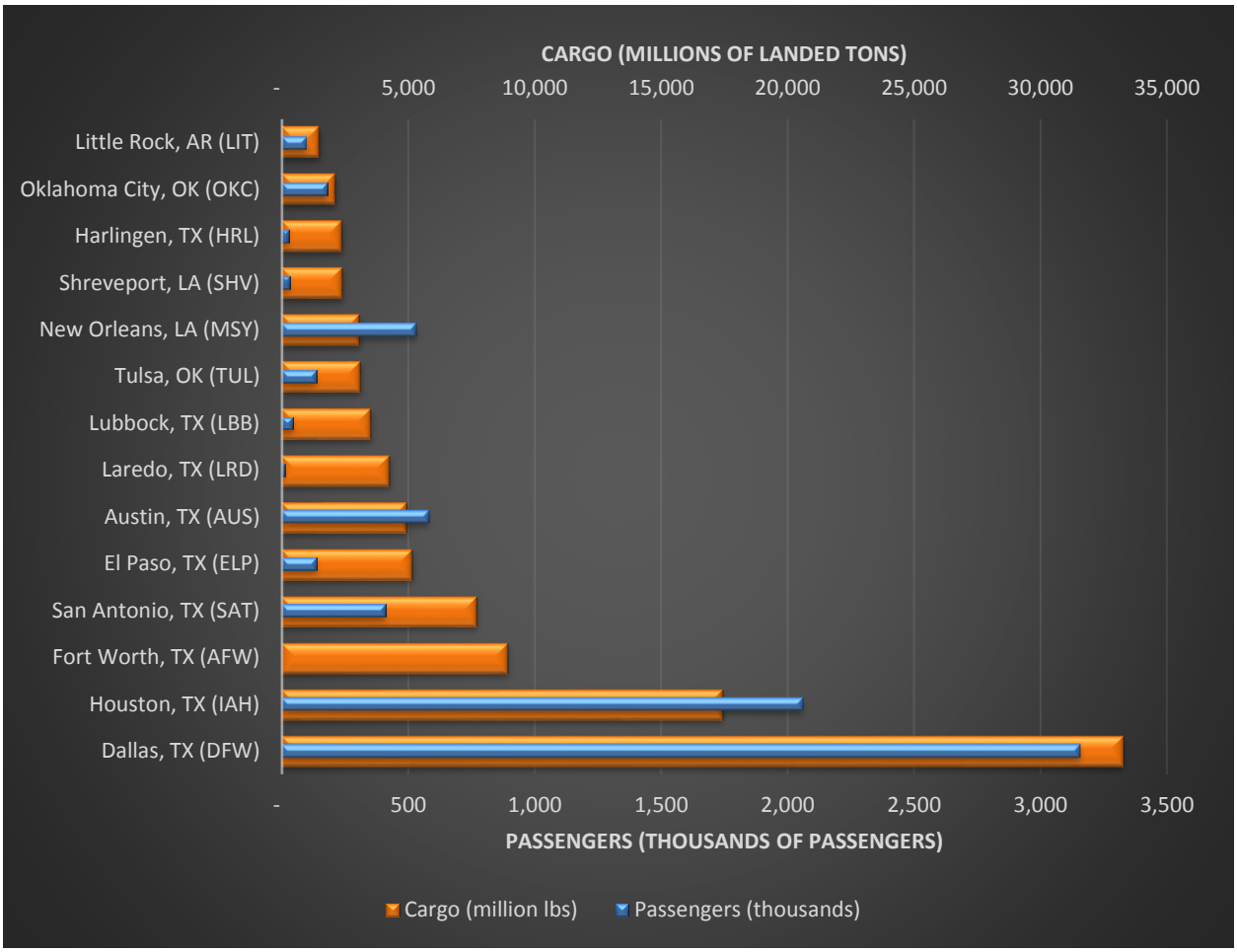

Source: Modified from Bureau of Transportation Statistics National Transportation Atlas Database 2015.

## Airports

Goods transported by air domestically in the Greater Texas Region are worth on average over 100 times more per ton than goods transported by truck.[26] The most air cargo activity occurs in the Dallas-Fort Worth (TX) region, with Dallas/Fort Worth International Airport (DFW) and Fort Worth Alliance Airport (AFW) together processing 42 percent of the Greater Texas Region's air cargo. Houston's George Bush Intercontinental Airport (IAH) processes another 17 percent of the total. A substantial portion of these air cargo volumes are derived from hubs in those cities by airlines such as UPS, FedEx, Atlas Air, United Airlines, and American Airlines. Airports in Tulsa, OK and New Orleans, LA also process substantial cargo tonnage. *Figure 8* shows the primary commercial airports based on annual number of passengers and cargo throughput.

[26] Oak Ridge National Laboratory (2017). Freight Analysis Framework data tabulation tool (FAF4). Retrieved from http://faf.ornl.gov/fafweb/Extraction2.aspx.

*Figure 8: Annual Passenger and Cargo Throughput for Greater Texas Region Airports (2015)*




Source: Modified from the Federal Aviation Administration, Passenger boarding (enplanement) and all-cargo data for U.S. airports.

## INFRASTRUCTURE CHALLENGES

**Congestion:** The busiest truck corridors already experience very high congestion as indicated by volume-to-capacity ratios at or above one (*Table 10*).[27] As VMT grows, the Greater Texas Region may require highway improvements to maintain today's level of service. These improvements do not necessarily have to be new infrastructure or expansions of existing infrastructure, but also can be Intelligent Transportation System (ITS) projects that expand effective capacity on existing infrastructure.

[27] Calculations based on Freight Analysis Framework version 4 (FAF4). Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm.

*Table 10: Busiest Truck Routes in Region*

| Name (if applicable) | Interstate | Location | Annual Average Daily Truck Traffic (2007) | Volume-to-Capacity Ratio (2007) |
|---|---|---|---|---|
| Julius Schepps Frwy | I-45 | Dallas, TX | 37,624 | 1.60 |
| — | I-10 | Baton Rouge, LA | 36,000 | 0.95 |
| Central Exwy | I-45 | Dallas, TX | 31,785 | 1.85 |
| Pan Am Exwy | I-35 | San Antonio, TX | 29,969 | 1.67 |
| R. L. Thornton Frwy | I-35E | Dallas, TX | 28,385 | 0.80 |
| Lyndon B. Johnson Frwy | I-635 | Dallas, TX | 24,869 | 1.06 |
| North Frwy | I-45 | Houston, TX | 24,852 | 2.26 |
| Fort Worth-Dallas Frwy | I-30 | Fort Worth, TX | 24,610 | 1.15 |
| — | I-40 | West Memphis, AR | 23,865 | 0.92 |
| — | I-40 | Oklahoma City, OK | 23,397 | 0.94 |
| — | I-10 | Baton Rouge, LA | 23,002 | 1.40 |

Source: FAF4 (2007).

The metropolitan areas around San Antonio, TX; Houston, TX; New Orleans, LA; Dallas-Fort Worth, TX; and Austin, TX are exceptionally congested in national rankings. Oklahoma City; OK and Baton Rouge, LA also experience moderate-to-severe congestion. Together these seven metropolitan areas generate over 600 million hours of annual delays. The metropolitan area with the greatest congestion as a percent of total lane miles is San Antonio, where 34 percent of lane miles may experience congestion.[28] Of these seven regions, commuters in Baton Rouge and Houston incur the greatest individual congestion-related costs. Congestion is forecast to become both more severe and more widespread.[29]

**Safety:** Transportation agencies' greatest priority is safety, a goal to which they commit significant resources. Since 1975, national motor vehicle fatality rates have been reduced by 50 percent even as VMT has climbed, reflecting great success on the part of transportation agencies and vehicle manufacturers.[30] Nonetheless, injuries and fatalities still occur. All states of the Greater Texas Region have automobile fatality rates above the national average.[31] Nationwide automobile fatality rates are higher in rural areas than urban areas.[32] Similarly, Louisiana, Oklahoma, and Texas experience rates of pedestrian fatality above national averages.[33]

**Maintenance and State of Good Repair:** Preserving state of good repair is a priority across modes. State of good repair matters not just for operations but also for budgets since it allows for maintenance at the lowest long-term cost. The Greater Texas Region is ahead of national averages on some measures of state of good repair, such as structurally deficient bridges. Depending on the state, the percent of bridges that are structurally deficient ranges from 2

[28] Texas A&M Transportation Institute (2015). 2015 urban mobility scorecard. Retrieved from https://mobility.tamu.edu/ums/.
[29] Calculations based on Freight Analysis Framework version 4 (FAF4). Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm.
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percent to 13 percent, and most states in the Greater Texas Region have successfully lowered their rates of deficient bridges.[34,35] Roadway quality also varies among states. Insufficient transportation funding is a common constraint since inflation and rising fuel efficiency have degraded state gas tax revenues.[36]

**Asset Management:** MAP-21 requires states to implement asset management programs for the National Highway System (NHS). U.S. DOT rulemaking in alignment with MAP-21 calls for state departments of transportation to submit an asset management plan in 2019, and to update them at least every four years.[37] The states of the Greater Texas Region have developed programs to manage transportation assets. For instance, Louisiana Department of Transportation and Development (DOTD) has an Asset Management Plan that includes performance targets for bridges and pavements to be evaluated. The metrics that best reflect the state of the transportation system vary among states based on the characteristics of their transportation system. After Hurricane Katrina, Louisiana DOTD changed its performance measure from "number of structurally deficient bridges" to "structurally deficient deck area" to reflect damage to a small number of long bridges over Lake Pontchartrain.[38] Similarly, the Oklahoma DOT has held peer exchanges with agencies in Ohio and Utah on transportation asset management.[39]

**Funding:** Funding limitations greatly complicate efforts to achieve asset management goals and require prioritization. Many states of the Greater Texas Region have insufficient funds to fully maintain infrastructure when all funding sources (Federal, state and local) are combined.[40] Accordingly, several states are seeking long-term funding through a variety of means, including tolls. Oklahoma, Texas, and Louisiana all operate toll roads, and the Arkansas legislature has granted legal authorization for tolling.[41] The Oklahoma Turnpike Authority leads the country in miles of toll roads managed, while the North Texas Tollway Authority generates the most revenue among the four states.[42] In June 2017, the Arkansas Highway Commission chose to ask voters in a ballot measure to fund road improvements.[43] In Louisiana in 2016, the Governor's Task Force on Transportation Infrastructure Investment recommended supplementing the state gas tax with other sources like "special permit fees and vehicle registration fees for the commercial trucking industry."[44]

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## MULTI-JURISDICTIONAL CHALLENGES AND OPPORTUNITIES

The concept of National Economic Networks provides a new focus for identifying, prioritizing, and addressing transportation challenges and opportunities across jurisdictional lines. Planning across these boundaries is receiving renewed attention at state, local, and Federal levels. The Greater Texas Region currently is experiencing rapid growth of population and employment in the country, which makes the Greater Texas Region one of the most dynamic of the National Economic Networks.

**Infrastructure Capacity:** A major challenge facing the Greater Texas Region is the fast population growth that will increase demand for transportation infrastructure. Driven by an employment boom, Texas has been one of the fastest growing states in the country, adding over two million people in six years. Texas' population grew by 19 percent between 2006 and 2016, while Oklahoma grew by 10 percent, Louisiana by 9 percent, and Arkansas by 6 percent. The rapid actual and forecasted population growth demands forward thinking, especially regarding infrastructure investment. Otherwise, congestion could constrain activity. Constraints on infrastructure capacity call for the careful evaluation, inventory, and strategic decision-making that emerge from multi-jurisdictional collaboration.

A variety of projects in the Greater Texas Region are intended to ensure adequate capacity and state of good repair. The Calcasieu Bridge carrying I-10 across the Calcasieu River in Lake Charles, LA is an example. Louisiana DOTD is leading public involvement, environmental review, and evaluation of alternatives to improve or replace this very heavily trafficked bridge while also increasing capacity.[45] Bridge capacity is especially important because I-10 on either side has two additional lanes compared with the bridge. The Oklahoma Turnpike Authority is investing in the "Driving Forward" initiative to expand and improve the state's turnpikes through six projects. The projects include measures from widening lanes to adding lanes, extending turnpikes, and improving toll plazas that will reduce congestion, improve safety, and increase capacity. Project completion is expected by 2021.[46]

**Congestion Relief:** The progressive completion of I-49 offers to reduce congestion and speed freight and passenger travel. The highway is nearly continuous from Lafayette, LA to Texarkana, AR, and north of Fort Smith, AR. The section between Fort Smith and Texarkana mostly remains to be built. In 2012, the Arkansas DOT (ARDOT) received a TIGER (Transportation Investment Generating Economic Recovery) grant for $21 million to continue construction near Fort Smith, AR.[47] Previous sections also have been built in part with TIGER grants. A brief portion of I-49 will pass through Texas north of Texarkana. Thus, the I-49 corridor involves three of the four states in the region.

The Texas Department of Transportation (TxDOT) launched a congestion relief initiative called "the Texas Clear Lanes Initiative" in 2016. The initiative has led to the allocation of $2.5 billion to fund 19 congestion relief projects, with a focus on Texas' four largest metropolitan areas.[48] The projects renovate and build new highway infrastructure that relieves traffic bottlenecks. The

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funding comes from voter-approved Proposition 7, which increases funds dedicated to the State Highway Fund.

**Transportation-related Economic Development:** The Greater Texas Region has a strong track record of setting the conditions to spur transportation-related economic development, often breathing new life into infrastructure. An example is Port San Antonio, an industrial park on part of the property of the former Kelly Air Force Base in San Antonio, TX. The Air Force base was closed in 2001, at which point 1,900 acres of the site were transferred to a state development authority for redevelopment as an industrial and commercial center. Port San Antonio brings together onsite rail access, an industrial airport, a foreign trade zone covering the entire site, and several other assets that have attracted companies in aerospace, logistics, energy, manufacturing, and other fields.[49] The site is still growing, having created 600 new jobs in 2016.[50]

**Mode Choice and Mobility Options:** Many parts of America depend most heavily on one mode for freight or especially passenger travel. New travel modes can give travelers and shippers more choices to better meet their travel needs, whether the options correspond with local, regional, or even multi-jurisdictional movement. There are opportunities for the Greater Texas Region and adjacent areas to increase mode choice. For instance, the four states use automobiles at or above 91 percent or more for commutes, which exceeds the national average of 86 percent.[51]

The Greater Texas Region is exploring intercity passenger rail to relieve roads and airports. Amtrak serves all four states and has routes such as the Heartland Flyer connecting Fort Worth with central Oklahoma. A proposal to re-establish passenger rail service between New Orleans and Baton Rouge received a Federal grant in late 2016 to plan rail stops in Baton Rouge, Gonzales, and LaPlace.[52] Texas Central Partners is leading a private-sector proposal for high-speed passenger rail between Dallas and Houston, which aims to begin operations in 2023 with a construction cost of approximately $12 billion, which would be entirely privately funded.[53] Although much farther in the future, there also have been recent proposals to build even higher-speed 'hyperloop'-style rail in the Greater Texas Region.[54] No matter the result on any particular project, such large-scale infrastructure investment calls for multi-jurisdictional collaboration.

**Intermodal Connections:** Intermodal terminals can speed goods movement and sometimes reduce the number of trucks on roadways. Transportation organizations and firms have been promoting intermodal connections in a variety of ways. The Port of New Orleans has begun planning for a second container terminal to accommodate ocean cargo growth. The proposed site is near Interstate Highways and already is served by Norfolk Southern rail, making it a natural intermodal transfer point.[55] Port Freeport south of Houston, TX, is building a rail spur that will allow goods to be transferred from ships to Union Pacific's rail network without using the

[49] http://www.portsanantonio.us/.
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road network.[56] In a similar vein, BNSF and Kansas City Southern Mexico a five-day-a-week rail service connecting intermodal terminals around Dallas, TX with those in Mexico.[57]

## REGIONAL COLLABORATIONS AND INITIATIVES IN THE GREATER TEXAS REGION

National Economic Networks have not traditionally been explicitly incorporated into infrastructure decision-making processes. Notwithstanding, experience has demonstrated the value of multi-jurisdictional cooperation in planning large-scale infrastructure and promoting economic development. This section traces a sample of multi-jurisdictional collaborative efforts in the Greater Texas Region. No matter the function addressed, each effort recognizes cross-border effects of cities' and states' actions, and desire better shared outcomes.

The Texas High-Speed Rail and Transportation Corporation (THSRTC) is a non-profit corporation aiming to inaugurating high-speed rail service via the collective efforts of several Texas regions. THSRTC members come from the public sector, private sector, and research institutions. Similarly, the Greater San Marcos Partnership (GSMP) is a recently founded public-private partnership that serves the Austin-San Antonio Innovation Corridor to promote sustainable and smart economic development. GSMP has developed a five-year economic development strategic plan called "Vision 2020," in which a corridor-centered perspective is incorporated into metropolitan level planning. The Southern Rail Commission is an analogous private organization promoting passenger rail in Louisiana into Texas, Alabama, and Mississippi. Priority routes include the pair between New Orleans and New York, as well as a route from Meridian, MS into eastern Texas via Shreveport, LA.[58]

Several corridor coalitions and studies spur coordination among local, regional, and state agencies. The I-10 Corridor Coalition involves TxDOT with three western DOTs to study and improve the I-10 corridor from the Louisiana border to Los Angeles.[59] Numerous intrastate corridor studies have been conducted, including a recent study in Arkansas spanning Lonoke, Pulaski, and Faulkner Counties along State Highway 89.[60] The 35W Coalition takes a different approach. It is primarily composed of private-sector members and engages policy-makers about mobility issues affecting I-35W between Fort Worth and Denton, TX.

Several states in the region have toll-based turnpikes in operation, including Louisiana, Oklahoma, and Texas. Many of the agencies have achieved interoperability of customer-payment devices. For instance, Oklahoma's Pike Pass is interoperable with the North Texas Toll Authority's system near Dallas/Fort Worth and on highways operated by the Kansas Turnpike Authority. Payment system interoperability facilities mobility through the region.[61]

Research centers at the University of Texas at Austin and Texas Southern University were recently named a Beyond Traffic Innovation Center (BTIC) by U.S. DOT to help address the Nation's transportation challenges.[62] The effort is a response to a recent DOT report, "Beyond

[56] http://www.progressiverailroading.com/intermodal/news/Texas-port-contracts-Primoris-to-complete-rail-projec--52097.
[57] http://www.joc.com/rail-intermodal/class-i-railroads/bnsf-railway/kcs-and-bnsf-launch-joint-us-mexico-intermodal-service-amid-nafta-threats_20161116.html.
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Traffic 2045," that identifies national transportation challenges in the context of continuing population growth, new technology, and climate change.[63] The center will be focusing on the Greater Texas Region and will work across academia as well as public and private sectors. The designation of the center presents new opportunities to improve decision-making in infrastructure and transit planning via multi-jurisdictional collaborative research and practice.

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# APPENDIX

## LIST OF STUDIES, FREIGHT PLANS, AND RESOURCES


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9. Texas Freight Mobility Plan (2017). https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm
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