



# PERMIAN BASIN FREIGHT AND ENERGY SECTOR TRANSPORTATION PLAN

## *EXECUTIVE SUMMARY*



# WHY IS A PERMIAN BASIN FREIGHT TRANSPORTATION PLAN IMPORTANT?

The Permian Basin of West Texas and Southeast New Mexico has produced hydrocarbons for about 100 years and has supplied more than 35.6 billion barrels of oil and about 125 trillion cubic feet of natural gas as of January 2020.<sup>1</sup> The Permian Basin is the most significant oil and gas producing region in the U.S., producing over 30% of the nation's oil and about 15% of the nation's natural gas. The importance of the region has increased significantly since 2010. In addition to oil and gas, the region is also the nation's largest supplier of alternative energy, including wind and solar energy.<sup>2</sup>

The growth in energy sector activity is driving rapid economic and population growth. The energy sector activity and the energy and non-energy related freight movements in the region have impacts that extend far beyond the Permian Basin.

Businesses and residents in the region rely upon raw materials, supplies, and consumer goods from all over the world to keep businesses operating and residents fed and clothed. Businesses also depend on access to global markets to export the oil, gas, and other products produced in the region.

*Rural Texas is key in providing food, fuel, and fiber for Texas, and the Permian Basin is one of the top providers of fuel to the state, the nation, and the world. The Permian Basin Freight and Energy Sector Transportation Plan provides insight to the region's economic impact and opportunities for connecting Texas to domestic and international markets. The Plan includes strategies that will enhance the safety, mobility, and reliability of the transportation network and quality of life for the people living and working in west Texas.*

Alvin New, Commissioner,  
Texas Transportation Commission

## ENERGY PRODUCTION



Produces more than **4 million barrels of oil per day**



Produces **50% of all natural gas** in Texas, **15%** in the U.S.



The **Permian Basin** is the **number 1 wind energy producer** in the U.S.

## STATEWIDE ECONOMIC CONTRIBUTIONS

In 2019, the Permian Basin Freight and Energy Sector activity generated:



**765,735**  
Jobs Statewide



**\$89.9 Billion**  
in Gross State Product



**\$52.1 Billion**  
in Income Statewide



**\$25 Billion**  
in Local and State Taxes

## COMPARING PERMIAN BASIN FREIGHT FLOW TO STATEWIDE



Freight tonnage per capita is 20 times higher in the Permian Basin than statewide.

<sup>1</sup> U.S. Energy Information Administration, January 2020.

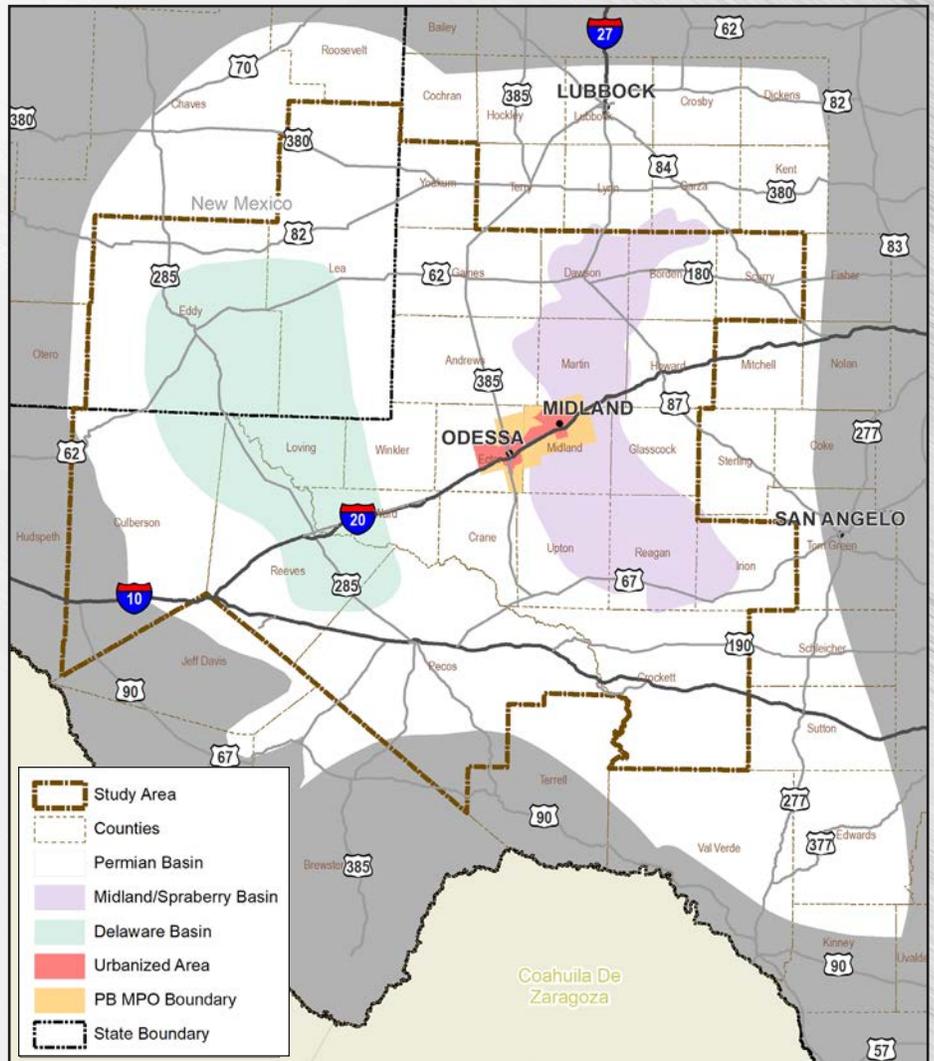
<sup>2</sup> U.S. Energy Information Administration.



# PERMIAN BASIN FREIGHT AND ENERGY SECTOR TRANSPORTATION PLAN

During the development of the Texas Freight Mobility Plan (TFMP), stakeholder workshops were held in the Permian Basin. At the workshops, stakeholders provided input on the volume and intensity of energy sector related freight transportation demand and challenges. As a result of the workshops and data assessment, the 2018 TFMP recommended the development of a regional freight and energy sector transportation plan for the Permian Basin. Addressing the lack of data and understanding of current and future energy sector related freight activity in the region was critical to developing the regional plan. The proliferation of the oil and gas industry throughout the region creates regional movements that are difficult to track, including movement of equipment between storage yards and oil fields and the movement of sand and water used and produced in hydraulic fracturing (fracing), none of which are accurately represented in the statewide and national commodity flow databases or other planning data and tools.

Permian Basin Freight and Energy Sector Transportation Plan Study Area



### PLAN PURPOSE

Develop a multimodal regional freight and energy sector transportation plan to improve safety and mobility throughout the Permian Basin by identifying local and regional freight challenges and opportunities, and identifying and prioritizing transportation improvements, including policy and program strategies.

REGIONAL FREIGHT TRANSPORTATION GOALS			
Improve performance of Permian Basin Multimodal Freight Network (PBMFN)	Improve safety on the PBMFN	Identify sustainable funding for the PBMFN	Enhance economic competitiveness of the Permian Basin
Maintain and preserve the PBMFN	Improve urban and rural system connectivity	Encourage public and private sector stakeholder engagement	Manage resources responsibly and foster transparency in decision-making



# STAKEHOLDER INFORMED PLAN

Stakeholder input was critical throughout the development of the freight plan and included public and private sector stakeholders.

## Public involvement framework:



**6 Permian Basin Freight Plan Steering Committee Meetings**



**25 Stakeholder Interviews**



**2 Industry Surveys**



**12 Industry and Community Forums**



**More than 20 Additional Virtual and In-Person Meetings**

## Stakeholder input was used to:



Document the region's freight transportation goals and objectives



Designate the Permian Basin Highway Freight Network



Enhance estimates of the volume of freight and number of truck trips in the region



Supplement state data with local knowledge and experience



Identify needs and challenges impacting freight safety and mobility



Develop and prioritize strategies and recommendations



Communicate the importance of Permian Basin freight and energy sector activity

The industry and community forums focused on key groups of stakeholders including truck and rail carriers and drivers, sand mine operators and haulers, petroleum companies and oilfield service providers, rural community leaders, urban community leaders, and state agency partners.

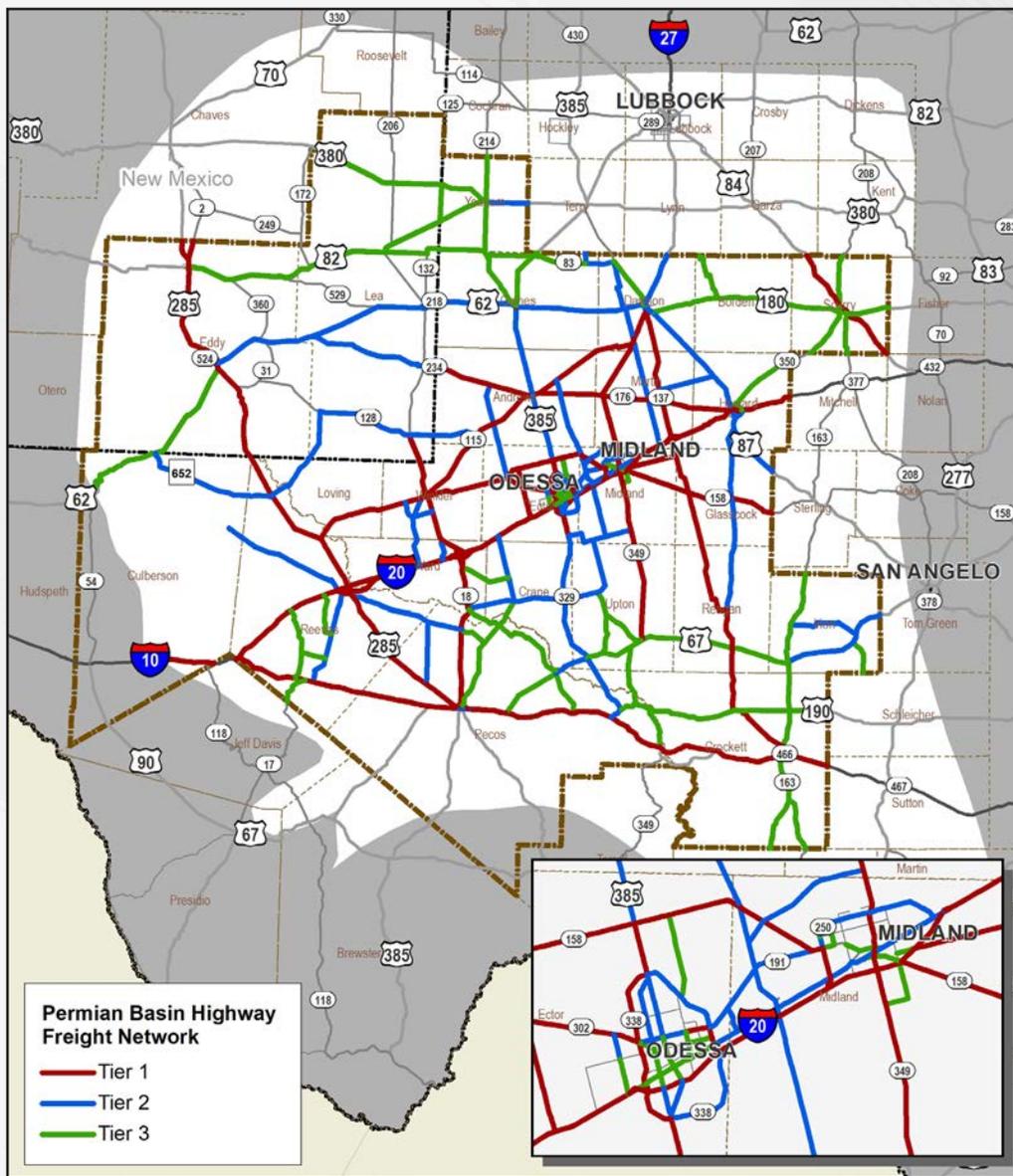
*The Permian Basin Freight and Energy Sector Transportation Plan has uncovered where we have struggled in the past and opened doors to where we want to be in the future. It has identified how much the Permian Basin is an asset to the growth of Texas and the nation. It will play a significant role in future preparedness when there is another surge in the energy market. Moving forward, this Plan will help us do a better job.*

Judge Debi Hays, Ector County Judge and Chair, Permian Basin Freight Plan Steering Committee



# PERMIAN BASIN HIGHWAY FREIGHT NETWORK

Permian Basin Highway Freight Network (PBHFN)



The designation of the Permian Basin Highway Freight Network (PBHFN) is a key outcome of the Permian Basin Freight Plan. The PBHFN:

- » Focuses investments on the portion of the system that carries most of the region's freight
- » Identifies candidates for Critical Urban and Rural Freight Corridors for the National Highway Freight Network
- » Establishes the basis for data collection and analysis for the Permian Basin Freight Plan
- » Provides a map of key freight corridors for local planning decisions

The PBHFN contains:

1,363 Tier 1 miles

1,367 Tier 2 miles

1,554 Tier 3 miles

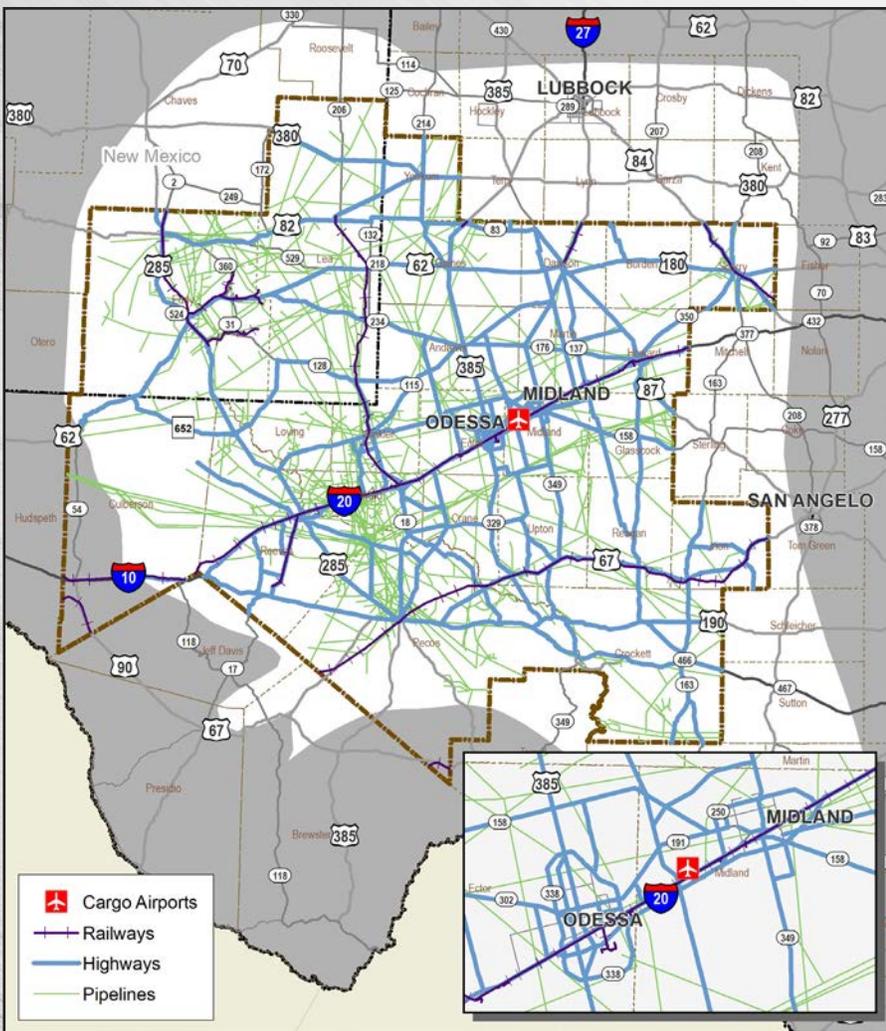
4,284 total miles

The PBHFN consists of nearly 4,300 miles divided into three tiers. Roadways on **Tier 1** and **Tier 2** are the most critical for goods movement and energy sector operations in the region; roadways on **Tier 3** are important connector routes on which freight volumes are likely to increase as the region continues to grow.

Designation of the network included data inputs like truck volume, OS/OW activity, and major freight facilities access. It also included qualitative input through extensive stakeholder review and feedback.

# PERMIAN BASIN MULTIMODAL FREIGHT NETWORK

Permian Basin Multimodal Freight Network (PBMFN)



The energy sector in the Permian Basin requires a multimodal network to move the pipe, construction materials, and machinery **into the region**, the sand, water, and oilfield service materials **within the region**, and the oil and gas **out of the region**. The Permian Basin Multimodal Freight Network (PBMFN) combines the PBHFN with:

- » Over 920 miles of active railroad in the Permian Basin region owned by two Class I and six regional railroad operators including:
  - Union Pacific Railroad (UP)
  - BNSF Railway Company (BNSF)
  - TxDOT (operated by Texas Pacifico)
  - Pecos Valley Southern
  - South Plains Lamesa Railroad
  - Lubbock and Western
  - Big Spring Railroad
- » Nearly 13,400 miles of pipeline used to transport:
  - Crude oil
  - Natural gas
  - Natural gas liquids (NGLs)
  - Refined petroleum products
- » Midland International Air and Space Port

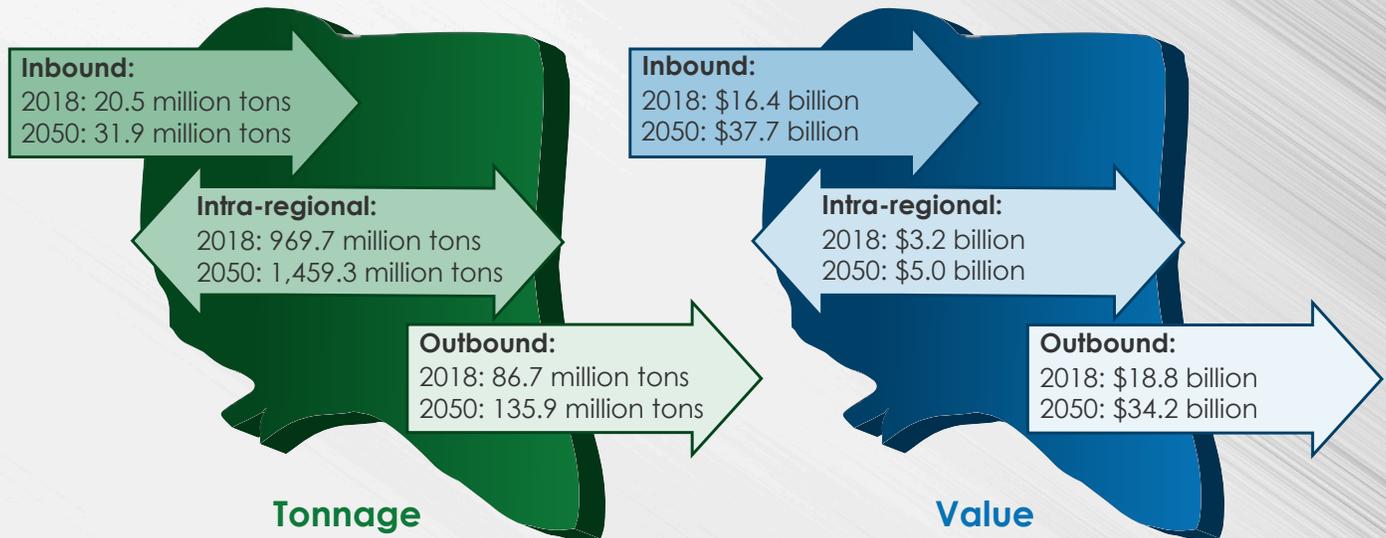
In 2018, an estimated 1.1 billion tons of freight valued at \$38.3 billion was transported on the PBMFN. By 2050, these volumes are expected to grow by 45% to 1.6 billion tons valued at \$76.9 billion. As noted previously, the demand for freight transportation in the Permian Basin is overwhelmingly driven by the energy sector as commodities such as sand, water, pipe, machinery, and oil and gas comprise about 90 percent of the total volume of freight movement.

TOTAL TONNAGE		TOTAL VALUE	
2018	2050	2018	2050
1,077 Million Tons	1,627 Million Tons	\$38 Billion	\$77 Billion



# FREIGHT AND ENERGY SECTOR TRANSPORTATION DEMAND IN THE PERMIAN BASIN

Intra-regional freight movements dominate in terms of tonnage due to the large volumes of water and sand. However, in terms of value, intra-regional flows pale in comparison to inbound and outbound freight flows. This is due to the higher value of the pipes, equipment, and consumer goods being imported and the oil and gas being exported.



## PERMIAN BASIN SPHERE OF INFLUENCE (SOI)



Defined as regions, states, and countries whose development both affect and are affected by unique and notable freight activity in the Permian Basin, the energy, consumer goods, and agricultural economic and transportation SOIs for the Permian Basin include international land Ports of Entry and seaport gateways, and extend from California to Georgia. Thus, the freight that moves in the Permian Basin has local, regional, state, national, and global implications.



# DEMAND FOR SAND, WATER, AND HEAVY EQUIPMENT IN THE PERMIAN BASIN

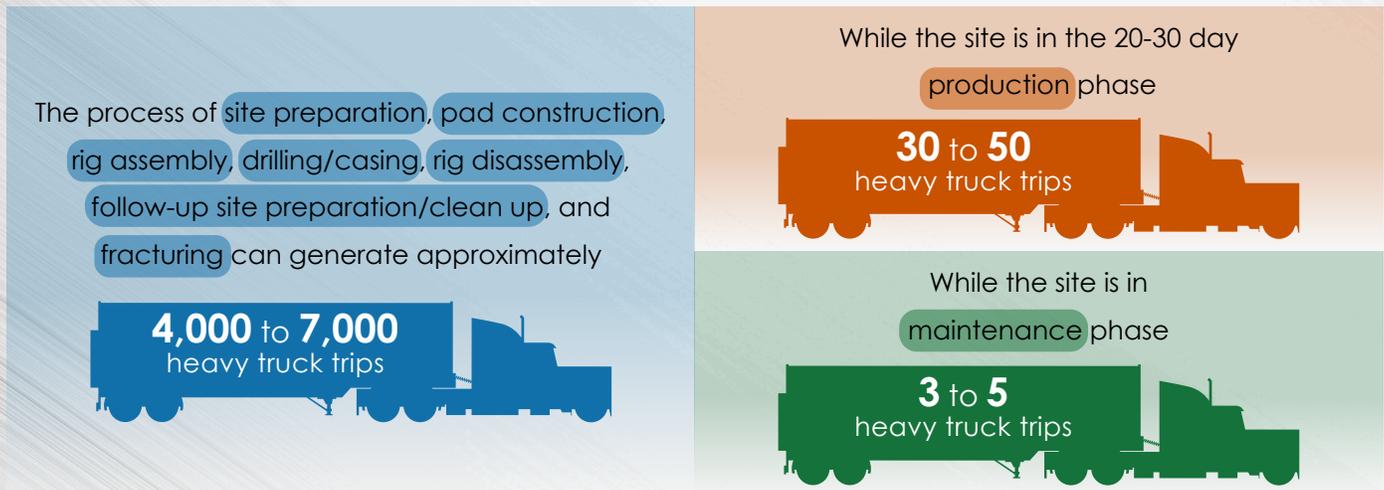
Because traditional transportation data sources do not capture the full scale of truck volumes in the region (specifically as it relates to oilfield commodities), the volume of freight demand associated with the transport of sand, fresh water, and produced water was estimated separately. More than 340 million tons of sand and water are moved annually in the Permian Basin, translating into about 106,000 truck trips per day.

Using these projections coupled with stakeholder input, the number of truck trips necessary to service oil and gas production sites were estimated by phase including the start-up and fracing phase, production phase, and well maintenance phase.

## TOTAL ESTIMATED TRUCKED SAND AND WATER TONNAGE AND IN THE PERMIAN BASIN, 2018



## TOTAL ESTIMATED TRUCK TRIPS BY PHASE

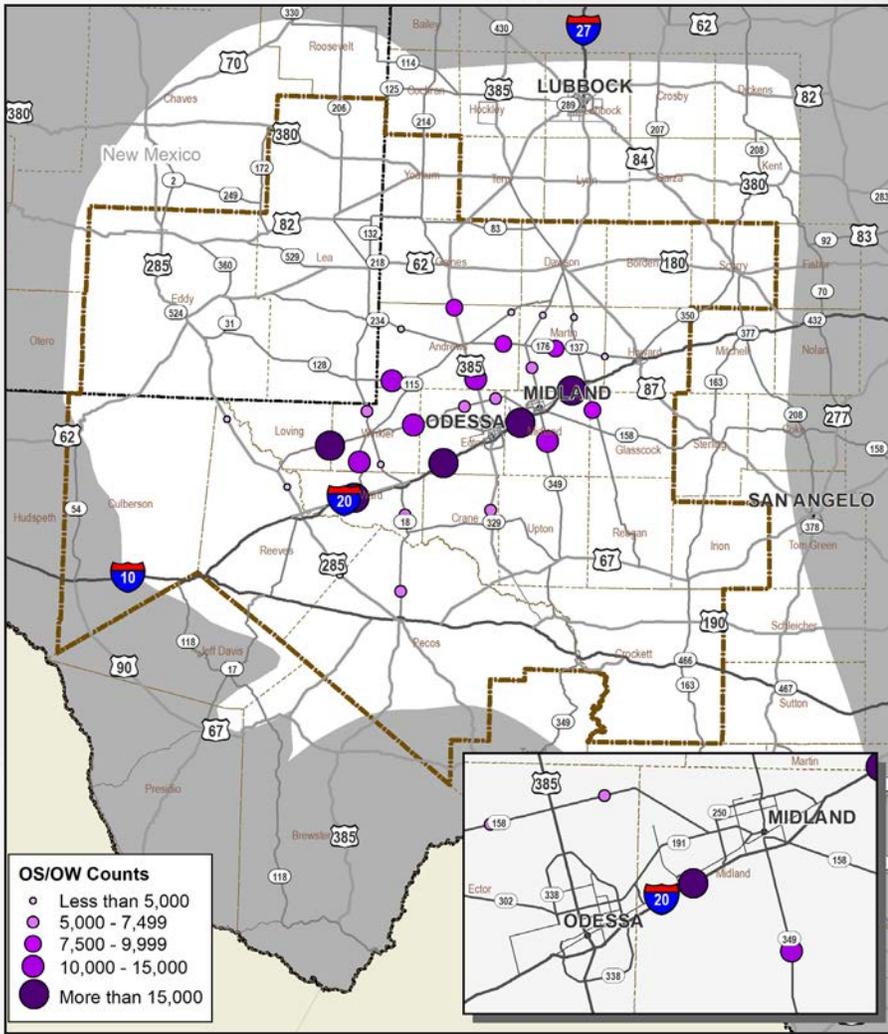


Commodity	Annual Loaded Truck Trips	Annual Total Truck Trips (Loaded + Empty)	Average Daily Truck Trips
SAND	1,600,217	3,200,434	8,768
FRESH WATER	1,540,685	3,081,370	8,442
PRODUCED WATER	16,318,277	32,636,554	89,415
<b>TOTAL</b>	<b>19,459,179</b>	<b>38,918,358</b>	<b>106,625</b>



# DEMAND FOR OVERSIZE/OVERWEIGHT PERMITTED LOADS IN THE PERMIAN BASIN

Select High Volume Locations for Permian Basin OS/OV Vehicle Analysis, October 2018-September 2019

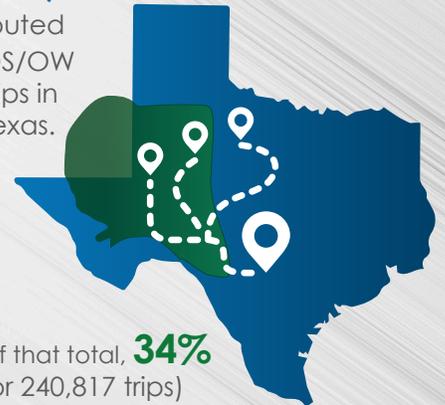


While all vehicle traffic causes wear and tear to roadways, trucks cause considerably more damage due to their size and weight. Even more damage is caused by trucks that exceed state and federal legal limits for size and weight and require permits to legally travel on public roads (commonly referred to as oversize/overweight (OS/OV) vehicles).

From October 2018 to September 2019, there were

**706,273**

routed OS/OV trips in Texas.



Of that total, **34%** (or 240,817 trips) were routed through the Permian Basin.

For comparison, the Permian Basin contains about

**7%** of TxDOT on-system miles.

## TOP 10 PERMIAN BASIN ROUTES FOR OS/OV TRANSPORTATION ACTIVITY





# FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS

The process for identifying freight-related transportation needs is both data-driven and stakeholder informed. Current and future freight transportation demand was overlaid with existing conditions and performance of the PBHFN to determine current and future deficiencies based on the following factors.

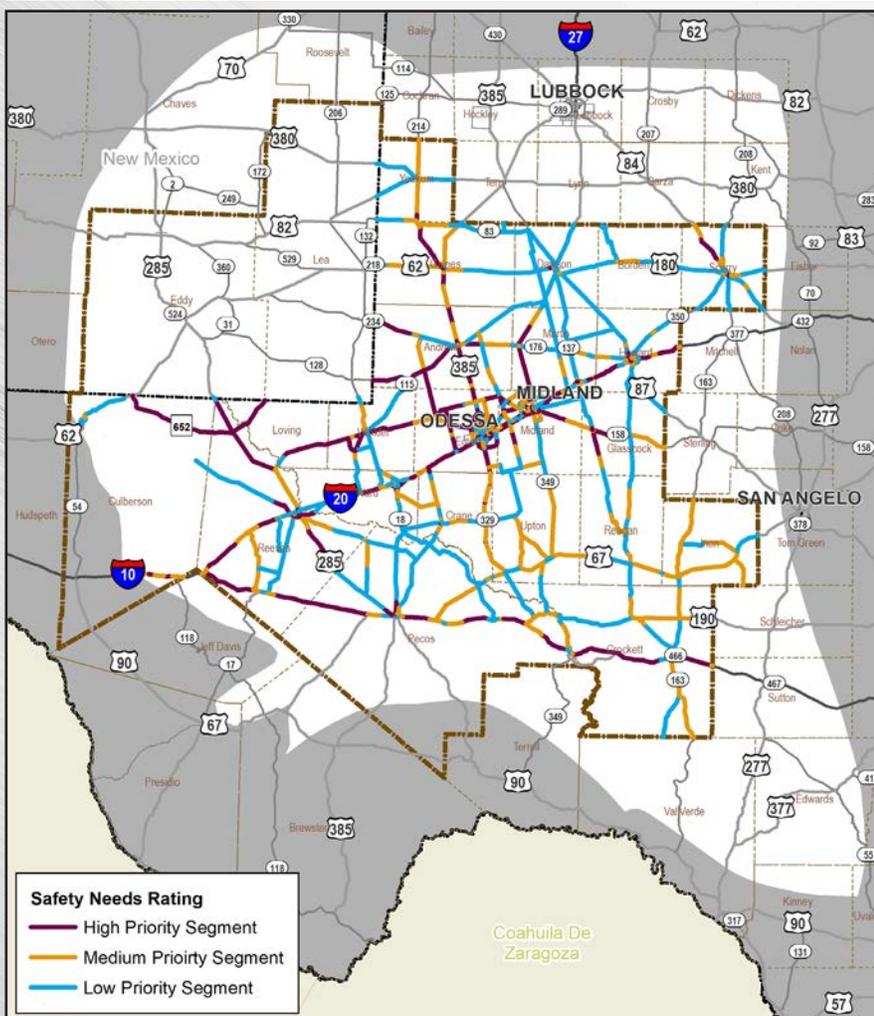
## FACTORS INCLUDED IN THE EVALUATION OF CONDITIONS AND PERFORMANCE OF THE PBHFN

Mobility & Reliability	Safety	Asset Utilization & Preservation	Rural Roads Connectivity
<ul style="list-style-type: none"> <li>Truck counts</li> <li>Truck travel time reliability</li> <li>Buffer time index</li> </ul>	<ul style="list-style-type: none"> <li>Truck involved crashes</li> <li>Rest areas and truck parking</li> <li>Access management</li> </ul>	<ul style="list-style-type: none"> <li>Pavement conditions</li> <li>Bridge load restrictions and conditions</li> <li>Bridge vertical clearance</li> <li>OS/OW activity</li> </ul>	<ul style="list-style-type: none"> <li>Frontage roads</li> <li>Number of lanes</li> </ul>

Freight transportation system needs and challenges in the Permian Basin cover a wide range of issues, Freight transportation needs were identified through vetting the conditions and performance with regional stakeholders to identify needs focused on safety, mobility, asset utilization and preservation and rural roads connectivity.

## SAFETY NEEDS

PBHFN Safety Needs Rating



High and medium safety needs are prevalent throughout the region and across all roadway functional classifications. Some of the notable high safety need routes include:

- » I-10 and I-20 throughout the Permian Basin
- » U.S. 285 and U.S. 385
- » SH 128, SH 158, SH 285 and SH 302
- » FM 652

**815 Miles of High needs**

**1,105 Miles of Medium needs**

Key factors impacting energy sector transportation safety include:

- » Number and severity of crashes
- » Unauthorized truck parking
- » Driver behavior such as speeding and hard braking events
- » Access management

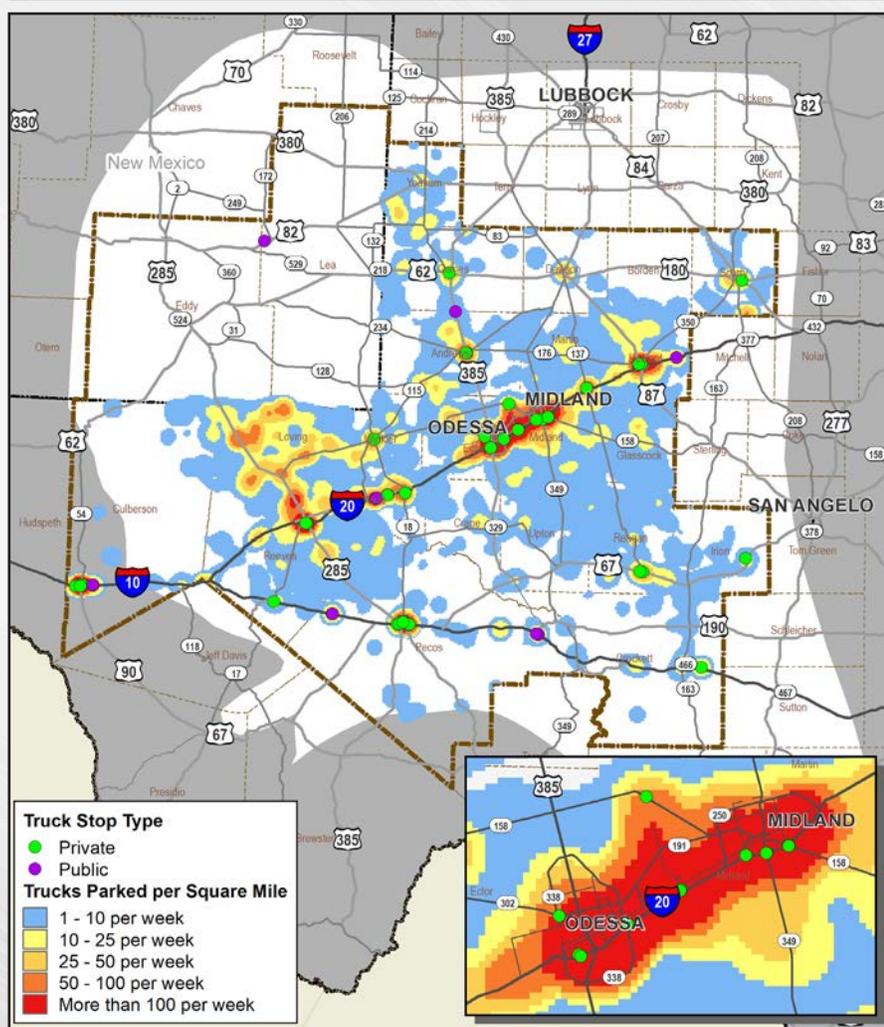
# FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS

From 2016 to 2018, Permian Basin truck-involved crashes **increased over 120%**.



## TRUCK PARKING NEEDS AND SAFETY IN THE PERMIAN BASIN

Truck Parking Density and Truck Stops in the Permian Basin, 2018



The lack of safe, authorized truck parking creates safety challenges throughout the region. Approximately 77% of the truck parking activity in the region is for shorter stops, ranging from 30 minutes to an hour. While truck parking shortages exist throughout the region, key locations where trucks were determined to park for more than one hour and/or over-night include:

- » Inside the urban core of Midland/Odessa
- » U.S. 285, U.S. 385, U.S. 84, and U.S. 67
- » SH 302





# FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS

## PERMIAN BASIN MOBILITY NEEDS

Congestion is impacting mobility and reliability on both urban and rural routes. The highest scoring mobility needs include:

- » Urban area along I-20 between Midland and Odessa,
- » Rural areas along U.S. 285 in Reeves County, U.S. 87 in Howard County,
- » U.S. 385 south of Odessa, and
- » FM 652 from U.S. 62 into New Mexico.

**210 miles** of **HIGH** priority needs  
**140 miles** of **MEDIUM** priority needs



## PERMIAN BASIN ASSET UTILIZATION AND PRESERVATION NEEDS

The highest priority asset preservation needs are located along the interstate routes with nearly the entirety of I-10 and I-20 displaying medium or high needs. Routes that are heavily traveled by sand and water trucks as well as oilfield equipment also have significant asset preservation needs including:

- » U.S. 285 and U.S. 385,
- » SH 302, and
- » FM 652.

**400 miles** of **HIGH** priority needs  
**1,190 miles** of **MEDIUM** priority needs



## PERMIAN BASIN RURAL ROADS AND CONNECTIVITY

Rural road and connectivity needs are systemic throughout the region and the highest number of mileage with high priority needs fell into this category and arise from critical portions or all of Tier 1 and Tier 2 PBHFN routes having only two lanes with limited shoulder width.

**1,340 miles** of **HIGH** priority needs  
**915 miles** of **MEDIUM** priority needs



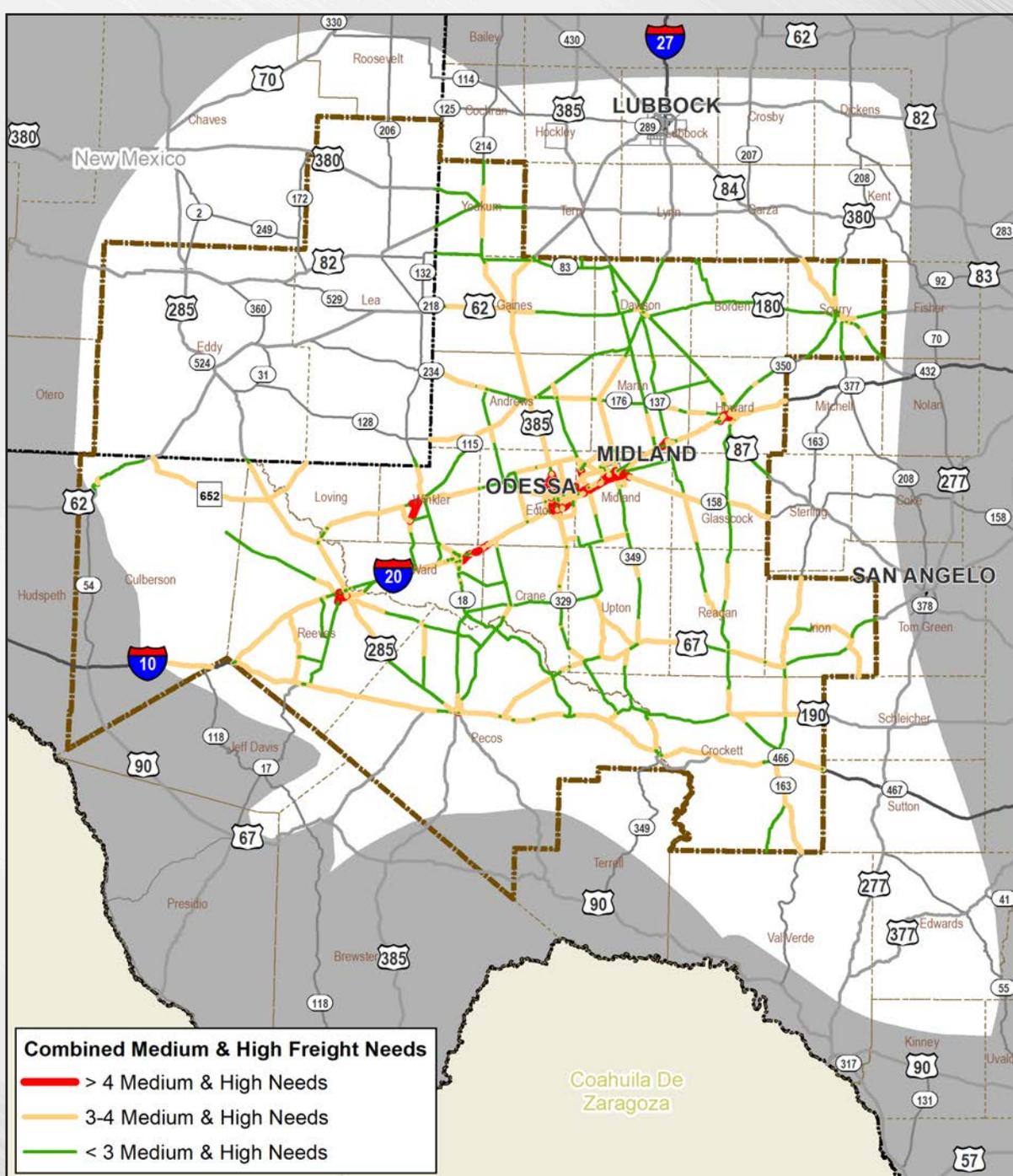


# COMBINED FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS

Analysis of the challenges and needs reveals that nearly 80% of the network has Medium or High needs in at least one category and many roadways have Medium and High needs in three or more categories across most of their mileage, including:

- » I-10 and I-20
- » U.S. 285, U.S. 385, U.S. 67, U.S. 87 and U.S. 84
- » SH 302, SH 349, SH 158, SH 176, SH 118 and SH 191
- » FM 652

PBHFN Combined Medium and High Needs Rating





# ADDRESSING FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS IN THE PERMIAN BASIN

The Permian Basin Freight Plan development process led to a robust and comprehensive set of strategies addressing the freight and energy sector transportation needs and challenges. This process provided a transparent, data-driven, and stakeholder-informed approach to decision-making for freight transportation improvements. It leveraged a variety of stakeholder engagement activities to gain varied perspectives. This input was combined with an assessment and prioritization of needs to develop a comprehensive and cost-effective approach for recommended actions. The approach includes three broad-based strategy categories for addressing freight and energy sector transportation needs and challenges in the Permian Basin.

After identifying and prioritizing the needs, the next step was to develop a comprehensive list of strategies. The strategies were vetted with stakeholders to develop recommendations and an implementation plan.

## Policies and Programs



- » Outreach, coordination, and collaboration
- » Planning, training, land use, and data
- » TxDOT led and TxDOT supported

## Operations and Technology



- » Transportation system management and operations (TSM&O)
- » Access management, signage, wayfinding, and road markings
- » Intelligent transportation systems

## Infrastructure



- » Planned projects
- » Strategic projects
- » Stakeholder proposed projects

## PROCESS FOR IDENTIFYING STRATEGIES



## SUMMARY OF PERMIAN BASIN FREIGHT PLAN RECOMMENDATIONS

There are **36 strategies** and **954 planned projects**:



**13** Policy recommendations



**14** Program recommendations



**5** Operational recommendations



**4** Technology recommendations



**954** Planned projects



# PERMIAN BASIN FREIGHT PLAN POLICY AND PROGRAM RECOMMENDATIONS

## POLICY RECOMMENDATIONS

### TxDOT Led Policy Recommendations

- Develop driveway separation and consolidation guidelines for improved access management
- Integrate freight considerations into the transportation project development process
- Collaborate with the Railroad Commission of Texas on adding transportation information to permit applications
- Monitor Railroad Commission of Texas energy sector permits for scheduling and location conflicts with highway projects
- Develop truck traffic impact analysis guidelines to include freight considerations in urban and rural areas

### TxDOT Supported Policy Recommendations

- Conduct research on human factors impacting transportation safety in the Permian Basin to aid in developing training for drivers operating in the region
- Assess the feasibility of off-peak truck operations
- Develop regional land use guidelines for mitigating freight and energy sector conflicts with residential and commercial land uses
- Collaborate with truck stop operators and local stakeholders to develop new or expand existing truck parking
- Collaborate with regional and local stakeholders to encourage truck parking at non-TxDOT public facilities and private commercial and industrial sites
- Collaborate with Texas DMV to investigate the feasibility of an OS/OW load reporting program that includes annual permit usage information
- Establish sustainable funding for transportation investments in the Permian Basin
- Explore opportunities for public-private partnerships for projects and programs

## PROGRAM RECOMMENDATIONS

### TxDOT Led Program Recommendations

- Develop a freight data collection and repository program to address the Permian Basin freight data gap
- Develop a freight transportation public education and awareness program
- Develop a regional technology-based freight safety and operations (TSM&O) program
- Develop and implement Permian Basin freight-centric design guidelines
- Develop multimodal freight planning, programming, and implementation guidelines for integrating freight into the investment decision-making process
- Develop wayfinding and signage guidelines for urban and rural areas to include private lease roads and major freight generators
- Develop a regional Incident Management Program with a focus on commercial vehicles

### TxDOT Supported Program Recommendations

- Establish a Permian Basin Freight Advisory Committee with public and private sector stakeholders
- Implement comprehensive, multimodal regional freight planning
- Develop a regional multimodal thoroughfare plan
- Explore opportunities, regulations, and policies for intraregional mass transit or van-pool programs servicing major employment sites
- Convene a biennial regional freight and energy sector transportation summit in partnership with regional stakeholders
- Explore opportunities to expand Permian Basin freight rail capacity while avoiding negative impacts to public safety and congestion
- Coordinate with the Permian Basin MPO, Permian Basin Regional Planning Commission, and other regional stakeholder groups on further freight planning and study



# PERMIAN BASIN FREIGHT PLAN OPERATIONS AND TECHNOLOGY RECOMMENDATIONS

## OPERATIONS AND TECHNOLOGY RECOMMENDATIONS

### Operations Recommendations

 Ensure all roadways on the PBHFN have adequate road markings, lighting, and signage

 Increase signage and wayfinding on the PBHFN for lease roads and mile markers on TxDOT routes

 Increase signage and ITS on freight routes for locations of truck parking, safety hotspots, queuing, blocked rail crossings, etc.

 Deploy additional Weigh-in-Motion and Automated Vehicle Classification/Count systems throughout the Permian Basin

 Conduct traffic signal timing study for urban arterials on the PBHFN

### Technology Recommendations

 Establish a regional Traffic Management Center with a focus on improving truck safety and mobility

 Deploy advance warning systems on critical PBHFN routes and at safety hotspots

 Deploy incident management

 Deploy Truck Parking Availability System along PBHFN



# PERMIAN BASIN FREIGHT AND ENERGY SECTOR TRANSPORTATION INVESTMENT PLAN

Two project lists were referenced to identify planned highway projects on the PBHFN: the 2021 Unified Transportation Program (UTP) and the TxDOT District Project Database. Projects from these sources form the Permian Basin Freight Investment Plan (FIP).

## Freight Investment Plan Summary



**954**  
Projects



Costing  
**\$10.9 billion**



**\$6.9 billion**  
fully/partially  
funded

## 2021 UNIFIED TRANSPORTATION PROGRAM PROJECTS

In the 2021 UTP, there are 718 projects at an estimated cost of nearly \$8.6 billion planned for the Permian Basin region on the PBHFN. Asset preservation projects represent the majority, with 412 projects, or 57% of the total. This is followed by 137 mobility and reliability projects, or about 19% of the total, and 123 safety projects, or about 17% of the total.

Project Category	Fully Funded		Partially Funded			Total Funded	
	No. of Projects	Authorized Funding (Millions \$)	No. of Projects	Authorized Funding (Millions \$)	Funding Gap (Millions \$)	No. of Projects	Total Cost (Millions \$)
ALTERNATE ROUTES	2	\$34.80	35	\$292.10	\$784.10	37	\$1,111.00
ASSET PRESERVATION	324	\$1,294.40	88	\$229.60	\$251.20	412	\$1,775.20
MOBILITY AND RELIABILITY	53	\$1,241.40	84	\$1,330.40	\$2,918.00	137	\$5,489.80
SAFETY	95	\$131.30	28	\$2.60	\$9.90	123	\$143.80
OTHER	8	\$24.00	1	\$0.40	\$39.90	9	\$64.30
<b>TOTAL</b>	<b>482</b>	<b>\$2,726.00</b>	<b>236</b>	<b>\$1,855.10</b>	<b>\$4,003.10</b>	<b>718</b>	<b>\$8,584.10</b>

As projects in the UTP are dynamic and its updated annually, there is no guarantee that projects in the UTP will be fully funded or implemented.

## ADDITIONAL DISTRICT PLANNED FREIGHT AND ENERGY SECTOR PROJECTS

The five TxDOT districts – Odessa, Abilene, El Paso, Lubbock and San Angelo Districts – in the Permian Basin have highway projects outside of the UTP. Many of these are asset preservation and safety projects.

Project Category	No. of Projects	Total Cost (Millions \$)
ALTERNATE ROUTES	6	\$215.19
ASSET PRESERVATION	170	\$1,155.61
MOBILITY AND RELIABILITY	47	\$894.34
SAFETY	13	\$69.21
<b>TOTAL</b>	<b>236</b>	<b>\$2,334.35</b>



# UNMET PERMIAN BASIN FREIGHT AND ENERGY SECTOR TRANSPORTATION NEEDS

In addition to the \$10.9 billion in planned projects in the Permian Basin, of which \$6.9 billion is fully or partially funded, there are still freight transportation needs on the PBHFN with no planned projects. Unmet needs, identified through the needs assessment and project identification process, provide the opportunity for information from the Permian Basin Freight and Energy Sector Transportation Plan to inform the project development process carried out by TxDOT and the Permian Basin MPO, leading to the identification and planning of projects to address the unmet freight transportation needs.

The combination of unfunded planned projects and the significant number of needs with no planned projects highlights the importance of a continued focus on developing policies, programs, technology, operation, and infrastructure strategies to address freight and energy sector transportation challenges in the Permian Basin.

### UNMET NEEDS ON THE PERMIAN BASIN HIGHWAY FREIGHT NETWORK

- 2,400 miles** with unmet **high and medium priority safety needs**
- 200 miles** with unmet **high and medium priority mobility needs**
- 250 miles** with unmet **high and medium priority asset preservation needs**

The unmet needs have a direct impact on the economic competitiveness and connectivity of the Permian Basin.

## STRATEGIC PROJECTS IMPACTING FREIGHT AND ENERGY SECTOR TRANSPORTATION IN THE PERMIAN BASIN

Five strategic projects impacting freight movement in the Permian Basin include the Ports to Plains Corridor, Reeves County Truck Reliever Route, I-14 Interstate Corridor Study, I-20 Corridor Improvements, and the Permian Promise Program. These projects are in various stages of development and stakeholders wishing to get involved with their advancement should contact TxDOT.

Ports-to-Plains Corridor	Reeves County Truck Reliever Route	I-14 Corridor	I-20 Corridor	Permian Promise
Interstate feasibility study completed June 2020	Alternate route to bypass the Pecos central business district	West Texas to the Texas-Louisiana border generally following U.S. 190	40+ miles from FM 1936 to FM 1208	Upgrades to key energy sector corridors
Upgrade to interstate standard portions of U.S. 87, U.S. 227, SH 349, and SH 158	Proposed loop bisector that aligns with FM 2119 on the north side of Pecos to SH 17 on the south side	Provide improved access to Beaumont, Port Arthur, and Corpus Christi	Convert frontage roads to one-way, add traffic lanes, and reconstruct interchanges	Add traffic lanes, reconstruct interchanges, relief routes, loops, and passing lanes



# PERMIAN BASIN FREIGHT AND ENERGY SECTOR TRANSPORTATION IMPLEMENTATION PLAN

The Permian Basin Freight and Energy Sector Transportation Plan strategies and recommendations were developed to support the safe and efficient movement of freight throughout the Permian Basin, today and in the future, by addressing the region's freight and energy sector transportation needs. An effective implementation plan offers a continuous cycle of improvement based on the recommendations outlined.

The implementation plan outlines the actions the state should take to implement recommendations based on overall need, input from the stakeholders, and overall feasibility. The Implementation Plan begins with the adoption of the Permian Basin Freight and Energy Sector Transportation Plan followed by immediate establishment of the Permian Basin Freight Advisory Committee. Short-term actions to advance the policy strategies should be completed with the next 12-18 months. Medium-term actions should begin within the next 12 months, and the full implementation should be completed within the next three to five years.

The following pages lay out the short- and medium-term actions for implementing the technology, operations, program, and policy recommendations made as part of the Permian Basin Freight and Energy Sector Transportation Plan.

## IMPLEMENTATION PLAN FOR ADVANCING TECHNOLOGY STRATEGIES

### Short-term Technology Actions

*(Complete in 12-18 months)*

**Action 1:** The state should explore funding and partnership opportunities for a Permian Basin regional traffic management center (TMC) concept of operations and feasibility study.

**Action 2:** The state should assess and identify the highest priority routes on the PBHFN for deploying advance warning systems.

**Action 3:** The state should conduct a feasibility study and develop a concept of operations for a high-resolution, real-time incident management program for the PBHFN to provide information and guidelines for detecting, responding to, and clearing incidents in an efficient manner.

**Action 4:** The state should assess the feasibility and effectiveness of a Truck Parking Availability System (TPAS) on I-20 and other Tier 1 PBHFN corridors.

### Medium-term Technology Actions

*(Initiate in next 12 months, Complete within 5 years)*

**Action 1:** The state and potential partners should initiate the TMC concept of operations and feasibility study following the short-term Technology Action 1.

**Action 2:** The state should develop a concept of operations for deploying advance warning detection systems on the corridors identified in the short-term Technology Action 2.

**Action 3:** The state should implement a regional incident management program pending the outcomes of the short-term Technology Action 3.

**Action 4:** Based on the outcome of short-term Technology Action 4, the state should develop a concept of operations for deploying TPAS on I-20 and other Tier 1 PBHFN corridors.

## IMPLEMENTATION PLAN FOR ADVANCING OPERATIONS STRATEGIES

### Short-term Operations Actions

*(Complete in 12-18 months)*

**Action 1:** The state should develop a plan for ensuring adequate road markings, lighting, and signage on all PBHFN corridors.

**Action 2:** The state should develop guidance for adding increased signage, including mile markers and private lease road signing, on the PBHFN.

**Action 3:** In conjunction with short-term Technology Action 3 and medium-term Program Action 1, the state should conduct a feasibility study and develop a concept of operations for deploying ITS to address general freight challenges and needs, such as truck parking locations, safety hotspots, blocked rail crossings, and real-time travel times on Tier 1 PBHFN corridors.

**Action 4:** In conjunction with short-term Program Action 2, the state should address the shortage of functioning WIM and VC devices in the Permian Basin by repairing or replacing malfunctioning equipment and deploying additional equipment in locations identified in the TxDOT WIM and VC Strategic Plan.

**Action 5:** The state should identify corridors with traffic signal timing needs, develop and implement traffic signal timing recommendations, and evaluate the effectiveness of the signal timing enhancements to improve freight movements and passenger vehicle travel.

### Medium-term Operations Actions

*(Initiate in next 12 months, Complete within 5 years)*

**Action 1:** The state should implement the plan developed by short-term Operational Action 1 to ensure adequate marking, lighting, and signage on PBHFN corridors.

**Action 2:** The state should implement the guidance for mile markers and private lease road signs developed in short-term Operational Action 2.

**Action 3:** The state should deploy a pilot project of the concept of operations for ITS developed under short-term Operational Action 3 on selected Tier 1 PBHFN corridors.

**Action 4:** Based upon the guidelines developed under short-term Operational Action 5, the state should conduct signal timing studies for the most critical PBHFN corridors.



## IMPLEMENTATION PLAN FOR ADVANCING PROGRAM STRATEGIES

### Short-term Program Actions

*(Complete in 12-18 months)*

**Action 1:** The state should support the formation of the Permian Basin Freight Advisory Committee and provide ongoing regional freight planning support, including as part of statewide freight planning efforts and through participation on the MPO policy and technical committees.

**Action 2:** The state should improve freight data collection in the Permian Basin by addressing the shortage of WIM and VC devices in the region. This includes repairing or replacing malfunctioning equipment and deploying additional equipment in locations identified in the TxDOT WIM and VC Strategic Plan.

**Action 3:** The state should use the findings from the Permian Basin Freight Plan to develop public outreach materials for use at regional, statewide, and national levels.

**Action 4:** The state should develop a standardized signage program for the Permian Basin to include reference location signs (mile markers) and commercial and leased roads driveway signing.

**Action 5:** The state should deliver freight transportation planning training to local, regional, and district transportation planners in the Permian Basin.

**Action 6:** The state should develop freight planning, programming, and implementation guidelines for transportation investment decision-making in the Permian Basin.

**Action 7:** The state should incorporate private lease roads and other major energy sector freight generators into access management guidelines for the PBHFN.

**Action 8:** The state should work with the MPO, the Permian Basin Freight Advisory Committee, local leaders, and private sector transportation stakeholders to convene a planning session for the first biennial Permian Basin Freight and Energy Sector Transportation Summit.

### Medium-term Program Actions

*(Initiate in next 12 months, Complete within 5 years)*

**Action 1:** The state should develop district level TSM&O plans with a focus on technology-based freight safety and operations.

**Action 2:** The state should develop a comprehensive freight data collection, repository, and reporting program that includes formulated rules, agreements, and guidelines for obtaining, sharing, and using public and private sector data sources.

**Action 3:** The state should implement the enhanced access guidelines for private lease roads and major freight generators developed in short-term Program Action 7.

**Action 4:** The state should participate in discussions with the MPO, Regional Planning Commission, other local planning partners, and the private sector to develop programs promoting intraregional transit and van-pool services to major freight generators, staff camps, and employment sites.

**Action 5:** The state should provide planning support for conducting regional multimodal thoroughfare plans.

**Action 6:** The state should undertake a Permian Basin Freight Rail Infrastructure Assessment to identify opportunities to build freight rail capacity while avoiding negative impacts to public safety and congestion at rail-highway crossings.

**Action 7:** The state and regional stakeholders should convene biennial Permian Basin Freight and Energy Sector Transportation Summits to facilitate an ongoing dialogue, information exchange, and Permian Basin Freight Plan implementation in the region.

## IMPLEMENTATION PLAN FOR ADVANCING POLICY STRATEGIES

### Short-term Policy Actions

*(Complete in 12-18 months)*

**Action 1:** The state should implement the recent Permian Basin Access Management guidelines completed by TTI for the Odessa District for driveway spacing and design for new and consolidation of existing driveways.

**Action 2:** The state should integrate the freight infrastructure design considerations currently under development by TxDOT into the Permian Basin project development process for future infrastructure improvements.

**Action 3:** The state should meet with the RRC to discuss 1) the feasibility of incorporating additional data reporting requirements into the permit application and updating processes, to include truck trip generation and commodity flow information; and 2) methods for obtaining RRC drilling data to inform construction letting and work zone planning.

**Action 4:** The state should coordinate with local planners to assess the feasibility of integrating freight and truck considerations into traffic impact analyses for industrial and commercial developments.

**Action 5:** The state should undertake research on the human factors associated with the transportation safety challenges in the Permian Basin. The research should focus on truck and general public driver behavior as well as the local industry transportation safety culture.

**Action 6:** The state should develop and share freight land use considerations and mitigation factors related to the energy sector with local leaders. The considerations could be developed in cooperation with the MPO and Regional Planning Commission through input from their boards and technical and policy committees.

**Action 7:** The state should convene a meeting with existing truck stop operators and regional stakeholders owning facilities with significant surface parking availability to exchange ideas and information on expanding safe truck parking along the PBHFN.

**Action 8:** The state should meet with Texas DMV and users of OS/OW permits to exchange ideas on collecting, submitting, and sharing additional data for multi-use permits to aid in local transportation network maintenance, construction, and investment planning.

### Medium-term Program Actions

*(Initiate in next 12 months, Complete within 5 years)*

**Action 1:** The state should develop and implement driveway separation and consolidation guidelines on PBHFN facilities.

**Action 2:** The state should develop freight and energy sector transportation investment funding guidelines that explore innovative funding and financing to include local, state, federal, and private sector funding opportunities.

**Action 3:** The state should coordinate with state, regional, and local agencies to streamline project delivery and build consistency among various jurisdictions in regulations, permitting, planning, and preservation of the freight network.

**Action 4:** The state should implement actions arising from collaboration with the RRC with regards to truck trip generation data collection and sharing and integrating real-time drilling data into construction and work zone planning from short-term Policy Action 3.

**Action 5:** The state should work with energy sector stakeholders to incorporate the findings from the safety research from short-term Policy Action 5 into company driver training and safety programs.

**Action 6:** The state should undertake a study to examine the feasibility and impact of off-peak truck operations for freight intensive activities, including oilfield operations, warehousing and distribution deliveries, and OS/OW movements.



# IMPLEMENTATION

## CALL FOR ACTION

The development of the Permian Basin Freight and Energy Sector Transportation Plan builds on the strong foundation of the 2018 Texas Freight Mobility Plan by enhancing and updating the data, tools, processes, and approaches. This lays the groundwork for the challenging job ahead: implementation. The Plan had a significant level of stakeholder engagement and was guided by the Steering Committee. It reaffirms the Permian Basin's freight transportation challenges and outlines strategies to address them.

Implementation of the Permian Basin Freight and Energy Sector Transportation Plan should focus on:

- 1. Continued collaboration:** Implementation will only be successful with the participation and collaboration of all public and private sector users and owners of the transportation system. TxDOT has an important role to play in maintaining and expanding the state's freight transportation infrastructure. These recommendations can only become actionable with strong coordination and cooperation with energy sector companies, railroads, marine ports, airports, and other freight industry stakeholders, as well as with other agencies, such as federal and state agencies, the Permian Basin MPO, cities and counties, and other entities. TxDOT will continue to engage regional stakeholders in the implementation of the Permian Basin Freight and Energy Sector Transportation Plan.
- 2. Policy and Program Recommendations:**
  - Take short- and medium-term actions to fully implement freight policy and program recommendations.
  - Ensure that regional project development and prioritization incorporates freight considerations such as design, truck parking, economic competitiveness, supply chains, market access, and goods movement criteria.
- 3. Permian Basin Freight Investment Plan:**
  - Move high freight priority partially funded projects to implementation by refocusing existing funding tied to low or medium freight priority projects.
  - Address the estimated \$4.0 billion funding shortfall for freight projects.
  - Outline how to advance the partially funded freight projects in the Freight Investment Plan through project development and implementation by assessing how these projects can be given higher priorities based on freight needs.
  - Identify potential investments or strategies to address freight transportation needs which do not have a currently planned project.
  - Focus efforts at the district and MPO levels on developing freight-centric projects.
  - Monitor progress of strategic projects and support efforts to advance the highest priorities for those efforts.





**Texas  
Department  
of Transportation**