



# U.S. Trade Connection at Eagle Pass Project

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FY 2017 TIGER

October 16, 2017

## Executive Summary

The U.S. Trade Connection at Eagle Pass Project will create American jobs, assist with economic and trade growth, and enrich the quality of life for Texas and the U.S. The project will improve the fluidity, efficiency, and safety of railroad operations and trade flows at an existing chokepoint between the U.S. and Mexico at Eagle Pass, Texas. The project will also reduce highway congestion and traffic, increase highway safety, reduce air emissions, and extend the life of public roadway infrastructure without placing costly burdens on shippers or the public.

The U.S. Trade Connection at Eagle Pass Project at a glance:

- \$9.9 million TIGER grant request
- Public-Private Partnership between the Texas Department of Transportation (TxDOT), Union Pacific Railroad (UP), and BNSF Railway (BNSF), a trackage rights tenant, that will provide 50 percent private funding (or \$9.9 million) of the \$19.8 million project cost
- Innovative solution supporting trade growth in a rural area
- An approximately 3-mile shovel-ready project to construct a second main track at Eagle Pass, Texas, on UP
- Supports increased U.S./Mexico trade
- Rapidly growing international border crossing
- Enables modal shift to rail from truck
- Enables rail capacity increase of 25 percent
- Fosters economic competitiveness and industry development
- Enhances global economic trade growth in a broad market basket of freight commodities
- Improves livability and safety of at-grade crossings in a rural area
- Reduces greenhouse emissions, and supports energy independence
- Broad support from multiple stakeholders, including partners, freight customers, and local county, city, and state governments and their representatives

Table ES-1: Outcomes and Benefits  
(Discounted at 7 percent, in 2016 \$)

| MERIT OUTCOMES  | BENEFITS (\$)  |
|---|----------------|
| Shipper Cost Savings from Truck to Rail Modal Diversion                       | \$11,306,845   |
| Avoided Emission Costs from Truck to Rail Modal Diversion                     | \$2,662,099    |
| Improved Safety and Avoided Accident Costs from Truck to Rail Modal Diversion | \$48,268,418   |
| Avoided Pavement Maintenance Costs from Truck to Rail Modal Diversion         | \$5,917,299    |
| Travel Time Cost Savings from Shorter Grade Occupancy Time                    | \$3,668,091    |
| Vehicle Operating Costs Savings from Shorter Grade Crossing Occupancy Time    | \$236,938      |
| Emissions Cost Savings from Shorter Grade Crossing Occupancy Time             | \$6,029        |
| Residual Value of Capital Assets  | \$1,132,321    |
| Operations and Maintenance (O&M) Costs  | (\$202,053)    |
| Lifecycle/Rehabilitation Costs  | (\$214,336)    |
| Capital Costs   | (\$16,137,462) |
| Total Benefits  | \$72,781,650   |
| Net Present Value   | \$56,644,188   |
| Benefit-Cost Ratio  | 4.51           |
| Return on Investment (%)  | 351%           |
| Payback Period (Years)  | 2.62           |
| Internal Rate of Return (%)   | 31.7%          |

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## 1. Project Description

The Texas Department of Transportation (TxDOT) has partnered with Union Pacific Railroad (UP) and BNSF Railway (BNSF) for the U.S. Trade Connection at Eagle Pass project. This project will increase the export of American products from mines, farms, and factories, and create jobs, opportunity, and wealth in America. The U.S. Trade Connection at Eagle Pass project increases exports by removing a railroad bottleneck at Eagle Pass, Texas, which currently restricts the

Figure 1-1: Eagle Pass, Texas



Source: Union Pacific Railroad

number of trains hauling export goods daily to global trading partners. When funded and constructed, the U.S. Trade Connection at Eagle Pass project will enable UP and BNSF to move 25 percent more daily trains carrying exported goods due to the additional infrastructure and the operational efficiencies achieved through construction as well as reduced idling times for trains. The resulting operational efficiencies will facilitate improved train throughput with parity and equal access to the Mexican border crossing at Eagle Pass. Ensuring that parity is achieved through this additional infrastructure is critical to BNSF's support for this project. Shifting freight modes from truck to rail will allow the project to simultaneously enable congestion relief, reduce highway maintenance costs, and lower accident costs on U.S. highways.

The project provides 1.6 miles of new track adjacent to the existing main track, and improves 1.0 miles of existing yard track to improve the handling of main line and yard trains. The project is designed to minimize impacts to adjacent property owners along the alignment, and provide improvements to eight highway-rail at-grade crossings. Significant improvements to the area's storm and rainwater drainage network will be included so that the new railroad track will not be subject to delays or interruptions from flooding, and to avoid drainage impacts on neighbors.

The U.S. Trade Connection at Eagle Pass project will enhance the value and capacity of the significant private-sector investments that have already been made. These investments include UP's construction of a railcar cleaning facility just north of Eagle Pass, a new track siding, a train staging area, and installation of signaling that improves train speed, capacity, and safety. UP is also investing in facilities that will continue to improve train capacity north of Eagle Pass, such as new staging tracks, a new railcar repair facility, and a new U.S. Customs and Border Protection (CBP) secondary inspection facility adjacent to the new

tracks. These projects demonstrate UP's strong commitment to increasing capacity at the Eagle Pass border crossing.

### **1.1 *The Opportunity***

Rail constraints at Eagle Pass crossing limits the number of trains that can move across the border. Increasing train volume has created the need to increase rail capacity. New rail infrastructure and its accompanying operational improvements will increase track capacity and alleviate this constraint.

The construction of the second main track provides the needed rail capacity to run higher volumes of trains and ensures equal dispatch commitments are honored as provided for in the conditions and agreements arising out of the merger between Union Pacific and Southern Pacific (UP-SP Merger). Additionally, the new infrastructure will eliminate disruptions to through-border train traffic (when existing rail-served industries are switched or otherwise occupied by UP and BNSF), because one main track will always remain open and available to receive trains. Both UP and BNSF operate on the main line, and this second main line will allow trains to move north and south more fluidly. This ability to move in parallel enhances the ability of international freight trade traffic to keeping moving in this congested border gateway. Railroad signal improvements combined with the additional main track will create operational efficiencies allowing for increased fluidity in freight movements to and from Mexico at this vital international border crossing. The U.S. Trade Connection at Eagle Pass project also complements recent UP and BNSF projects and infrastructure investments already completed in the area.

## **2. Project Location**

This project is located in the Rio Grande Valley in southern Texas along the U.S.–Mexico international border at Eagle Pass, one of six major rail gateways between the U.S. and Mexico. The UP Eagle Pass Subdivision connects the border crossing at Eagle Pass to the UP Del Rio Subdivision and the broader North American freight rail network at Spofford, Texas, approximately 35 miles to the north. At the border UP and BNSF (through rights originally established as a result of the UP-SP Merger) interchange at the border with Ferromex (FXE), and continue to southern destinations throughout Mexico. **Figure 2-1** shows the Eagle Pass area including connections to the national freight rail network.

**Figure 2-2** shows the project location with Eagle Pass.

Figure 2-1: Eagle Pass, Texas – Transportation Map

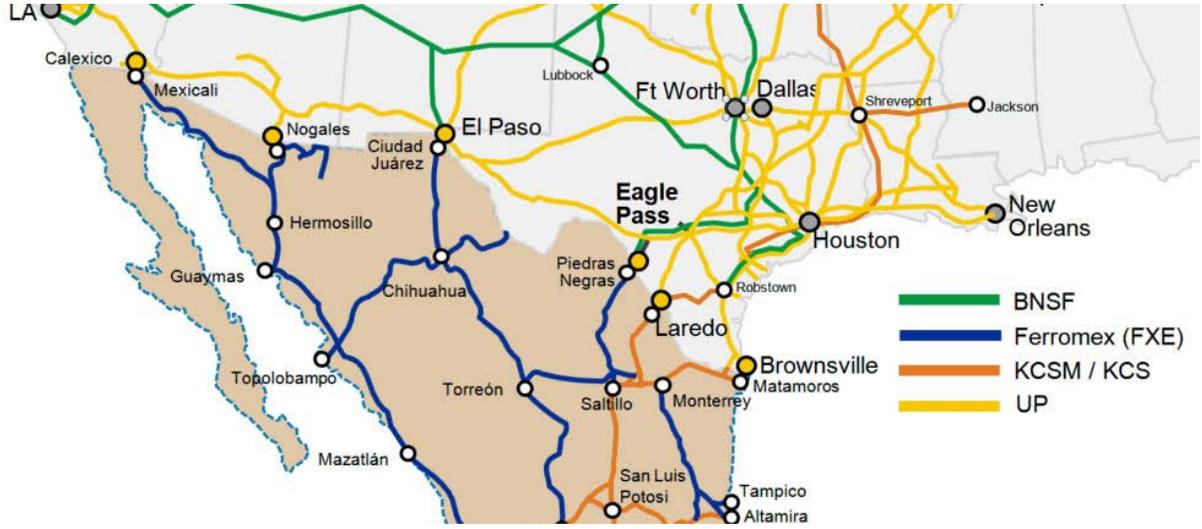


Figure 2-2: Project Location



### 3. Project Parties

TxDOT is serving as the primary sponsor for this application, and is acting in partnership with UP. In addition, a list of project supporters can be found in Section 6 with their Letters of Support located in **Appendix A**.

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*Texas Department of Transportation (TxDOT)*  
Project Sponsor - TxDOT will serve as the grant recipient, and will be responsible for project implementation. TxDOT has helped connect Texas communities to commerce and people to opportunity by building and maintaining the state's transportation network.

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*Union Pacific Railroad (UP)*  
UP is the *Project Initiator and owner of the track and right-of-way*. UP will assist TxDOT in engineering design, construction, and operations. UP is a major Class I railroad serving Texas and 22 other U.S. states.

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*BNSF Railway (BNSF)*  
BNSF is a *Project Partner*. BNSF would provide financial support to the project consistent with the terms of the 1996 UP-SP Merger Settlement Agreement and its resulting trackage rights agreement, which is the source of its rights to utilize the railroad. BNSF is a major Class I railroad serving Texas and 27 other U.S. states and three Canadian provinces.

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## 4. Grant Funds and Sources and Uses of all Project Funds

### 4.1 Project Costs and Funding Sources

TxDOT and local parties strongly support the U.S. Trade Connection at Eagle Pass project. The state lists this project as a high priority in both its 2016 State Rail Plan and 2016 Freight Mobility Plan.<sup>1,2</sup> The U.S. Trade Connection at Eagle Pass project was identified as providing Class I railroad capacity, as well as providing security improvements for the U.S.

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<sup>1</sup> Texas Department of Transportation (TxDOT), 2016 Texas State Rail Plan, Chapter 4, page 4-10, <http://www.txdot.gov/government/reports/texas-rail-plan.html>. Accessed September 29, 2017.

<sup>2</sup> TxDOT, 2016 Texas Freight Mobility Plan, Appendix G, Page G2-3, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

Customs and Border Patrol (CBP). To leverage and maximize federal funding, UP committed to privately funding \$9.9 million of the project, which represents 50 percent of the total funds needed to complete the project. TxDOT and UP are requesting \$9.9 million in TIGER grant funding to complete this shovel-ready project. BNSF is also a key stakeholder who supports this project; the railroad has trackage rights over UP, as a result of the UP-SP Merger, and will be a beneficiary of the proposed enhancements.

**Table 4-1** shows the commitment of matching funds and the amount of TIGER funding necessary to complete the project. **Table 4-2** summarizes the uses of project funds broken down by major activities. TxDOT, UP, and BNSF are committed to improving the multimodal network and improving railroad fluidity across the border by both railroads. To that end, UP and BNSF will contribute \$9.9 million toward the project’s \$19.8 million cost expended over a three-year construction period. These funds cover engineering costs (the engineering plans are currently 90 percent complete), right-of-way (permanent and temporary easements plus contingency), and construction (track, signal, civil, roadway, structures, and drainage). The TIGER grant of \$9.9 million when combined with state funds and local investment provides critical funding to complete the rail and local roadway improvement components of the project.

*Table 4-1: Combined – Summary of Project Costs and Funding Sources*

*Table 4-2: Use of Project Funds*

| Project Component | Federal (TIGER) | Private (UP)   | TOTAL           | Project Elements     | Funds Allocated | Percent of Funds |
|-------------------|-----------------|----------------|-----------------|----------------------|-----------------|------------------|
| Engineering       | N/A             | \$1.55 M       | \$1.55 M        | Engineering Services | \$1.55 M        | 7.8%             |
| Real Estate       | N/A             | \$0.27 M       | \$0.27 M        |                      |                 |                  |
| Construction      | \$8.91 M        | \$7.09 M       | \$16.0 M        | Real Estate          | \$0.27 M        | 1.4%             |
| Contingency (10%) | \$0.99 M        | \$0.99 M       | \$1.98 M        | Construction         | \$16.0 M        | 80.8%            |
|                   |                 |                |                 | Contingency          | \$1.98 M        | 10.0%            |
| <b>TOTAL</b>      | <b>\$9.9 M</b>  | <b>\$9.9 M</b> | <b>\$19.8 M</b> | <b>TOTAL</b>         | <b>\$19.8 M</b> | <b>100%</b>      |

With private funding dedicated to finishing engineering and real estate tasks after TIGER award announcements, preconstruction activities will be finished without delaying construction obligations of TIGER funds.

#### **4.2 Detailed Budget Breakdown and TIGER Fund Allocation**

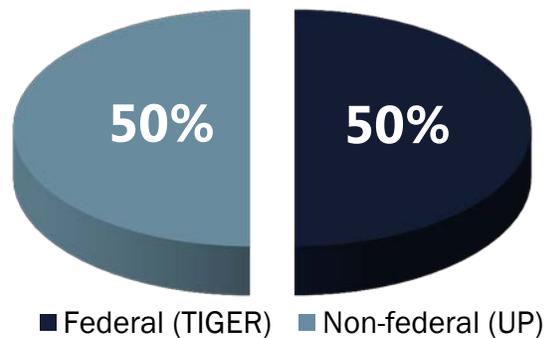
**Table 4-2** summarizes the uses of project funds broken down by the project’s major elements. TxDOT, UP, and BNSF are committed to improving the Texas freight network and associated railroad connectivity while growing American rail exports. UP will contribute \$9.9

million towards the project's \$19.8 million cost, expended over a three-year period. See **Appendix A** for a letter showing UP's funding commitment and support of the project.

In sole preparation for this project, UP has invested roughly \$729,000 in engineering, real estate, permitting, and utility relocation costs. These previously incurred expenses show UP's

commitment to the success of the U.S. Trade Connection at Eagle Pass project, which has essentially made the project shovel-ready.

Figure 4-1: Source of Funds, Percentages



The TIGER match of \$9.9 million combined with UP's private match will provide critical project funding to ensure the completion of this important border capacity project. See **Appendix B** for detailed cost estimates of each project component.

#### Cost Share

Supported by TxDOT, UP will fund \$9.9 million (50 percent) of the total project cost of \$18.8 million expended evenly over a three-year period and are requesting \$9.9 million in TIGER funds from the U.S. Department of Transportation (USDOT). **Figure 4-1** shows the funding breakdown. TxDOT has maximized efforts to secure funds for the project from other non-federal sources, such as private project partners. In Texas, revenues from motor vehicle fuel taxes are constitutionally dedicated to highway projects and cannot be used for rail projects; therefore, TxDOT cannot contribute funding for this project. In addition, private funds will be used to cover future life-cycle costs, such as future annual operations and maintenance costs and any potential capital investment.

## 5. Project Alignment with TIGER FY 2017 Selection Criteria

The U.S. Trade Connection at Eagle Pass project will address several challenges and provide a variety of long-term benefits including the following:

- **Improve safety in communities.** A double-track rail project will bring long-term improvements to surrounding communities. New track infrastructure and bridges will increase network resiliency. Improvements to existing highway grade crossings and signal systems will provide a public benefit for pedestrians and motorists alike. As part of the project's scope, enhancements to a pedestrian underpass at Milepost (MP) 33.90 will include new canopy improvements to benefit trail users.
- **Improve the state of good repair of existing rail and roadway infrastructure.** According to the 2016 Texas Freight Mobility Plan, Texas is home to five of the seven U.S. rail

border crossings with Mexico, all of which are maintained by private railroads.<sup>3</sup> This linkage provides a vital service to the American economy, and provides a means to export bulk quantities of American goods. This project will add approximately 25 percent more capacity to this railroad border crossing through new rail infrastructure improvements that are necessary to handle future growth in export and import volumes. With the added railroad capacity, more goods have the potential to be shipped via rail rather truck, bringing the added benefit of reducing highway and local road repair costs, pavement damage, and congestion.

- **Enhance economic competitiveness.** “Mexico was the United States' 2nd largest goods export market in 2016<sup>4</sup>.” Improving the efficiency and volume of trade at rail border crossings is vital to U.S. economic growth. More rail capacity means more American goods can move by rail and be exported to U.S. trading partners; the same is true about imports. The U.S. Trade Connection at Eagle Pass project proposes to increase rail capacity by approximately 25 percent allowing more additional trade will cross the Eagle Pass Border Crossing.
- **Promote environmental sustainability.** Rail transportation is fuel-efficient and provides lower emissions per ton-mile than truck transportation. The U.S. Trade Connection at Eagle Pass project will divert trucks from local, state, and interstate highways through added rail capacity, resulting in reduced emissions and fuel use. Passenger vehicle delay will also be lowered through operational efficiencies created through the double-track project, which will result in reduced emissions and fuel use.
- **Improve quality of life.** The project adds resiliency to the rail network at the Eagle Pass border crossing, and improves the performance of rail operations with the potential to reduce vehicle delay for motorists at highway-rail grade crossings. Any travel time savings passed along to the public aids in improving quality of life. With operational improvements made during the project, reductions in freight rail congestion, locomotive idling, and vehicle emissions will also be realized.

The following sections describe these benefits and others in detail over a 20-year horizon, and focus on how the project meets and exceeds the requirements for the primary selection criteria of this application.

## 5.1 *Primary Merit Criteria*

### **Safety**

The major benefit of this project is improved safety and avoided accident costs made possible by the modal diversion from truck to rail and preventing accidents and fatalities on

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<sup>3</sup> TxDOT, 2016 Texas Freight Mobility Plan, Appendix G, Page G2-3, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

<sup>4</sup> Office of the United States Trade Representative, Mexico | United States Trade Representative, <https://ustr.gov/countries-regions/americas/mexico>. Accessed September 29, 2017.

U.S. highways. The project will also enhance existing grade crossing infrastructure. UP and TxDOT have looked for further safety improvements, and will upgrade the canopy at the pedestrian crossing under Bridge MP 33.90.

The quantifiable safety benefit of this project is avoided accident costs from the modal diversion from truck to rail on U.S. highways. Over a 20-year period, safety and accident costs savings will total \$48.3 million discounted at 7 percent.

### State of Good Repair

The U.S. Trade Connection at Eagle Pass project will improve freight rail capacity, rehabilitate existing track, add new infrastructure, and enhance system resiliency and reliability. With more flexibility for freight movements, the rail network will see increased availability for maintenance windows, allowing for the upkeep, rehabilitation, and replacement of existing track assets. This is critical for maintaining a transportation network in a state of good repair.

Figure 5-1: River Crossing at U.S.-Mexico Border



Source: Union Pacific Railroad

To remain competitive across global markets, American trade relies on continual capital investment at border crossings. Rail border crossings can move large volumes of goods without impacting infrastructure conditions of nearby highways and local roadways. In the case of Eagle Pass, private railroad investment ensures safe, reliable, and efficient use of this gateway for American trade. The public realizes a multitude of benefits from the continued investment of the railroads that keep trucks off highways and local roadways.

### Public-Private Partnership

Public-private partnerships can help to maximize both public and private investment for capital improvements, especially in areas that have economic importance. With the potential for increased exports with many U.S. trading partners, the U.S. Trade Connection at Eagle Pass project would help provide the added freight capacity for expected future trade growth, a vital component to the economic growth of Texas and

Figure 5-2: Truck Congestion at Eagle Pass Border Crossing



Source: Union Pacific Railroad

the U.S. UP has pledged to provide 50 percent (\$9.9 million) of the project's total costs. TxDOT and UP are seeking federal TIGER funds to cover the remaining 50 percent of the project's cost, with BNSF contributing in accordance with its underlying trackage rights agreement. This balance in investment would ensure that TxDOT, UP, BNSF, and the USDOT would maximize return on investment and support regional and national economic vitality. Additionally, federal funding for the U.S. Trade Connection at Eagle Pass project would **provide UP the opportunity to make targeted investments in other locations needing infrastructure improvements**, including multimodal connections to industrial facilities, such as ports, industrial parks, and transloading facilities that support American exports.

The quantifiable state of good repair benefit of this project is avoided pavement maintenance costs from the modal diversion from truck to rail. Over a 20-year period, pavement maintenance savings will total \$5.92 million, discounted at 7 percent.

### **Economic Competitiveness**

The 2016 Texas Freight Mobility Plan states that economic competitiveness is dependent on investment in infrastructure, and making operational improvements that strengthen the contribution of the national freight network by reducing congestion and increasing productivity, particularly for U.S. industries and businesses.<sup>5</sup> This is important as freight tonnage is expected to double between 2014 and 2040.<sup>6</sup> Even more drastically, at the U.S.-Mexico border crossings, railroad cross-border tonnage is expected to increase by 213 percent, predominately in the export direction.<sup>7</sup> Planning ahead and investing in locations such as railroad border crossings is essential to avoiding a backlogged transportation system that impedes economic growth and vitality in the U.S. Below are more discussions related to economic competitiveness within the U.S. and how the U.S. Trade Connection at Eagle Pass project fits into the equation.

*Figure 5-3: Eagle Pass Border Rail Bottleneck*



*Source: Union Pacific Railroad*

#### *Globalization*

A reduction in input costs can also increase the economic competitiveness of some businesses allowing competition in markets from which they would otherwise be excluded. Globalization increases the levels of competition across all markets in the world, and being

<sup>5</sup> TxDOT, 2016 Texas Freight Mobility Plan, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

<sup>6</sup> TxDOT, 2016 Texas Freight Mobility Plan, Chapter 7, Page 7-31, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

<sup>7</sup> TxDOT, 2016 Texas Freight Mobility Plan, Chapter 7, Page 7-32, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

able to reduce input costs for U.S. goods and services can have a long-lasting reach and economic success for many American businesses and exports.

Nationally, the U.S. Trade Connection at Eagle Pass project increases the economic competitiveness of U.S. businesses by lowering production and shipping costs for exported or imported goods. This is primarily done through modal diversion from truck to rail. Rail has the potential to move very high volumes of goods rather inexpensively compared to movement by truck. The lower rail transportation costs are divided over higher (or bulk) quantities moved, resulting in lower variable costs (or input costs). Therefore, the economic outcomes generated by the project give the U.S. the ability for more domestically produced goods to reach foreign markets.

In addition, the project's proposed rail infrastructure will provide 25 percent more capacity through Eagle Pass, meaning that more train slots will be available with additional flexibility in managing and operating a more efficient gateway. Since the demand for train slots can be great, an increase in supply has the potential to lower transportation costs for bulk commodities being transported across the border when compared to trucks. While no additional truck capacity is being added at the Eagle Pass trade gateway, an increase in rail capacity is likely to draw market share away from truck transport.

#### *Resiliency and Economic Shocks*

Continual investment in transportation infrastructure allows for a stronger America, benefitting U.S. businesses with railroad improvements that result in a stronger and more efficient supply chain. The project's new rail infrastructure also adds capacity to the rail border, which improves the system resiliency and reliability. This is especially needed at times when economic shocks in trade markets might exist. Economic shocks are also unexpected supply and demand shifts in the trade markets. General examples of economic shocks are oil booms where the U.S. may want to export more oil to markets demanding it. The current primary transportation system cannot handle a rapid increase of production for a commodity, e.g., food shortages where the U.S. would need to export bulk quantities of food (or vice versa).

Manufacturers utilizing a just-in-time supply chain for inventory control (especially true for expensive product inputs/materials), will be susceptible to short-term economic shocks. Longer-term economic shocks have potential to affect consumers and producers at all levels. Having ample capacity and resiliency to respond to economic shocks means that transportation systems (rail in this case) can handle surges in volume without experiencing

*Figure 5-4: Mixed Commodities at Eagle Pass*



Source: Union Pacific Railroad

system gridlock for long periods of time. The U.S. Trade Connection at Eagle Pass project will provide added capacity and resiliency.

### *Export Market Examples*

The following real-world export market examples feature commodities that will benefit from the added rail capacity and modal diversion from long-haul truck to rail. The examples are intended to underscore the opportunities for improved economic competitiveness brought about by the project.

- **Texas Coal.** Eagle Pass Mine located 7 miles northeast of Eagle Pass supplies American coal to electrical generating stations in the Mexican state of Coahuila. The mine currently produces 2.7 million tons of bituminous coal annually, and ships it south by train.<sup>8</sup>

Exported coal has been good for the City of Eagle Pass increasing sales tax revenue by 25 percent for the City, and creating more than 100 direct jobs within the area. Additionally, the mine supplies Maverick County with approximately \$1 million in property taxes per year.

Transporting this mineral by rail will ensure pavement damage to local, state, and federal roads is avoided – alleviating some burdens to government-supplied maintenance and capital improvements. Air quality impacts and roadway congestion are also avoided, benefitting the public. This partnership provides massive public and private benefits in the U.S. and abroad. The U.S. Trade Connection at Eagle Pass project will assist in providing adequate capacity for the transportation of this commodity by rail and avoid shipping the short-haul commodity by truck.

- **American Grain and Feedstocks.** In 2016, the U.S. exported nearly 525 million bushels of corn to Mexico.<sup>9</sup> The U.S. also exported 23.86 million bushels of sorghum, 5.3 million bushels of barley, and 1.9 million tons of distillers dried grains south to Mexico.<sup>10</sup> These ingredients come from the America's Heartland and Pacific Northwest (where UP and BNSF operate).<sup>11</sup> "One in four bushels of feed grains exported by the U.S. in one form or another will go to Mexico via primary trade gateways, including Eagle Pass<sup>12</sup>."

In the summer of 2016, the gasohol concentrations in Mexico changed from E-6 (or 6 percent fuel ethanol to 94 percent gasoline) to a maximum of E-10 (or 10 percent ethanol to 90 percent gasoline), which will increase the demand for U.S. feedstock

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<sup>8</sup> Dos Republicas Coal Partnership, Project Description, <http://www.dosrepublicas.com/project.html>. Accessed October 3, 2017.

<sup>9</sup> U.S. Grains Council Beef, Barley and Ethanol Teams From Mexico Explore U.S. Market Collaboration. <https://www.grains.org/news/20170831/beef-barley-and-ethanol-teams-mexico-explore-us-market-collaboration>. Published August 31, 2017. Accessed October 3, 2017.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ethanol Producer Magazine, USGC: U.S. Feed Grains Exports to Mexico Soar in 2015-2016, <http://www.ethanolproducer.com/articles/13757/>. Accessed October 3, 2017.

exports for use in creating ethanol.<sup>13</sup> U.S. grain exports look to remain a strong market between the two nation states. Once again, the U.S. Trade Connection at Eagle Pass project provides a means to transport and export long-haul commodities like grain across the border lessening the impacts to other American infrastructure.

- **American Beer Ingredients.** The U.S. exports many of the ingredients to make beer (such as, barley, rice, malt, hops, etc.) and other supplies like glass for packaging. These ingredients and supplies come from U.S. farmers and glass factories. For instance, railroads often transport bulk quantities of recycled glass to bottle manufacturing plants, and then the glass bottles are exported to foreign markets. In turn, some of this beer is imported back to the U.S.

Other commodities exported by rail include autos/auto parts, intermodal, frac sand, food, and chemicals.<sup>14</sup> Food and beverage products (including beer), finished autos, electronics, and chemicals are imported to the U.S. through this trade gateway.<sup>15</sup>

#### *Monetized Economic Competitiveness Benefit*

Over a 20-year period (discounted at 7 percent), the quantifiable economic competitiveness benefits of this project are approximately:

- Shipper Cost Savings from Truck to Rail Diversion – \$11.3 million
- Vehicle Operating Cost Savings from Shorter Grade Crossing Occupancy Time – \$236,938

The quantifiable economic competitiveness benefits total approximately \$11.5 million.

In addition, the U.S. Trade Connection at Eagle Pass project has the following ancillary benefits.

- **Improve market** access potential for Texan and other American export and supporting services.
- **Provide greater opportunities** for direct export to global markets.
- **Help trade and manufacturing** market sectors remain competitive in both the global and domestic environment.
- **Reduce congestion** on local and state highways through modal diversion from truck to rail.

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<sup>13</sup> Business Insider, Mexico Approves Increasing Ethanol Content in Gasoline to 10 Percent, <http://www.businessinsider.com/r-mexico-approves-increasing-ethanol-content-in-gasoline-to-10-percent-2017-6>. Published June 26, 2017. Accessed October 3, 2017.

<sup>14</sup> Union Pacific Corporation, 2016 Investor Fact Book, [https://www.up.com/cs/groups/public/@uprr/@investor/documents/investordocuments/investor\\_fact\\_book\\_2016.pdf](https://www.up.com/cs/groups/public/@uprr/@investor/documents/investordocuments/investor_fact_book_2016.pdf). Accessed October 13, 2017.

<sup>15</sup> Ibid.

- **Maintenance** of this rail project will be covered by private funds, which is an added public benefit.

The Benefit-Cost Analysis (BCA) submitted as **Appendix C** to this application examines these issues from a larger scale, and shows that the regional and national economic competitiveness impacts of this project are significant and will provide measurable, long-term public benefits.

## **Environmental Sustainability**

Rail is essential to achieving reduced congestion on our nation's highways resulting in safer roads and a cleaner environment. The proposed improvements will reduce emissions by diverting the movement of goods to rail. In particular, the diversion from long-haul truck to rail as a result of the proposed improvements results in a reduction of emissions for pollutants such as carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOC), nitrogen oxides (NO<sub>x</sub>), and particulate matter (PM). The emission cost reductions for these pollutants are monetized in the BCA. Additionally, the project will save energy helping to reduce dependence on foreign oil through fuel savings.

### *Preserving Nature*

TxDOT and UP are dedicated to meeting the needs of the present without compromising the future. Construction of the project components will be conducted in an environmentally sensitive and responsible manner by using natural resources efficiently and mitigating impacts to preserve wetlands, natural habitats, and Texas' air quality. This will be done in accordance with environmental best management practices and by utilizing a Storm Water Pollution Prevention Plan (SWPPP) for the project location.

In addition, track construction will mostly occur within existing UP right-of-way along with roadway and bridge projects associated with the project. Using the existing right-of-way (originally purposed for railroad use) will eliminate the need for greenfield construction, lowering the potential for environmental impacts, right-of-way acquisition, and land development costs. UP will ensure that any environmental impacts are mitigated below a level of significance in compliance with National Environmental Policy Act (NEPA).

### *Reducing Emissions*

The project will decrease the amount of air emissions within the region through the modal diversion from truck to rail. Additionally, the U.S. Trade Connection at Eagle Pass project will reduce wait times for trains needing to make crossover moves into various yards and tracks. Shorter wait times will reduce locomotive idle and improve air quality within the region as well as fuel consumption and overall operating time.

Operational efficiencies achieved through the construction of the project will also decrease wait times at railroad highway grade crossings. The reduced idling time will also decrease the amount of air emissions and fuel consumption from passenger cars within the region.

Reductions to motor vehicles idling from shorter grade crossing occupancy times and from the modal diversion from truck to rail will improve air quality with an overall decrease in emissions from vehicles traveling within the area. The project will reduce approximately 399,979 tons of CO<sub>2</sub>, 102 tons of NO<sub>x</sub>, 6.7 tons of VOC, and 15.5 tons of PM through the 20-year period of operation.

The project is estimated to save \$2.7 million in emission costs at a 7 percent discount rate over 20 years. See **Appendix C** for the BCA results.

### **Quality of Life**

The public is a direct and indirect user of the railroad system. Normal everyday goods, including food, clothing, and energy products move by rail and are consumed by people. It is clear that rail facilities and systems (or rail infrastructure) are shared or used by the public and benefit the public. Therefore, rail infrastructure investments are needed to continue to provide high system reliability and resiliency, to ensure that the public maintains a high quality of life and lowered impacts to daily life directly related to rail transportation. This could not be more true for the Eagle Pass border crossing, which looks to improve infrastructure at the second busiest Mexican border railroad crossing in the U.S. in 2016.

The planning and construction of infrastructure directly involving the public can consume a significant amount of time, and may burden the resources of local and state governments (both monetarily or temporally). The leveraging of federal funding with private funds will allow targeted infrastructure improvements to alleviate some of the local community concerns while freeing state and local government resources to focus on other areas that will enhance the quality of life for its residents.

Additionally, the U.S. Trade Connection at Eagle Pass project will be built within the existing railroad right-of-way eliminating the need to relocate people or businesses; therefore, not affecting their long-term quality of life.

#### *Monetized Quality of Life Benefit*

The quantifiable quality of life benefit of this project is travel time savings for vehicular passengers from shorter grade crossing occupancy time. This will be achieved from operational efficiencies created by the project. Over a 20-year period, travel time savings will total \$3.7 million, discounted at 7 percent.

## 5.2 Secondary Merit Criteria

### Innovation

#### *Design*

This project has demonstrated innovation through the planning and development of a strong public-private partnership to support and facilitate this project. During design, UP carefully planned the project to minimize impacts to right-of-way, drainage, and existing utilities. The design also utilizes crossovers, which are common track components that allow trains to readily move from one side of a track or yard to another side over a relatively short distance. However, the location of the crossover is strategic for both the constructability and maintenance purposes. In addition, UP will use standard railroad components as much as possible for ease of maintenance, resiliency, and availability of track, roadway, and structures components. Smart and innovative design helps to lower project costs and minimize impacts to the public.

#### *Construction*

Innovative construction and mitigation techniques will be researched and utilized as appropriate during the implementation and construction phase of the project by the project parties and contractors. Innovative strategies will be needed to phase the construction of the project. Long track outages (or track curfews) are not desirable as they disrupt businesses that rely on railroad shipments to produce their goods or services. Minimizing curfew lengths is necessary.

#### *Resource Use*

After construction, wood track ties removed as part of the project's track rehabilitation will be re-used. According to UP, of the millions of wood railroad ties it replaces annually nearly 85 percent are re-used in some manner.<sup>16</sup> Moreover, UP looks for reuse opportunities within the community for items with a remaining useful life.<sup>17</sup> UP also recycles electronic equipment, signal batteries, metal, and solid waste.<sup>18</sup> This sustainable practice

Figure 5-5: Eagle Pass – Railroad Corridor



Source: Union Pacific Railroad

<sup>16</sup> Union Pacific Railroad, Operations, <https://www.up.com/aboutup/environment/operations/index.htm>. Accessed October 3, 2017.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

limits waste haulage, keeps materials out of landfills, helps to reduce resource consumption, and is an innovative way of doing business. UP will apply the same practices to the construction of the U.S. Trade Connection at Eagle Pass project.

## 6. Partnership

Per the 2016 Texas Freight Mobility Plan, “Rail is and will continue to be vital to the economic growth of Texas, and supportive policies and public-private partnerships are needed to support the private-sector’s ability to make the needed investments into the Texas rail system<sup>19</sup>.”

TxDOT, UP, and BNSF have been at the forefront of this effort to solidify support to improve rail capacity, increase rail exports, and reduce railroad border crossing congestion. TxDOT has included the project in its State Freight Mobility Plan and State Rail Plan because of its proposed benefits to border crossing capacity and potential to assist CBP in improving border security.

A broad range of organizations, businesses, public agencies, and government officials also support the U.S. Trade Connection at Eagle Pass project. These partnerships comprise an important part of the project, as the proposed rail improvements will deliver benefits to the border crossing and surrounding community.

Letters of support can be found in **Appendix A**. Below is a list of the project supporters received before the TIGER fiscal year (FY) 2017 due date. Other letters of support will be mailed to USDOT after the TIGER application has been submitted.

| Project Supporters   |   |
|--|---|
| <ul style="list-style-type: none"> <li>▪ <b>U.S. Senate</b> – Texas Sen. John Cornyn</li> </ul>            | <ul style="list-style-type: none"> <li>▪ <b>Kinney County</b> – Judge Tully Shahan</li> </ul>   |
| <ul style="list-style-type: none"> <li>▪ <b>U.S. Congress</b> – Texas Rep. Will Hurd</li> </ul>            | <ul style="list-style-type: none"> <li>▪ <b>Middle Rio Grande Development Council</b> – Executive Director Nick Gallegos</li> </ul>                   |
| <ul style="list-style-type: none"> <li>▪ <b>Texas</b> – State Sen. Carlos Uresti</li> </ul>                | <ul style="list-style-type: none"> <li>▪ <b>Border Trade Alliance</b> – President Britton Clarke</li> </ul>   |
| <ul style="list-style-type: none"> <li>▪ <b>City of Eagle Pass</b> – Mayor Ramsey English Cantu</li> </ul> | <ul style="list-style-type: none"> <li>▪ <b>Dos Republicas Coal Partnership (Eagle Pass Mine)</b> – President Andres Gonzalez-Saravia Coss</li> </ul> |

<sup>19</sup>TxDOT, 2016 Texas Freight Mobility Plan, Appendix G, Page G2-3, <https://www.dot.state.tx.us/move-texas-freight/studies/freight-plan.htm>. Accessed September 29, 2017.

| Project Supporters  |   |
|---|---|
| <ul style="list-style-type: none"> <li>▪ <b>City of Eagle Pass</b> – Councilman Place 4 Luis Sifuentes</li> </ul> | <ul style="list-style-type: none"> <li>▪ <b>Hub Group</b> – President Donald G. Maltby</li> </ul>                           |
| <ul style="list-style-type: none"> <li>▪ <b>City of Eagle Pass</b> – City Manager Art B. Rodriguez</li> </ul>     | <ul style="list-style-type: none"> <li>▪ <b>BNSF Railway</b></li> </ul>   |
| <ul style="list-style-type: none"> <li>▪ <b>City of Spofford</b> – Mayor Pablo Resendez</li> </ul>                | <ul style="list-style-type: none"> <li>▪ <b>Ferromex</b> – Chief Operations Officer Hugo Gómez</li> </ul>                   |
| <ul style="list-style-type: none"> <li>▪ <b>Maverick County</b> - Judge David R. Saucedo</li> </ul>               | <ul style="list-style-type: none"> <li>▪ <b>Union Pacific Railroad</b> – AVP of Public Affairs Brenda Mainwaring</li> </ul> |

## 7. Project Readiness

Union Pacific has extensive experience in delivering capacity projects across their network that spans 23 states and over 32,000 route miles nearly 20 percent of which lie in Texas. In addition, UP’s recent experience completing several capacity projects in the area and working relationships with local agencies and utility companies have proven the ability to deliver projects on time and within budget.

### 7.1 *Technical Feasibility*

TxDOT has successfully managed many federal funding grants in the past, and is familiar with administration of federal funding and contracting requirements. TxDOT has also worked with UP on several projects in the past, and is currently working with UP on multiple projects in the state.

UP has delivered large capital projects of many types utilizing its in-house Engineering Department and consultants working for the railroad. UP’s Engineering, Real Estate, and Public Affairs departments have been coordinating closely with representatives from TxDOT, local agencies, and utility companies on several projects over the last five years. The developed relationships between UP and these public entities will facilitate implementation of the project.

### **Right-of-Way**

UP has invested \$19,000 for right-of-way purchases, and has set aside an additional \$15,000 for acquisition of temporary and permanent construction easement rights necessary to complete the project. All permanent right-of-way needed to complete the project has already been purchased. UP has held negotiations with adjacent landowners for obtaining temporary easements during the design process, and is confident right-of-way will not pose a substantial risk to the project.

## Project Design

UP began design of the U.S. Trade Connection at Eagle Pass project with their in-house Engineering Department in 2014. The project is designed to a 90 percent level for engineering plans, specifications, and estimate. Project estimates and engineering design documents are found in **Appendix D**. Project design will be finalized upon confirmation of project funding sources, and will be completed quickly with only minor revisions.

## Project Schedule

The project’s final design and permitting will be completed upon notice of funding, and is anticipated to be complete by the end of 2018. Competitive bidding will begin at the start of 2019 with construction starting second quarter of 2019 and lasting approximately one year. Project closeout is anticipated by the end of summer 2020. **Table 7-1** summarizes major project milestones and demonstrates that the TIGER funds will be obligated before the statutory deadline of September 30, 2020.

Table 7-1: Project Schedule

| 2018  |    |    |             | 2019  |    |    |    | 2020              |    |    |    |
|---|----|----|-------------|---|----|----|----|-------------------|----|----|----|
| Q1  | Q2 | Q3 | Q4          | Q1  | Q2 | Q3 | Q4 | Q1                | Q2 | Q3 | Q4 |
| Complete Design, Entitlements, & Permitting |    |    |             |   |    |    |    |                   |    |    |    |
|   |    |    | Bid Project |   |    |    |    |                   |    |    |    |
|   |    |    |             | Construction Begins: Track, Roadway, and Structures |    |    |    |                   |    |    |    |
|   |    |    |             |   |    |    |    | Project Close Out |    |    |    |

## 7.2 Required Approvals

### Environmental Permits and Reviews

The project is located within a developed area that has been previously disturbed by construction activities consisting of an existing railroad corridor and adjacent roadways. Some permitting activities have been completed such as the wetland delineation, threatened and endangered species (T&E) habitat assessment, and a cultural resource database review. No major issues were found. The project will go through the NEPA process in accordance with TIGER funding requirements; however, it is anticipated that a Categorical Exclusion (CE) will be granted. Completion of final permitting activities is anticipated for completion prior to the proposed 2019 project bidding. The project is expected to be permitted under a non-notifying Pre-Construction Notification (PCN).

Coordination with local agencies has begun for the floodplain development permits required for construction of two bridges over existing concrete drainage channels. A National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Discharge General permit will be required with approval from the Texas Commission on Environmental Quality (TCEQ). Coordination with the various agencies and permit applications will be listed

as important milestones for the project. UP can adjust the project bidding and construction schedule if needed to accommodate revisions to the permitting timeline without jeopardizing project completion by September 2020.

### 7.3 Agency Approvals

UP’s preliminary design plans have been submitted for approval to the various agencies and municipalities for their review and comment prior to finalization of the plans. TxDOT approval is required for construction of pier protection on an existing overhead highway bridge, and City of Eagle Pass approval is required for various roadway improvements associated with the project. Final approvals will be obtained upon completion of final engineering plans, and any construction requirements will be included in the construction documents.

The attached letters provide further evidence that there is a wide range of support from federal, state, and local elected officials to complete the project in a timely manner. See **Appendix A** for Letters of Support.

### 7.4 State and Regional Plans

The U.S. Trade Connection at Eagle Pass project has been included in the [2016 State Rail Plan](#) and [2016 Freight Mobility Plan](#) ensuring TxDOT’s continued support for Class I railroad capacity as well as providing any necessary security improvements for U.S. Customs and Border Patrol (CBP). This project was listed as a high priority for TxDOT, UP, and BNSF.

### 7.5 Mitigation

A table has been developed assessing the risks that may pose a threat to the ability of the project to meet its objectives and schedule along with proposed mitigation actions. **Table 7-2** below shows the general categories of risk assessed and mitigation strategies.

Table 7-2: Risk and Mitigation Strategies

1 = Low      2 = Minor      3 = Moderate      4 = Significant

| Risk # | Risk Category | Risk Name                         | Description                                     | Likelihood | Impact |          | Mitigation Strategies  |
|--------|---------------|-----------------------------------|---|------------|--------|----------|--|
|        |               |                                   |   |            | Cost   | Schedule |  |
| 1      | Financial     | Loss of Public or Private Funding | Loss of funding due to unforeseen circumstances | 1          | 2      | 3        | Given public and private benefits, this project will need both public and private sources to be completed in a timely manner. If a funding source does not materialize, the project will be delayed. |

| Risk # | Risk Category             | Risk Name                                   | Description  | Likelihood | Impact |          | Mitigation Strategies   |
|--------|---------------------------|---|--|------------|--------|----------|---|
|        |                           |   |  |            | Cost   | Schedule |   |
| 2      | Management                | Stakeholders                                | Stakeholders may have varying procedures and objectives                            | 1          | 2      | 2        | UP has successfully worked numerous times with TxDOT, BNSF, and local agencies, and has open lines of communication to address potential concerns.  |
| 3      | Contracting & Procurement | Administrative Burden                       | UP will manage construction, TxDOT will manage public funding                      | 1          | 1      | 1        | TxDOT is experienced in administering federal grants. UP has successfully completed many capital projects in the area with a similar scope, and has worked with TxDOT on projects throughout the state. |
| 4      | Contracting & Procurement | Availability of Qualified Contractors       | Project involves specialized construction, and is being undertaken in a rural area | 1          | 1      | 1        | UP has experience delivering rail capacity projects in rural areas across the western U.S., including projects in the Eagle Pass area.  |
| 5      | Construction              | Traffic                                     | Roadway traffic congestion resulting from construction                             | 2          | 1      | 2        | Project phasing will reduce impact. Coordination with the local jurisdiction will occur prior to scheduling work and outages to minimize potential impacts.   |
| 6      | Construction              | Business Disruption                         | Existing rail-served businesses in the area may be impacted by construction        | 1          | 1      | 2        | Project phasing will reduce impact. Coordination with customers will occur to minimize business disruption.   |
| 7      | Construction              | Railroad Operations Disruption              | Rail traffic disruption resulting from construction                                | 2          | 1      | 2        | Project phasing will reduce impacts. Construction will be coordinated with railroad operations.   |
| 8      | Construction              | CBP Operations Disruption                   | Delays and/or disruption to CBP operations as a result of construction             | 1          | 1      | 2        | Early coordination with CBP to coordinate construction activities. CBP secondary inspection will already be active at Clarks Park Yard.   |
| 9      | Environmental             | State Historic Preservation Officers (SHPO) | Historic/ archaeological/ cultural resources discoveries                           | 1          | 2      | 2        | Required regulations will be followed and responded to accordingly. There are no known SHPO resources in the area. The project location has been previously developed.                                  |

| Risk # | Risk Category            | Risk                  | Description  | Likelihood | Impact |          | Mitigation Strategies  |
|--------|--------------------------|-----------------------|--|------------|--------|----------|--|
|        |                          | Name                  |  |            | Cost   | Schedule |  |
| 10     | Environmental            | Wetlands              | Project impact on existing wetlands                            | 1          | 1      | 1        | Preliminary investigation suggests this is not a problem.  |
| 11     | Environmental            | Floodplain            | Project impact on existing floodplains                         | 1          | 1      | 2        | Floodplain development permits required for bridge construction are anticipated to be obtained within two-three months   |
| 12     | Environmental            | Endangered Species    | Impact to any endangered species within the project area       | 1          | 1      | 2        | Required environmental regulations will be followed and responded to accordingly. There are no known endangered species within the project areas.                                  |
| 13     | Environmental            | NEPA                  | Compliance with NEPA due to federal funding                    | 1          | 1      | 2        | Categorical Exclusion (CE) anticipated.  |
| 14     | Agency Approvals         | City Approvals        | Approvals for roadway crossing improvements                    | 1          | 1      | 2        | City has reviewed preliminary roadway plans. There is ongoing coordination.  |
| 15     | Agency Approvals         | TxDOT Approvals       | Approvals for pier protection at HWY 57 Overhead               | 1          | 1      | 2        | TxDOT has reviewed preliminary plans and provided comments.  |
| 16     | Real Estate              | Property acquisitions | Need for property acquisition                                  | 1          | 1      | 2        | Property acquisitions required per current (90%) design have been completed. No additional property needs are anticipated.   |
| 17     | Real Estate              | Easements             | Need for Temporary Construction Easements (TCE)                | 1          | 1      | 2        | TCE negotiations are ongoing with city and TxDOT as part of agency approvals. TCE negotiations with private landowners have been initiated.  |
| 18     | Utilities                | Utility Relocations   | Need for some utilities to be relocated as a result of project | 2          | 2      | 2        | Coordination is ongoing with affected utility companies to relocate utility lines as necessary.  |
| 19     | Utilities                | Utility Conflicts     | Unforeseen utility conflicts                                   | 1          | 2      | 3        | Utility coordination effort is underway to identify utilities, including a Subsurface Utility Engineering investigation.   |
| 20     | Operations & Maintenance | Storm Water           | Management of storm water during and post construction         | 1          | 1      | 1        | A Storm Water Pollution Prevention Plan (SWPPP) will be incorporated into the design, and will address storm water management during construction and once the site is stabilized. |

## 8. Results of Benefit-Cost Analysis

**Table 8-1** summarizes the main benefits monetization for the proposed improvements, which are categorized under the main criteria established in the TIGER program. A 23-year period of analysis was used in the estimating the project benefits and costs, which includes three years of project development (design and construction) and 20 years of operation. Annual costs and benefits are estimated through 2040. Construction of all the improvements is expected to be completed in mid-2020, thus benefits start accruing in 2020 for the full operation of the project (20 years).

*Table 8-1: Summary of Benefit Metrics*

| Benefit Categories  | Undiscounted         | 3% Discount Rate     | 7% Discount Rate    |
|---|----------------------|----------------------|---------------------|
| Shipper Cost Savings from Truck to Rail Diversion                         | \$28,306,088         | \$18,632,136         | \$11,306,845        |
| Avoided Emission Costs from Truck to Rail Diversion                       | \$5,444,165          | \$3,924,304          | \$2,662,099         |
| Improved Safety and Avoided Accident Costs from Truck to Rail Diversion   | \$120,837,426        | \$79,539,758         | \$48,268,418        |
| Avoided Pavement Maintenance Costs from Truck to Rail Diversion           | \$14,813,644         | \$9,750,900          | \$5,917,299         |
| Travel Time Cost Savings from Shorter Grade Crossing Occupancy Time       | \$9,077,048          | \$5,999,222          | \$3,668,091         |
| Vehicle Operating Cost Savings from Shorter Grade Crossing Occupancy Time | \$597,955            | \$391,784            | \$236,938           |
| Emissions Cost Savings from Shorter Grade Crossing Occupancy Time         | \$12,602             | \$8,988              | \$6,029             |
| Residual Value of Capital Assets  | \$5,743,546          | \$2,825,444          | \$1,132,321         |
| Operating and Maintenance Costs   | (\$500,000)          | (\$330,461)          | (\$202,053)         |
| Lifecycle/Rehabilitation Costs  | (\$591,360)          | (\$379,571)          | (\$214,336)         |
| <b>Total Benefits</b>   | <b>\$183,741,114</b> | <b>\$120,362,504</b> | <b>\$72,781,650</b> |
| Capital Costs   | (\$19,759,300)       | (\$18,081,428)       | (\$16,137,462)      |
| <b>Net Present Value</b>  | <b>\$163,981,814</b> | <b>\$102,281,076</b> | <b>\$56,644,188</b> |

Considering all monetized benefits (user as well as non-user) and costs (capital as well as operating and maintenance costs), the estimated internal rate of return (IRR) of the project is estimated at 31.7 percent. The payback period is estimated at 2.62 years. With a 7 percent discount rate, the project would result in a net present value of nearly \$56.6 million and a benefit-cost ratio of 4.51. With a 3 percent real discount rate, the net present value of the project would increase to over \$102.3 million for a benefit-cost ratio of 6.66 (see **Table 8-2** below).

Table 8-2: Summary of Benefit-Cost Analysis

| Category                    | Undiscounted   | 3% Discount Rate | 7% Discount Rate |
|-----------------------------|----------------|------------------|------------------|
| Total Benefits              | \$183,741,114  | \$120,362,504    | \$72,781,650     |
| Capital Costs               | (\$19,759,300) | (\$18,081,428)   | (\$16,137,462)   |
| Net Present Value           | \$163,981,814  | \$102,281,076    | \$56,644,188     |
| Return on Investment        | 830%           | 566%             | 351%             |
| Benefit-Cost Ratio          | 9.30           | 6.66             | 4.51             |
| Payback Period (years)      | 2.62           |                  |                  |
| Internal Rate of Return (%) | 31.7%          |                  |                  |

A Benefit-Cost Analysis only presents those costs and benefits that can be measured and monetized. Particularly in an area such as livability, benefits are difficult to measure and should be assumed to be some number in addition to the total presented so that the true ratio of benefits to costs is higher than the reported figures. For a detailed discussion of the methodology, reference the Benefit-Cost Analysis and technical appendix in **Appendix C**.

## 9. Federal Wage Certification Letter

Signed certification stating that TxDOT will comply with the requirements of Subchapter IV of Chapter 31 of Title 40, United States Code (federal wage rate requirements) as required by the FY 2016 Appropriations Act is completed and attached as **Appendix E**.

## 10. Standard Form 424 (Application for Federal Assistance)

TxDOT has completed the Standard Form 424 and has uploaded it to grants.gov.