

Appendix D  
Detailed Cost/Benefit Analysis

**2020 BUILD Grant**  
**Wichita Falls, Texas:**  
**Event Center Corridor and Central Business Corridor**

Benefit Cost Analysis Summary

Dr. Sarah Quintanar

## **Introduction**

The proposed Event Center Corridor and Central Business Corridor Project improvements are vital for the continuing growth of downtown Wichita Falls. These projects are important complements to other investments being made by the city, but specifically this BUILD Grant would create a significantly safer connection for vehicles, cyclists, and pedestrians.

As discussed in the Project Narrative, specific goals of the grant include:

- better connectivity for pedestrians and cyclists Events Center, River Development District, and the Central Business District as well as the community's 26 mile circle hike/bike trail network
- updating intersections to current American with Disabilities Accessibility standards
- increasing bicycle safety by installing shared and dedicated lanes
- increasing safety for both cyclists and pedestrians through intersection improvements
- improving vehicle traffic flow by replacing five signalized intersections and updating the technology
- upgrade crossings at key intersections to provide audio beaconing
- upgrade all street lighting to the latest LED technology on post mounted poles

## **Project: Baseline and Improvements**

The project can be defined in terms of replacements and renovations in two specific areas:

- 1) Event Center Corridor
- 2) Central Business Corridor

Proposed improvements are similar across these two downtown areas however, the baseline conditions of travel and accident patterns differ.

### **Event Center Corridor: Baseline**

The Event Center Corridor is made up of Lamar and Scott Street (bounded by the Wichita River to the north and 10<sup>th</sup> Street to the south) and sees significantly more accidents and traffic than the Central Business Corridor. Specifically, most traffic is on Scott Street: this is the major travel route downtown (2017 Downtown Traffic & Parking Report).

The Event Center Corridor connects the River Development District and Wichita Fall's 26-mile circular hiking and biking trail. This trail is a \$40 million investment providing residents across the city with a safe option for cycling without vehicle interference.

Lamar, Scott, and their cross streets in this area face significant safety issues especially for pedestrian and cyclist traffic. Sidewalks and crosswalks currently are in disrepair: broken, uneven surfaces and in some places missing altogether. Scott Street currently has no continuous stretch of sidewalk from the river to 6<sup>th</sup> Street or 6<sup>th</sup> to 10<sup>th</sup> streets. The sidewalk that is present between 6<sup>th</sup> and 10<sup>th</sup> is in extremely poor shape with cracks and uneven sections. Where cyclists are unable to use the sidewalks, they are riding in undesignated downtown streets. Cyclists often use this route due to its connection with the city trail and downtown, however, there is a lack of bicycle facilities making it a challenging ride.

The 5 signalized intersections along Scott are not up to date in terms of safety for those with disabilities (specifically those with sight impairments). Street light poles in this area are over 60 years old: they are not of breakaway design and are hazardous in vehicle collisions.

### **Central Business Corridor: Baseline**

The Central Business Corridor is comprised of Indiana and Ohio Street (bounded by 7<sup>th</sup> and 10<sup>th</sup> Streets). This area is severely lacking in infrastructure for cyclists and pedestrians despite supporting a large number of retail shops, restaurants, and taverns. This area has also experienced growth in residential and multifamily housing over the past 10 years through the downtown development efforts of the city.

Downtown hosts a number of festivals throughout the year. Hotter-N-Hell Hundred is the largest; a national biking event which hosts approximately 13,000 riders. Other festivals generally see 10,000 attendees each: St.Paddy's Day, Cajun Fest, and Artwalk on the first Thursday of every month. Additionally, there is a Farmer's Market at 8<sup>th</sup>/Indiana opened daily during season.

### **Wichita Falls Downtown Revitalization Efforts**

The narrative describes in great detail the efforts of the city over the past 30 years to revitalize downtown Wichita Falls to its previous status as a strong economic and business hub. These projects have been extremely successful thus far, and the city continues to devote resources to its goal with an additional \$12 million planned facility improvements. Investments range from projects aimed at bringing events to Wichita Falls to the infrastructure needed to support downtown businesses and residents. For example, 200 additional parking stalls will be available in the summer of 2020 through \$125,000 in parking garage improvements. The BUILD grant provides an important additional piece to these efforts: revitalization of connectors within downtown to the rest of the city. A selection of other completed projects are discussed below.

### **Wichita Falls Multipurpose Events Center (MPEC), Convention Center and Hotel**

Located in the downtown Central Business District (in the northwest corner), the Multi-Purpose Events Center (MPEC) is one of the largest traffic generators in the community as well as a vital piece in much of the economic development of downtown since its completion in 2003. This area also houses: Festival Park (5.5 acres), J.S. Bridwell Agricultural Center, Kay Yeager Coliseum (6,500 seats), and Ray Clymer Exhibit Hall.

The City of Wichita Falls is currently in an agreement to design and construct a 200 room Marriott hotel with 14,000 square foot Ballroom/Conference Center: with a specific goal to increase Wichita Fall's ability to compete for larger conventions needing a full-service hotel. It also functions as an important extension to the MPEC and events held there. The development is expected to break ground in September 2020.

Over the past three fiscal years<sup>1</sup>, MPEC has had an average of 16 events per month with about 18,600 attendees. With the other downtown developments taking place, it is not unreasonable to expect these numbers to increase.

### **Wichita Falls Travel Center**

The Wichita Falls Travel Center was completed in 2013 and combines public transportation, intercity bus transportation, regional providers, taxi companies, and share ride services into one facility. Importantly, it is next to the Community's Event Center and the hike/bike trail. Over 500,000 people use the travel center each year.

### **Beacon Lighthouse for the Blind**

Beacon Lighthouse is located at 300 7<sup>th</sup> Street (off MLK Boulevard between 6<sup>th</sup> and 7<sup>th</sup> Street) and has provided employment opportunities for the blind and visually impaired for over 50 years. In fact, this building houses 50,000 square feet of industrial and office space manufacturing and employs the blind and visually impaired. In February 2019 they were awarded the Employment Growth Award by the National Industries for the Blind (NIB). The BUILD project will bring sidewalks and intersection audio beaconing leading to Beacon Lighthouse up to ADA standards thereby increasing safety and accessibility for visitors and employees.

### **Improvements**

BUILD Grant funding is being requested first to address current issues in accessibility and safety. Specifically, the intersections along Scott and Lamar (except for 8<sup>th</sup> and Lamar) will be updated to meet current ADA standards and correct slope issues. These areas will incorporate new stamped concrete and bus shelters for increased pedestrian safety. Upgrades to LED lighting will improve nighttime safety as well as decrease maintenance costs. Based on a study of traffic flow, these intersections will remain all-way stops (2017 Downtown Traffic & Parking Report).

The 5 signalized intersections on Scott Street will be upgraded to safer breakaway poles and mast arms and their pedestrian signals replaced to include audio beaconing. This will have a huge impact on pedestrian safety especially for those with sight disabilities. Given the close proximity of the Beacon Lighthouse for the Blind, this is particularly important.

Dedicated bicycle lanes along Lamar and Scott will drastically improve safety (and enjoyment/ease) for bicyclists. In fact, there is evidence that dedicated lanes also improve vehicle travel times. Dedicated lanes will help bikers currently using this route between the city's neighborhoods, trail and downtown, but also is expected to increase ridership in general. Large events and their participants, like the 13,000 riders in Hotter-N-Hell Hundred will also see quantifiable benefits from these improvements.

The city development plan includes these upgrades for cross-streets in downtown, though funding for those improvements are not included in the BUILD Grant request.

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<sup>1</sup> March 2019 and 3 years prior.

## Benefits

Following the BCA Guidance for Discretionary Grant Programs, January 2020, we determined the **Benefit Cost Ratio to be 3.29**. There are significant quantifiable benefits specific to safety and economic competitiveness. Additionally, there are important benefits which were not quantified due to uncertainty in predicting their value or difficulty in separating the benefit from this specific project vs. other downtown revitalization projects. Both are discussed in detail below.

## Safety Improvements

Prior to 2016 the number of accidents within the project area was fairly constant at 25-28 per year, however, after the finalization of the first downtown revitalization projects, accidents increased by roughly 10 for 2017- present (to range between 35-38 for these latter years). From 2016 to 2019 overall accidents increased by about 35%. The change in injuries was less consistent though there was an immediate jump which later tapered off, likely because the improvements increased traffic (increasing accident/injury) but also improved safety (decreasing accidents).

The Texas DOT Crash Records Information System (CRIS) provides some limited data on crash severity including the number of fatalities, not injured, possible injury, non-incapacitating injury, incapacitating injury, and unknown injury. Estimates are provided matching this information to KABCO Levels and their corresponding monetized values for the project area and arterial routes. For the entire project area, there have been zero fatalities associated with a crash over the past 10 years. If injuries occur, they are minor or moderate in nature.

Texas DOT lists state-wide accepted Crash Modification Factors (Standard CMF Accepted Values for the State List Texas), which are applied here. Perhaps the most significant aspect of the project in terms of accident prevention are the new signals on Scott Street and the sidewalk installations (particularly on Lamar and Scott Streets). Sidewalk installation is expected to reduce accidents and injuries by a standard 20% reduction factor while the signal improvements reduce by 50%.<sup>2</sup> The improvements to be completed to bring the intersections up to ADA standards, stamped concrete, pedestrian safety, and LED Lighting likely will further decrease accidents and injury, as standard reduction factors for these improvements alone range from 10% to 20%. The impact of bicycle lanes on accidents and injury are difficult to predict since the goal to increase bicycling downtown WF will also likely increase the number of cyclists traveling in the area (net effect uncertain). As a conservative estimate, we apply a reduction factor of 35% to account for the overall impact of the project's safety impact.

The work is to be completed in 3 distinct phases, with safety benefits calculated to accrue in the two years prior to full completion. Safety benefits were calculated in monetized to Year 4 values and 1/3 applied for year 2 and 1/3 for year 3. Economic competitiveness savings was not calculated with phasing in, because this savings likely requires some network effects to accrue.

Assuming a 35% reduction rate in accidents for the project area, we would expect a decrease of 11.99 accidents per year. Considering the project area and surrounding arterial routes, this translates to a safety benefit of **\$693,335.94** annually from injury prevention. The additional safety benefit pertaining to reduction in annual property damage cost of **\$85,673.73**.

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<sup>2</sup> State List Texas Standard CMFA Accepted Values, #407 Install Sidewalks, #108 Improve Traffic Signals, #131 Improve Pedestrian Signals.

## **Economic Competitiveness Benefits to Existing and New Users**

### **Drivers**

Estimates for the number of existing drivers were drawn from a 2017 Wichita Falls Study on Consolidated Traffic: adjusted to correspond to the proposed project area and extrapolated assuming growth from data collection to the start of the project.<sup>3</sup>

In practice, current drivers who use these routes may choose to continue driving or may choose to bike once the infrastructure is present. We do not explicitly account for this “switching” behavior in terms of drivers no longer choosing to drive. Wichita Falls has demonstrated high growth in traffic volumes, especially downtown, but we assume vehicle traffic volumes are constant after the project start. This should offset the “switching” to bikes, which we are not including explicitly. For cyclists, the overall expected increase in biking trips does capture those who “switch” as well as new cyclists despite the fact that this is not modeled separately.

### **Cyclists and Pedestrians**

For the project area, the city estimates a current daily cyclist count of between 25 and 50, where we extrapolate to 14,600 bike trips per year.

The addition of bicycle lanes not only increases safety, but also should increase the number of cyclists as safer travel becomes available into the downtown area and linking to the city’s 26 mile central trail. The additions on Lamar and Scott will connect downtown to the large city-wide bike trail. People ride these bike trails regularly, and we expect the addition of safer downtown route to encourage some spillover into the area. Additionally, with the development of the MSU dormitory (approximately 200 people) and hotel infrastructure for the Convention Center and MPEC, we assume an additional 40% in ridership in downtown Wichita Falls after the project is complete. This rate is assumed based on meta analyses of other case studies within the United States show increased ridership between 21% and 171% after dedicated or shared bike lanes are installed (NACTO 2016). This increase also is intended to capture potential “switching” from driving to biking in the area. Even still, other potential impacts of continued economic development strategies in downtown Wichita Falls are not included in the expected growth for ridership so this is thought to be a lower bound estimate.

The new bicycle lanes installed on Lamar and Scott will greatly impact well-being for citizens of Wichita Falls, but also for the numerous visitors throughout the year who come for festivals, the Farmer’s Market, and Hotter-N-Hell Hundred (about 10,000 each). Additionally, MSU is currently in the process of establishing a 110-room dormitory downtown. The pedestrian count used in the analysis is based on these events, but is not intended to capture the true volume of pedestrian travel: instead, this provides an easily quantifiable lower-bound.<sup>4</sup>

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<sup>3</sup> 25% growth based on traffic volume estimates for Wichita County provided by the Texas DOT.

<sup>4</sup> The BNSF Railroad & 7<sup>th</sup> Street Intersection Study Analysis found an average of 70.8 people per day crossed at the intersection of 7<sup>th</sup> and the railroad in northern downtown. This location is slightly to the north-east of the project area, but provides one relevant datapoint for estimating pedestrian volume.

## **Reduction in Travel Time**

The project will decrease travel times for drivers, cyclists, and pedestrians traveling downtown. Modernized signals should improve vehicle flow. Additionally, there is evidence that designated bike lanes decrease traffic congestion and commute time for vehicles travelling on those roads. Researchers found up to a 35% reduction in travel time after inputting designated lanes (NYDOT 2014). Wichita Falls experiences significantly less traffic congestion than cities where existing studies were conducted, thus we have assumed a 10% decrease in travel time- specifically, 30 seconds shorter for rides on Lamar or Scott Streets.

Cyclists will be able to more easily and seamlessly complete their commute with designated places to ride and improved signaling. For the project area, the city estimates a current daily cyclist count of between 25 and 50. We assume a similar decrease in travel time for cyclists as for drivers: one minute reduction in travel time resulting from clearer bike lanes, modernized intersections and smoother riding.

Pedestrians should also experience shorter travel times with less concern about tripping on damaged sidewalks and clearer, updated crossing signals. We assume a one minute reduction in travel time for both existing pedestrians and new pedestrian users.

Generally in this type of analysis new users' benefits are discounted by .5 to account for the switching decision as a function of the travel time reduction. In this case, new users are not "switching" due to time savings, but due to the increased network benefit of safer travel by foot or bike so we did not discount these benefits. However, discounting does not qualitatively change the results.

## **Unquantified Benefits**

### **Quality of Life**

Improvements to quality of life resulting from the BUILD investments for both citizens and visitors to Wichita Falls are enormous. There are health benefits and environmental benefits to walking or cycling as opposed travelling in a vehicle. Emissions decrease with larger driving populations as well. However, those benefits are generally not realized on a large scale without a network of safe routes, especially within a city. Wichita Falls began to distinguish itself as a "cycling friendly" city years ago both through investments and project development. In fact, the city earned a Bronze Bicycle Friendly Community designation this year. This proposed project is a continuation of that effort, and in fact, a very important link between downtown revitalization and the established city trail system.

### **Accessibility**

Currently, the intersections and sidewalks of both the Event Center Corridor and Central Business Corridor do not meet ADA standards. It is difficult to quantify this benefit of bringing these routes up to current standards, though it is an extremely important change to be made especially considering the direct impact it will have on the employees and visitors to the Beacon Lighthouse for the Blind.



## Property Values

Downtown Wichita Falls has seen drastic increases in property values over the last two years due to a focus on economic development projects and other investments in the area: nearly 6 million dollars increase. Additional property value increases are likely; both as an effect of this project and others aimed at revitalizing downtown. We have opted not to quantify property value benefits for this analysis as the increase specific to the BUILD project are likely small and difficult to separate from the broader economic development impacts.

## Costs

Capital costs are provided according to estimates explained in greater detail in the narrative, for a total of **\$27,777,778.00**.

After the construction phase, maintenance costs for the area will actually be lower than current maintenance costs. New sidewalks should require minimal (if any) repairs for the first five years. The intersections being replaced are currently asphalt and will be concrete after replacement, which requires less maintenance. Currently Wichita Falls is spending about \$2,500 per year on these sidewalk and pothole repairs which will not be incurred with the proposed project. We assume after the first five years these costs will start to increase by increments of \$750, but not reaching current expenses for significantly longer.

## Residual Value

Much of the sidewalk being replaced in this project has been in use for 80 years. Similarly, the intersections being replaced have been used for over 60 years. It is likely the current proposed project will provide benefits for longer than the standard 30 year baseline BCA. Assuming instead a project benefit period of 50 years, the residual value is estimated at **\$11,111,111.20** or a present value of **\$1,459,634.65**.

<b>Total Net Benefit</b>	<b>Total Benefit - Cost Ratio</b>	<b>Discounted Net Benefit</b>	<b>Discounted Benefit-Cost Ratio</b>
\$91,420,942.73	\$91,420,942.73	\$27,720,741.02	\$27,720,741.02
\$27,777,778.00	\$27,777,778.00	\$24,581,730.01	\$24,581,730.01
<b>\$63,643,164.73</b>	<b>3.29115</b>	<b>\$3,139,011.01</b>	<b>1.127696912</b>

## Summary

The Wichita Falls BUILD Project will drastically improve safety, decrease accidents and injury, increase ability for bicycle and pedestrian travel, and support the numerous other economic development efforts in downtown Wichita Falls. The project benefits will have large implications on the well-being of Wichita Falls residents along with the broader implications for visitors and the region.

## Sources

Aldred, Rachel. (August 2016). "Cycling near misses: Their frequency, impact, and prevention." *Transportation Research Part A: Policy and Practice* 90, pp.69-83.

Beacon Lighthouse for the Blind, [beaconwf.com/about-beacon-lighthouse-inc/](http://beaconwf.com/about-beacon-lighthouse-inc/)

Bicycle Friendly Community (BFC) Bronze Award: Wichita Falls, TX. The League of American Bicyclists, Fall 2019.

BNSF Railroad & 7<sup>th</sup> Street Intersection Study Analysis- Wichita Falls Community Action Network (WeCAN) and WF Traffic Engineering

Standard CMF Accepted Values for the State List Texas.

2017 Downtown Parking and Traffic Report- Wichita Falls

National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide*.

National Association of City Transportation Officials (NACTO). "High-Quality Bike Facilities Increase Ridership Make Biking Safer" (July 2016). <https://nacto.org/2016/07/20/high-quality-bike-facilities-increase-ridership-make-biking-safer/>

New York City Department of Transportation. Protected Bicycle Lane Analysis. September 2014.

Safety Savings				
KABCO Level	Injury Reduction	Present Value	Monetized Value at Year 4	Savings per Year
O- NO INJURY	12.6125	\$3,200	\$3,601.63	\$45,425.54
C- POSSIBLE I	1.9125	\$63,900	\$71,920.01	\$137,547.02
B- NON-INCA	1.4	\$125,000	\$140,688.60	\$196,964.04
A- INCAFACT	0.1375	\$459,100	\$516,721.09	\$71,049.15
U- INJURED (\$	1.2375	\$174,000	\$195,838.53	\$242,350.18
				\$693,335.94

Accident Reduction	Present Value	Monetized Value at Year 4	Savings per Year
17.3	\$4,400.00	\$4,952.24	\$85,673.73

Vehicle Operating Cost Savings	Project Miles	Monetized Value at Year 4	Savings per Year
Cyclists	5,840	2	\$0.46
Pedestrians	65,440	2	\$0.46

Time Savings	Annual Traffic	Monetized Value at Year 4	Savings per Year
Existing Drivers	6,980,398	\$0.29	\$995,156.53
Existing Cyclists	14,600	\$0.57	\$8,325.76
Existing Pedestrian Trips	100,000	\$0.57	\$57,025.78
New Cyclists	5,840	\$0.57	\$11,656.07
New Pedestrians	65,440	\$0.57	\$37,317.67

Useful Service Life	Calculated Benefit	Project Cost	Residual Value	Discounted Residual Value
50	30	\$27,777,778.00	\$11,111,111.20	\$1,459,634.65

Assumed Inflation Rate	3%
Discount Rate	7%

Present Value Vehicle Operating Costs	\$0.41
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Existing Bicycle Traffic in Project Area	40% Growth	New Cyclists
14,600	20,440	5,840

	Present Value: Per Hour Travel Savings	Present Value: Per Minute Travel Savings
Drivers	\$15.20	\$0.25
Bikers/Pedestrians	\$30.40	\$0.51

# New Residents Downtown	220
# Festival Attendees	10,000
#Pedestrians	100440

Year	Project Year	Value of Safety Savings	Safety Savings Discounted at 7%	Value of Economic Competitiveness Savings	Economic Competitiveness Savings Discounted at 7%	O&M Costs	Discounted O&M Costs	Construction Costs	Discounted Construction Costs
2021	0							\$1,341,324.00	\$1,341,324.00
2022	1							\$9,017,497.00	\$8,427,567.29
2023	2	\$244,763.78	\$213,786.16					\$10,391,534.00	\$9,076,368.24
2024	3	\$504,213.38	\$411,588.31					\$7,027,423.00	\$5,736,470.47
2025	4	\$779,009.67	\$594,302.75	\$1,175,267.36	\$896,605.84	(\$2,500.00)	(\$1,907.24)	\$0.00	\$0.00
2026	5	\$802,379.96	\$572,085.82	\$1,210,525.38	\$863,087.86	(\$2,575.00)	(\$1,835.94)	\$0.00	\$0.00
2027	6	\$826,451.36	\$550,699.43	\$1,246,841.14	\$830,822.90	(\$2,652.25)	(\$1,767.31)	\$0.00	\$0.00
2028	7	\$851,244.90	\$530,112.54	\$1,284,246.37	\$799,764.10	(\$2,731.82)	(\$1,701.24)	\$0.00	\$0.00
2029	8	\$876,782.24	\$510,295.25	\$1,322,773.77	\$769,866.37	(\$2,813.77)	(\$1,637.64)	\$0.00	\$0.00
2030	9	\$903,085.71	\$491,218.79	\$1,362,456.98	\$741,086.32	(\$1,802.50)	(\$980.44)	\$0.00	\$0.00
2031	10	\$930,178.28	\$472,855.47	\$1,403,330.69	\$713,382.16	(\$1,856.58)	(\$943.79)	\$0.00	\$0.00
2032	11	\$958,083.63	\$455,178.63	\$1,445,430.61	\$686,713.67	(\$1,912.27)	(\$908.51)	\$0.00	\$0.00
2033	12	\$986,826.14	\$438,162.61	\$1,488,793.53	\$661,042.13	(\$1,969.64)	(\$874.54)	\$0.00	\$0.00
2034	13	\$1,016,430.92	\$421,782.70	\$1,533,457.33	\$636,330.28	(\$2,028.73)	(\$841.85)	\$0.00	\$0.00
2035	14	\$1,046,923.85	\$406,015.12	\$1,579,461.05	\$612,542.23	(\$1,030.00)	(\$399.45)	\$0.00	\$0.00
2036	15	\$1,078,331.57	\$390,836.98	\$1,626,844.88	\$589,643.45	(\$1,060.90)	(\$384.52)	\$0.00	\$0.00
2037	16	\$1,110,681.51	\$376,226.26	\$1,675,650.23	\$567,600.71	(\$1,092.73)	(\$370.14)	\$0.00	\$0.00
2038	17	\$1,144,001.96	\$362,161.72	\$1,725,919.74	\$546,381.99	(\$1,125.51)	(\$356.31)	\$0.00	\$0.00
2039	18	\$1,178,322.02	\$348,622.97	\$1,777,697.33	\$525,956.49	(\$1,159.27)	(\$342.99)	\$0.00	\$0.00
2040	19	\$1,213,671.68	\$335,590.33	\$1,831,028.25	\$506,294.57	(\$257.50)	(\$71.20)	\$0.00	\$0.00
2041	20	\$1,250,081.83	\$323,044.90	\$1,885,959.10	\$487,367.67	\$2,000.00	\$516.84	\$0.00	\$0.00
2042	21	\$1,287,584.28	\$310,968.46	\$1,942,537.87	\$469,148.32	\$2,060.00	\$497.52	\$0.00	\$0.00
2043	22	\$1,326,211.81	\$299,343.47	\$2,000,814.01	\$451,610.06	\$2,121.80	\$478.92	\$0.00	\$0.00
2044	23	\$1,365,998.17	\$288,153.06	\$2,060,838.43	\$434,727.44	\$2,185.45	\$461.01	\$0.00	\$0.00
2045	24	\$1,406,978.11	\$277,380.98	\$2,122,663.58	\$418,475.95	\$2,251.02	\$443.78	\$0.00	\$0.00
2046	25	\$1,449,187.46	\$267,011.60	\$2,186,343.49	\$402,831.99	\$2,318.55	\$427.19	\$0.00	\$0.00
2047	26	\$1,492,663.08	\$257,029.85	\$2,251,933.79	\$387,772.85	\$2,388.10	\$411.22	\$0.00	\$0.00
2048	27	\$1,537,442.97	\$247,421.26	\$2,319,491.80	\$373,276.67	\$2,459.75	\$395.85	\$0.00	\$0.00
2049	28	\$1,583,566.26	\$238,171.87	\$2,389,076.56	\$359,322.40	\$2,533.54	\$381.05	\$0.00	\$0.00
2050	29	\$1,631,073.25	\$229,268.25	\$2,460,748.86	\$345,889.79	\$2,609.55	\$366.81	\$0.00	\$0.00
2051	30	\$1,680,005.45	\$220,697.47	\$2,534,571.32	\$332,959.33	\$2,687.83	\$353.09	\$0.00	\$0.00
Total		\$32,462,175.23	\$10,840,013.00	\$47,844,703.42	\$15,410,503.54	(\$2,952.88)	(\$10,589.83)	\$27,777,778.00	\$24,581,730.01

Total Net Benefit	Total Benefit - Cost Ratio	Discounted Net Benefit	Discounted Benefit-Cost Ratio
\$91,420,942.73	\$91,420,942.73	\$27,720,741.02	\$27,720,741.02
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\$63,643,164.73	3.29115	\$3,139,011.01	1.127696912

Annual Traffic Volumes	
Lamar	1,582,913
Scott	3,546,542
Indiana	1,123,500
Ohio	727,443

Initial Projected Difference in O&M
-\$2,500.00

Project Costs	Date Payment Due (work completed)	Amount
Phase I & II: environmental	Mar-21	\$20,000.00
Phase I: engineering	Jul-21	\$1,321,324.00
Phase II: engineering	Jan-22	\$755,041.00
Phase I: project management, sidewalk, lighting	Nov-22	\$8,262,456.00
Phase II: project management, sidewalk, lighting	Nov-23	\$9,626,493.00
Phase III: environmental and engineering	Nov-23	\$765,041.00
Phase III: project management, sidewalk, lighting	Aug-25	\$7,027,423.00
Total		\$27,777,778.00

Accident Data	Project Area				Yearly Average	35% Reduction
	2016	2017	2018	2019		
Accident Severity (Texas DOT)						
N - Not Injured	24	26	28	22	25	8.75
C- Possible Injury	5	5	3	2	3.75	1.3125
B - Non-incapacitating Injury	2	5	3	0	2.5	0.875
A- Incapacitating Injury	0	0	0	1	0.25	0.0875
99 - Unknown Injury	5	2	1	3	2.75	0.9625
Total Accidents	36	38	35	28	34.25	11.9875

Accident Severity (Texas DOT)	Arterial Routes (Highway Access Roads and Scott/Lamar Outside of Project Area)				Yearly Average	5% Reduction
	2016	2017	2018	2019		
N - Not Injured	73	90	80	66	77.25	3.8625
C- Possible Injury	18	12	8	10	12	0.6
B - Non-incapacitating Injury	13	6	7	16	10.5	0.525
A- Incapacitating Injury	1	1	2	0	1	0.05
99 - Unknown Injury	3	8	5	6	5.5	0.275
Total Accidents	108	117	102	98	106.25	5.3125

Total Reduction	
Accident Severity (Texas DOT)	
N - Not Injured	12.6125
C- Possible Injury	1.9125
B - Non-incapacitating Injury	1.4
A- Incapacitating Injury	0.1375
99 - Unknown Injury	1.2375
Total Accidents	17.3