

**U.S. Department of Transportation**

**National Infrastructure Investments Grant Program**

**“TIGER Discretionary”**

**GRANT APPLICATION**

**Project Name: Loop 82 (Aquarena Springs Dr) UPRR Overpass Project**

**Project Type: Multimodal Transportation Project**

**Project Cost: \$38,003,502**

**Funds Requested: \$ 16,743,502 (44.058%)**

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**EIN / TIN: 74-6002238**

**Application ID:**

**Website: <http://www.txdot.gov/business/rail/tiger3.htm>**

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**Supporting Documentation can be found at:**

**<http://www.txdot.gov/business/rail/tiger3.htm>**

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## **I. Project Description**

### **A. Introduction**

The Loop 82 (Aquarena Springs Drive) Union Pacific Railroad Overpass Project is a multimodal project that will have a significant impact on the region through rail, vehicular, pedestrian, safety, and mobility improvements. The project consists of the design and construction of a grade separated crossing of the Union Pacific Railroad's (UP) Austin Subdivision Main Line 1 (ML-1) and Loop 82 (also known as Aquarena Springs Drive) at their intersection in San Marcos, Texas. The project includes the design and reconstruction of a four-lane, undivided roadway with a grade separation within the project limits; including access roads, City street improvements, and bicycle and pedestrian facilities. The project runs directly through an important and highly utilized portion of Texas State University's campus. With Texas State's student population nearly 35,000, the City of San Marcos' daytime population more than doubles to nearly 80,000. The project will dramatically improve safety for an intersection rated in the top five for congestion in Hays County and will enable improved and safe access for students, faculty, and visitors to the University,

The project will provide significant benefits to the City of San Marcos, the region, and state through the integration and better use of multimodal connections on the facility and eliminate the existing at-grade highway-rail intersection with associated vehicular-rail conflicts. Reducing vehicular-rail conflicts will also reduce vehicular idling time at the existing crossing, thereby providing environmental benefits in the form of lower vehicular emissions. Safety will be improved by the reduction in vehicular-rail conflict exposure and through improved response times for Emergency Medical Services (EMS), as well as law enforcement officials. The UP effectively bisects the City of San Marcos, separating a large portion of the population from EMS and law enforcement services when trains occupy the main line. This occurs an average of 25 times daily when trains operate over this at-grade crossing. This roadway-rail configuration has historically resulted in significant delays in EMS and law enforcement response times which continue to this day. Grade separating these facilities will eliminate this problem with the resulting improvement in safety and quality of life for the citizens. San Marcos is located between two major cities, Austin and San Antonio. It's geographic location places it along a major Interstate and freight rail corridor that is one of the busiest NAFTA trade routes in the nation. San Marcos is also home to the State's 5<sup>th</sup> largest university which has increased the City's profile and importance in the region. In addition, the US Department of Commerce has invested millions in developing the Science, Technology and Advanced Research (STAR) Park in partnership with the City and University which will draw corporate research in areas of alternative energy and further establish San Marcos as a center of high-tech employment.

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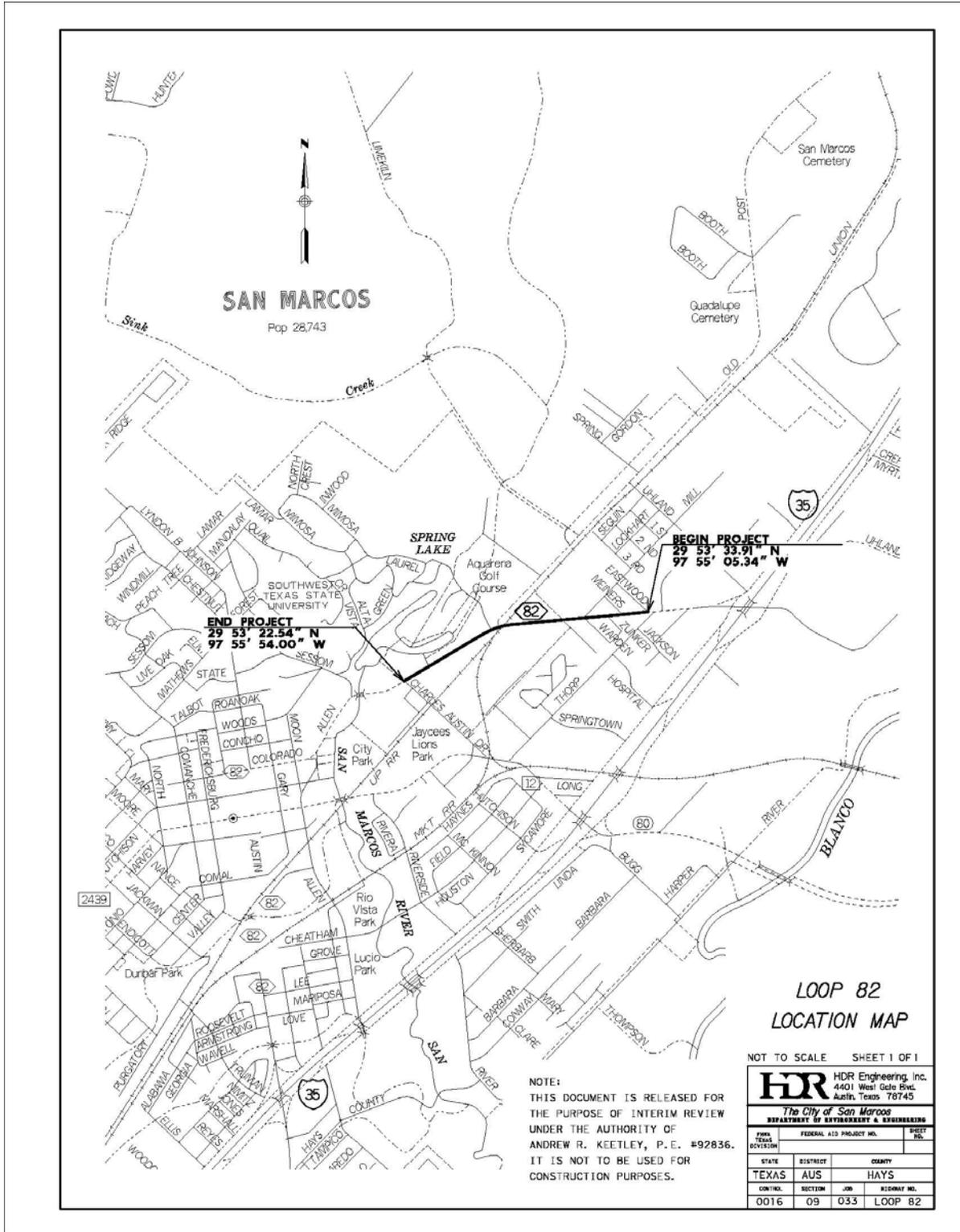
The benefits from completing the project exceed \$38.1 million over 20 years, with a benefit – cost ratio of 1.25 to 1.<sup>1</sup>

US DOT TIGER grant funding would enable completion of this project. The project area is shown in Figure 1.

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<sup>1</sup> See the benefit cost analysis at <http://www.txdot.gov/business/rail/tiger3.htm> for details on how the project provides these benefits.

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**Figure 1: Project Location**

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## B. Project Components

The project is wholly within the City of San Marcos in Hays County, Texas, and is designed to grade separate the intersection of Loop 82 and UP's Austin Subdivision Mainline 1 and improve local roadways. The project includes:

- acquisition of right-of-way,
- relocation of utilities (as necessary),
- reconstruction of a deteriorated section of Loop 82 (Aquarena Springs Drive),
- construction of a grade separation (bridge) on Loop 82 (Aquarena Springs Drive) over UP's Austin Subdivision ML-1,
- construction of access roads including turn-arounds at each end of the grade separation,
- construction of City street connections,
- realigning Post Road with improvements to another existing at-grade crossing, and
- improved pedestrian and bicycle access facilities to Texas State University.

The City of San Marcos is literally divided in two by UP's main lines. The Austin Subdivision ML-1 extends through the City in a north-south direction parallel to Interstate Highway 35 (IH-35). The Austin Subdivision ML-2 enters the City from the south, parallel to ML-1 and IH-35, then turns and extends east toward Lockhart, Texas. This divergence is located just south of the proposed improvements to Loop 82.

Downtown San Marcos, Texas State University, and other regionally significant facilities are located west of UP's Austin Subdivision ML 1. The existing Loop 82 Corridor provides a major gateway to the historic San Marcos square and downtown area, as well as the Hays County Courthouse and other county and City offices. San Marcos square is considered the entertainment and commercial center of San Marcos and Hays County. Most emergency services are located east of the Austin Subdivision ML-1 and cannot access the City center or west side of town when trains block the Loop 82 grade crossing.

Loop 82 is currently a 60' wide, four lane, undivided, asphalt roadway with a 35 mph speed limit. UP's Austin Subdivision ML-1 is a single track rail line with a 30 mph maximum train speed. The Loop 82 and UP Austin Sub ML-1 crossing has an ADT of 33,000 and a train count of 25 trains per day. This high volume of vehicular and train traffic, coupled with the low train speeds, causes numerous vehicular-rail conflicts on a daily basis. These conflicts have a negative impact to mobility, air quality, safety, livability, and quality of life. An aerial view of the Loop 82 grade crossing is shown in Figure 2.

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**.Figure 2: Aerial View of Crossing**

Completion of the proposed improvements will increase mobility in the area by providing a safe, grade-separated crossing of the UP in the center of San Marcos. Emergency response time will be improved by providing access for those services from the east to west across the grade separated facility. Pedestrian and bicycle mobility will also be enhanced by the planned improvements.

### C. Geospatial Data

The proposed project begins on Loop 82 approximately (0.30 miles west of IH-35) at the intersection of Thorpe Lane (with Loop 82) and extends to the west over the UP Austin Subdivision ML-1 to the intersection of Charles Austin Drive (and Loop 82). The total length of the project is approximately 1.15 miles. The geospatial data for the beginning and end of the project is shown in Table 1.

Location	Latitude	Longitude	Description of Location
Project Begins	29.89271	-97.91812	Loop 82 Roadway Improvements Begin (from Thorpe Lane to the west)
Grade Separation	29.89217	-97.92623	Intersection of Loop 82 and UP Austin Sub ML-1; US DOT # 447677 C
Project Ends	29.88977	-97.93164	Loop 82 Roadway Improvements End (at Charles Austin Blvd.)

**Table 1: Project Geospatial Data**

The Loop 82 and UP Austin Subdivision ML-1 crossing is shown in Figure 3, looking north along the tracks toward the crossing.



**Figure 3: Loop 82 – UP Austin Subdivision ML-1 Crossing**

## **II. Project Parties**

The project parties are the City of San Marcos, the Union Pacific Railroad, and the Texas Department of Transportation (TxDOT). The City of San Marcos and TxDOT are co-applicants for funding. Texas State University supports the project's goals of improving access and mobility to their campus, which is located immediately adjacent to the project. TSU has ownership of portions of the right-of-way that will be used for the project and is working with the City to affect a transfer of that property. The project also has broad support throughout the community.

TxDOT will be responsible for the project from design through final construction. TxDOT has vast experience managing federal and state infrastructure projects as well as rail rehabilitation/construction projects and is the appropriate party to manage this project on behalf of the City of San Marcos. TxDOT has an effective asset management approach that optimizes the long-term cost structure and viability of the project, which includes:

- extensive experience in planning and designing roadways and bridge structures, (including grade separations), and maintaining the largest state roadway system in the U.S.,
- decades of experience in administering federal highway and federal project funds, and
- direct supervision of contractors during construction activities.

## **III. Grant Funds and Sources/Uses of Project Funds**

The City of San Marcos is partnering with TxDOT and the UP to develop the project. A combination of local, state, private, and federal funds is committed to the project, totaling \$21,260,000 (55.942%) of the project total. A TIGER grant award of \$16,743,502 (44.058%) is needed to complete the project. The sources of funds and participation for the project are shown in Table 2. These amounts are escalated to 2013 dollars, the planned project construction date.

<b>Funding Source</b>	<b>Participation</b>	<b>Total</b>
City of San Marcos	7.921	\$ 3,010,000
Union Pacific RR	2.322	882,500
TxDOT Category 6 Funds	6.966	2,647,500
Federal Appropriation to City of San Marcos	1.579	600,000
Federal Category 6 Funds	37.154	14,120,000
TIGER Discretionary	44.058	16,743,502
<b>TOTAL</b>	<b>100%</b>	<b>\$38,003,502</b>

**Table 2: Source of Funds**

The uses of funds are shown in Table 3. The detailed project budget is included as Attachment “A” to this application.

<b>Item</b>	<b>Total</b>
Engineering	\$2,600,000
Project Management, Inspection	\$1,845,817.28
Right of Way	\$5,078,000.00
Road Construction	\$3,197,367.03
Bridge Construction	\$17,053,896.65
Drainage	\$1,060,080.00
Traffic Controls	\$1,008,441.65
Environmental Controls	\$1,058,382.57
Mobilization	\$2,230,198.74
Utilities	\$631,057.00
Subtotal	\$35,763,240.92
2013 Escalation	\$ 2,240,261.08
<b>Total</b>	<b>\$ \$38,003,502</b>

**Table 3: Uses of Project Funds<sup>2</sup>**

#### **IV. Selection Criteria**

##### **A. Long-Term Outcomes**

###### *i State of Good Repair*

The proposed project will improve the condition of an existing roadway transportation system and minimize life-cycle costs by widening the existing facility and bringing it into a state of good repair. The project includes improvements to both the main lanes of Loop 82 and the associated access roads and intersecting streets, which will enhance the serviceability of these assets.. The project will provide for a grade separation of UP’s Austin Subdivision ML-1 that will eliminate through traffic at this grade crossing.

The project will be appropriately capitalized up-front via a partnership between the City of San Marcos, the federal government, TxDOT, and UP.

<sup>2</sup> See supporting documentation at <http://www.txdot.gov/business/rail/tiger3.htm> for the detailed project budget.

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The facility's current condition and performance and the projected condition and performance can be established by the following metrics:

1. Vehicular Delay

Current: Vehicular through traffic is delayed daily for varying periods when trains block the existing crossing of Loop 82 and UP Austin Subdivision ML-1. This occurs at least 25 times daily. The project will also reroute approximately 60% of traffic from the Post Road grade crossing on the roadway extension, thereby reducing delays for commuters on that crossing also.

Projected: The project will grade separate Loop 82 and ML-1 which will eliminate delays to through traffic.

2. Emergency Response Time

Current: Most emergency response services in San Marcos are located east of the UP Subdivision ML-1, while the city offices, county offices, major businesses, and population centers are located west of ML-1. The at-grade crossing of Loop 82 and ML-1 causes poor response times by emergency responders when the crossing is blocked by trains. This presents a significant public safety and public health issue.

Projected: Emergency response times will be greatly improved after Loop 82 and ML-1 are grade separated.

3. Community Enhancements

Current: The UP Austin Subdivision ML-1 bisects the City of San Marcos and effectively creates a barrier between the City and County Offices, Central Business District, Texas State University, and the population centers located west of town. It also creates a barrier between these locations and the IH-35, the main north-south highway through Central Texas.

Projected: The grade separation of Loop 82 and UP ML-1 is a component of the revitalization of downtown San Marcos. It will eliminate the barrier between the city center and the east side of town. The project includes improvements to city streets and frontage roads, as well as bicycle and pedestrian facilities. The project will also reduce emissions from idling vehicles. This scope of work will provide multiple enhancements to community cohesion and livability in the San Marcos region.

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*ii. Economic Competitiveness*

The project will support the long-term efficiency, reliability, and cost-competitiveness of businesses in San Marcos by providing mobility and access improvements to the area. The improvements are a component of the San Marcos Downtown Master Plan Revitalization Project. The Loop 82 – UP grade separation is envisioned as a Gateway Project intended to support the revitalization, redevelopment, and growth of downtown San Marcos. The construction of bicycle lanes, sidewalks, and a shared-use path would encourage the development of mixed use development patterns. This would result in a lower-cost transportation alternative and decreased congestion for the local businesses and Texas State University facilities.

*iii. Livability*

The project will benefit the livability of the region and have a positive impact on community life by improving vehicular mobility and safety at the intersection of Loop 82 and UP's Austin Subdivision ML-1. Mobility will be greatly increased by grade separating the roadway from the rail line, which will reduce vehicular idling and delay time at the crossing.

The construction of bicycle lanes, sidewalks, and a shared-use path will enhance the livability of the area. Texas State University (TSU) serves nearly 35,000 students on the 457 acre campus, which is accessed via Loop 82. Texas State's Bobcat Stadium is also located adjacent to the project and is in the process of planning an expansion from 15,000 to 24,500 seats.

The Loop 82 corridor also provides access to the historic San Marcos square as well as the downtown area, which includes the Hays County Courthouse. This is the entertainment and commercial center of San Marcos.

The project will enhance points of modal connectivity by separating through traffic on Loop 82 from local traffic on the access roads and intersecting streets. This would improve access and safety at a transit bus stop that is located just west of Charles Austin Drive. The mobility of the City transit buses and Texas State's shuttle buses will be increased by reducing traffic congestion and delays.

*iv. Sustainability*

The grade separation of Loop 82 and UP's Austin Subdivision ML-1 will improve energy efficiency by reducing vehicular idling time at the existing crossings. This will provide multiple benefits for many generations from air quality improvements, sustainability, economic growth, and reductions in the use of greenhouse gas hydrocarbons.

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There are substantial transportation-related costs related to energy consumption and greenhouse gas emissions. If Loop 82 is not grade separated, those costs and greenhouse gas emissions would increase dramatically over time as VMT and congestion increases, which would cause adverse effects to the environment.

*v. Safety*

The project will provide safety improvements for the traveling public, as well as the operating railroad, by eliminating vehicular-train conflicts for through traffic on Loop 82. Safety will also be enhanced by improved response times for Emergency Medical Services (EMS), as well as law enforcement officials. The UP effectively bisects the City of San Marcos, separating a large portion of the population from EMS and law enforcement services when trains occupy the main line. This roadway-rail configuration has historically resulted in significant delays in EMS and law enforcement response times which continue to this day. Grade separating these facilities will eliminate this problem with the resulting improvement in safety and quality of life for the citizens.

**B. Job Creation & Near Term Economic Activity<sup>3</sup>**

The Minnesota IMPLAN Group’s input-output model has been used to estimate the direct, indirect and induced effects of the Loop 82 project in terms of employment, value added and labor income. Employment represents full-time and part-time jobs created for a full year.

Value added represents total business sales (output) minus the cost of purchasing intermediate products and is roughly equivalent to gross regional/domestic product. Labor income consists of employee compensation (wage and salary payments as well as health and life insurance, retirement payments and any other non-cash compensation) and proprietary income (payments received by self-employed individuals as income).

The project is expected to generate 592 job-years during the development phase. It is also expected to create \$45.4 million in value added, including \$30.8 million in labor income. A breakdown of short-term impacts by type of effect (direct, indirect and induced) is provided in Table below. Note that the purchasing cost of the Right of Way (ROW) is not included in the total spending for the Economic Impact Analysis. ROW is regarded as a transfer from one entity to another.

**Table 4: Direct, Indirect and Induced Impacts during Project Development Phase**

	<b>Spending (Millions of 2011 Dollars)</b>	<b>Direct</b>	<b>Indirect</b>	<b>Induced</b>	<b>Total</b>
Employment*		239.3	128.9	224.0	592.2
Labor Income**	\$30.69	\$12.34	\$7.94	\$10.53	\$30.81
Value Added**		\$14.03	\$12.70	\$18.70	\$45.42

<sup>3</sup> See: “Benefit-Cost and Economic Impact Analysis” at <http://www.txdot.gov/business/rail/tiger3.htm>

*Note: \* Employment impacts from IMPLAN should not be interpreted as full-time equivalent (FTE) as they reflect the mix of full and part time jobs that is typical for each sector. On average, the ratio of FTE to full- and part-time jobs is estimated at 90 percent. \*\*Millions of Dollars of 2011.*

Another method to estimate job-years from additional spending uses the Council of Economic Advisors' (CEA) methodology<sup>4</sup>. This assumes that for every \$92,000 of government spending, one job-year is created. The following table shows the difference in job-year estimates using the IMPLAN and CEA methodologies. Note that the employment impacts are lower when using CEA's approach.

**Table 5: Job Year Estimates with IMPLAN and CEA Methodology**

	Spending (Millions of 2010 Dollars)	Direct	Indirect	Induced	Total
IMPLAN *	\$30.69	239.3	128.9	224.0	592.2
CEA		213.5		120.1	333.5

*Note: \* Employment impacts from IMPLAN should not be interpreted as full-time equivalent (FTE) as they reflect the mix of full and part time jobs that is typical for each sector.*

A breakdown of short-term economic impacts (IMPLAN estimates) in terms of employment (job-hours), labor income and value added is provided by quarter in Table below.

**Table 6: Short-Term Economic Impacts Resulting from Project Development**

Period	Spending (Millions of 2010 Dollars)*	Total Job-Hours**	Direct Job-Hours**	Total Labor Income (Millions of 2010 Dollars)	Total Value Added (Millions of 2010 Dollars)
Year 2011 - Q3	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2011 - Q4	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2012 - Q1	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2012 - Q2	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2012 - Q3	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2012 - Q4	\$0.33	2,813	1,137	\$0.33	\$0.48
Year 2013 - Q1	\$0.48	4,179	1,689	\$0.48	\$0.71
Year 2013 - Q2	\$0.48	4,179	1,689	\$0.48	\$0.71
Year 2013 - Q3	\$4.08	35,315	14,272	\$4.10	\$6.04
Year 2013 - Q4	\$4.08	35,315	14,272	\$4.10	\$6.04
Year 2014 - Q1	\$3.92	33,949	13,720	\$3.94	\$5.81
Year 2014 - Q2	\$3.92	33,949	13,720	\$3.94	\$5.81
Year 2014 - Q3	\$3.92	33,949	13,720	\$3.94	\$5.81
Year 2014 - Q4	\$3.92	33,949	13,720	\$3.94	\$5.81
Year 2015 - Q1	\$3.92	33,949	13,720	\$3.94	\$5.81
<b>Total</b>	<b>\$30.69</b>	<b>265,613</b>	<b>107,346</b>	<b>\$30.81</b>	<b>\$45.42</b>

<sup>4</sup> Executive Office of the President, Council of Economic Advisers, "Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009," Washington, D.C., May 11, 2009.

Notes: \* includes engineering (\$4.45 million) and construction (\$26.34 million); \*\* assuming average weekly hours of 34.5 (Bureau of Labor Statistics estimate).

Table 7 below presents the short-term increase in employment and labor income resulting from the project development in key industries employing low-income people. 353 cumulative job-years are expected to be created in those industries by the end of 2015, bringing in an additional \$16.6 million in labor income.

**Table 7: Short-Term Impacts in Key Industries Employing Low-Income People**

Sectors	Employment (Job-Years)	Labor Income (Millions of 2010 Dollars)
Agriculture, forestry, fishing and hunting	0.0	\$0.19
Construction	242.4	\$12.50
Retail trade	36.8	\$1.40
Truck transportation	6.1	\$0.33
Administrative and support and waste management and remediation services	21.5	\$0.87
Nursing and residential care facilities, home health care services	15.3	\$0.51
Accommodation and food services	27.6	\$0.64
Personal and laundry services	3.1	\$0.20
<b>Total</b>	<b>352.9</b>	<b>\$16.64</b>

### C. Innovation

There are no definitive technological benefits from this project as described in the NOFA.

### D. Partnership

This is a multi-party, public-private partnership for the improvement of vehicular and rail mobility and safety in the City of San Marcos. The project parties are the City of San Marcos, TxDOT, and the Union Pacific Railroad. The City of San Marcos and TxDOT are co-applicants for the TIGER grant funding. TxDOT, the City of San Marcos, and UP are all contributing funds to the project. Texas State University supports the project's goals of improving access and mobility to their campus, which is located immediately adjacent to the project, and the community. The project also has the support of numerous public officials, businesses, academic institutions, and the citizens of San Marcos and Hays County.

### E. Results of Benefit-Cost Analysis

The project provides significant benefits for the region as well as the state and nation. The various categories of benefits have been briefly discussed in the previous sections of this

application. A Benefit-Cost Analysis study of the project’s impacts over a 20 year period was completed and is available for review at <http://www.txdot.gov/business/rail/tiger3.htm>. The results of the Benefit-Cost Analysis are summarized in Tables 8 and 9 below.

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	\$38.24	\$53.01
Total Discounted Costs	\$30.76	\$33.50
Net Present Value	\$7.47	\$19.50
Benefit / Cost Ratio	1.24	1.58
Internal Rate of Return (%)	9.7%	
Payback Period (years)	9.4	

**Table 8: Discounted Project Benefit/Cost Summary**

Long-Term Outcomes	Benefit Categories	7% Discount Rate	3% Discount Rate
Economic Competitiveness	Travel Time Savings due to Elimination of Wait Time at Loop 82 Grade Crossing	\$11.93	\$20.63
	Reduced Vehicle Operating Costs due to Elimination of Wait Times at Loop 82 Grade Crossing	\$0.76	\$1.29
	Travel Time Savings due to Elimination of Wait Time for Reduced Traffic at Post Rd Crossing	\$2.50	\$4.32
	Reduced Vehicle Operating Costs due to Elimination of Wait Times for Reduced Traffic at Post Rd Crossing	\$0.16	\$0.27
Livability	Health Improvement due to Improved Bicycle Facilities	\$0.56	\$0.92
	Mobility Benefit due to Improved Bicycle Facilities	\$1.80	\$2.93
	Recreation Benefit due to Improved Bicycle Facilities	\$8.34	\$13.61
	Reduced Auto Use Benefits due to Improved Bicycle Facilities	\$0.01	\$0.02
Environmental Sustainability	Environmental Savings due to Reduced Vehicle Waiting Times at Loop 82 Grade Crossing	\$0.32	\$0.44
	Environmental Savings due to Reduced Vehicle Waiting Times at Post Rd Crossing	\$0.07	\$0.09
Safety	Reduced Accident Costs due to Elimination of Loop 82 Grade Crossing	\$11.78	\$8.48
<b>Total Benefit Estimates</b>		<b>\$38.24</b>	<b>\$53.01</b>

**Table 9: Benefit – Cost Calculations**

The project has a Return-On-Investment (ROI) of 9.7% and a benefit cost ratio of 1.24 to 1 when considering the benefits and costs detailed in the analysis.

## **V. Project Readiness and NEPA**

### **A. Project Schedule**

The project schedule is dependent upon the timing of a grant award and execution of the grant agreement. The total duration of the project is estimated at 1,022 days. Assuming that all agreements were finalized in the first quarter of 2012, the project would start on April 2012 and be completed in March 2015. A detailed schedule of activities is available at <http://www.txdot.gov/business/rail/tiger3.htm>.

The project is in the State Transportation Improvement Plan (STIP). Any delays in the grant approval and appropriation process would result in similar delays in project implementation.

### **B. Environmental Approvals**

The environmental process is estimated to be completed in 406 days from the Notice to Proceed.

## **VI. Federal Wage Rate Certification**

TxDOT follows federal wage rate requirements and the federal wage rate certification is provided as an attachment to the application.

## **VII. Summary**

The grade separation of Loop 82 and UP's Austin Subdivision ML-1 is a significant component of the revitalization of San Marcos, Texas. The project is needed to improve access to various city and county offices, as well as Texas State University and area businesses. The project is also critical to improving the response time of Emergency Medical Services, law enforcement, and other essential services.

The estimated impacts from the project show a savings of over \$90.48 million over a 20 year period<sup>5</sup>. The project will have positive direct and indirect impacts on the economy, employment levels, tax revenues, and highway costs. It is estimated that the project will create 194 construction jobs and 410 other jobs. The economic impact from the wages

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<sup>5</sup> See: "Benefit-Cost and Economic Impact Analysis" at <http://www.txdot.gov/business/rail/tiger3.htm>

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associated with job creation totals a minimum of \$13,892,966. The project will also improve the long-term efficiency and reliability of these transportation resources and contribute to the economic competitiveness of the region and state.