

# TEXAS ENERGY SECTOR RURAL IMPROVEMENT PROGRAM

## 4 - Glasscock County and Reagan County Improvement Project

**BUILD Transportation Grants** – Application – Rural Western  
Texas - Permian Basin, State of Texas



Project Number: **TBD**

Prepared for: **United States Department of Transportation**

Prepared by: **Texas Department of Transportation**

July 2018

PROJECT INFORMATION	
Sponsoring Organization	Texas Department of Transportation (TxDOT)
DUNS Number	806782553
EIN	000000000
Program of Projects	Texas Energy Sector Rural Improvement Program
Name of Project	Glasscock County and Reagan County Improvement Projects
Type of Project	Roadway
Location of Project	Glasscock and Reagan Counties, State of Texas
Congressional District	Will Hurd, Congressional District 23
BUILD Application Amount Requested	\$25,000,000
BUILD Application Agency Match	\$3,761,864
BUILD Application Partnership Match	\$16,250
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## **I. PROJECT DESCRIPTION: TEXAS ENERGY SECTOR RURAL IMPROVEMENT PROGRAM OF PROJECTS**

The Texas Department of Transportation (TxDOT) has developed the Texas Energy Sector Rural Improvement Program of Projects (Program) to address critical infrastructure needs arising from the accelerated growth of the energy industry in West Texas, specifically within the Permian Basin. TxDOT has invested over \$200 million in the Program to date and is seeking BUILD Grant funding to deliver four additional projects within the Program. The Program of Projects applications being submitted for FY 2018 funding consideration are:

1. Reeves County Improvement Project
2. Reeves County and Loving County Connectivity Project
3. Winkler County Improvement Project
4. Glasscock County and Reagan County Improvement Project

The projects included in the application have been prioritized based on a roadway improvement plan developed in partnership with local and regional governments and with input from citizens and private entities. TxDOT is addressing additional components of the Program by leveraging state funding sources that originate from energy resource production, including oil and gas severance taxes and general revenue sources. These four projects have a combined benefit-cost ratio of 1.49, providing extensive operator, delay, and environmental savings throughout the region.

The traffic and truck counts at the proposed project locations have risen steeply over the past decade and in some cases, more than doubled between 2016 and 2017 alone. Delivering the projects in TxDOT's applications will provide rural Texans and the energy, mining, trucking, construction, manufacturing, and agricultural industries with critical safety and congestion improvement projects including grade separations, wider roads and stronger pavement that will reduce life-cycle costs.

The Federal Highway Administration's most recent round of Every Day Counts initiatives includes project bundling as a recommended step towards cost and time savings. TxDOT agrees with this recommendation and believes bundling the BUILD projects will result in expedited project delivery, reduced cost and efficiency in procurement and construction time.

TxDOT has a history of identifying and realizing efficiencies in contracting and design, ranging from the implementation of large-scale interstate programs to delivering local construction and maintenance projects. TxDOT proposes this bundle of projects within the overall Texas Energy Sector Rural Improvement Program to utilize BUILD grant funds as effectively as possible by finding cost and time efficiencies. Bundling these projects within the larger Program provides efficiencies within the overall design, bidding, and construction process, including:

- Coordinating and managing the final design of grade separations simultaneously saves costs and resources within TxDOT;

- Letting multiple projects for construction in the same contract allows for better unit prices on larger quantities of materials through economies of scale;
- Identifying common staging areas between projects lowers a single contractor's mobilization costs instead of multiple contractors' staging areas and mobilization of equipment; and,
- Implementing a coordinated effort throughout the program to allow for future placement of broadband and fiber installation.

If the Permian Basin were an independent nation, it would be the fourth-largest member of the Organization of Petroleum Exporting Countries<sup>1</sup> and has become the number one producer of renewable energies in the United States.<sup>2</sup> Roads in the Permian Basin have experienced significant damage from trucks hauling water, sand, equipment, and products needed to support the exponential increase in oil and gas production. This type of use was not anticipated when the roads were first constructed.

Further compounding the challenge, oil and gas production in the Permian Basin is projected to double by 2023, meaning Texas mining would yield sixty percent of the net global output in this timeframe.

Addressing the infrastructure needs and overall transportation network in the Permian Basin is critical to ensuring that future roadways will be able to support increasing levels of energy production and regional economic productivity.

The high level of coordination and partnership between TxDOT, local governments, and stakeholders in all four applications exemplifies the urgent need to deliver the remaining Program projects. It is further illustrated by letters of support from 21 members of the Texas Congressional Delegation, the U.S. Senate Majority Whip John Cornyn, the Chairman of the Texas Railroad Commission, the Chairman of the Texas Freight Advisory Committee, additional local and state elected officials, and a broad range of private industry associations.

**Exhibit 1** identifies all four Texas Energy Sector Rural Improvement Program of Projects within the Permian Basin area and Reeves, Winkler, Loving, Glasscock, and Reagan Counties.

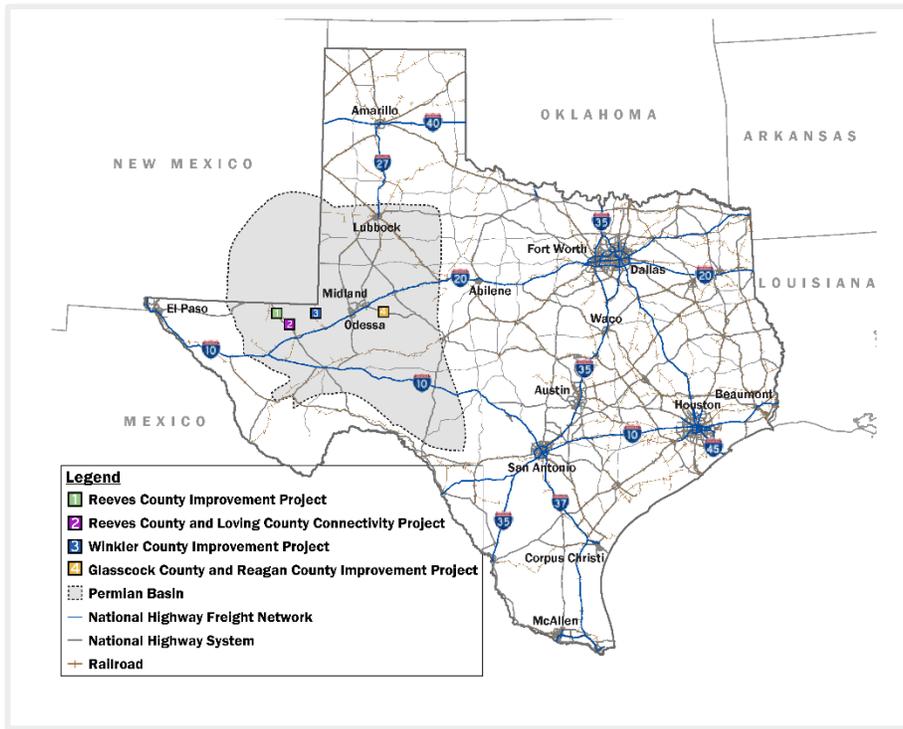
As part of this Program, TxDOT is seeking BUILD grant funding assistance to make the **Glasscock County and Reagan County Improvement Project (Project)** a reality. The Project encompasses a group of improvements along State Highway (SH) 137 and includes reconstructing the existing at-grade roadway geometry on SH 158 at SH 137 to a grade-separated overpass and interchange. The corridor is an important link between the Midland/Odessa area and the city of San Angelo and provides connections to nearby Interstate Highway 20 (I-20).

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<sup>1</sup> Accessed at: <https://www.houstonchronicle.com/business/energy/article/Permian-will-outpace-all-OPEC-nations-except-12995744.php>

<sup>2</sup> Accessed at: <https://blogs.scientificamerican.com/plugged-in/texas-got-18-percent-of-its-energy-from-wind-and-solar-last-year/>

**Exhibit 1. Map of TxDOT’s BUILD Submittal of Program of Projects**



A complete project description of the Texas Energy Sector Rural Improvement Program is included in **Appendix A**.

**WHY SUPPORT THE GLASSCOCK COUNTY AND REAGAN COUNTY IMPROVEMENT PROJECT?**

The Glasscock County and Reagan County Improvement Project (Project) is a group of projects on SH 158 at SH 137 and along SH 137. The Project includes reconstructing the existing at-grade roadway geometry to a grade-separated interchange and strategically widening SH 137 to add dedicated turning lanes at critical intersections, strengthening the pavement structure, and planning for future fiber installation along the corridor. The investment in infrastructure is much needed on this corridor as increased demand, traffic volumes, and heavy loads on the corridor are straining the rural network. Exponential traffic growth in the area, in particular at the SH 158/SH 137 intersection, and large numbers of trucks as detailed in **Table 1** are creating traffic delays and issues with pavement. **Table 2** provides a summary of project benefits.

**Glasscock County and Reagan County Improvement Project Overview**

- A grade separation on SH 158 at SH 137 with a total estimated cost of \$27,495,798. The BUILD grant would fund 38% of the grade separation. The remaining cost will be funded by state funding and other federal funds.
- Corridor improvements on SH 137 include widening to add dedicated turning lanes, strengthening pavement, and plans for anticipated future fiber installation. Total cost for improvements between SH 158 and 11.5 miles south of the Glasscock County



line is \$24,961,448. The BUILD grant would fund 59% of the roadway improvements. The remaining cost will be funded by state funding and other federal funds.

**Table 1. Traffic Growth and Percentage of Trucks from 2016 to 2017**

Roadway	Direction	% Traffic Increase (2016 to 2017)	% Trucks
SH 158	EB	39%	50%
SH 158	WB	75%	55%
SH 137	NB	53%	50%
SH 137	SB	55%	50%

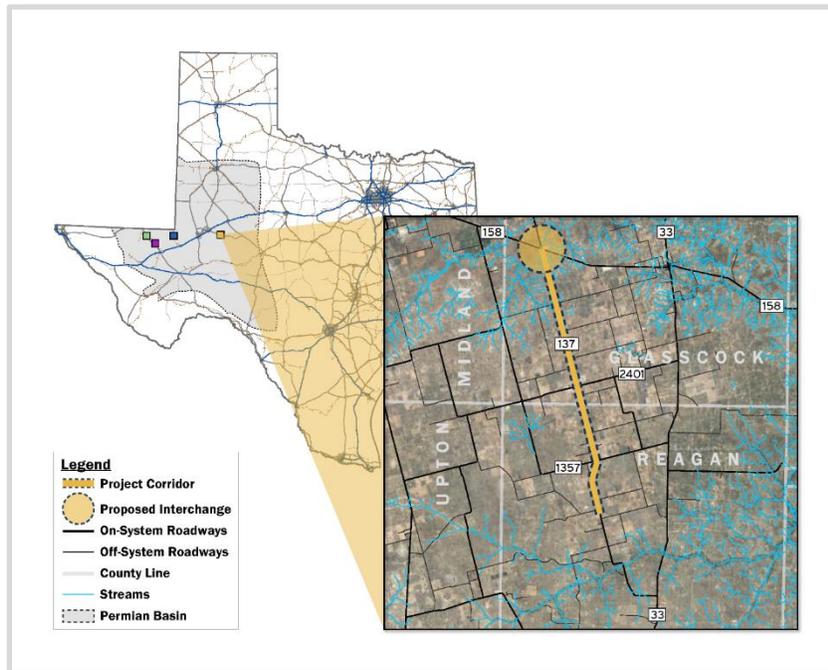
**Table 2. Project Benefits at a Glance**

Glasscock County and Reagan County Improvement Project at a Glance	
Demand and Economic Vitality	<ul style="list-style-type: none"> <li>! Existing traffic regularly results in delays of more than 20 minutes</li> <li>! Delays will worsen if the bottleneck at the existing intersection is not resolved</li> <li>✓ <i>Project will reduce delay and have a positive impact on the economic vitality of the region resulting in travel time savings and reduced emissions</i></li> </ul>
Providing Safe & Reliable Transportation	<ul style="list-style-type: none"> <li>! Permian Basin region is 2% of Texas population but accounts for 10% of state highway fatalities</li> <li>! Heavy truck and freight traffic on state highways not designed for freight and with improper geometry for frequent stops and turns by heavy freight</li> <li>✓ <i>Project will reduce conflict opportunities between intersecting roadways</i></li> </ul>
Growth & Livability in Rural Areas	<ul style="list-style-type: none"> <li>! Existing rural roadways were not designed for high traffic volumes or the level of heavy freight seen today</li> <li>! There is an existing need for improved infrastructure for residential mobility</li> <li>✓ <i>Project will improve condition and durability of infrastructure, improving network connectivity and reliability for residents</i></li> </ul>
Innovative Approach	<ul style="list-style-type: none"> <li>! Project area lacks updated technology, roadway design, and safety measures</li> <li>✓ <i>TxDOT is leveraging a new and innovative funding measure, Proposition 1, directing a portion of existing oil and gas production tax to the State Highway Fund (SHF).</i></li> <li>✓ <i>Roadways designed for easy integration of fiber and broadband infrastructure in the future, as needed.</i></li> </ul>

## II. PROJECT LOCATION

The proposed grade separation is located at the intersection of SH 137 and SH 158 within Glasscock County, while the roadway improvements are south along SH 137. The intersection is located approximately 18 miles south of I-20. Both SH 137 and SH 158 are TxDOT-designated primary Energy Sector Corridors, which prioritizes the facilities for roadway improvements and safety enhancements due to their location in this energy sector region. **Exhibit 2** identifies specific area and corridors of the Project.

**Exhibit 2. Glasscock County and Reagan County Improvement Project**



The Project is located within the Permian Basin. Energy outputs in this region which produces oil, natural gas, biodiesel, solar, and wind resources for the region, state, and nation are expected to continue unabated.

Energy production from the Permian Basin is projected to more than double by 2023 at a rate of three million barrels per day (accounting for more than 60% of growth in net global output from 2017 to 2023<sup>3</sup>). It is estimated that over 1,000 trucks are used for the construction of every well (a period of 35 to 40 days), and roughly 350 trucks are required per year during production to keep the wells open, in addition to any petroleum products that may be moved by truck from the wells to trans-loading facilities.<sup>4</sup> If production increases as expected, additional pressure will be put on rural roadways such as SH 137 and SH 158.<sup>5</sup> Furthermore, pipelines in the Permian Basin region are nearing capacity forcing even more trucks on the road in order to move production resources.

<sup>3</sup> Accessed at: <https://www.mrt.com/business/oil/article/Permian-Basin-could-double-oil-production-by-12995254.php>

<sup>4</sup> Accessed at: <https://static.tti.tamu.edu/tti.tamu.edu/documents/409186/IR-16-03.pdf>

<sup>5</sup> Accessed at: [https://ftp.txdot.gov/pub/txdot-info/energy/impacts\\_energy.pdf](https://ftp.txdot.gov/pub/txdot-info/energy/impacts_energy.pdf)



TxDOT will construct facility improvements that benefit the safe movement of people and goods along the local and national network. These improvements will ensure roadways meet adequate level-of-service needs while maintaining a state of good repair.

The Project will not only provide benefit to freight and energy-related traffic. Local communities are also expected to reap benefits from the improvements included in this project through increased safety, easier access to critical services, fewer delays, and overall improvement of the quality of life in the region.

### III. GRANT FUNDS, SOURCES, AND USES OF PROJECT FUNDS

TxDOT is requesting \$25,000,000 in BUILD grant funds for the Glasscock and Reagan Counties project, 48 percent of the total future project cost. These funds will be used for project design, construction, and project oversight. The tables below as well as the project information form, 424 form, and 424C forms included in **Appendix B** provide detail on the cost, committed and expected funding, federal funding overview, project budget, BUILD funding allocation, and TxDOT’s financial condition and grant management capabilities.

**Table 3. Total Project Cost**

Glasscock County and Reagan County Improvement Project					
Segment	Total Cost	Federal Funds	State Funds	Private Funds	BUILD Grant
SH 158 at SH 137 Grade Separation	\$27,498,798	\$15,398,417	\$1,691,685	\$16,250	\$10,389,446
SH 137 (SH 158 to Glasscock/Reagan County Line)	\$14,724,840	\$4,891,429	\$1,222,857	\$0	\$8,610,554
SH 137 (Glasscock/Reagan County Line to 11.5 mi S of County Line)	\$10,236,608	\$3,389,286	\$847,322	\$0	\$6,000,000
<b>Total BUILD Request</b>					<b>\$25,000,000</b>

**Table 4. Complete Glasscock County and Reagan County Improvement Plan**

Glasscock County and Reagan County Improvement Project				
Segment	From	To	Description	Let Date
SH 158	At SH 137	--	Construct grade separation	2020
SH 137	SH 158	Reagan Co. Line	Widen to add turning lanes at intersections, strengthening pavement, and future fiber installation	2020
SH 137	Glasscock Co Line	11.5 mi S of Glasscock Co. Line	Widen to add turning lanes at intersections, strengthening pavement, and future fiber installation	2020

Budget summaries compiled by TxDOT Engineering and State Budget Departments, July 2018



TxDOT is responsible for the construction and maintenance of nearly 80,000 centerline miles of roadway. Primary funding for these activities comes from traditional sources such as gas tax revenues, vehicle registration fees, federal reimbursements, and local participation. TxDOT has also received funding from non-traditional sources, such as bond proceeds and the federal stimulus programs.

TxDOT has been awarded and managed many grants as part of its overall roadway development and oversight. We are familiar with and have complied with USDOT's processes for grant awards and implementation.

This Project and the comprehensive Texas Energy Sector Rural Improvement Program is necessary to ensure the safety and reliability of the system for the vehicles and drivers on the identified corridors. Rural roadway improvement needs have outpaced Texas roadway infrastructure funding, and while Proposition 1 (discussed later in further detail) has recently secured additional funding revenue for transportation infrastructure, there is an urgent existing need to address the increased demands placed upon rural infrastructure.

## IV. MERIT CRITERIA

### A. SAFETY

The Project will improve safety through:

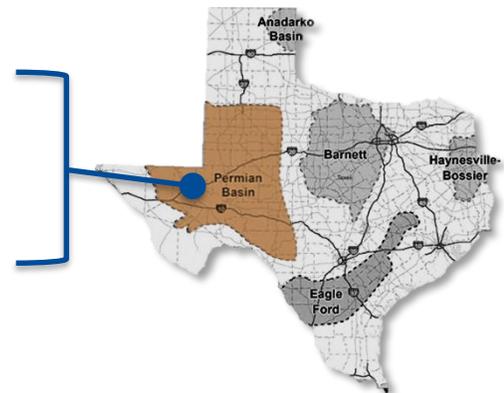
- Reducing congestion on SH 158 currently causing back-up and collisions;
- Reducing conflict points through grade separation of SH 158 at SH 137;
- Widening pavement width on key intersections along SH 137 corridor to allow for safer deceleration and turns by heavy freight;
- Strengthening pavement as detailed in the State of Good Repair criteria section; and
- Adding turning lanes at strategic intersections to separate slow-moving turning traffic and high-speed vehicles

The safety, well-being, and quality of life for those who travel on public infrastructure is of the utmost concern to TxDOT, and this Project addresses a dire need for safety improvements to the corridor and the existing intersection. TxDOT has identified all five of the energy sectors within the state, including the Permian Basin, as areas with high rates of injuries, fatalities, and loss of property based on TxDOT's Crash Records Information System (CRIS).<sup>6</sup>

In 2016, there were approximately 25,300 fatal and serious injury crashes in Texas' six energy sectors, of which almost 1,500 included fatalities.<sup>7</sup> **The Project area has seen an increase of 118% in crashes over only two years (2015 to 2017), which included a fatality.**<sup>8</sup>

Currently, the Permian Basin region accounts for roughly two percent of the overall Texas population but represents a staggering 10 percent of the fatalities on state highways<sup>9</sup>. In 2016, there were 4,212 fatal and serious injury crashes with 289 fatalities occurring within the Permian Basin.<sup>10</sup>

Reported crashes occurred all along the SH 158 and SH 137 corridors. Additionally, there were 44 reported accidents within the project intersection in 2017 (an increase of 42% from 2015), and a fatality occurred at the intersection.



View of Permian Basin

<sup>6</sup> Accessed at: <https://www.txdot.gov/inside-txdot/division/traffic/crash-statistics.html>

<sup>7</sup> <https://www.txdot.gov/driver/share-road/be-safe-drive-smart/energy-sector.html>

<sup>8</sup> Accessed at: <https://cris.dot.state.tx.us/public/Query/app/public/welcome>

<sup>9</sup> Accessed at <https://www.houstonpublicmedia.org/articles/news/2018/05/04/283575/researcher-points-tolegislative-fixes-for-oilfields-crumbling-roads/>

<sup>10</sup> <https://www.txdot.gov/driver/share-road/be-safe-drive-smart/energy-sector.html>

This elevated level of crashes is tied to the surge of energy production in the area. The energy boom is compounding roadway dangers with increased traffic and large trucks on the road. Frequent stops and slow acceleration/deceleration of trucks on these facilities throughout the region cause disruption to traffic flow, impede mobility, and present safety concerns for both the delivery of goods and local travelers.

SH 137 is a two-lane roadway (one travel lane in each direction) with a minimal shoulder that does not allow for safe passing or a safe emergency area. The proposed improvements include dedicated left-turn lanes, and acceleration and deceleration lanes, which together minimize potential conflicts in the corridor with trucks and freight. These improvements will allow through traffic to move more efficiently with fewer impedances and conflict points.

Moreover, the SH 158/SH 137 grade-separated intersection provides a similar positive impact by reducing potential conflicts between heavy trucks and other motorists. A grade-separated interchange removes the existing conflict points between traffic turning on and off SH 137 at slow speeds and the faster traffic on SH 158. Currently, due to delay and back-up, drivers are forced to turn and merge into tight gaps in faster-moving traffic. This Project will result in improved safety and mobility for all motorists at this intersection. Additionally, TxDOT will continue to work with local governments and residents to improve safety in the Permian Basin and other energy sector areas.

TxDOT has crafted and implemented a robust public information campaign to improve safety in the Permian Basin energy sector. This includes educating the public on crash statistics in the area, providing safety tips, and conducting a targeted safety media campaign that includes print materials, billboards, video public service announcements (PSAs), audio PSAs, and utilizing social media. TxDOT continues to coordinate a comprehensive safety program, working with Highway Patrol, safety groups, governments, companies, and subject matter experts in efforts to reduce injuries, fatalities, and economic losses. Specifically, to this Program of Projects, TxDOT has worked with local governments and residents in the Permian Basin area:

- 2016: Participated in ‘Day Without Traffic Fatalities’ after a Road Safety Forum
- 2018: Presented major rehab projects to residents, and encourages all people and companies who travel US 285 to share their input



TxDOT's safety campaign materials

- Collaborated to create safety video for Permian Basin residents available on governmental sites<sup>11</sup> and YouTube
- Developed Energy Sector Safety Campaign Webpage with print and billboards, Video PSAs, and Audio PSAs



*Permian Basin safety video available online*



*Permian Basin safety video available online*

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<sup>11</sup> Accessed at: <https://www.txdot.gov/driver/share-road/be-safe-drive-smart/energy-sector.html>

## **IV. MERIT CRITERIA**

### **B. STATE OF GOOD REPAIR**

The Project will ensure state of good repair through:

- Improving pavement condition on nearly 30 miles of SH 137;
- Upgrading pavement to a level that can withstand heavy freight traffic;
- Improving infrastructure at the existing SH 158 and SH 137 intersection; and
- Ensuring pavement is high quality, has a long life cycle, and reduces overall maintenance costs on the roadways to comply with the Texas Transportation Asset Management Plan.

This Project will improve the condition of infrastructure at an intersection and on a corridor that are long overdue for investment. Pavement on SH 137 is rapidly deteriorating as the corridor was not originally designed for high volumes of heavy freight.

Energy development, production, and distribution are taking a toll on the existing infrastructure that was not designed to meet today’s existing freight loads or volumes. Pipe, sand, and water associated with common energy activities can weigh more than the Empire State Building.<sup>12</sup>

This Project is part of a larger overall asset management effort by TxDOT to maintain and improve rural corridors. More than 1,700 miles of improvements are currently planned by TxDOT which include pavement strengthening, addition of shoulders, and the addition of passing and travel lanes. Upgrading and rehabilitating the existing infrastructure on this corridor will contribute to a state of good repair while strategically planning for economic growth by reducing or eliminating existing mobility barriers.

Extremely heavy loads across the region have begun to take their toll and impede the network’s utility for high-volume transportation. Texas A&M University’s Texas Transportation Institute (TTI) estimates that the total cost of rebuilding the infrastructure as a result of increased energy-related activities is



*TTI field visit image highlighting shoulder and lane pavement conditions, including tight turning radii for large vehicles*



*TTI field visit image highlighting minimal to almost no shoulder and poor lane pavement conditions*

<sup>12</sup> Accessed at: <https://www.houstonpublicmedia.org/articles/news/2018/05/04/283575/researcher-points-to-legislative-fixes-for-oilfields-crumbling-roads>)

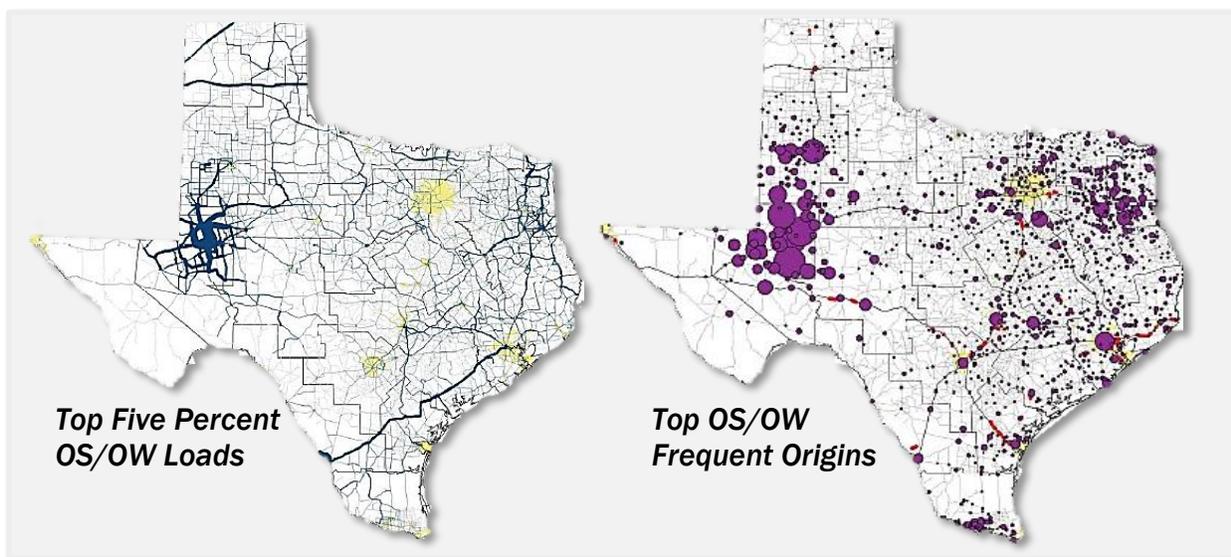
approximately \$1 billion annually to the roadways under TxDOT’s jurisdiction. TTI estimates approximately another \$1 billion annually is necessary for roadways under local jurisdiction.<sup>13</sup>

The improvements to the SH 137 corridor will extend the life of the pavement and contribute to a state of good repair. Furthermore, improvements will be made with high-quality and durable pavement to reduce lifecycle costs of the corridor. The new grade-separated interchange will also be constructed to TxDOT standards to accommodate the high freight volumes and heavy loads that pass through the interchange, including a bridge clearance that conforms to the newly adopted freight network height of 18.5 feet.

Upgrading and rehabilitating the existing rural transportation infrastructure through this Project will support a state of good repair and economic growth while reducing or eliminating existing transportation mobility barriers in the region.

The Permian Basin and Project area is clearly an area that experiences heavy and overweight truck and freight traffic. Oversized and overweight loads experienced throughout the state are shown in **Exhibit 3**; there is a visible density of oversized and overweight loads within the Permian Basin region on roadways such as SH 158, SH 137, as well as Interstates 20 and 10.

**Exhibit 3. Texas Oversized and Overweight Loads**



*TxDOT’s 2017 Freight Plan detailing needs to accommodate oversize and overweight loads*

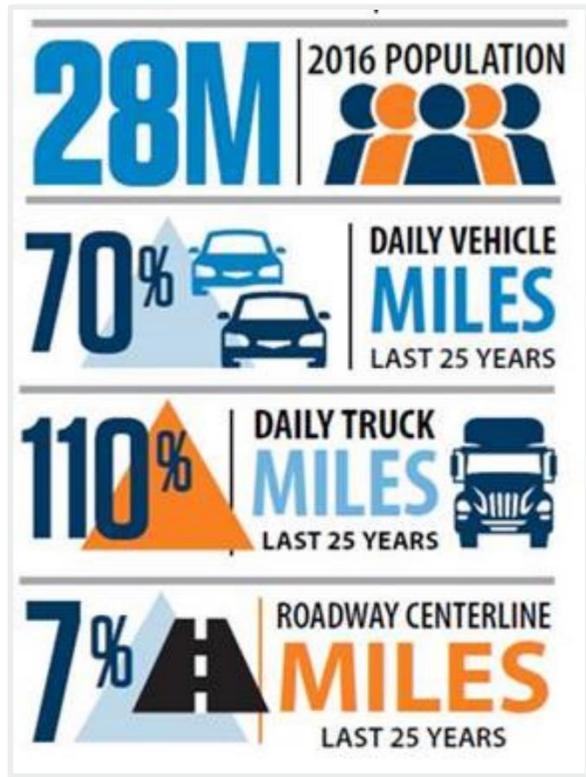
TxDOT maintains over 197,000 miles of Texas highways and right of way, which presents challenges for rapidly-changing pavement conditions within certain areas across the state. The population within Texas has grown by more than 50 percent over the last 25 years.

<sup>13</sup> Accessed at: <https://ftp.dot.state.tx.us/pub/txdot-info/sla/strategic-plan-2015-2019.pdf>

During the same period, daily vehicle miles traveled have increased by 70 percent and daily truck miles traveled have increased by 110 percent on TxDOT maintained roadways, while roadway centerline miles have increased by only seven percent. In addition, Texas moved more than two billion tons of freight in 2016 with more than half of the freight moved by trucks on the state’s highways; freight movement is expected to double by 2045.

One of the overarching goals assigned to TxDOT is the preservation of transportation assets. It is important that the state continues to develop and maintain its system of highways to support the population, vehicle, and freight movement demand on its highways. Highways that are not maintained in a state of good repair increase transportation costs for people and goods. With increased congestion, the cost of travel and goods will increase as well. It is estimated that the trucking industry in Texas incurred \$5.1 billion in congestion costs in 2016.

The Texas Transportation Asset Management Plan<sup>14</sup> details the processes in which the state utilizes life-cycle planning to forecast network-level funding needs to sustain performance of the existing assets and recommend the most cost-effective way to optimize its long-term condition. These methods include using semi-automated procedures for obtaining pavement condition information, forecasting future pavement conditions to recommend optimized pavement work plans and implementing four-year pavement management plans, and standardized and regularly-scheduled bridge inspections to assist in prioritization of structure rehabilitation and replacement. TxDOT has allocated \$1.2 billion in 2018 towards asset preservation activities through its Category 1 (Preventive Maintenance and Rehabilitation) funds, including \$24 million for the San Angelo District with a ten-year budget for the District of \$283 million.



*Changes in Texas Demographics and Transportation System*

<sup>14</sup> The Texas Transportation Asset Management Plan was submitted to FHWA in April 2018

## IV. MERIT CRITERIA

### C. ECONOMIC COMPETITIVENESS

The Project will advance economic competitiveness by:

- Reducing delays and improving travel time reliability anticipated to result in \$62M in truck/passenger vehicle operating costs, \$65M in time savings for all motorists, and \$38M in shipper/logistics costs.<sup>15</sup>
- Eliminating a freight bottleneck at the SH 158/SH 137 intersection through grade separation;
- Reducing congestion for freight and transport in the energy industry;
- Improving travel time reliability for residents commuting to work; and,
- Generally improving traffic flow and reducing delays for an efficient movement of goods in the region.

If the constraints creating delay at the SH 137/SH 158 at-grade intersection are not addressed, bottlenecks will worsen and congestion will increase. Since the energy sector is reliant on efficient transportation of goods, increased delay has a direct impact on the economic vitality of the region. Energy production in the area depends on efficient truck and freight movements throughout the Permian Basin, and particularly to the nearby I-20 corridor and Union Pacific rail line.



*View of SH 137 and SH 158 existing at-grade from the SH 158*

The grade separation at the SH 158/SH 137 intersection, in conjunction with the associated roadway improvements, will increase the efficiency of the movement of goods and people through the region by creating unimpeded grade-separated movement while removing conflicts between heavy trucks entering and exiting these facilities and reducing associated congestion and bottlenecks along the corridors. The existing intersection configuration is underperforming and poses a threat to safety and the movement of goods in the region.

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<sup>15</sup> See BCA Calculation Spreadsheet

The existing delays result in increased costs of doing business in the Permian Basin. This Project and the associated Program have the opportunity to alleviate bottlenecks throughout the region which are causing delays on primary energy sector corridors. **Savings over a 30-year period related to delays and travel time savings is \$65 million.** These savings are realized by the business community as well as residents when transportation costs are reduced for industry and commuters.

TxDOT has engaged in a series of studies and surveys to support the state's initiative to remain competitive in local, national, and international markets. The results from those efforts have further illustrated the need for an efficient network. In 2013 the Corporate Site Survey (an annual research effort to identify the key factors influencing business site location decisions) concluded that eleven of the top 26 site selection factors were related to transportation.<sup>16</sup> Furthermore, highway accessibility has ranked first or second in importance over the life of this study.

Texas has been recognized as the top exporting state in the nation for 16 consecutive years with over \$264 billion in exports in 2017. Texas exports some of the world's top producing commodities, including petroleum and coal products, chemicals, electronic and machinery products, and transportation equipment; many originating within the Permian Basin and reliant on an efficient transportation network to cost-effectively enter the market. An efficient, well-connected, and safe roadway network is necessary not only for the success of the local rural economy in Glasscock and Reagan Counties, but also for Texas and U.S. economy.

Texas feeds the national economy and leads the nation in energy production, primarily from crude oil and natural gas, providing more than one-fifth of domestically-produced energy.<sup>17</sup> As of January 2017, the 29 refineries in Texas process more than 5.6 million barrels of crude oil per day and account for 30 percent of the U.S. refining capacity.<sup>18</sup> Texas also has abundant renewable energy resources and has rapidly developed its wind production leading the nation in wind-powered generation capacity with more than 21,450 megawatts since 2014.<sup>19</sup>

**Exhibit 4** shows the concentration of new wells in the Permian Basin between 2012 and 2015. The energy industry has seen and anticipates continued growth in the region, placing an even greater strain on the existing transportation network. Facilities (including oil wells, gas wells, injection wells, etc.) in the Permian Basin totaled 444 in April 2018, up 113 from the same time in 2017.<sup>20</sup>

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<sup>16</sup> Accessed at: <https://ftp.dot.state.tx.us/pub/txdot-info/freight/one-pagers/freight-and-economic-development.pdf>

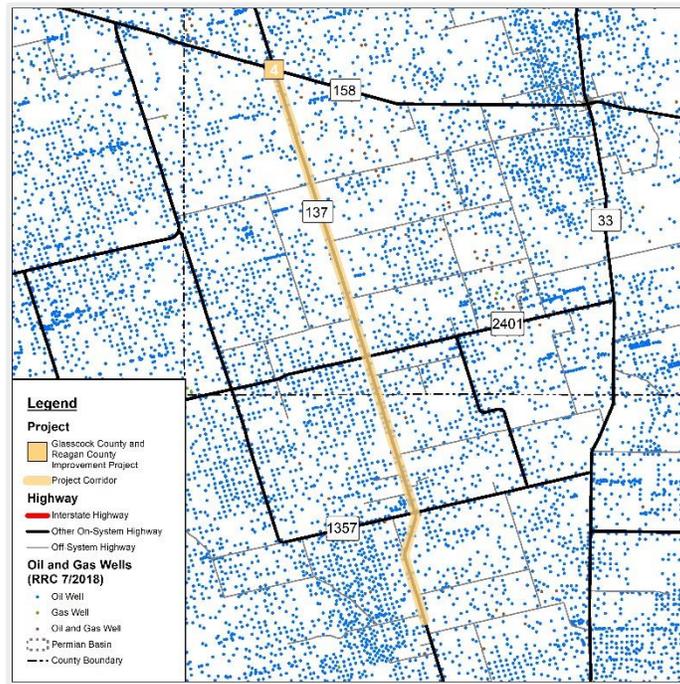
<sup>17</sup> Accessed at: <https://www.eia.gov/state/analysis.php?sid=TX>

<sup>18</sup> Accessed at: <https://www.eia.gov/state/?sid=TX>

<sup>19</sup> Accessed at: <https://www.eia.gov/state/?sid=TX>

<sup>20</sup> TxDOT press release, 2018.

**Exhibit 4. Oil and Gas Wells in Project Area<sup>21</sup>**



**State energy facts at a glance:**



*Five of the nation's 31 oil basins are in Texas*



*Seven of the nation's 26 natural gas hubs are in Texas. Two are in the Permian Basin*



*In total, 181 of 551 natural gas processing plants are located in Texas, and 81 located in the Permian Basin*



*Of the 1,043 wind power plants nationwide, 152 are in Texas, many of which are in the Permian Basin.*

It is imperative that the resources within the state of Texas are mobilized and distributed throughout the US in a reliable and cost-efficient manner. The energy sector relies on the transportation network to provide the link between the place of origin and the end user. To do so, the transportation network must be well-connected and reliable. Localized congestion on ranch-to-market roads and state highways impedes the flow of the state's resources and slows the necessary freight movement. While the energy sector is planning to significantly increase output, the industry is concerned about capacity and congestion throughout the

<sup>21</sup> <http://www.rrc.state.tx.us/about-us/resource-center/research/data-sets-available-for-purchase/digital-map-data/>

Permian Basin. These are real concerns for people relying on the movement of basic goods and energy.

Whether it is fossil fuels, clean energy, electric power, hydrogen, or fuel cells, these energy sources heat and cool homes, assist with the production of food and goods, fuel cars, power buses, and support the nation's requirements to maintain a thriving economy. Instability in the energy market world-wide can impact the supply, demand, and price point of energy, which impacts a thriving economy and quality of life.

The ability for the Permian Basin region to efficiently produce and transport energy on roadways is critical from a national security standpoint to mitigate market changes throughout the global economy. Energy production can also increase cooperation with trade partners and contribute to a stable economy.

## VI. MERIT CRITERIA

### D. ENVIRONMENTAL PROTECTION

The Project will support environmental protection by:

- Reducing congestion and congestion-related vehicle emissions, thus improving air quality;
- Supporting the advancement of renewable energy, particularly wind energy production;
- Investing in rural infrastructure to ensure all residents have equitable mobility; and
- Reducing congestion and congestion-related vehicle emissions anticipated to result in a savings of approximately \$700,000 in environmental costs.<sup>22</sup>

The Project and adjacent roadway improvements would result in environmental benefits by reducing congestion and congestion-related emissions associated with heavy trucks idling during regular traffic delays. By improving mobility within the region, air quality impacts associated with traffic congestion will be reduced as congestion is reduced or eliminated through the grade-separation and roadway improvement projects.

Texas produces energy from a broad range of sources including wind energy. Based on the American Wind Energy Association (AWEA) most recent market report in Q4 of 2017, Texas greatly surpassed all other states for total wind capacity and new 2017 installations as shown in **Exhibit 5**.<sup>23</sup> Many of these wind farms are located in the Permian Basin, utilizing the state and rural transportation infrastructure. SH 137 has been identified as a recommended route for turbine transportation based on shipping points and nearby wind farms.<sup>24</sup> The Bearkat wind farm, which went online in 2017, is located just off of SH 137 with 57 windmills that represent almost 200 MW of capacity.

Similar to the heavy and oversized loads in other energy sectors, freight traffic for wind farms causes great strain to the infrastructure and network from heavy loads, slow and oversized loads, congestion, and additional traffic. Corridor improvements and a grade-separated SH 137/SH 158 intersection will help to ensure the safety of other motorists and adequate facility needs for wind turbine transportation.

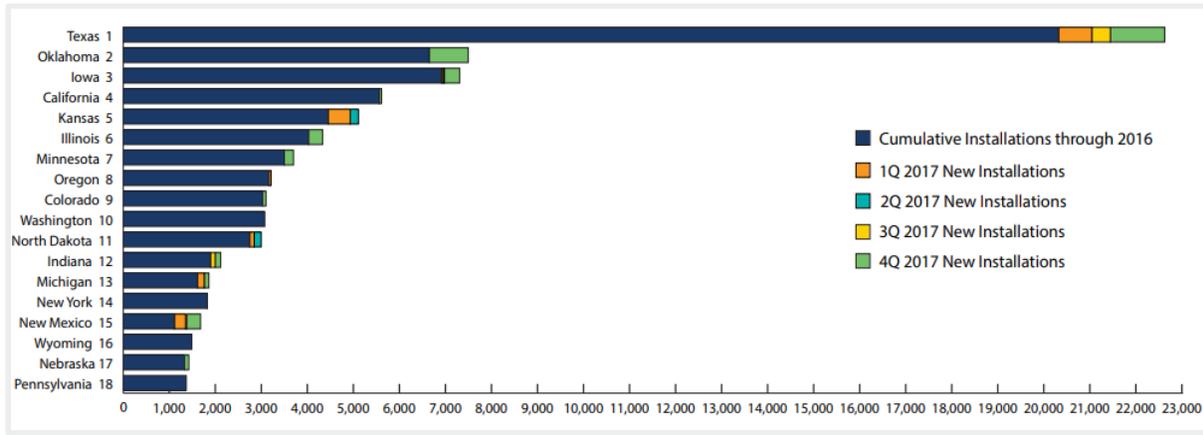
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<sup>22</sup> See BCA calculation spreadsheet

<sup>23</sup> Accessed at: <http://awea.files.cms-plus.com/FileDownloads/pdfs/4Q%202017%20AWEA%20Market%20Report%20Public%20Version.pdf>

<sup>24</sup> Accessed at: [http://www.caee.utexas.edu/prof/bhat/ABSTRACTS/Wind%20\\_Turbines.pdf](http://www.caee.utexas.edu/prof/bhat/ABSTRACTS/Wind%20_Turbines.pdf)

**Exhibit 5. Top Wind Power Capacity States, 2017**



Additionally, natural gas is an important product collected from the Permian Basin region. Thanks to the increased use of natural gas, US energy-related emissions of CO<sub>2</sub> from power generation are at their lowest point in nearly 30 years. The environmental benefits associated with natural gas go well beyond CO<sub>2</sub> reductions and include reductions in NO<sub>x</sub>, SO<sub>2</sub>, and other emissions.<sup>25</sup>

TxDOT implements an Environmental Management System (EMS) as part of its core business processes used to manage environmental considerations during all phases of road construction from concept through final construction. The EMS program is built on the continuous improvement model of Plan, Do, Check, and Act.

The objective of the EMS is to develop and implement processes that focus on improving environmental compliance and performance so that TxDOT can remain fully compliant with environmental legal requirements.

These processes include:

- Compliance with all applicable environmental laws and regulations, minimizing pollution and associated risks to the environment, and supporting an ongoing process for continual improvement in TxDOT environmental performance; and,
- Communicate environmental management practices and compliance requirements to all affected TxDOT personnel, consultants, contractors, and other participants in TxDOT’s road construction operations.

<sup>25</sup> Accessed at: <http://www.hydraulicfracturing.com/#/?section=air-emissions>

## **IV. MERIT CRITERIA**

### **E. QUALITY OF LIFE**

The Project will improve quality of life by:

- Reducing congestion and improving travel time reliability;
- Improving mobility for rural residents;
- Improving safety of motorists, including truck drivers and residents;
- Reducing congestion anticipated to result in a savings of \$62M in truck/passenger vehicle operating costs, \$65M in time savings for all motorists, and a \$38M savings in shipper/logistics costs;
- Improving safety conditions with an anticipated result in a \$98M savings in safety costs; and,
- Designing to preserve right of way for fiber network.

Improving quality of life for area citizens is a major driving force behind the implementation of the Project. Due to the rural nature of the region, area residents have limited roadway facility options for traveling within and around the region, and they currently experience significant travel delays on these limited facilities as a result of growing energy sector activity. These delays result in negative impacts not only to commute times but also negative impacts to accessing healthcare and other critical destinations in the region.

SH 158 and SH 137 are critical links to larger cities (Midland/Odessa area and the city of San Angelo) where rural residents seek health care. These roads also serve as connectors for rural residents in and between Garden City, Big Lake, and Barnhart.

Existing congestion along SH 137 creates a barrier to accessing these facilities, particularly in emergency situations. Long travel times due to congestion, particularly in an emergency, are an unacceptable risk for residents and travelers in the area. Reducing congestion would improve access to nearby medical facilities and result in more reliable response times for emergency personnel.

If local congestion increases and bottlenecks are not resolved, local commuter traffic and regional through traffic will experience even longer travel times. This Project, as part of the overall Program, will create reliable redundancy and access to the I-10 and I-20 corridors,



*Delay occurs at all times as shown with INRIX  
Typical Traffic on a Sunday at noon*



*Example of common delay due to at-grade crossing for freight, workers, rural residents, and thru traffic*

two of Texas' primary freight corridors and of particular importance to the National Highway Freight Network and energy industry. The Project will improve the condition and efficiency of these corridors and will enhance quality of life, roadway safety, and economic development.

Safety is another major quality of life indicator, and as discussed in the safety section of this application, the proposed grade separation and roadway improvement projects would result in fewer opportunities for conflict between heavy freight trucks and everyday motorists. Through the implementation of the Project improvements, there will be an increase in safety along these corridors for local residents, heavy trucks, and the general public passing through the area, as well as providing reliable transportation connectivity to jobs.

Furthermore, preservation of right of way (ROW) for anticipated fiber installation helps to bridge the 'digital divide' that many rural communities experience throughout the nation. Broadband access has transitioned from a luxury to a necessity for full participation in the economy and society.

## IV. MERIT CRITERIA

### F. INNOVATION

The Project will deploy an innovative approach by:

- Utilizing an innovative funding tool, one that provides incremental financing from the energy sector;
- Relying on TxDOT's successful deployment of several innovative technologies and initiatives across the state; and
- Preserving right-of-way for fiber optic.

The Project will be designed to include fiber in the grade-separated intersection during utility adjustments and will preserve ROW for future fiber as part of the associated roadway improvements. The planning for the future installation of fiber at the time of construction will save costs through removing possible utility impacts for new-location installation. Broadband access has transitioned from a luxury to a necessity for full participation in the economy and society, and there is a nation-wide effort to bridge the 'digital divide' in rural communities. Cooperatives Connect Rural America, a co-op, has seen great success in partnering with government organizations to bring fiber services to several rural communities in Texas. TxDOT has also coordinated with out to other utility service companies within the area, including Atmos Energy and AT&T, to plan the possible installation of fiber in the project limits.

TxDOT leads 32 municipal and regional partners in a shared interest in mobility and safety challenges related to automated and connected vehicles on public roadways. The Texas Automated Vehicle Proving Ground Partnership was one of ten nationally-designated sites and the only statewide consortium to offer controlled environments for the automated vehicles to be assessed. Research is in progress throughout the state for future use of automated vehicles, which may one day use this project's infrastructure. TxDOT is at the forefront of several other innovative technologies including sensor technology, origin/destination data gathering, and mobile cameras used in obtaining digital photographs of vehicles on state highways to improve the detection, mitigation, and documentation of safety risks.

TxDOT is a 21<sup>st</sup>-century organization and continually looks to enter innovative funding arrangements and implement innovative transportation technologies to improve the mobility of Texas residents and those traveling throughout the state.

Proposition 1 funding is an innovative funding tool that provides incremental financing from the energy sector to fund additional roadway improvements or provide maintenance to keep the State's roadway in a state of good repair. Proposition 1 funding is used throughout the region as an ongoing renewal of the regions that have challenges due to the economic drivers that create those very challenges. The Non-Federal Revenue section within this application detail the effectiveness of the Proposition 1 funding.



TxDOT has an overall innovative holistic program approach to the implementation of improvements and maintenance within the Energy Sector areas. In 2012, TxDOT formed the Task Force on Texas' Energy Sector Roadway Needs to develop recommendations for addressing the State's energy-related infrastructure issues. The task force was comprised of representatives from State agencies, local governments, and the energy industry.

Ultimately, the design of the improvements will guide how effective the Project and larger Program are at achieving TxDOT's goals of safety, economic competitiveness, community livability, and state of good repair. TxDOT will consider additional innovative options within the design that may increase safety, such as smart signals, and maintain the state of good repair while providing the competitiveness that the region needs to thrive.

## IV. MERIT CRITERIA

### G. PARTNERSHIP

The Project and Program have received an overwhelming level of support including:

- Letters of support from a broad, statewide range of local, state, and federal elected officials;
- Letters of support from major industry associations and private corporations; and
- Public support through the passage of Proposition 1 funding for allocation into the overall Program.

Collaboration between TxDOT and local, regional, and statewide stakeholders within the Permian Basin region has been ongoing for many years. Because of this collaboration, a broad range of partners and stakeholders have offered their support for the overall Program and the Project.

In March 2012, TxDOT formed the Task Force on Texas' Energy Sector Roadway Needs (Task Force) to develop recommendations for addressing the state's energy-related infrastructure issues. One of the task force's primary challenges was to identify innovative funding strategies for the unique road maintenance and repair needs of the energy sector regions. Additionally, the group focused on ways to raise public awareness around driver safety in these regions.

Over the course of a year, the task force gathered data from transportation partners around the state and held numerous meetings to assess the options. As a result of the Task Force's collaboration, TxDOT has repaired and rehabilitated many segments of key energy corridors throughout the state and is leading ongoing efforts to strengthen pavements and provide safety enhancements on key roadways in energy sector regions.

The task force was comprised of representatives from state agencies, local governments and the energy industry:

- Texas Department of Transportation (TxDOT)
- Texas Department of Public Safety (DPS)
- Texas Commission on Environmental Quality (TCEQ)
- Railroad Commission of Texas (RRC)
- Texas Department of Motor Vehicles (TxDMV)
- Texas Association of Counties (TAC)
- America's Natural Gas Alliance (ANGA)
- Association of Energy Service Companies (AESC)
- Midland-Odessa Transportation Alliance (MOTRAN)
- Texas Alliance of Energy Producers
- Texas Competitive Power Advocates (TCPA)
- Texas Farm Bureau (TxFB)
- Texas Independent Producers and Royalty Owners Association (TIPRO)

- Texas Trucking Association (TxTA)
- Texas Oil and Gas Association (TxOGA)
- Texas Pipeline Association (TPA)
- The Wind Coalition

Demonstrating strong statewide support for awarding BUILD Grant funds to the Program is a letter signed by 21 members of the Texas Congressional Delegation, including all five House Committee Chairmen from Texas. Recognizing the importance of this funding opportunity to Texas, U.S. Senate Majority Whip John Cornyn, the Chairman of the Texas Railroad Commission and the Chairman of the Texas Freight Advisory Committee have also provided letters of support. Additional letters are included from eight local and state elected officials and 14 industry associations and private companies.

- Anadarko Petroleum Corporation
- Association of General Contractors-Texas
- MOTRAN Alliance
- Permian Basin Petroleum Association
- Permian Basin Road Safety Coalition
- Shell Exploration and Production Company
- Texas Alliance of Energy Producers
- Texas Association of Counties
- Texas Association of Manufacturers
- Texas Association of Realtors
- Texas Farm Bureau
- Texas Oil and Gas Association
- Texas Pipeline Association
- Texas Sheep and Goat Raisers Association
- Royal Dutch Shell

These letters of support are included as **Appendix C** to this application. In addition to simply lending support for the project, an energy sector business and the Permian Basin Road Safety Coalition are participating directly by allocating a monetary contribution to the overall Program.





*TxDOT works with market experts to ensure impacts of economic development are mitigated and to focus efforts on transporting resident to jobs generated by economic growth*

On November 4, 2014, 80% of Texas voters approved a ballot measure known as Proposition 1, which authorized a constitutional amendment for transportation funding. Under the amendment, a portion of existing oil and natural gas production taxes (also known as severance taxes) would be divided evenly between the Economic Stabilization Fund (ESF) and the State Highway Fund (SHF). Pursuant to Section 49-g(c), Article III, Texas Constitution, the funds may only be used for "constructing, maintaining, and acquiring rights-of-way for public roadways other than toll roads." Thus, the project facilities met the qualification threshold and were allocated funds accordingly. Between 2015 and 2018, TxDOT has allocated over \$48 million of Proposition 1 funds towards the various roadway improvements in the San Angelo District with a proposed \$12M in additional Proposition 1 funds planned for allocation in 2019.

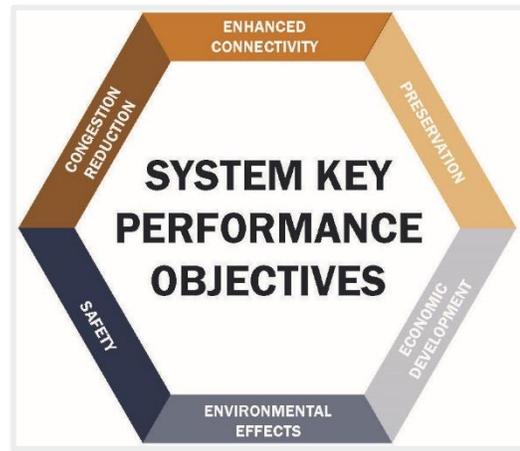
The funds received from the energy sector, through both Proposition 1 and the additional project-specific funds, as well as the broad stakeholder support show a strong partnership and collaboration between the energy sector and TxDOT. The energy sector understands the impact it has on the region, both positively and negatively, and has partnered with TxDOT to identify ways that regional transportation infrastructure is not only maintained properly and upgraded appropriately through participating in funding programs and coordinating efforts with the Permian Road Safety Coalition.

**LEVERAGING NON-FEDERAL REVENUE FOR THE TEXAS ENERGY SECTOR RURAL IMPROVEMENT PROGRAM PROJECTS**

On November 4, 2014, 80 percent of Texas voters approved a ballot measure known as Proposition 1, which authorized a constitutional amendment for transportation funding. Under the amendment, a portion of existing oil and natural gas production taxes (also known as severance taxes) would be divided evenly between the Economic Stabilization Fund (ESF) and the State Highway Fund (SHF) and used to construct, maintain and acquire right of way for public roads.

Between 2015 and 2018, TxDOT has allocated \$200 million including over \$48 million of Proposition 1 funds towards the various roadway improvements in the San Angelo District. An additional \$240 million in total investment is planned in the next ten years.

In November 2015, Texas voters approved a second ballot measure, Proposition 7, adding an additional non-Federal revenue stream to TxDOT’s funding. Proposition 7 sets aside a portion of the state sales and use tax for transportation, as long as overall sales tax receipts reach a certain benchmark. Additionally, a percentage of revenue growth from taxes on motor vehicle sales and rentals will be allocated for transportation projects beginning in 2020.



*TxDOT’s metrics used when budgeting the statewide transportation improvements projects, ensuring revenues are used on projects for the best return on investment, and have the greatest impact on rural and urban residents*

**Both Proposition 1 and Proposition 7 qualify under the BUILD program as newly secured sources of revenue and help to leverage state funds against federal funds.**

*“Approving Proposition 1 not only will help fund highways and roads but will help maintain Texas’ economic competitiveness and save and add jobs.” – Austin American-Statesman<sup>26</sup>*

## V. PROJECT READINESS

With the help of BUILD grant funding, the Glasscock County and Reagan County Improvement Project is expected to obligate funds by May 2020, well in advance of the grant obligation deadline, and will be fully constructed by the end of 2022.

TxDOT intends to improve the at-grade intersection at SH 137 and SH 158 by constructing an overpass for SH 158 over SH 137 and improving the at-grade intersection for the remaining traffic. Schematic drawings have been prepared for the SH 137/158 grade-separated intersection. The Project shall include:

Grade separation:

- Two 12-foot lanes in each direction on SH 158 with 10-foot outside shoulders,
- Two 12-foot lanes in each direction with turning lanes on SH 137,
- Pavement design to accommodate current and future vehicle and truck requirements,
- Utility adjustments and storm sewer/culvert installations,
- Roadway safety lighting and bridge underpass lighting,
- Driveway installations, and

<sup>26</sup> Accessed at: [https://www.mystatesman.com/news/opinion/support-road-funding-proposition/mYIE12RkAqUn1gXubN308K/?icmp=statesman\\_internallink\\_invitationbox\\_apr2013\\_statesmanstbtomystatesmanpremium#66175da1.3569926.735483](https://www.mystatesman.com/news/opinion/support-road-funding-proposition/mYIE12RkAqUn1gXubN308K/?icmp=statesman_internallink_invitationbox_apr2013_statesmanstbtomystatesmanpremium#66175da1.3569926.735483)



- ROW acquisition as required for improvements.

SH 137 improvements:

- Additional turning lanes at critical intersections,
- Pavement design and rehabilitation to accommodate current and future vehicle and truck requirements, and
- Utilities and culvert installations with safety end treatments, as required.

Improvements for the Project shall adhere to TxDOT’s Roadway Design Manual, Bridge Design Manual, Hydraulic Design Manual, and ROW Utility Manual as design progresses and will follow processes set in the TxDOT Plans, Specifications, & Estimates Preparation Manual.

The SH 137/SH 158 proposed intersection improvements have been quantified based on the schematic drawings. For the purposes of the improvements along SH 137, appropriate levels of design and associated quantities were determined to adequately determine construction costs. Current cost estimates have been detailed using available information on current pricing from average low bid unit prices for determined unit quantities. A contingency level of 20% has been provided for the construction of the grade separation and roadway portions of the Project as appropriate for the level of design.

Project Schedule

The project schedule includes the major project milestones for engineering and design completion, ROW acquisition and permitting, and construction. The schedule demonstrates that the project stratifies funding obligation and construction deadlines required by the BUILD grant program. The schedule allows adequate time for procurement, reviews, and contingency. With BUILD grant funding, the Project will be fully constructed in 2022 with the SH 137 improvements completed in 2021.

**Exhibit 6. Glasscock County and Reagan County Improvement Project Schedule (Grade Separation)**

Work Phase	2018	2019	2020	2021	2022
Categorical Exclusion Designation Date	◆				
Right-of-Way Design	■				
Final Design (Milestone)		◆			
Right-of-Way Acquisition Complete (Milestone)		◆			
Construction Begins			■	■	■
Project Completion (Milestone)					◆



**Exhibit 7. Glasscock County and Reagan County Improvement Project Schedule (SH 137 Improvements)**

Work Phase	2019	2020	2021
Categorical Exclusion Designation Date	◆		
Final Design (Milestone)	◆		
Right-of-Way Acquisition Complete (Milestone)	N/A		
Construction Begins		■	
Project Completion (Milestone)			◆

Required Approvals – Environmental Clearance

The project has followed the environmental process and portions of the project have completed the necessary National Environmental Protection Agency (NEPA) clearance.

The grade separation project at SH 158 and SH 137 has followed the environmental process and portions of the project have completed the necessary National Environmental Protection Agency (NEPA) clearance. Environmental documentation completed to date is available upon request. This project contains no jurisdictional waters of the U.S., and this location does not support habitat for any federally listed species. Habitat that may support state species of greatest conservation need will be surveyed and followed with the appropriate TPWD coordination. Any affected environmental impacts will be addressed in NEPA process (in-progress). There are no historic or cultural resources near this project’s footprint.

The Glasscock County roadway improvements and grade separation project is included as part of the energy corridor priority projects. The grade separation project at SH 158 and SH 137 in Glasscock County is listed in the 2019 – 2022 Statewide Transportation Improvement Program. The roadway projects will be added to the 2019 – 2022 Statewide Transportation Improvement Program once they are fully funded. Both the roadway projects and the grade separation project have construct authority authorized by the 2019 Unified Transportation Program.

The NEPA clearance process for the SH 137 roadway improvement projects will be conducted in 2019, and will achieve NEPA clearance by August 2019. The SH 137 roadway projects will include reconstruction of existing roadway and as such should only minimally disturb any vegetation or habitat of concern. Any affected environmental impacts will be addressed in NEPA process. There are no historic or cultural resources near this project’s footprint.

All required state and local approvals as well as associated public engagement will be completed in advance of Project clearance.

Assessment of Project Risks and Mitigation Strategies

The Project has several risks that are typical of any project of this type and magnitude. TxDOT has been very successful in mitigating project risks, and one of the key factors contributing to that success is the implementation of a risk management process that

identifies potential risks to the project at a very early planning stage and identifies mitigation strategies to manage each risk element. The process tracks each risk element as the project moves along its development phases. Potential risks and mitigation strategies for the project are outlined below.

- ROW: All needed ROW for the construction of the Project has not been acquired for the grade separation. This is considered a medium risk considering the length of the ROW acquisition process and the potential for increasing real estate values. Additional ROW needs are not anticipated for the SH 137 roadway improvements.
- NEPA: The corridor has not received NEPA clearance. Categorical Exclusions are anticipated by August 2018 for the grade separation and August 2019 for the SH 137 improvements. This is a low-level risk since other adjacent projects have been cleared in similar timeframes.
- Design effort: The final design is not completed and is anticipated to be complete for the grade separation in May 2019 and for the SH 137 improvements by November 2019. This is considered a low-level risk with TxDOT's familiarity with these types of design efforts and few known challenging design elements.

## VI. BENEFIT COST ANALYSIS

A Benefit-Cost Analysis (BCA) was conducted for the Glasscock County and Reagan County Improvement Project in accordance with 2018 USDOT BCA Guidance. The project includes grade separation at SH 158 and SH 137, SH 137 from SH 158 to Reagan County Line, and SH 137 from Glasscock County Line to 11.5 miles south of Glasscock County Line.

**Based on input data, the Glasscock County and Reagan County Improvement Project has a B/C ratio of 1.89.** A Benefit/Cost (B/C) ratio above 1.0 is considered favorable, meaning that the life-cycle benefits of a project exceeds the estimated costs over the same period. See **Appendix D** for details on the B/C ration.

Based on input data, project benefits and costs were calculated for the project. Costs include construction and non-construction costs such as operating/ maintenance expenses and residual value. Project benefits classes include operating cost savings, value of time savings, crash cost reductions, logistics cost savings, and emission reductions (environmental benefits).