



**“Natchitoches Safe Streets Revitalization” Project**

**Benefit-Cost Analysis**

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## **SUMMARY OF ANTICIPATED ANNUAL PROJECT BENEFITS**

PART 1, SAFETY BENEFITS [PEDESTRIAN CRASH REDUCTION] = \$5,021,342 Annually

PART 2, SAFETY BENEFITS [BICYCLE CRASH REDUCTION] = \$427,137 Annually

PART 3, NON-SAFETY BENEFITS [PEDESTRIAN & BICYCLE] = \$1,517,147 Annually  
plus \$12,134 in 2027

PART 4, STREET MAINTENANCE COST SAVINGS = \$51,692 Annually

TOTAL = \$7,017,318 ANNUALLY

WITH ADDITIONAL \$12,134 IN CALENDAR YEAR 2027

[TO BE ADJUSTED IN SUCCESSIVE YEARS, PER TABLE A-6 OF U.S. DOT *BENEFIT-COST ANALYSIS GUIDANCE FOR DISCRETIONARY GRANT PROGRAMS*]

### **PART 1, ANTICIPATED SAFETY BENEFITS RESULTING FROM IMPLEMENTATION OF PLANNED PEDESTRIAN COUNTERMEASURES [BASED ON CRASH DATA FROM 2012 TO 2018 AT LOCATIONS INCLUDED IN PROPOSED PROJECT]**

#### **COUNTERMEASURE 1 – INSTALL SIDEWALKS**

Louisiana Severity A [KABCO Level K] = 0 crashes at specified locations from 2012 to 2018

LA Severity B [KABCO Level A] = 2 crashes in 7 years = 0.286 crash per year @ monetized value of \$521,300 = \$148,943 annually

LA Severity C [KABCO Level B] = 9 crashes in 7 years = 1.286 crash per year @ monetized value of \$142,000 = \$182,571 annually

LA Severity D [KABCO Level C] = 16 crashes in 7 years = 2.286 crashes per year @ monetized value of \$72,500 = \$165,714 annually

LA Severity E [KABCO Level O] = 3 crashes in 7 years = 0.429 crash per year @ monetized value of \$3,700 = \$1,586 annually

TOTAL = \$498,814 annually times Crash Reduction Factor [CRF] of 0.88 for this countermeasure =

**Anticipated annual value of \$438,957 for reduction in crashes resulting from implementation of this countermeasure**

#### **COUNTERMEASURE 2 – CONSTRUCT PAVED SHOULDERS**

LA Severity A [KABCO Level K] = 2 crashes in 7 years = 0.286 @ \$10,900,000 = \$3,114,285 annually

LA Severity B [KABCO Level A] = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually

LA Severity D [KABCO Level C] = 2 crashes in 7 years = 0.286 @ \$72,500 = \$20,714 annually

LA Severity E [KABCO Level O] = 0 crashes from 2012 to 2018

TOTAL = \$3,155,285 annually times CRF of 0.71 = **Anticipated annual value of**

**\$2,240,252 for reduction in crashes resulting from implementation of this countermeasure**

### **COUNTERMEASURE 3 – INSTALL HIGH-VISIBILITY CROSSWALK MARKINGS**

LA Severity A [KABCO Level K] = 2 crashes in 7 years = 0.286 @ \$10,900,000 = \$3,114,286 annually

LA Severity B [KABCO Level A] = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually

LA Severity D [KABCO Level C] = 2 crashes in 7 years = 0.286 @ \$72,500 = \$20,714 annually

LA Severity E [KABCO Level O] = 1 crash in 7 years = 0.143 @ \$3,700 = \$529 annually

TOTAL = \$3,155,815 annually times CRF of 0.48 = **Anticipated annual value of \$1,514,791 for reduction in crashes resulting from implementation of this countermeasure**

### **COUNTERMEASURE 4 – INSTALL ADVANCE YIELD/STOP SIGNS AT CROSSWALKS**

From section 3 above, Annual value of crashes at locations where crosswalks will be installed = \$3,155,815 times CRF of 0.25 for installation of advance yield/stop signs =

**Anticipated additional annual value of \$788,954 for reduction in crashes resulting from implementation of this countermeasure**

### **COUNTERMEASURE 5 – INSTALL PEDESTRIAN SIGNAL**

LA Severity A, B, C, & E = 0 crashes at specified locations from 2012 to 2018

LA Severity D [KABCO Level C] = 1 crash in 7 years = 0.143 @ 72,500 = \$10,357 annually

Times CRF of 0.51 = **Anticipated annual value of \$5,282 for reduction in crashes resulting from implementation of this countermeasure**

### **COUNTERMEASURE 6 – INSTALL RECTANGULAR RAPID FLASHING BEACON [RRFB]**

LA Severity A, B, C, & D = 0 crashes at specified locations from 2012 to 2018

LA Severity E [KABCO Level O] = 1 crash in 7 years = 0.143 @ \$3,700 = \$529 annually

Times CRF of 0.47 = **Anticipated annual value of \$249 for reduction in crashes resulting from implementation of this countermeasure**

### **COUNTERMEASURE 7 – INSTALL OVERHEAD LIGHTING**

LA Severity A, B, & E = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 5 crashes in 7 years = 0.714 @ \$142,000 = \$101,429 annually

LA Severity D [KABCO Level C] = 4 crashes in 7 years = 0.571 @ \$72,500 = \$41,429 annually

TOTAL = \$142,858 annually times CRF of 0.23 = **Anticipated annual value of \$32,857 for reduction in crashes resulting from implementation of this countermeasure**

**TOTAL ANTICIPATED ANNUAL VALUE FOR REDUCTION IN PEDESTRIAN CRASHES RESULTING FROM IMPLEMENTATION OF ALL PLANNED COUNTERMEASURES = \$5,021,342**

#### **Sources of Data:**

1. Pedestrian crash data for 2012-2018 was obtained from LACRASH and is listed by location in the attached summary.

2. Conversion of Louisiana crash severity code to KABCO scale was obtained from FHWA Highway Safety website.
3. Monetized value of reduced fatalities and injuries was obtained from Table A-1 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.
4. Crash Reduction Factors for the listed counter-measures were derived from Crash Modification Factors listed in FHWA publication, *Toolbox of Pedestrian Countermeasures and Their Potential Effectiveness*, dated September 2018, where  $CRF = (1.0 - CMF)$ .

**PART 2, ANTICIPATED SAFETY BENEFITS RESULTING FROM IMPLEMENTATION OF PLANNED BICYCLE COUNTERMEASURES**  
*[BASED ON CRASH DATA FROM 2012 TO 2018 AT LOCATIONS INCLUDED IN PROPOSED PROJECT]*

**COUNTERMEASURE 1 – INSTALL SEPARATED BIKE LANES**

Louisiana Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 crash per year @ monetized value of \$10,900,000 = \$1,557,143 annually

LA Severity B = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 4 crashes in 7 years = 0.571 crash per year @ monetized value of \$142,000 = \$81,143 annually

LA Severity D [KABCO Level C] = 9 crashes in 7 years = 1.286 crashes per year @ monetized value of \$72,500 = \$93,214 annually

LA Severity E [KABCO Level O] = 1 crash in 7 years = 0.143 crash per year @ monetized value of \$3,700 = \$529 annually

TOTAL = \$1,732,029 annually

Times Crash Reduction Factor [CRF] of 0.037 for this countermeasure [CMF ID No. 8287 from Crash Modification Factors Clearinghouse] =

**Anticipated annual value of \$64,085 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 2 – INSTALL SHARED LANE MARKINGS (“SHARROWS”)**

No monetized benefit was included for this countermeasure due to the unavailability of a definitive Crash Modification Factor. It is generally accepted, however, that safety benefits should result.

**COUNTERMEASURE 3 – CONSTRUCT PAVED SHOULDERS**

Again, no monetized benefit was included for this countermeasure due to the unavailability of a definitive Crash Modification Factor. It is generally accepted, however, that safety benefits should result.

**COUNTERMEASURE 4 – INSTALL OVERHEAD LIGHTING**

LA Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 @ \$10,900,000 = \$1,557,143 annually

LA Severity B = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually

LA Severity D = 0 crashes at specified locations from 2012 to 2018  
LA Severity E [KABCO Level O] = 2 crashes in 7 years = 0.286 @ \$3,700 = \$1,057 annually  
TOTAL = \$1,578,486 annually times CRF of 0.23 [assumed to be the same for bicycle crashes as for pedestrian crashes] = **Anticipated annual value of \$363,052 for reduction in crashes resulting from implementation of this countermeasure**

**TOTAL ANTICIPATED ANNUAL VALUE FOR REDUCTION IN BICYCLE CRASHES RESULTING FROM IMPLEMENTATION OF ALL PLANNED COUNTERMEASURES = \$427,137**

**Sources of Data:**

1. Bicycle crash data for 2012-2018 was obtained from LACRASH and is listed by location in the attached summary.
2. Conversion of Louisiana crash severity code to KABCO scale was obtained from FHWA Highway Safety website.
3. Monetized value of reduced fatalities and injuries was obtained from Table A-1 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.

**ANTICIPATED SAFETY BENEFITS FOR SCALED PROJECT [IMPACT ZONE 1] RESULTING FROM IMPLEMENTATION OF PLANNED PEDESTRIAN COUNTERMEASURES**

*[BASED ON CRASH DATA FROM 2012 TO 2018 AT LOCATIONS INCLUDED IN PROPOSED PROJECT]*

**COUNTERMEASURE 1 – INSTALL SIDEWALKS**

Louisiana Severity A [KABCO Level K] = 0 crashes at specified locations from 2012 to 2018  
LA Severity B [KABCO Level A] = 2 crashes in 7 years = 0.286 crash per year @ monetized value of \$521,300 = \$148,943 annually  
LA Severity C [KABCO Level B] = 7 crashes in 7 years = 1.00 crash per year @ monetized value of \$142,000 = \$142,000 annually  
LA Severity D [KABCO Level C] = 11 crashes in 7 years = 1.571 crashes per year @ monetized value of \$72,500 = \$113,929 annually  
LA Severity E [KABCO Level O] = 0 crashes in Impact Zone 1 from 2012 to 2018  
TOTAL = \$404,872 annually times Crash Reduction Factor [CRF] of 0.88 for this countermeasure =

**Anticipated annual value of \$356,287 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 2 – CONSTRUCT PAVED SHOULDERS**

LA Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 @ \$10,900,000 = \$1,558,700 annually  
LA Severity B [KABCO Level A] = 0 crashes at specified locations from 2012 to 2018  
LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually  
LA Severity D [KABCO Level C] = 0 crashes in Impact Zone 1 from 2012 to 2018  
LA Severity E [KABCO Level O] = 0 crashes from 2012 to 2018

TOTAL = \$1,578,986 annually times CRF of 0.71 = **Anticipated annual value of \$1,121,080 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 3 – INSTALL HIGH-VISIBILITY CROSSWALK MARKINGS**

LA Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 @ \$10,900,000 = \$1,558,700 annually

LA Severity B [KABCO Level A] = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually

LA Severity D [KABCO Level C] = 1 crash in 7 years = 0.143 @ \$72,500 = \$10,368 annually

LA Severity E [KABCO Level O] = 0 crashes in Impact Zone 1 from 2012 to 2018

TOTAL = \$1,589,354 annually times CRF of 0.48 = **Anticipated annual value of \$762,890 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 4 – INSTALL ADVANCE YIELD/STOP SIGNS AT CROSSWALKS**

From section 3 above, Annual value of crashes at locations where crosswalks will be installed = \$1,589,354 times CRF of 0.25 for installation of advance yield/stop signs =

**Anticipated additional annual value of \$397,338 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 5 – INSTALL PEDESTRIAN SIGNAL**

0 crashes in Impact Zone 1 from 2012 to 2018

**COUNTERMEASURE 6 – INSTALL RECTANGULAR RAPID FLASHING BEACON [RRFB]**

0 crashes in Impact Zone 1 from 2012 to 2018

**COUNTERMEASURE 7 – INSTALL OVERHEAD LIGHTING**

LA Severity A, B, & E = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 5 crashes in 7 years = 0.714 @ \$142,000 = \$101,429 annually

LA Severity D [KABCO Level C] = 4 crashes in 7 years = 0.571 @ \$72,500 = \$41,429 annually

TOTAL = \$142,858 annually times CRF of 0.23 = **Anticipated annual value of \$32,857 for reduction in crashes resulting from implementation of this countermeasure**

**TOTAL ANTICIPATED ANNUAL VALUE FOR REDUCTION IN PEDESTRIAN CRASHES RESULTING FROM IMPLEMENTATION OF ALL PLANNED COUNTERMEASURES = \$2,670,452**

**Sources of Data:**

1. Pedestrian crash data for 2012-2018 was obtained from LACRASH and is listed by location in the attached summary.
2. Conversion of Louisiana crash severity code to KABCO scale was obtained from FHWA Highway Safety website.

3. Monetized value of reduced fatalities and injuries was obtained from Table A-1 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.
4. Crash Reduction Factors for the listed counter-measures were derived from Crash Modification Factors listed in FHWA publication, *Toolbox of Pedestrian Countermeasures and Their Potential Effectiveness*, dated September 2018, where  $CRF = (1.0 - CMF)$ .

**PART 2, ANTICIPATED SAFETY BENEFITS FOR SCALED PROJECT [IMPACT ZONE 1] RESULTING FROM IMPLEMENTATION OF PLANNED BICYCLE COUNTERMEASURES**  
*[BASED ON CRASH DATA FROM 2012 TO 2018 AT LOCATIONS INCLUDED IN PROPOSED PROJECT]*

**COUNTERMEASURE 1 – INSTALL SEPARATED BIKE LANES**

Louisiana Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 crash per year @ monetized value of \$10,900,000 = \$1,557,143 annually

LA Severity B = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 crash per year @ monetized value of \$142,000 = \$20,306 annually

LA Severity D [KABCO Level C] = 3 crashes in 7 years = 0.429 crashes per year @ monetized value of \$72,500 = \$31,071 annually

LA Severity E [KABCO Level O] = 0 crashes in Impact Zone 1 from 2012 to 2018

TOTAL = \$1,608,520 annually

Times Crash Reduction Factor [CRF] of 0.037 for this countermeasure [CMF ID No. 8287 from Crash Modification Factors Clearinghouse] =

**Anticipated annual value of \$59,515 for reduction in crashes resulting from implementation of this countermeasure**

**COUNTERMEASURE 2 – INSTALL SHARED LANE MARKINGS (“SHARROWS”)**

No monetized benefit was included for this countermeasure due to the unavailability of a definitive Crash Modification Factor. It is generally accepted, however, that safety benefits should result.

**COUNTERMEASURE 3 – CONSTRUCT PAVED SHOULDERS**

Again, no monetized benefit was included for this countermeasure due to the unavailability of a definitive Crash Modification Factor. It is generally accepted, however, that safety benefits should result.

**COUNTERMEASURE 4 – INSTALL OVERHEAD LIGHTING**

LA Severity A [KABCO Level K] = 1 crash in 7 years = 0.143 @ \$10,900,000 = \$1,557,143 annually

LA Severity B = 0 crashes at specified locations from 2012 to 2018

LA Severity C [KABCO Level B] = 1 crash in 7 years = 0.143 @ \$142,000 = \$20,286 annually

LA Severity D = 0 crashes at specified locations from 2012 to 2018

LA Severity E [KABCO Level O] = 2 crashes in 7 years = 0.286 @ \$3,700 = \$1,057 annually

TOTAL = \$1,578,486 annually times CRF of 0.23 [assumed to be the same for bicycle crashes as for pedestrian crashes] = **Anticipated annual value of \$363,052 for reduction in crashes resulting from implementation of this countermeasure**

**TOTAL ANTICIPATED ANNUAL VALUE FOR REDUCTION IN BICYCLE CRASHES RESULTING FROM IMPLEMENTATION OF ALL PLANNED COUNTERMEASURES = \$422,567**

**Sources of Data:**

1. Bicycle crash data for 2012-2018 was obtained from LACRASH and is listed by location in the attached summary.
2. Conversion of Louisiana crash severity code to KABCO scale was obtained from FHWA Highway Safety website.
3. Monetized value of reduced fatalities and injuries was obtained from Table A-1 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.

**PART 3, ANTICIPATED NON-SAFETY BENEFITS RESULTING FROM IMPLEMENTATION OF PLANNED BICYCLE AND PEDESTRIAN IMPROVEMENTS**

**SECTION 1, COMMUTING BENEFITS**

Among the 360 respondents to Question Nos. 3 and 4 of the Bicycle and Pedestrian User Survey in Appendix A of the *City of Natchitoches Bicycle and Pedestrian Master Plan* [hereinafter referenced as “the Plan”], 137 indicated they currently are daily pedestrian commuters [94 to work and 43 to school] and 30 indicated they currently are daily bicycle commuters [17 to work and 13 to school], for a total of 167 current daily pedestrian and bicycle commuters. This calculates as 137/167, or 82.0% pedestrians and 30/167, or 18.0% bicyclists.

According to Question No. 8 of the survey, 134 respondents indicated that they would be “very likely” to walk or bike to work, and 108 respondents indicated they would be “very likely” to go to school by walking or biking, if it were safe and convenient to do so. These figures represent an increase of 75 daily commuters, if all respondents actually were to change their mode of commuting. Assuming that only 90% of them actually would do so, however, yields a conservative figure of 67 new daily bike and ped commuters, if the bicycle and pedestrian improvements identified in the Plan would address the needs of these potential commuters. An additional 51 respondents indicated they would be “somewhat likely” to go to work, and an additional 33 indicated they would be “somewhat likely” to go to school, by walking or biking if it were safe and convenient to do so. Assuming that only 50% of them would actually do so, however, yields an additional 42 daily commuters, for a total of 109 new daily bike and ped commuters that could be expected from implementation of the bicycle and pedestrian improvements identified in the Plan.

The 360 survey respondents represent only 3.15% of the adult population of the City of Natchitoches, ages 18 to under 65 [which is 11,435 as calculated from Census Bureau Quick Facts website]. Ratioing the survey results to represent a conservative 10% of the City’s adult



population yields a figure of 346 new bike and ped daily commuters – an assumed 82.0% or 284 from walking and 18.0% or 62 from biking, based on the percentages indicated by the responses to Question Nos. 3 and 4.

According to Page 28 of the Plan, 82.7% of commuting in Natchitoches is comprised of vehicles in which the driver is the only occupant. Applying this conversion factor, the anticipated reduction in the number of vehicles resulting from the additional pedestrian and bicycle commuters is 286 per day, which, projected over a period of one year, using 50 work weeks per year and 5 workdays per week and two commuter trips per day, yields an annual decrease of 143,000 vehicles. Assuming an average commute distance of one-half mile [zero to one mile] yields an annual reduction of 71,500 commuting miles, which, at the value of \$0.43 per mile shown in Table A-5 of the U.S. DOT *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, yields a total **annual vehicle operating cost savings of 30,745** from increased pedestrian and bicycle commuting if the planned improvements are constructed.

NCHRP Report No. 552, *Guidelines for Analysis of Investments in Bicycle Facilities*, also indicates that mobility benefits accrue from increases in bicycle commuters who are able to utilize off-street bicycle trails or on-street bicycle lanes. A review of the planned bicycle improvements listed on Pages 78 and 79 of the Plan indicates that 33 of the 98 listed routes for improvement, or 33.7%, involve the construction of separated bike lanes. Utilizing the formula given on Page 39 of this publication, the annual mobility benefit derived from the 62 new daily bicycle commuters can be calculated as follows, where, in this case, M = 18.02 minutes for an on-street bike lane without parking, and V = \$12: Annual Mobility Benefit = M x V/60 x 33.7% of [existing commuters + new commuters] x 50 x 5 x 2 = 18.02 x 12/60 x [30 + 62] x 50 x 5 x 2 = **\$55,869 annual Mobility Benefit**.

The decrease in the number of commuter vehicles also will result in a corresponding decrease in vehicle emissions. According to the EPA Fact Sheet referenced in Note 6 below, the average passenger car emits 0.693 grams of nitrous oxide, 368.4 grams of carbon dioxide, and 0.0041 grams of 2.5 micron particulate matter per mile driven. For light passenger trucks, these figures are 0.95 grams, 513.5 grams, and 0.0045 grams, respectively. For purposes of this BCA, we are assuming that 75% of the commuting vehicles are passenger cars and that 25% are light trucks. Calculation of the weighted average for each emission yields 0.75725 gram per mile for nitrous oxide, 404.7 grams per mile of carbon dioxide, and 0.0042 grams per mile of PM2.5. Multiplying each figure by the anticipated annual reduction of 71,500 commuter miles, and converting to metric ton, then utilizing the monetized values in Table A-6 of the *Benefit-Cost Analysis Guidance* publication, results in the following calculations:

Nitrous Oxide: 71,500 miles x 0.75725 grams per mile / 1,000,000 @ \$17,300 in 2027 [the first year following project completion] = \$937 in 2027 [to be adjusted for each successive year, per Table A-6]

Carbon Dioxide: 71,500 x 404.7/1,000,000 @ \$58 in 2027 = \$1,678 in 2027

PM2.5: 71,500 x 0.0042/1,000,000 @ \$818,600 in 2027 = \$246 in 2027

**Total value of emissions reductions = \$2,861 in 2027 [to be adjusted for each successive year]**

Note: The value of reduced sulfur dioxide emissions was not included in this analysis due to the absence of information on the EPA website relative to the average SO<sub>2</sub> emissions per vehicle mile traveled.

**TOTAL ANTICIPATED COMMUTING BENEFITS RESULTING FROM PROJECT IMPLEMENTATION = \$86,614 ANNUALLY FOR LIFE OF PROJECT, PLUS \$2,861 IN CALENDAR YEAR 2027 [TO BE ADJUSTED FOR EACH SUCCESSIVE YEAR, PER TABLE A-6 OF *BENEFIT-COST ANALYSIS GUIDANCE PUBLICATION*].**

## **SECTION 2, UTILITARIAN TRIP BENEFITS**

Utilitarian trips include those for running errands, shopping, or eating. The survey results for walking or biking for these purposes indicate that even further reductions can be expected from implementation of the planned bicycle and pedestrian improvements.

Question Nos. 3 and 4 of the survey indicate that a total of 108 respondents currently walk daily in order to run errands, shop, or eat, and an additional 26 respondents currently bike daily for these purposes, for a total of 134 [80.6% of which are pedestrians and 19.4% are bicyclists]. Survey Question No. 8 indicates that these numbers would increase if walking and biking were safe and convenient, with a total of 250 respondents stating they would be “very likely” to walk or bike for these purposes. This figure represents an increase of 116 pedestrians/bikers. Assuming that only 90% of these respondents would actually change their mode of travel for utilitarian trips if the planned pedestrian and bicycle improvements were implemented, this would adjust this figure to 104 new bike and ped utilitarian trips, of which 80.6% or 84 may be assumed to be pedestrians and 20 may be assumed to be bikers.

An additional 192 respondents indicated they would be “somewhat likely” to walk or bike for utilitarian trips if safe and convenient to do so. Assuming that only 50% of them would actually do so, however, yields a figure of 96 fewer utilitarian vehicle trips, of which 80.6% or 77 may be assumed to be pedestrians and 19 may be assumed to be bicyclists. Adding the “very likely” respondents yields anticipated total increases of 161 new pedestrians and 39 new bikers making utilitarian trips. Again ratioing the 3.15% survey response rate to reflect a conservative 10% of the City’s adult population yields total anticipated increases of 511 new pedestrians and 124 new bicyclists making utilitarian trips, if the planned pedestrian and bicycle improvements are made. This represents a decrease of 635 daily utilitarian trips by passenger vehicles, or 231,775 trips annually. Assuming an average trip length of one-half mile, times two to include the return trip, this equates to an annual reduction of 231,775 utilitarian trip miles, which, at the value of \$0.43 per mile shown in Table A-5 of the U.S. DOT *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, yields a total expected **annual vehicle operating cost savings of \$99,663** if the planned pedestrian and bicycle improvements are constructed.

This decrease in the number of vehicles utilized for utilitarian trips also will result in a corresponding decrease in vehicle emissions, as follows:

Nitrous Oxide: 231,775 miles x 0.75725 grams per mile / 1,000,000 @ \$17,300 in 2027 [the first year following project completion] = \$3,036 in 2027 [to be adjusted for each successive year, per Table A-6]

Carbon Dioxide: 231,775 x 404.7/1,000,000 @ \$58 in 2027 = \$5,440 in 2027

PM2.5: 231,775 x 0.0042/1,000,000 @ \$818,600 in 2027 = \$797 in 2027

**Total value of emissions reductions = \$9,273 in 2027 [to be adjusted for each successive year]**

Again, the value of reduced sulfur dioxide emissions was not included in this analysis due to the absence of information on the EPA website relative to the average SO<sub>2</sub> emissions per vehicle mile traveled.

**TOTAL ANTICIPATED UTILITARIAN TRIP BENEFITS RESULTING FROM PROJECT IMPLEMENTATION = \$99,663 ANNUALLY FOR LIFE OF PROJECT, PLUS \$9,273 IN CALENDAR YEAR 2027 [TO BE ADJUSTED FOR EACH SUCCESSIVE YEAR, PER TABLE A-6 OF *BENEFIT-COST ANALYSIS GUIDANCE PUBLICATION*].**

### **SECTION 3, RECREATIONAL WALKING AND BIKING**

The survey indicated that 122 respondents currently walk daily and 39 currently bike daily for recreational purposes, for a total of 161. A total of 270 respondents indicated they would be “very likely” to walk or bike for these purposes if it were safe and convenient to do so, and another 35 indicated they would be “somewhat likely” to do so. Again applying a 90% factor to the “very likely” respondents and a 50% factor to the “somewhat likely” respondents yields numbers of 243 and 18, respectively, for a total of 261, which represents an increase of 100 recreational pedestrians and bicyclists. Again ratioing the 3.15% survey response rate to reflect a conservative 10% of the City’s adult population yields an anticipated total of 317 new daily recreational pedestrians and bikers. These are assumed to be residents of the City of Natchitoches.

Page 39 of NCHRP Report No. 552 provides a formula for monetizing the annual recreational benefits resulting from new bicycle infrastructure, and Page 46 of this publication extends these benefits to include pedestrians. The calculation of these benefits are as follows:

**Annual Recreation Benefit [City of Natchitoches residents] = \$10 x 365 x [number of new recreational cyclists and pedestrians] = \$10 x 365 x 317 = \$1,157,050**

Since Natchitoches is a major tourist attraction, it reasonably can be assumed that improved pedestrian and bicycle routes throughout the City would be heavily utilized by tourists. According to the Plan, there were a total of 74,171 tourists who visited the City in 2017. If there were an increase of just 1% in walking and biking by visitors to the City resulting from the planned pedestrian and bicycle improvements, this would increase the number of recreational pedestrians and bikers by an additional 742. Applying the formula above to this group results in the following calculation:

**Annual Recreation Benefit [Tourists] = \$10 Daily x 742 new tourist cyclists and pedestrians = \$7,420**

**TOTAL RECREATIONAL BENEFITS FROM PROJECT IMPLEMENTATION = \$1,164,470**

**SECTION 4, HEALTH BENEFITS**

Similarly, Page 39 of the NCHRP report provides a formula for monetizing the annual health benefits resulting from new bicycle facilities, and Page 46 of this publication extends these benefits to include pedestrians. The calculation of these benefits is as follows:

**Annual Health Benefit = Total Number of New Cyclists and Pedestrians @ \$128 = [346 new daily bike and ped commuters + 635 new daily bikers and pedestrians from utilitarian trips + 317 new daily City resident recreational bikers and pedestrians + 742/365 new tourist bikers and pedestrians ] = \$166,400**

**SUMMARY OF NON-SAFETY BENEFITS FROM IMPLEMENTATION OF PEDESTRIAN & BICYCLE PLAN**

Commuting Benefits = \$86,614 Annually plus \$2,861 in 2027 [to be adjusted for each successive year]

Utilitarian Trip Benefits = \$99,663 Annually plus \$9,273 in 2027 [to be adjusted in successive years]

Recreational Benefits = \$1,164,470 Annually

Health Benefits = \$166,400 Annually

**TOTAL = \$1,517,147 Annually plus \$12,134 in 2027 [to be adjusted for each successive year]**

**Sources of Data:**

1. *City of Natchitoches Bicycle and Pedestrian Master Plan.*
2. Monetized value of reduced vehicle operating costs was obtained from Table A-5 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.
3. Monetized value of reduced damage costs for vehicle emissions was obtained from Table A-6 of U.S. DOT publication, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated February 2021.
4. National Cooperative Highway Research Program [NCHRP] Report No. 552, *Guidelines for Analysis of Investments in Bicycle Facilities*, dated 2006.
5. U.S. Census Bureau Quick Facts website
6. EPA Fact Sheet, "Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks," dated October 2008, from EPA website.

## ADJUSTMENTS TO BCA FOR SCALED PROJECT – IMPACT ZONES 1 & 2

### Scope of Scaled-Down Project and Effect on Estimated Construction and Maintenance Costs

The scaled project includes only the planned bicycle and pedestrian improvements located within Impact Zones 1 and 2. Based on a review of Pages 78 and 79 of the *City of Natchitoches Bicycle and Pedestrian Master Plan*, this reduces the cost for these improvements to \$5,112,390. In addition, two other line items shown in the “Recap of Project Costs” for the complete project, namely, “Additional for Reconstruction of 10’ Wide Paved Shoulders on Routes Shown in Plan” and “Additional for Embankment and Drainage for Shoulder Widening/Paving,” are not applicable to the scaled-down project and thus are not included in the Cost Recap for Impact Zones 1 and 2.

The estimated costs for Right-of-Way and Utility Relocations will also be reduced as follows.

**Right-of-Way:** Eliminate the estimated R/W cost for construction of paved shoulders on LA-504 [\$36,350] and reduce the estimated R/W cost for constructing separated bicycle and multi-use shared paths by 11.503 miles x 5280 x 11’ avg. width / 43,560 = 15.34 Acres @ \$10,000 = \$153,400

Revised estimated cost for R/W = \$502,350 - \$36,350 - \$153,400 = \$312,600

**Utility Relocation:** Revised construction cost for NBPP improvements in Impact Zones 1 and 2 is \$5,112,390 as mentioned above, plus estimated cost for additional sidewalks in areas where additional R/W will be needed [\$931,070], per the Cost Estimate Worksheet, plus estimated cost of drainage improvements from Welch St. to Holmes St. [\$176,381] = \$6,219,841 x 10% = \$621,984.

The “Recap of Project Costs” for Impact Zones 1 and 2 reflects these figures, to which 10% has been added for engineering, 3% has been added for administration of the project by LA DOTD, and 10% has been added to the overall cost estimate for contingencies.

The reduced scope of work for these two zones is also reflected in the estimated cost for preventive maintenance work in future years after the new bike facilities are constructed, as there is a reduction of 13.296 miles of paved shoulders, and a reduction of 11.503 miles of bike lanes and shared use paths, from what was shown in the “Supplement to Summary of Annuitized Project Costs and Benefits” for the complete project. This reduces the estimated cost for sealing pavement cracks in Year 8 following project completion to \$279,322 and also reduces the estimated cost for applying an asphaltic surface treatment in Year 13 to \$1,741,200. These figures are reflected in the BCA Summary for Impact Zones 1 and 2. The costs for all other planned maintenance and replacements in the future years are unaffected by the reduction in project scope.

The cost revisions outlined above are also reflected in the timing of preconstruction and construction costs shown in the “Summary of Annuitized Project Costs and Benefits” for the scaled-down project.

### **Effect of Scaling on Anticipated Project Benefits**

**Safety Benefits:** The reduced project scope results in the elimination of three pedestrian crashes [1 fatal and 2 minor] from the BCA calculations, which reduces the anticipated annual value for reduction in pedestrian crashes from \$5,021,342 to \$3,902,170. The annual value for reduction in bicycle crashes is unchanged.

**Non-Safety Benefits:** The reduced project scope does not affect Commuting Benefits or Utilitarian Trip Benefits, since Impact Zone 3 lies outside of the one-mile buffer area that was considered in the calculation of these benefits for the complete project.

It was assumed that the elimination of the Impact Zone 3 improvements would decrease the number of new Recreational bikers by only 10%, since the bike routes contained in that zone are located farther away from the residential areas of the City and thus the elimination of these planned improvements would be likely to impact only the number of more avid and experienced bikers. This adjustment reduced the annual Recreational Benefits to \$1,048,023 and the annual Health Benefits to \$162,282.

Thus, the total annual Non-Safety Benefits was reduced to \$1,396,582 plus \$12,134 in calendar year 2027 for reduced emissions [adjusted for each successive year].

**Maintenance Cost Savings from Resurfacing Streets:** This portion of the project benefits is unaffected by the reduction in scope of work to include only Impact Zones 1 and 2.

**Total Annual Project Benefits:** The reduced project scope results in total anticipated annual benefits of \$5,725,889 plus another \$12,134 in calendar year 2027 for reduced emissions that was adjusted in successive years, in accordance with Table A-6 of U.S. DOT *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*.

### **ADJUSTMENTS TO BCA FOR SCALED PROJECT – IMPACT ZONE 1**

#### **Scope of Scaled-Down Project and Effect on Estimated Construction and Maintenance Costs**

The scaled project includes only the planned bicycle and pedestrian improvements located within Impact Zone 1. Based on a review of Pages 78 and 79 of the *City of Natchitoches Bicycle and Pedestrian Master Plan*, this reduces the cost for these improvements to \$1,450,612.

Two other line items shown in the “Recap of Project Costs” for the complete project, namely, “Additional for Reconstruction of 10’ Wide Paved Shoulders on Routes Shown in Plan” and “Additional for Embankment and Drainage for Shoulder Widening/Paving,” are not applicable to the scaled-down project and thus are not included in the Cost Recap for Impact Zone 1.

The estimated cost for the construction of additional sidewalks not included in the Bike/Ped Plan remains unchanged at \$3,542,600.

The estimated cost for advance warning signs and other traffic control devices will be decreased as follows: Deduct advance warning signs and flashing beacons at 4 crosswalk locations not located within Impact Zone 1 @ \$6,620 = \$26,480. This deduction results in a revised Total Estimated Cost of \$202,590 for signing at locations within Impact Zone 1.

The estimated costs for street lighting, resurfacing of streets, and additional drainage improvements remain the same as shown in the “Recap of Estimated Costs” for the complete project.

The estimated costs for Right-of-Way and Utility Relocations will also be reduced as follows.

**Right-of-Way:** Additional right-of-way will still be needed for the construction of sidewalks as outlined in the Calculation Worksheet for the complete project, at an estimated cost of \$91,600. The right-of-way needs for the construction of separated bike lanes and multi-use shared paths will be reduced to the following:  $4.893 \text{ miles} \times 5280 \times 11' \text{ avg. width} / 43,560 = 6.52 \text{ Acres} @ \$10,000 = \$65,200$ . The estimated cost for additional R/W needed for the drainage improvements from Welch St. to Holmes St. remains unchanged at \$4,800. Thus, the revised total estimated cost for additional R/W needed for construction of the planned improvements in Impact Zone 1 is \$161,600.

**Utility Relocation:** The revised construction cost for NBPP improvements in Impact Zone 1 is \$1,450,612 as mentioned above, plus estimated cost for additional sidewalks in areas where additional R/W will be needed [\$931,070], per the Cost Estimate Calculations Worksheet, plus estimated cost of drainage improvements from Welch St. to Holmes St. [\$176,381] = \$2,558,063 x 10%, for a revised estimated cost for utility relocations of \$255,806 for the planned improvements in Impact Zone 1.

The “Recap of Project Costs” for Impact Zone 1 reflects these figures, to which 10% has been added for engineering, 3% has been added for administration of the project by LA DOTD, and 10% has been added to the overall cost estimate for contingencies.

The reduced scope of work within Impact Zone 1 is also reflected in the estimated cost for preventive maintenance work in future years after the new bike facilities are constructed. Since these changes are extensive, a revised “Estimated Preventive Maintenance and Replacement Costs” document has been prepared for the scaled-down version of the project. The cost revisions outlined above are also reflected in the timing of preconstruction and construction costs shown in the “Summary of Annuitized Project Costs and Benefits” for the scaled-down project.

#### **Effect of Scaling on Anticipated Project Benefits**

**Safety Benefits:** The reduced project scope results in extensive reductions in the anticipated safety benefits from reduced bicycle and pedestrian crashes. A revised worksheet has been prepared showing the new calculation of safety benefits, which results in an anticipated annual value of \$2,670,452 for reduction in pedestrian crashes and an anticipated value of \$422,567 for reduction in bike crashes in Impact Zone 1.

**Non-Safety Benefits:** The NBPP survey results on which the number of new bike and pedestrian commuters and those biking and walking for utilitarian trips and for recreational purposes was not broken down relative to geographical locations within the City. Therefore, it is not possible to precisely evaluate these numbers by project impact zone.

Therefore, the reduction in non-safety project benefits resulting from the scaled-down project will be estimated by ratioing the total cost of bicycle and pedestrian improvements for the complete project by the total cost of such improvements to be constructed only within Impact Zone 1, according to the following formula:

Ratio of Non-Safety Benefits for Scaled Project = A/B

Where A = Total Cost of Planned Bike/Ped Improvements in Zone 1 = \$1,450,612 + \$3,542,600 + \$202,590 + \$630,334 + \$161,600 + \$255,806 = \$6,243,542

And B = Total Cost of Planned Bike/Ped Improvements for Complete Project = \$9,651,791 + \$745,315 + \$1,038,320 + \$3,542,600 + \$229,070 + \$630,334 + \$502,350 + \$930,521 = \$17,270,301

Thus, Ratio of Non-Safety Benefits for Scaled Project = \$6,243,542/\$17,270,301 = 0.362

Applying this factor to the Non-Safety Benefits for the complete project yields a revised benefit of 0.362 x \$1,517,147 or \$549,207 annually plus 0.362 x \$12,134 or \$4,393 in calendar year 2027 for reduced emissions.

**Maintenance Cost Savings from Resurfacing Streets:** This portion of the project benefits [estimated at \$51,692 annually] is unaffected by the reduction in scope of work, as all planned street resurfacing is located within Impact Zone 1 .

**Total Annual Project Benefits:** The reduced project scope results in total anticipated annual benefits of \$3,693,918 plus another \$4,393 in calendar year 2027 for reduced emissions that will be adjusted for successive years, in accordance with Table A-6 of U.S. DOT *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*.



**2021 FEDERAL RAISE GRANT APPLICATION  
NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT  
SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS**

**PAGE 1-OF-2**

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2019									
2020									
2021									
2022	1			\$662,982	\$619,609			(\$619,609)	
2023	2			\$801,128	\$699,736			(\$699,736)	
2024	3			\$542,758	\$443,052			(\$443,052)	
2025	4			\$11,591,737	\$8,843,278			(\$8,843,278)	
2026	5			\$10,568,164	\$7,534,953			(\$7,534,953)	
2027	6	\$7,017,313	\$4,684,101					\$4,684,101	
2028	7	\$7,017,313	\$4,377,985					\$4,377,985	
2029	8	\$7,017,313	\$4,091,887					\$4,091,887	
2030	9	\$7,017,313	\$3,824,510					\$3,824,510	
2031	10	\$7,017,313	\$3,574,578					\$3,574,578	
2032	11	\$7,017,313	\$3,340,982	\$368,900		\$671,756	\$319,145	\$3,021,837	Replace Pavement Markings
2033	12	\$7,017,313	\$3,122,695					\$3,122,695	
2034	13	\$7,017,313	\$2,918,711	\$681,606		\$1,384,090	\$574,342	\$2,344,369	Crack Seal
2035	14	\$7,017,313	\$2,728,052					\$2,728,052	
2036	15	\$7,017,313	\$2,549,836					\$2,549,836	
2037	16	\$7,017,313	\$2,383,240	\$479,038		\$1,145,494	\$388,013	\$1,995,227	Replace PM & Ped. Signals
2038	17	\$7,017,313	\$2,227,597					\$2,227,597	

		<b>Subtotals</b>	<b>\$39,824,174</b>		<b>\$18,140,628</b>		<b>\$1,281,500</b>	<b>\$20,402,046</b>	
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(1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.

(2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown. (3) The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].

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**2021 FEDERAL RAISE GRANT APPLICATION  
NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT  
SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS**

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2039	18	\$7,017,313	\$2,082,108	\$2,450,775		\$6,535,126	\$1,933,508	\$148,600	Asph. Surface Treatment
2040	19	\$7,017,313	\$1,946,128					\$1,946,128	
2041	20	\$7,017,313	\$1,819,042					\$1,819,042	
2042	21	\$7,017,313	\$1,700,324	\$599,754		\$1,883,282	\$454,837	\$1,245,487	Repl. PM, Signs, & OH Lights
2043	22	\$7,017,313	\$1,589,311					\$1,589,311	
2044	23	\$7,017,313	\$1,485,556					\$1,485,556	
2045	24	\$7,017,313	\$1,388,585					\$1,388,585	
2046	25	\$7,017,313	\$1,297,952					\$1,297,952	
		<b>Subtotals</b>	<b>\$13,309,006</b>		<b>\$0</b>		<b>\$2,388,345</b>	<b>\$10,920,661</b>	

<b>Total</b>			<b>\$53,133,180</b>		<b>\$18,140,628</b>		<b>\$3,669,845</b>	<b>\$31,322,707</b>	

**B/C RATIO = \$53,133,180 / (\$18,140,628 + \$3,669,845) = 2.44**

- (1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.
- (2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown.
- (3) The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].

**2021 FEDERAL RAISE GRANT APPLICATION**  
**NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT**  
**SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS -- SCALED PROJECT [ZONES 1 & 2]**

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2019									
2020									
2021									
2022	1			\$430,375	\$402,219			(\$402,219)	
2023	2			\$516,340	\$450,991			(\$450,991)	
2024	3			\$341,194	\$278,516			(\$278,516)	
2025	4			\$7,542,070	\$5,753,807			(\$5,753,807)	
2026	5			\$6,857,887	\$4,889,577			(\$4,889,577)	
2027	6	\$5,725,889	\$3,820,842					\$3,820,842	
2028	7	\$5,725,889	\$3,570,748					\$3,570,748	
2029	8	\$5,725,889	\$3,337,026					\$3,337,026	
2030	9	\$5,725,889	\$3,118,613					\$3,118,613	
2031	10	\$5,725,889	\$2,914,477					\$2,914,477	
2032	11	\$5,725,889	\$2,723,697	\$368,900		\$671,756	\$319,145	\$2,404,552	Replace Pavement Markings
2033	12	\$5,725,889	\$2,545,437					\$2,545,437	
2034	13	\$5,725,889	\$2,378,839	\$279,322		\$567,200	\$235,365	\$2,143,474	Crack Seal
2035	14	\$5,725,889	\$2,223,163					\$2,223,163	
2036	15	\$5,725,889	\$2,077,659					\$2,077,659	
2037	16	\$5,725,889	\$1,941,652	\$479,038		\$1,145,494	\$388,013	\$1,553,639	Replace PM & Signals

2038	17	\$5,725,889	\$1,814,598					\$1,814,598	
		<b>Subtotals</b>	<b>\$32,466,751</b>		<b>\$11,775,110</b>		<b>\$942,523</b>	<b>\$19,749,118</b>	

(1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.

(2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown. (3)

The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].

**2021 FEDERAL RAISE GRANT APPLICATION  
NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT  
SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS -- ZONES 1 & 2**

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2039	18	\$5,725,889	\$1,695,840	\$1,741,200		\$4,643,005	\$1,373,698	\$322,142	Asph. Surface Treatment
2040	19	\$5,725,889	\$1,584,853					\$1,584,853	
2041	20	\$5,725,889	\$1,481,134					\$1,481,134	
2042	21	\$5,725,889	\$1,384,217	\$599,754		\$1,883,282	\$454,837	\$929,380	Repl. PM, Signs, & OH Lights
2043	22	\$5,725,889	\$1,293,629					\$1,293,629	
2044	23	\$5,725,889	\$1,208,971					\$1,208,971	
2045	24	\$5,725,889	\$1,129,854					\$1,129,854	
2046	25	\$5,725,889	\$1,055,914					\$1,055,914	
		<b>Subtotals</b>	<b>\$10,834,412</b>		<b>\$0</b>		<b>\$1,828,535</b>	<b>\$9,005,877</b>	

<b>Total</b>			<b>\$43,301,163</b>		<b>\$11,775,110</b>		<b>\$2,771,058</b>	<b>\$28,754,995</b>	

**B/C RATIO = \$43,301,163 / (\$11,775,110 + \$2,771,058) = 2.98**

(1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.

(2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown. (3)

The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].



**2021 FEDERAL RAISE GRANT APPLICATION**  
**NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT**  
**SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS -- SCALED PROJECT [ZONE 1]**  
**PAGE 1-OF-2**

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2019									
2020									
2021									
2022	1			\$286,969	\$268,195			(\$268,195)	
2023	2			\$331,409	\$289,465			(\$289,465)	
2024	3			\$188,862	\$154,168			(\$154,168)	
2025	4			\$4,967,326	\$3,789,548			(\$3,789,548)	
2026	5			\$4,685,940	\$3,341,010			(\$3,341,010)	
2027	6	\$3,693,918	\$2,464,773					\$2,464,773	
2028	7	\$3,693,918	\$2,303,654					\$2,303,654	
2029	8	\$3,693,918	\$2,153,074					\$2,153,074	
2030	9	\$3,693,918	\$2,012,344					\$2,012,344	
2031	10	\$3,693,918	\$1,880,804					\$1,880,804	
2032	11	\$3,693,918	\$1,757,858	\$329,600		\$600,192	\$285,145	\$1,472,713	Replace Pavement Markings
2033	12	\$3,693,918	\$1,642,972					\$1,642,972	
2034	13	\$3,693,918	\$1,535,604	\$128,674		\$261,289	\$108,425	\$1,427,179	Crack Seal
2035	14	\$3,693,918	\$1,435,260					\$1,435,260	
2036	15	\$3,693,918	\$1,341,465					\$1,341,465	
2037	16	\$3,693,918	\$1,253,788	\$397,169		\$949,725	\$321,700	\$932,088	Replace PM & Signals

2038	17	\$3,693,918	\$1,171,874					\$1,171,874	
		<b>Subtotals</b>	<b>\$20,953,470</b>		<b>\$7,842,386</b>		<b>\$715,270</b>	<b>\$12,395,814</b>	

(1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.

(2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown. (3)

The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].

**2021 FEDERAL RAISE GRANT APPLICATION  
NATCHITOCHEs SAFE STREETS REVITALIZATION PROJECT  
SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS -- ZONE 1**

PAGE 2-OF-2

Calendar Year	Project Year	Value of Savings (2019) (1)	Discounted Project Savings at 7% (2)	Const. & Maint. Cost \$2019	Discounted Const. Cost at 7%	Maint. Cost (3)	Discounted Maint. Cost at 7%	NPV at 7%	Comments
2039	18	\$3,693,918	\$1,095,305	\$487,500		\$1,299,946	\$384,607	\$710,698	Asph. Surface Treatment
2040	19	\$3,693,918	\$1,023,741					\$1,023,741	
2041	20	\$3,693,918	\$956,860					\$956,860	
2042	21	\$3,693,918	\$894,373	\$542,424		\$1,703,260	\$411,359	\$483,014	Repl. PM, Signs, & OH Lights
2043	22	\$3,693,918	\$835,951					\$835,951	
2044	23	\$3,693,918	\$781,349					\$781,349	
2045	24	\$3,693,918	\$730,318					\$730,318	
2046	25	\$3,693,918	\$682,623					\$682,623	
		<b>Subtotals</b>	<b>\$7,000,520</b>		<b>\$0</b>		<b>\$795,966</b>	<b>\$6,204,554</b>	

<b>Total</b>		<b>\$27,953,990</b>		<b>\$7,842,386</b>		<b>\$1,511,236</b>	<b>\$18,600,368</b>	
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**B/C RATIO = \$27,953,990 / (\$7,842,386 + \$1,511,236) = 2.99**

(1) Values in Column 1 do not include Value of Reduced Emissions in each year, which is tabulated in the attached Supplement.

(2) Values in Column 1 have been discounted at 7% and added to discounted Value of Reduced Emissions, to obtain the figures shown. (3) The 2021 costs for the item replacements and preventive maintenance treatments were inflated to the year shown using an inflation rate of 5.6% per year [CPI-U for Southern U.S. for May 2021].

**2021 FEDERAL RAISE GRANT APPLICATION -- NATCHITOCHESES SAFE STREETS REVITALIZATION PROJECT  
SUPPLEMENT TO SUMMARY OF ANNUITIZED PROJECT COSTS & BENEFITS -- VALUE OF REDUCED EMISSIONS BY YEAR**

YEAR	NOx \$/MT	VALUE	PM \$/MT	VALUE	SUBTOTAL	DISC. @ 7%	CO2 \$/MT	VALUE	DISC. @ 3%	TOTAL
2027	\$17,300	\$3,944	\$818,600	\$1,040	\$4,984	\$2,711	\$58	\$7,119	\$5,456	<b>\$8,167</b>
2028	\$17,500	\$3,990	\$829,800	\$1,054	\$5,044	\$2,564	\$59	\$7,241	\$5,388	<b>\$7,952</b>
2029	\$17,700	\$4,036	\$841,200	\$1,068	\$5,104	\$2,425	\$60	\$7,364	\$5,320	<b>\$7,745</b>
2030	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$2,303	\$61	\$7,487	\$5,251	<b>\$7,554</b>
2031	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$2,152	\$62	\$7,610	\$5,180	<b>\$7,332</b>
2032	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$2,012	\$63	\$7,732	\$5,112	<b>\$7,124</b>
2033	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,880	\$64	\$7,855	\$5,042	<b>\$6,922</b>
2034	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,757	\$66	\$8,101	\$5,048	<b>\$6,805</b>
2035	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,642	\$67	\$8,223	\$4,975	<b>\$6,617</b>
2036	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,535	\$68	\$8,346	\$4,902	<b>\$6,437</b>
2037	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,434	\$69	\$8,469	\$4,830	<b>\$6,264</b>
2038	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,340	\$70	\$8,591	\$4,757	<b>\$6,097</b>
2039	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,253	\$71	\$8,714	\$4,684	<b>\$5,937</b>
2040	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,171	\$72	\$8,837	\$4,612	<b>\$5,783</b>
2041	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,094	\$73	\$8,960	\$4,540	<b>\$5,634</b>
2042	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$1,023	\$75	\$9,205	\$4,528	<b>\$5,551</b>
2043	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$956	\$76	\$9,328	\$4,455	<b>\$5,411</b>
2044	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$893	\$77	\$9,451	\$4,382	<b>\$5,275</b>
2045	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$835	\$78	\$9,573	\$4,310	<b>\$5,145</b>
2046	\$18,000	\$4,104	\$852,700	\$1,083	\$5,187	\$780	\$79	\$9,696	\$4,238	<b>\$5,018</b>

**NOTES:**

1. FOR NOx, THE MULTIPLIER IS 303,275 COMMUTING & UTILITARIAN MILES X 0.75275 / 1 MILLION = 0.228 METRIC TONS PER YEAR.
2. FOR PM2.5, THE MULTIPLIER IS 303,275 COMMUTING & UTILITARIAN MILES X 0.0042 / 1 MILLION = 0.00127 METRIC TONS PER YEAR.
3. FOR CO2, THE MULTIPLIER IS 303,275 COMMUTING & UTILITARIAN MILES X 404.7 / 1 MILLION = 122.735 METRIC TONS PER YEAR.
4. VALUES SHOWN ABOVE PER METRIC TON ARE TAKEN FROM TABLE A-6 OF U.S. DOT BCA GUIDELINES.

5. THE TOTAL SHOWN ABOVE FOR EACH YEAR IS ADDED TO THE TOTAL RECURRING ANNUAL FIGURE OF \$7,017,318 [DISCOUNTED TO THE YEAR 2019] IN ORDER TO OBTAIN THE TOTAL DISCOUNTED VALUE OF PROJECT BENEFITS FOR EACH YEAR AS SHOWN IN THE "SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS."

**2021 FEDERAL RAISE GRANT APPLICATION -- NATCHITOCHESES SAFE STREETS REVITALIZATION PROJECT  
SUPPLEMENT TO SUMMARY OF ANNUITIZED PROJECT COSTS & BENEFITS -- VALUE OF REDUCED EMISSIONS BY YEAR**

<b>SCALED PROJECT -- ZONE 1</b>										
<b>YEAR</b>	<b>NOx \$/MT</b>	<b>VALUE</b>	<b>PM \$/MT</b>	<b>VALUE</b>	<b>SUBTOTAL</b>	<b>DISC. @ 7%</b>	<b>CO2 \$/MT</b>	<b>VALUE</b>	<b>DISC. @ 3%</b>	<b>TOTAL</b>
2027	\$17,300	\$1,427	\$818,600	\$377	\$1,804	\$1,202	\$58	\$2,577	\$2,158	<b>\$3,360</b>
2028	\$17,500	\$1,444	\$829,800	\$382	\$1,826	\$1,137	\$59	\$2,621	\$2,131	<b>\$3,268</b>
2029	\$17,700	\$1,460	\$841,200	\$387	\$1,847	\$1,075	\$60	\$2,666	\$2,105	<b>\$3,180</b>
2030	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$1,021	\$61	\$2,710	\$2,077	<b>\$3,098</b>
2031	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$954	\$62	\$2,755	\$2,050	<b>\$3,004</b>
2032	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$892	\$63	\$2,799	\$2,022	<b>\$2,914</b>
2033	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$833	\$64	\$2,844	\$1,995	<b>\$2,828</b>
2034	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$779	\$66	\$2,932	\$1,997	<b>\$2,776</b>
2035	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$728	\$67	\$2,977	\$1,968	<b>\$2,696</b>
2036	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$680	\$68	\$3,021	\$1,939	<b>\$2,619</b>
2037	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$636	\$69	\$3,066	\$1,911	<b>\$2,547</b>
2038	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$594	\$70	\$3,110	\$1,882	<b>\$2,476</b>
2039	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$555	\$71	\$3,155	\$1,853	<b>\$2,408</b>
2040	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$519	\$72	\$3,199	\$1,824	<b>\$2,343</b>
2041	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$485	\$73	\$3,243	\$1,796	<b>\$2,281</b>
2042	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$453	\$75	\$3,332	\$1,791	<b>\$2,244</b>
2043	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$424	\$76	\$3,377	\$1,762	<b>\$2,186</b>
2044	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$396	\$77	\$3,421	\$1,733	<b>\$2,129</b>
2045	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$370	\$78	\$3,466	\$1,705	<b>\$2,075</b>
2046	\$18,000	\$1,485	\$852,700	\$392	\$1,877	\$346	\$79	\$3,510	\$1,676	<b>\$2,022</b>

**NOTES:**

1. FOR NOx, THE MULTIPLIER IS  $0.362 \times 303,275 \text{ MILES} \times 0.75275 / 1 \text{ MILLION} = 0.0825 \text{ METRIC TONS PER YEAR}$ .
2. FOR PM2.5, THE MULTIPLIER IS  $0.362303 \times 303,275 \text{ MILES} \times 0.0042 / 1 \text{ MILLION} = 0.00046 \text{ METRIC TONS PER YEAR}$ .
3. FOR CO2, THE MULTIPLIER IS  $0.362 \times 303,275 \text{ MILES} \times 404.7 / 1 \text{ MILLION} = 44.430 \text{ METRIC TONS PER YEAR}$ .
4. VALUES SHOWN ABOVE PER METRIC TON ARE TAKEN FROM TABLE A-6 OF U.S. DOT BCA GUIDELINES.





**SUPPLEMENT TO “SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS”**

**ESTIMATED PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS**

**PART 1 – EXPECTED SERVICE LIFE OF ITEMS TO BE CONSTRUCTED**

*[From FHWA Safety Program Publication, Countermeasure Service Life Guide, dated March, 2021]*

<u>Countermeasure to Be Constructed &amp; Page</u>	<u>Expected Service Life, Years</u>	<u>Table No.</u>
Concrete Sidewalks	20	20 / 48
Asphalt Paved Shoulders	20	25 / 53
Thermoplastic Crosswalks	5	15 / 41
Advance Warning Signs	15	26 / 55
Pedestrian Signals	10	19 / 47
RRFB	10	20 / 48
Overhead Lighting	15	16 / 42
Separated Bike Lane	20	14 / 40

**PART 2 – CALCULATION OF PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS**

**Replacement of Thermoplastic Pavement Markings in Years 6, 11, & 16**

1. “Sharrows” – Total length of street segments for sharrows = 17.238 miles  
x 5280 / 250’ spacing = 364 each + additional marking for each street segment (25)  
= 389 markings @ \$100 = \$38,900
  2. Crosswalks – 7 from Bike/Ped Plan  
Plus 103 @ additional sidewalks in target area = 110 total @ \$3,000 = \$330,000
- TOTAL FOR REPLACEMENT OF THERMOPLASTIC PAVEMENT MARKINGS = \$368,900**

**Replacement of Pedestrian Signals and RRFB’s in Year 11**

1. Pedestrian Signal = \$10,000 per NBPP less \$3,000 crosswalk markings = \$7,000 X 2 = \$14,000
  2. RRHB’s = 2 @ \$15,569 per NBPP = \$31,138
  3. RRFB’s = 2 @ \$5,000 = \$10,000 per Cost Estimate Calculation Worksheet
  4. Solar-Powered Flashing Beacons = 11 crosswalks x 2 @ \$2,500 = \$55,000
- TOTAL = \$110,138**

**Replacement of Signs in Year 16**

1. Shared Lane signing: 25 street segments x 2 = 50 signs  
Plus additional signs for long segments: 1.007 mile + 1.536 + 0.96 + 5.667 + 1.999  
= 11.919 miles x 2 divided by 0.5 mile spacing = 48 additional signs; Total = 98  
signs x 7 Sq. Ft. @ \$25 = \$17,150
  2. Advance warning signs & posts @ crosswalks = 11 crosswalks x 2 @ (\$600 + \$210)  
= \$17,820
  3. Additional signs & posts = \$146,250 per Cost Estimate Calculation Worksheet
- TOTAL FOR REPLACEMENT OF SIGNS = \$181,220

**Replacement of Overhead Street Lights in Year 16**

From cost estimate for initial installation, 87 LED luminaires @ \$326 x 1.75 = \$49,634

**Crack Seal Asphalt Pavements in Year 8**

1. Paved Shoulders = 16.059 miles x 5280 x 2 / 10' spacing x 10' length = 169,583 Lin. Ft.
  2. Sep. Bike Lanes & Shared Lanes = 25.136 miles x 5280 / 10' spacing x 10' length = 132,718 Lin. Ft.
  3. Streets to be resurfaced = 21,390 Lin. Ft. / 10' spacing x 18' length = 38,502 Lin. Ft.
- TOTAL = 340,803 LIN. FT. @ \$2.00 = \$681,606

**Asphaltic Surface Treatment in Year 13**

1. Paved Shoulders = 16.059 miles
  2. Separated Bike Lanes & Shared Use Lanes = 25.136 miles divided 2 = 12.568 miles of equivalent two-lane roadway
  3. Streets to be resurfaced = 21,390 / 5280 = 4.05 miles
- TOTAL = 32.677 MILES @ \$75,000 PER MILE = \$2,450,775

**PART 3 – SUMMARY OF PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS BY YEAR FOLLOWING PROJECT COMPLETION**

**YEAR 6 [CY 2032]:** Replace Thermoplastic Pavement Markings @ \$368,900

**YEAR 8 [CY 2034]:** Crack Seal @ \$681,606

**YEAR 11 [CY 2037]:** 1) Replace Thermoplastic Pavement Markings @ \$368,900  
2) Replace Pedestrian Signals & RRFB's @ \$110,138  
Total = \$479,038

**YEAR 13 [CY 2039]:** Apply Asphaltic Surface Treatment @ \$2,450,775

**YEAR 16 [CY 2042]:** 1) Replace Thermoplastic Pavement Markings @ \$368,900  
2) Replace Signs @ \$181,220  
3) Replace Overhead Street Lights @ \$49,634  
Total = \$599,754

**SUPPLEMENT TO “SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS”**

**ESTIMATED PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS FOR SCALED PROJECT [IMPACT ZONE 1]**

**PART 1 – EXPECTED SERVICE LIFE OF ITEMS TO BE CONSTRUCTED**

*[From FHWA Safety Program Publication, Countermeasure Service Life Guide, dated March, 2021]*

<u>Countermeasure to Be Constructed &amp; Page</u>	<u>Expected Service Life, Years</u>	<u>Table No.</u>
Concrete Sidewalks	20	20 / 48
Asphalt Paved Shoulders	20	25 / 53
Thermoplastic Crosswalks	5	15 / 41
Advance Warning Signs	15	26 / 55
Pedestrian Signals	10	19 / 47
RRFB	10	20 / 48
Overhead Lighting	15	16 / 42
Separated Bike Lane	20	14 / 40

**PART 2 – CALCULATION OF PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS**

**Replacement of Thermoplastic Pavement Markings in Years 6, 11, & 16**

1. “Sharrows” – Total length of street segments in Impact Zone 1 for sharrows = 4.853 miles  
 $x 5280 / 250'$  spacing = 102 each + additional marking for each street segment (14)  
 = 116 markings @ \$100 = \$11,600
  2. Crosswalks – 3 from Bike/Ped Plan  
 Plus 103 @ additional sidewalks in target area = 106 total @ \$3,000 = \$318,000
- TOTAL FOR REPLACEMENT OF THERMOPLASTIC PAVEMENT MARKINGS = \$329,600**

**Replacement of Pedestrian Signals and RRFB’s in Year 11**

1. Pedestrian Signal = \$10,000 per NBPP less \$3,000 crosswalk markings = \$7,000 X 1 = \$7,000
2. RRHB’s = 1 @ \$15,569 per NBPP = \$15,569
3. RRFB’s = 2 @ \$5,000 = \$10,000 per Cost Estimate Calculation Worksheet
4. Solar-Powered Flashing Beacons = 7 crosswalks x 2 @ \$2,500 = \$35,000

TOTAL = \$67,569

**Replacement of Signs in Year 16**

1. Shared Lane signing: 14 street segments x 2 = 28 signs  
Plus additional signs for long segments: 1.007 mile x 2 divided by 0.5 mile spacing = 4 additional signs; Total = 32 signs x 7 Sq. Ft. @ \$25 = \$5,600
  2. Advance warning signs & posts @ crosswalks = 7 crosswalks x 2 @ (\$600 + \$210) = \$11,340
  3. Additional signs & posts = \$146,250 per Cost Estimate Calculation Worksheet
- TOTAL FOR REPLACEMENT OF SIGNS = \$163,190

**Replacement of Overhead Street Lights in Year 16**

From cost estimate for initial installation, 87 LED luminaires @ \$326 x 1.75 = \$49,634

**Crack Seal Asphalt Pavements in Year 8**

1. Paved Shoulders = 0
  2. Sep. Bike Lanes & Shared Lanes = 4.893 miles x 5280 / 10' spacing x 10' length = 25,835 Lin. Ft.
  3. Streets to be resurfaced = 21,390 Lin. Ft. / 10' spacing x 18' length = 38,502 Lin. Ft.
- TOTAL = 64,337 LIN. FT. @ \$2.00 = \$128,674

**Asphaltic Surface Treatment in Year 13**

1. Paved Shoulders = 0
  2. Separated Bike Lanes & Shared Use Lanes = 4.893 miles divided 2 = 2.45 miles of equivalent two-lane roadway
  3. Streets to be resurfaced = 21,390 / 5280 = 4.05 miles
- TOTAL = 6.50 MILES @ \$75,000 PER MILE = \$487,500

**PART 3 – SUMMARY OF PREVENTIVE MAINTENANCE AND REPLACEMENT COSTS BY YEAR FOLLOWING PROJECT COMPLETION**

**YEAR 6 [CY 2032]:** Replace Thermoplastic Pavement Markings @ \$329,600

**YEAR 8 [CY 2034]:** Crack Seal @ \$128,674

**YEAR 11 [CY 2037]:** 1) Replace Thermoplastic Pavement Markings @ \$329,600  
2) Replace Pedestrian Signals & RRFB's @ \$67,569  
Total = \$397,169

**YEAR 13 [CY 2039]:** Apply Asphaltic Surface Treatment @ \$487,500

**YEAR 16 [CY 2042]:** 1) Replace Thermoplastic Pavement Markings @ \$329,600  
2) Replace Signs @ \$163,190  
3) Replace Overhead Street Lights @ \$49,634  
Total = \$542,424

**2021 FEDERAL RAISE GRANT APPLICATION**

**NATCHITOCHESES SAFE STREETS REVITALIZATION PROJECT  
RECAP OF ESTIMATED COSTS -- COMPLETE PROJECT**

<b>Project Component</b>	<b>Estimated Cost</b>	<b>Source</b>
Construction of All Improvements Outlined in Natchitoches Bike/Pedestrian Plan	\$9,651,791	Bike/Ped Plan
+ Additional for Reconstruction of 10' Wide Paved Shoulders on Routes Shown in Plan	\$745,315	Calc. Worksheet
+ Additional for Embankment & Drainage for Shoulder Widening/Paving	\$1,038,320	"
Construction of Sidewalks in Project Target Area Not Included in Bike/Ped Plan	\$3,542,600	"
Additional for Installation of Advance Warning Signs at Crosswalks	\$229,070	"
Installation of Street Lighting on Texas Street, MLK Drive, and Amulet Street	\$630,334	"
Resurfacing of Streets in Target Area	\$1,995,611	"
Additional Drainage Improvements from Welch Street to Holmes Street	\$176,381	2017 Study
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>	<b>\$18,009,422</b>	
Right-of-Way for Sidewalks, Paved Shoulders, Sep. Bike Lanes, & Drainage Improvements	\$502,350	Calc. Worksheet
Utility Relocation for New Sidewalks, Paved Shos., Bike Lanes, & Drainage Improvements	\$930,521	"
<b>TOTAL ESTIMATED COST FOR RIGHT-OF-WAY AND UTILITY RELOCATION</b>	<b>\$1,432,871</b>	
<b>TOTAL ESTIMATED COST FOR CONSTRUCTION, RIGHT-OF-WAY, AND UTILITIES</b>	<b>\$19,442,293</b>	
Engineering [Preconstruction Engineering and Construction Engineering & Inspection] @ 10%	\$1,944,229	
LA DOTD Administration @ estimated 3%	\$583,269	
<b>SUBTOTAL</b>	<b>\$21,969,791</b>	
10% Contingency	\$2,196,979	
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$24,166,770</b>	

**2021 FEDERAL RAISE GRANT APPLICATION**  
**NATCHITOCHEES SAFE STREETS REVITALIZATION PROJECT**  
**RECAP OF ESTIMATED COSTS -- SCALED PROJECT [ZONES 1 & 2]**

Project Component	Estimated Cost	Source
Construction of Improvements Outlined in Natchitoches Bike/Pedestrian Plan	\$5,112,390	Bike/Ped Plan
Construction of Sidewalks in Project Target Area Not Included in Bike/Ped Plan	\$3,542,600	Adjst. to BCA
Additional for Installation of Advance Warning Signs & Sign Upgrades	\$229,070	Calc. Worksheet
Installation of Street Lighting on Texas Street, MLK Drive, and Amulet Street	\$630,334	"
Resurfacing of Streets in Target Area	\$1,995,611	"
Additional Drainage Improvements from Welch Street to Holmes Street	\$176,381	2017 Study
TOTAL ESTIMATED CONSTRUCTION COST	\$11,686,386	
Right-of-Way for Sidewalks, Paved Shoulders, Sep. Bike Lanes, & Drainage Improvements	\$312,600	Adjst. To BCA
Utility Relocation for New Sidewalks, Paved Shos., Bike Lanes, & Drainage Improvements	\$621,984	Adjst. To BCA
TOTAL ESTIMATED COST FOR RIGHT-OF-WAY AND UTILITY RELOCATION	\$934,584	
TOTAL ESTIMATED COST FOR CONSTRUCTION, RIGHT-OF-WAY, AND UTILITIES	\$12,620,970	
Engineering [Preconstruction Engineering and Construction Engineering & Inspection] @ 10%	\$1,262,097	
LA DOTD Administration @ estimated 3%	\$378,629	
SUBTOTAL	\$14,261,696	
10% Contingency		
	\$1,426,170	
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$15,687,866</b>	

**2021 FEDERAL RAISE GRANT APPLICATION  
 NATCHITOCHEES SAFE STREETS REVITALIZATION PROJECT  
 RECAP OF ESTIMATED COSTS -- SCALED PROJECT [ZONE 1]**

Project Component	Estimated Cost	Source
Construction of Improvements Outlined in Natchitoches Bike/Pedestrian Plan	\$1,450,612	Bike/Ped Plan
Construction of Sidewalks in Project Target Area Not Included in Bike/Ped Plan	\$3,542,600	Calc. Worksheet
Additional for Installation of Advance Warning Signs and Other Sign Upgrades	\$202,590	Adjst. To BCA
Installation of Street Lighting on Texas Street, MLK Drive, and Amulet Street	\$630,334	Calc. Worksheet
Resurfacing of Streets in Target Area	\$1,995,611	"
Additional Drainage Improvements from Welch Street to Holmes Street	\$176,381	"
TOTAL ESTIMATED CONSTRUCTION COST	\$7,998,128	
Right-of-Way for Sidewalks, Separated Bike Lanes, & Drainage Improvements	\$161,600	Adjst. To BCA
Utility Relocation for New Sidewalks, Bike Lanes, & Drainage Improvements	\$255,806	"
TOTAL ESTIMATED COST FOR RIGHT-OF-WAY AND UTILITY RELOCATION	\$417,406	
TOTAL ESTIMATED COST FOR CONSTRUCTION, RIGHT-OF-WAY, AND UTILITIES	\$8,415,534	
Engineering [Preconstruction Engineering and Construction Engineering & Inspection] @ 10%	\$841,553	
LA DOTD Administration @ estimated 3%	\$252,466	
SUBTOTAL	\$9,509,553	
10% Contingency	\$950,955	
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$10,460,508</b>	

## **CALCULATION WORKSHEET FOR ESTIMATED COSTS SHOWN IN “RECAP OF ESTIMATED COSTS”**

### **Construction of Improvements Outlined in City of Natchitoches Bicycle and Pedestrian Master Plan**

The estimated costs shown for each proposed improvement listed on Pages 78 and 79 of this plan [hereinafter referenced as NBPP] were totaled to obtain the **\$9,651,791** figure shown in the Recap.

### **Additional for Construction of 10-Foot-Wide Paved Shoulders on Routes Shown in NBPP**

A review of the list of proposed improvements shown on Pages 78 and 79 of the NBPP revealed an error in the “cost multiplier” for the routes where paved shoulders are to be constructed, in that the \$145,000 per mile figure shown covers the cost for construction of only one 10-foot-wide shoulder per roadway. For 7.343 miles of listed roadways – Highway 1 Loop [3 segments], LA-1, LA-3175, and US-84 [which should be referenced as LA-6] – the existing shoulder widths range from 6 feet to 10 feet. Thus, the costs shown for these segments must be corrected as follows: 7.343 miles @ \$145,000 x 2 shoulders = \$2,129,470 x Avg. 8’ wide/10 = \$1,810,050 less \$1,064,735 cost included in NBPP = **Additional Cost of \$745,315**

This figure is shown as a separate line item in the “Recap of Estimated Costs.” The remaining listed roadway segments shown for paved shoulder work have existing shoulders that average 5 feet in width, therefore the cost multiplier shown is appropriate for these roads.

### **Additional for Embankment and Drainage for Shoulder Widening/Paving**

For three routes listed in the Bicycle and Pedestrian Plan for the construction of paved shoulders – Williams Avenue [2.034 miles from St. Clair Avenue to Blanchard Road], Keyser Avenue [0.338 mile from Blanchard Road to Eastern City Limits], and the LA-504 portion [3.328 miles] of what is shown as “Texas Street/Old Grove Road” – the existing narrow shoulders must be widened to a minimum width of 5 feet, which will require widening of the existing embankment, as well as relocation of the existing roadside ditches, neither of which are included in the estimated costs shown in the NBPP. Calculation of these additional costs follows, with the unit prices shown being based on recent local street rehab projects.

Embankment Material = 5.700 miles x 5280 x 2 sides x Avg. 3’ fill x Avg. 7.5’ width / 27 x 1.3 = 65,208 Cu. Yds. of Borrow @ \$15 = \$978,120

Relocation of Roadside Ditches = 5.700 miles x 5280 x 2 sides / 100 = 602 Stations of Grading and Shaping Ditches @ \$100 = \$60,200

**Total Additional Cost for Embankment and Drainage for Shoulder Widening/Paving = \$1,038,320**

### **Construction of Sidewalks in Project Target Area Not Included in Bike/Ped Plan**

In addition to the sidewalks listed in the NBPP, sidewalks are to be constructed along several other main streets located within the project target area. These streets are listed below, along with calculations of the estimated cost for each, including crosswalks and ADA-compliant



ramps. For the estimated unit costs shown below, guidance was obtained from a publication entitled, *Costs for Pedestrian and Bicyclist Infrastructure Improvements*, dated October 2013, which was prepared for the Federal Highway Administration by the University of North Carolina Highway Safety Research Center. Generally, the average cost for each component was used, with some adjustments for inflation from the date of this publication to the present time.

<u>Street Segment Length,</u>	<u>Lin. Ft.</u>	<u>No. of Intersecting Side Streets</u>
Amulet Street [Julia to 5 <sup>th</sup> ]	4,030	12
[2 sides, Howell to 5 <sup>th</sup> ]	2,200	
Dixie/Sanford [Amulet to Texas]	4,730	10
Dixie Street [Texas to Gold]	3,225	7
Gold Street [Dixie to Welch]	1,500	3
Julia Street [Amulet to Lake]	425	0
Lake Street [MLK to LA-1]	3,780	10
Martin Luther King Drive	5,270	17
[2 sides, Univ. to Amulet]	2,320	
Powell [Amulet to Old Robeline]	1,350	2
Welch/Breazeale Springs	3,135 + 1,495	9
SUBTOTALS	33,460	70

Additional for Texas Street [Sidewalk cost included in NBPP] 24 + 2 mid-block  
 Additional for Old Robeline Road [Sidewalk cost included in NBPP] 7

TOTALS 33,460 103

Concrete Sidewalk = 33,460 Lin. Ft. @ \$35 = \$1,171,100  
 High-Visibility Crosswalks [Thermoplastic Pavement Markings] = 103 @ \$3,000 = \$309,000  
 ADA Curb Ramps = 103 x 2 = 206 @ \$1,000 = \$206,000

On the following streets, the installation of new sidewalks on portions of the following streets will necessitate that the existing roadside ditches be replaced with subsurface drainage systems in order to maintain proper drainage. Based on unit prices for recent local street rehabilitation projects, the cost for this work is estimated as follows:

- Dixie Street [Stella to Gold] = 1,600 Lin. Ft.
- Dixie/Sanford [Amulet to Dean] = 2,670 Lin. Ft.
- Gold Street = 1,500 Lin. Ft.
- Lake Street [LA-1 to Sewanne] = 760 Lin. Ft.
- Old Robeline Road [cost of sidewalks included in NBPP] = 2,730 Lin. Ft.
- Powell Street = 1,350 Lin. Ft.

Total = 10,610 Lin. Ft. @ est. \$150 for storm drain pipe = \$1,591,500  
 Plus catch basins @ 200' spacing = 10,610 Lin. Ft. / 200 = 53 CB's @ \$5,000 = \$265,000

**TOTAL FOR CONSTRUCTION OF ADDITIONAL SIDEWALKS IN PROJECT TARGET AREA = \$3,542,600**

**Additional for Installation of Advance Warning Signs and Other Traffic Control Devices**

In advance of each mid-block crosswalk location, a W11-2 advance warning sign [30"x30"] will be placed, along with a W16-9B placard [30"x18"] with legend, "Ahead." In addition, immediately adjacent to each crosswalk, a W11-2 warning sign with solar-powered flashing beacon, along with an arrow placard [W16-7B], will be placed to mark the location at which traffic must stop for pedestrians in the crosswalk. Based on the most recent "Statewide Weighted Average Unit Prices" found on the LA DOTD website, the estimated cost for these advance signs and warning devices at each crosswalk location, in both directions of vehicular travel, is as follows:

Signs: 2 @ [(2.5'x2.5') + (2.5'x1.5')] = 20.0 Sq. Ft. @ \$30 = \$600

Square Tubing Sign Posts: 2 @ \$105 = \$210

Solar-Powered Flashing Beacons: 1 @ \$2,500 = \$2,500

TOTAL = \$3,310 PER CROSSWALK x 2 directions of travel = \$6,620 PER CROSSWALK  
x [6 crosswalks at previous crash locations plus 5 additional mid-block crosswalks] = \$72,820

At two locations on Texas Street – the intersection of Welch Street and the intersection of Breda Street/Martin Luther King Drive/Berry Street – the planned pedestrian improvements include the installation of Rectangular Rapid Flashing Beacons [RRFB] for additional safety. Using the most recent

"Statewide Weighted Average Unit Prices" found on the LA DOTD website, the estimated cost for these installations will be \$5,000 each, for a total of \$10,000.

Other planned signing upgrades include the replacement of existing Stop signs [R1-1] and other existing regulatory and warning signs within Impact Zone 1 with new signs meeting the current FHWA requirements for retroreflectivity. Based on an estimated count, the cost for this signing upgrade work is calculated as follows:

500 signs @ 6.25 Sq. Ft. = 3,125 Sq. Ft. @ \$30 = \$93,750 + 500 Square Tubing Sign Posts @ \$105 = \$52,500 = \$146,250

**TOTAL FOR ADVANCED WARNING SIGNS AND OTHER SIGN UPGRADES = \$229,070**

**Installation of Overhead Street Lighting on Texas Street, Martin Luther King Drive, and Amulet Street**

The estimated cost for this work is calculated as follows:

Amulet Street = 3,890 Lin. Ft. divided by 200' spacing = 20 spaces + 1 = 21 street light assemblies

MLK Drive = 5,100 Lin. Ft. divided by 200' spacing = 26 spaces + 1 = 27 street light assemblies

Texas Street = 7,500 Lin. Ft. divided by 200' spacing = 38 spaces + 1 = 39 street light assemblies

Total Estimated Cost = 87 light poles @ \$6,100 for 40' aluminum single-arm pole [from LA DOTD "Statewide Weighted Average Unit Prices"] = \$530,700  
 Plus 87 LED luminaires @ \$326 material cost [price quote from City of Natchitoches vendor] x estimated 1.75 markup for contracted work = \$49,634  
 Plus estimated cost for wiring, etc. = \$50,000  
**TOTAL ESTIMATED COST FOR STREET LIGHTS = \$630,334**

**Resurfacing of Streets in Project Target Area**

A total of 30 individual street segments is planned for resurfacing as part of the proposed Safe Streets Revitalization Project. A cost estimate for resurfacing each street segment was previously prepared by the staff engineer for the City of Natchitoches as part of his recent evaluation of the entire City street network for funding consideration in the City's Fiscal Year 2021-22 Street Rehabilitation Program. For most of these streets, the proposed scope of work consists of construction of a 12-inch thick cement-treated base course followed by placement of 2-inch thick asphalt surfacing. Based on the bid unit prices for recent local street rehab projects, the unit prices utilized in the cost estimates are \$12.00 per square yard for the base course and \$125 per ton for the asphalt surfacing. Totaling the individual cost estimate for each listed street segment results in an overall estimated cost of **\$1,995,611** for the street resurfacing work, which is shown in the "Recap of Estimated Costs."

**Drainage Improvements from Welch Street to Holmes Street**

In 2017 the City of Natchitoches retained the firm of S.E. Huey Co. to investigate drainage issues that were being experienced beginning at the outlet end of an existing cross-drain structure located underneath Welch Street, just east of its intersection with J.C. Deblieux Drive, and the inlet end of an existing subsurface drainage system near Holmes Street, in which residences in that area were being inundated during heavy rainfall events. The result of that study was a report dated September 22, 2017, which listed several recommended improvements, along with the estimated cost for such improvements, which total \$215,544 [reference Pages 11-13 of this report]. Deducting engineering and other costs that are covered elsewhere in this RAISE grant application, including an overlap with the planned scope of work for the resurfacing of Raphiel Street, and adjusting the remaining estimated cost to 2021 dollars using an inflation rate of 5% per annum, yields the following calculations:

2017 Cost Estimate of \$215,544 less engineering @ \$29,300 = \$186,244 x 1.2155 = \$226,381 [2021 \$]

Less \$50,000 overlap with scope of work for Raphiel Street resurfacing = **\$176,381 Shown in Cost Recap**

**Estimated Right-of-Way Costs for Sidewalks, Paved Shoulders, Separated Bike Lanes, & Drainage Improvements**

**Sidewalks** – Street segments where additional R/W will be needed:  
 Texas St. = 15,312 LF  
 Dixie St. [Stella to Gold] = 1,600 LF  
 Dixie/Sanford St. [Amulet to Dean] = 2,670 LF

Gold St. = 1,500 LF

Lake St. [LA-1 to Powell] = 1,440 LF

Old Robeline Road = 2,730 LF

Powell = 1,350 LF

TOTAL = 26,602 Lin. Ft. x 15' width / 43,560 = 9.16 Acres @ est. \$10,000 = \$91,600

**Paved Shoulders** – Street segments where additional R/W will be needed:

Keyser Ave. [Blanchard to Corp. Limit] = 0.338 mile x 2 x 5,280 x 10' width / 43,560 = 0.82 Acre @ est. \$10,000 = \$8,200

Williams Ave. [St. Clair to Blanchard] = 2.034 mile x 2 x 5,280 x 10' width / 43,560 = 4.93 Acres @ est. \$10,000 = \$49,300

LA-504 [LA-6 to LA-3191] = 3.0 mile x 2 x 5,280 x 10' width / 43,560 = 7.27 Acres @ est. \$5,000 = \$36,350

TOTAL = \$93,850

**Separated Bike Lanes** – From *City of Natchitoches Bicycle and Pedestrian Master Plan*, the total length of separated bicycle lanes and multi-use shared paths to be constructed is 23.227 miles. Thus, the estimated right-of-way cost is calculated as follows:

$23.227 \times 5,280 \times 11' \text{ avg. width} / 43,560 = 30.97 \text{ Acres @ est. } \$10,000 = \$309,700$

**Drainage Improvements** – Tracing out the planned drainage improvements on Google Earth yields a length of 1,050 linear feet for this work. At a 20' width of additional right-of-way needed, this calculates to 0.48 acre, which, at an estimated cost of \$10,000 results in an estimated cost of \$4,800.

**TOTAL ESTIMATED RIGHT-OF-WAY COST = \$502,350**

### **Estimated Utility Relocation Costs**

Utility relocation costs are estimated at 10 percent of the construction cost for all planned project components that involve work that is located outside the limits of the existing roadway crown, which are listed below:

Bicycle and Pedestrian improvements shown in NBPP [\$9,651,791] less \$1,454,036 portion located within existing roadway crown = \$8,197,755

Additional Sidewalks in areas where additional R/W will be needed = 26,602 LF @ \$35 = \$931,070

Drainage Improvements from Welch St. to Holmes St. = \$176,381

TOTAL = \$9,305,206 @ 10% = **\$930,521**

**2021 FEDERAL RAISE GRANT APPLICATION  
NATCHITOCHESS SAFE STREETS REVITALIZATION PROJECT  
ANTICIPATED PROJECT DEVELOPMENT MILESTONES**

Project Activity	Anticipated Start	Anticipated Completion
Funding Approval		11/30/2021
Execute Project Agreement with FHWA	12/1/2021	2/28/2022
Procure Engineering Design Firm	3/1/2022	5/31/2022
Survey, Design, & Plan Development	6/1/2022	5/31/2023
Add Project to Statewide Transportation Improvement Plan *	3/1/2022	5/31/2022
NEPA Environmental Clearance *	7/1/2022	3/31/2023
Obtain Regulatory Permits *	7/1/2022	9/30/2022
Approval of Final Plans, Specs, and Cost Estimate / Obligation of Federal Funds	6/1/2023	8/31/2023
Right-of-Way Appraisal & Acquisition [including review by LA DOTD & FHWA]	9/1/2023	8/31/2024
Preparation for Letting	9/1/2024	9/30/2024
Bid Advertisement	10/1/2024	10/31/2024
Bid Review / Contract Award & Execution / Schedule Pre- Construction Conference	11/1/2024	1/31/2025
Utility Relocation *	2/1/2025	4/30/2025
Construction	2/1/2025	1/31/2027

\* The noted activities are concurrent with other project activities.

**SUPPLEMENT TO “SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS”**

**ANTICIPATED TIMING OF PRECONSTRUCTION AND CONSTRUCTIONS COSTS**

**Calendar Year 2022**

50% of Engineering Design = 50% of \$1,944,229 divided by 2 = \$486,057  
20% of LA DOTD Administration = 20% of \$583,269 = \$116,654  
TOTAL = \$602,711 x 1.1 for Contingency = \$662,982

**Calendar Year 2023**

Remaining 50% of Engineering Design = \$486,057  
25% of Right-of-Way = 25% of \$502,350 = \$125,588  
20% of LA DOTD Administration = \$116,654  
TOTAL = \$728,299 x 1.1 = \$801,129

**Calendar Year 2024**

Remaining 75% of Right-of-Way = 75% of \$502,350 = \$376,762  
20% of LA DOTD Administration = \$116,654  
TOTAL = \$493,416 x 1.1 = \$542,758

**Calendar Year 2025**

50% of Construction = 50% of \$18,009,422 = \$9,004,711  
100% of Utility Relocation = \$930,521  
50% of CE&I = 50% of \$1,944,229 divided by 2 = \$486,057  
20% of LA DOTD Administration = \$116,654  
TOTAL = \$10,537,943 x 1.1 = \$11,591,737

**Calendar Year 2026**

Remaining 50% of Construction = \$9,004,711  
Remaining 50% of CE&I = \$486,057  
Remaining 20% of LA DOTD Administration = \$116,654  
TOTAL = \$9,607,422 x 1.1 = \$10,568,164

**SUPPLEMENT TO “SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS”**

**ANTICIPATED TIMING OF PRECONSTRUCTION AND CONSTRUCTIONS COSTS FOR IMPACT ZONES 1 & 2**

**Calendar Year 2022**

50% of Engineering Design = 50% of \$1,262,097 divided by 2 = \$315,524  
20% of LA DOTD Administration = 20% of \$378,629 = \$75,726  
TOTAL = \$391,250 x 1.1 for Contingency = \$430,375

**Calendar Year 2023**

Remaining 50% of Engineering Design = \$315,524  
25% of Right-of-Way = 25% of \$312,600 = \$78,150  
20% of LA DOTD Administration = \$75,726  
TOTAL = \$469,400 x 1.1 = \$516,340

**Calendar Year 2024**

Remaining 75% of Right-of-Way = 75% of \$312,600 = \$234,450  
20% of LA DOTD Administration = \$75,726  
TOTAL = \$310,176 x 1.1 = \$341,194

**Calendar Year 2025**

50% of Construction = 50% of \$11,686,386 = \$5,843,193  
100% of Utility Relocation = \$621,984  
50% of CE&I = 50% of \$1,262,097 divided by 2 = \$315,524  
20% of LA DOTD Administration = \$75,726  
TOTAL = \$6,856,427 x 1.1 = \$7,542,070

**Calendar Year 2026**

Remaining 50% of Construction = \$5,843,193  
Remaining 50% of CE&I = \$315,524  
Remaining 20% of LA DOTD Administration = \$75,726  
TOTAL = \$6,234,443 x 1.1 = \$6,857,887

**SUPPLEMENT TO “SUMMARY OF ANNUITIZED PROJECT COSTS AND BENEFITS”**

**ANTICIPATED TIMING OF PRECONSTRUCTION AND CONSTRUCTIONS COSTS FOR IMPACT ZONE 1**

**Calendar Year 2022**

50% of Engineering Design = 50% of \$841,553 divided by 2 = \$210,388  
20% of LA DOTD Administration = 20% of \$252,466 = \$50,493  
TOTAL = \$260,881 x 1.1 for Contingency = \$286,969

**Calendar Year 2023**

Remaining 50% of Engineering Design = \$210,388  
25% of Right-of-Way = 25% of \$161,600 = \$40,400  
20% of LA DOTD Administration = \$50,493  
TOTAL = \$301,281 x 1.1 = \$331,409

**Calendar Year 2024**

Remaining 75% of Right-of-Way = 75% of \$161,600 = \$121,200  
20% of LA DOTD Administration = \$50,493  
TOTAL = \$171,693 x 1.1 = \$188,862

**Calendar Year 2025**

50% of Construction = 50% of \$7,998,128 = \$3,999,064  
100% of Utility Relocation = \$255,806  
50% of CE&I = 50% of \$841,553 divided by 2 = \$210,388  
20% of LA DOTD Administration = \$50,493  
TOTAL = \$4,515,751 x 1.1 = \$4,967,326

**Calendar Year 2026**

Remaining 50% of Construction = \$3,999,064  
Remaining 50% of CE&I = \$210,388  
Remaining 20% of LA DOTD Administration = \$50,493  
TOTAL = \$4,259,945 x 1.1 = \$4,685,940