Benefit-Cost Analysis Supplementary Documentation

FY 2017-18 INFRA Grant Program

I-75 at Overpass Road Interchange

Pasco County, FL

October 30, 2017

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1. Introduction

This document provides detailed technical information on the economic analysis conducted in support of the grant application for the I-75 at Overpass Rd. Interchange in Pasco County, Florida project.

Section 2, Methodological Framework, introduces the conceptual framework used in the Benefit-Cost Analysis (BCA). Section 3, Project Overview, provides an overview of the project, including a summary of cost estimates and schedule; and a description of the types of effects that the proposed I-75 Interchange project is expected to generate. Section 4, General Assumptions, discusses the general assumptions used in the estimation of project costs and benefits, while estimates of travel demand/traffic growth can be found in Section 5, Travel Demand Projections. Specific data elements and assumptions pertaining to the long-term outcome selection criteria are presented in Section 6, Benefits Measurement, Data and Assumptions, along with associated benefit estimates. Estimates of the project's Net Present Value (NPV), its Benefit-Cost ratio (BCR) and other project evaluation metrics are introduced in Section 7, Summary of BCA Findings. Next, Section 8, BCA Sensitivity Analysis, provides the outcomes of the sensitivity analysis reflective of a lower discount rate. Additional data tables are provided in Section 9, Aggregate Annual Benefits and Costs, including annual projections of benefits and costs to assist USDOT in its review of the application.[1]

2. Methodological Framework

The Benefit-Cost Analysis (BCA) conducted for this project includes the monetized benefits and costs measured using USDOT guidance. Qualitative merits of the project are also outlined where applicable. A BCA provides projections of the benefits that are expected to accrue from a project over a specified period, and compares them to the anticipated costs of the project. Costs include both the resources required to develop the project and the costs of maintaining the new or improved asset over time. Forecasted benefits are based on the projected impacts of the project on both users and non-users of the facility, valued in monetary terms.[2]

[1] While the calculations/models themselves do not accompany this appendix, they are provided separately as part of the application.

[2] USDOT, Benefit-Cost Analysis Guidance for TIGER and INFRA Applications, July 2017.

The specific methodology used for this application was developed with the BCA guidance prepared by USDOT, and is consistent with the INFRA program guidelines. In particular, the methodology involves:

- Establishing existing and future conditions under the Build and No-build scenarios;
- Assessing benefits with respect to each of the five long-term outcomes identified in the Notice of Funding Opportunity (NOFO);
- Measuring benefits in dollar terms, whenever possible, and expressing benefits and costs in a common unit of measurement;
- Using USDOT guidance for the valuation of travel time savings, vehicle operating costs savings, safety benefits and reductions in air emissions, while relying on industry best practice for the valuation of other effects; and
- Discounting future benefits and costs with the real discount rates recommended by USDOT (7 percent, and 3 percent for sensitivity analysis).

3. Project Overview

This project will result in the reconstruction of the existing Overpass Road overpass at I-75 (No-Build) to a full diamond interchange at I-75 (Build). The project is located in Pasco County, Florida, which is part of the larger Tampa Bay region. A more detailed description of the project is provided in the main body of this application.

3.1 Types of Impacts/Impacts

The proposed I-75 Interchange at Overpass Road is expected to result in a number of changes impacting the regional population. These are broadly summarized in Table 1 below.

Table 1: Summary of the Transportation Improvements and Associated Impacts and Benefits

Current Status or Baseline & Problems to Be Addressed	Changes to Baseline / Alternatives	Type of Impacts	Population Affected by Impacts	Benefits
The existing I-75 interchanges in the vicinity of Overpass Rd. are congested, which will be exacerbated by the expected population growth	Reconfiguration of Overpass Rd. into a full interchange	Congestion relief and changes in vehicle hours and vehicle miles traveled	Area residents and businesses, freight carriers, and travelers passing through the area	Travel time savings, and vehicle operating cost savings
Growing delays across the area road network generate air emissions	The project alleviates delays by redistributing traffic to the new interchange	Congestion relief and changes in vehicle hours and vehicle miles traveled	All residents	Reduced emission costs
Growing traffic volumes across the area road network generate accidents	The reduces distance traveled by redistributing traffic to the new interchange	Changes in vehicle miles traveled	Area residents and businesses, freight carriers, and travelers passing through the area	Reduced accident costs

3.2 Project Cost[3] and Schedule

The proposed interchange reconfiguration project is estimated to cost $62.1 million in total upfront investment. This amount is scheduled to be expended over a four-year timeframe, with the first year (2018) allocated to design-build proposal and concept plan completion as well as some right-of-way acquisition (at $12.2 million), while the final 30-months through 2021 are allocated to the design/build activities (at $48.9 million) of the project[4]. The table below shows an estimated cost and annual schedule related to the project.

[3] All cost estimates in this section are in expressed in 2016 constant dollar terms, unless otherwise noted.

[4] I-75 and Overpass Road Interchange Project, Florida Job Growth Grant Fund Public Infrastructure Grant Proposal, 2017

Table 2: Summary of the Project's Estimated Investment Costs (in millions of 2016$)

	2018	2019	2020	2021	4-year Total
Annual Cost	$ 13.2	$ 14.7	$ 19.6	$ 14.7	**$ 62.1**

Starting from the first full year of the interchange operations in 2022, there will also be an increase in the operating and maintenance (O&M) costs for the improved facility relative to the No-Build scenario. The change in O&M costs was computed based the difference between the current O&M costs (using the average per lane mile cost of $14 thousand, and the current length of about 2 lane miles), and the Build configuration (based on the per mile cost of $20 thousand, and length of about 7 lane miles). This incremental cost is projected to be $102 thousand per year, for a 20-year operations total of $2.04 million. As per the latest Benefit-Cost Analysis Guidance for INFRA documents, O&M costs are included (as a negative value in this case) in the numerator of the benefit-cost ratio.

3.3 Disruptions Due to Construction

The construction of the proposed I-75 Interchange at Overpass Rd. is not expected to cause any significant disruption to existing traffic in the area. As most of the construction is envisioned to take place in the lightly-traveled overnight hours, and will be combined with various mitigating measures such as appropriate safety signage, the impact on traffic flow is expected to be minimal, and is hence not quantified in the BCA.

3.4 Effects on Primary Selection Criteria

The main benefit categories associated with the project are mapped into the five primary selection criteria set forth by USDOT in the table below.

Table 3: Benefit Categories and Expected Effects on Primary Selection Criteria

Primary Selection Criteria	Benefit or Impact Categories	Description	Monetized	Quantified	Qualitative
State of Good Repair	Residual value of investment	Residual value of the project investment at the end of the period of analysis	Yes	Yes	No
Economic Competitiveness	Change in travel time costs	Change in travel time due to lower congestion in the area stemming from the new interchange	Yes	Yes	No
	Change in vehicle operating costs	Change in vehicle operating cost due to lower vehicle miles traveled in the region	Yes	Yes	No
	Job creation	Temporary construction jobs, and permanent jobs associated with development around the new interchange	No	No	Yes
	Improved land access	Improved access to developable land locations around the new interchange	No	No	Yes
Quality of Life	Improved access to jobs	Improved access to jobs in locations around the region	No	No	Yes
Environmental Sustainability	Change in emissions	Change in emission volumes due to lower vehicle miles traveled in the region	Yes	Yes	No
Safety	Safety benefits	Change in the number of accidents due to decreased vehicle miles traveled in the region	Yes	Yes	No

4. General Assumptions

The BCA measures benefits against costs throughout the 24-year period of analysis beginning at the start of construction in year 2018, and including 20 years of operations from 2022 through 2041[5].

The monetized benefits and costs are estimated in constant dollars of 2016 with future dollars discounted in compliance with INFRA requirements using a seven percent real rate, and sensitivity testing at three percent.

The methodology makes several important assumptions and seeks to avoid overestimation of benefits and underestimation of costs. Specifically:

- Input prices are expressed in 2016 dollars;
- The period of analysis begins in 2018 and ends in 2041. It includes project development and construction years (2018 - 2021), and 20 years of operations (2022 - 2041);
- A constant seven percent real discount rate is assumed throughout the period of analysis. A three percent real discount rate is used for sensitivity analysis; and
- Opening year demand is an input to the BCA, and is assumed to be fully realized in Year 1 (no ramp-up).

5. Travel Demand Projections

Travel demand projections serve as a critical input to forecasting the key benefits included in this BCA. The travel demand model deployed in this analysis was the Tampa Bay Regional Planning Model (TBRPM). This model was developed for the planning activities of the Tampa Bay Area. The model is the cooperative and combined planning efforts of the Florida Department of Transportation (FDOT) District 7 and the Metropolitan Planning Organizations (MPOs) in the Tampa Bay Area. The study area for the TBRPM corresponds with the jurisdiction of FDOT District 7 and includes Pasco, Hillsborough, Pinellas, Hernando, and Citrus Counties of Florida. TBRPM version 8.2 was used to develop the vehicle hours traveled (VHT) and vehicle miles traveled (VMT) forecast with and without the project. The regional VMT and VHT values were estimated for the base year 2010 without the proposed Overpass Road interchange. The future year 2040 model forecasts were produced for both No-Build and Build (with the interchange) conditions.

5.1 Demand Projections Summary

The resulting projections for vehicle hours traveled and vehicle miles traveled by vehicle type for the Build and No-Build scenarios are presented in the Table 4 below.

[5] 2040 is the horizon year of the Tampa Bay Regional Planning Model that was used for quantification of the VHT and VMT differentials between the Build and N-Build scenarios.

Table 4: Travel Demand Projections, Average Daily VMT and VHT

Year/Scenario	VMT Auto	VMT Truck	VHT Auto	VHT Truck
2010 Base	62,960,550	3,131,145	1,954,841	87,712
2040 No-Build	100,183,439	5,231,318	3,533,712	172,915
2040 Build	100,140,716	5,231,158	3,530,315	172,863

6. Benefits Measurement, Data and Assumptions

The proposed interchange project will yield various benefits for the traveling public and the larger economy. These are based most heavily on the reductions of times and distance traveled by motorists in the area. The following subsections describe the measurement approach used for each benefit or impact category identified in Table 3 (Benefit Categories and Expected Effects on Primary Selection Criteria), and provides an overview of the associated methodology, assumptions, and estimates.

6.1 State of Good Repair

To quantify the benefits associated with maintaining the existing transportation network in a state of good repair, the residual value of the project's initial investment in the interchange structure was estimated. The proposed interchange is expected to retain some value beyond the 2041 time horizon for which the various benefits described in this document are computed. The residual value of the proposed project was estimated based on the assumption of a useful life of 50 years for the structure.

Based on the initial value of $48.9 million, and assuming straight-line depreciation, the combined residual value of the interchange in place in year 2041 is projected to be $29.3 million, with a discounted value of $5.8 million in present value terms.

6.2 Economic Competitiveness

The proposed project would contribute to enhancing the economic competitiveness of the area and potentially beyond through improvements in the mobility of people and goods within and across the region. In this analysis, two measures of mobility are presented: travel-time savings and vehicle operating cost savings.

6.2.1 TRAVEL TIME SAVINGS

Travel time savings are a function of vehicle hours traveled. The analysis of the reduction in VHT was based on the data from the TBRPM, as described in Section 5 above.

A summary of the VHT saved with the proposed interchange (Build), relative to the No-Build scenario, by major vehicle class for the first year of operations (2022) and the horizon year of the TBRPM model (2040) is presented in Table 5 below. These changes are based on an annualization factor of 300 days.

Table 5: Projected VHT Savings (annualized)

	Auto	Truck	Total
2022	285,875	4,163	290,038
2040	1,019,207	15,638	1,034,845

As can be seen in Table 5, VHT reductions are projected to amount to about 290 thousand in year 2022, increasing by about 2 percent per year to 1.035 million in 2040, with the great majority (i.e., 98 percent) of the savings captured by automobile users.

The hours saved with the interchange build scenario were monetized with the motorist's value of travel time (VOTT). This analysis recognizes that the economic VOTT varies by trip purpose. However, due to the structure of the travel demand model only the overall automobile and truck differentiation in VOTT was practical. For each of these vehicle classes, the travel time benefits were derived by multiplying VHT savings by the appropriate VOTT (using the latest BCA Guidance for INFRA), and applicable vehicle occupancy rates. It should be noted that there is no induced demand in the travel demand model used as the number of trips under the Build and No-Build scenarios is the same. As such, the results pertain only to existing users, and not any induced travel demand.

Travel time savings are expected to be about $5.7 million in the first year of operations (2022), increasing to $20.4 million in year 2040, for a 20-year total of about $256.4 million (before discounting), as summarized in Table 6.

Table 6: Projected Total Travel Time Savings (in millions of 2016$)

	Travel Time Savings
2022	$5.7
2040	$20.4
20-year Total	$256.4

6.2.2 VEHICLE OPERATING COST SAVINGS

Vehicle operating costs are a function of vehicle miles traveled. The new interchange at Overpass Rd. is projected to also result in reductions in travel distances in the area. This is expressed in the savings in VMT as per the results from the TBRPM. A summary of the annualized VMT saved with the project, for autos and trucks, is presented in Table 7 below.

Table 7: Projected VMT Savings (annualized)

	Auto	Truck	Total
2022	3,880,266	14,048	894,314
2040	2,816,882	47,785	12,864,667

As shown in Table 7, reductions in VMT are expected to reach about 3.9 million in 2022, rising by an average of about 1.6 percent annually, to 12.9 million in 2040, with the vast majority of these reductions accrued to passenger vehicle users.

The vehicle operating cost savings related to this project were derived using the savings in VMT and the average operating costs per mile for passenger and commercial vehicles, as per the latest US DOT BCA Guidance. The resulting annualized vehicle operating cost savings are projected to amount to about $1.6 million in year 2022, rising to $5.2 million by 2040. The corresponding 20-year operations period total is $66.8, as summarized in Table 8.

Table 8: Projected Vehicle Operating Cost Savings (in millions of 2016$)

	Vehicle Operating Cost Savings
2022	$1.6
2040	$5.2
20-year Total	$66.8

6.2.3 JOB CREATION

Injection of capital infrastructure spending, such as that related to the proposed I-75 interchange, into the area economy will lead to direct construction and related professional services jobs, as well as indirect jobs supporting the suppliers of materials and equipment. In turn, these direct and indirect jobs support, through re-spending of earnings, additional jobs within the economy (induced impacts).

Additionally, the new interchange is expected to aid further business (with the related jobs) attraction and retention that would not otherwise occur, especially when combined with the Pasco County's economic development initiatives[6]. However, these impacts were not quantified as part of this application.

6.2.4 LAND ACCESS

The new interchange will also improve access to the nearby land that is slated for development. Proposed developments in the area, such as the Connected Cities high-tech pilot community, and the Industrial Park will become more accessible with the interchange access to I-75, and may be better positioned to realize their full potential[7]. This land access benefit was not quantified, and hence, is not incorporated in the project outcomes monetization included in this application.

6.3 Quality of Life

The project would contribute to enhancing the quality of life in the study area through improved access to job opportunities. With a new interchange option that provides generalized cost (time and money) savings, residents of Pasco County will have improved access to the larger job market within the County as well as elsewhere in the

[6] I-75 and Overpass Road Interchange Project, Florida Job Growth Grant Fund Public Infrastructure Grant Proposal, 2017

[7] ibid

Tampa Bay region. This may result in associated productivity and income gains, improving the overall quality of life in the area. This effect is not, however, included in the project outcomes quantification.

6.4 Environmental Sustainability

The proposed project would contribute to environmental sustainability through reductions in air pollution and CO_2 emissions. These environmental benefits were calculated as the product of tons of emissions saved by pollutant and their unit value per ton. The unit values for VOCs, NOx, PM, and SO_2 reflect the US DOT recommendations from the latest BCA Guidance for INFRA, while the CO_2 unit values are based on a 2009 publication by the National Highway Traffic Safety Administration ("Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks," page VIII-32). Tons of emissions saved by pollutant are a function of emissions rates and changes in VMT by vehicle type and speed. The emission rates were based on the EPA's MOVES (Motor Vehicles Emission Simulator) model specific to the District Seven region in Florida, while changes in VMT by speed bin were obtained from the TBRPM.

The resulting emission cost savings are summarized in Table 9. These savings are projected to be close to $0.2 million annually, totaling $3.8 million over the 20-year operations timeframe (before discounting). They include savings related to carbon dioxide and the other four pollutants.

Table 9: Projected Total Air Emissions Savings (in millions of 2016$)

	Emission Savings
2022	$ 0.2
2040	$0.2
20-year Total	$3.8

6.5 Safety Benefits

Vehicle crashes are often very costly in terms of loss of life, productivity losses due to injury, and vehicle or other property damage. The proposed project would contribute to promoting US DOT's safety long-term outcome through reductions in the number of accidents on the area highway network.

The monetized safety benefits of the proposed interchange were calculated based on reductions in the number of crashes and unit cost of crashes estimates by severity. The reductions in crashes by severity were computed as a function of annualized vehicle miles traveled reductions and crash rates by severity. The crash rates specific to FDOT

District 7, are in turn based on the numbers of reported accidents (from the Florida Integrated Exchange Report System) and the area vehicle miles traveled (from FDOT's highway mileage reports) for the recent five years. The unit costs of crashes, by severity, are based on the KABCO-level monetized values from the latest BCA Guidance for INFRA. They were adjusted for the average number of vehicles involved per accident (based on CalTrans, TASAS data), and applicable injuries per injury crash and fatalities per fatal crash (based on the University of Florida's Signal Four Analytics' data for the recent five years specific to the vicinity of the proposed interchange).

Table 10 summarizes the resulting safety benefits, which are projected to be valued at about $1.5 million in year 2022, increasing to $4.9 million in year 2040, for the 20-year total of $63.6 million (before discounting).

Table 10: Projected Accident Cost Savings (in millions of 2016$)

	Accident Savings
2022	$1.5
2040	$4.9
20-year Total	$63.6

7. Summary of BCA Findings

The tables below summarize the BCA findings. Annual costs and benefits are computed over the full period of analysis (24 years). As stated earlier, the initial four-year investment is expected to be completed by 2022, with the benefits accruing during the full 20-year period of operations, through year 2041.

The total benefits and costs, expressed in 2016 dollars, for the analysis period are shown in Table 11. This table reflects a summation of the annualized benefits and costs for each year between 2018 and 2041. In accordance with the USDOT guidance for economic analysis, the annualized benefits and costs were discounted to reflect the time value of money. Consistent with the OMB Circulars A-94, a real discount rate of seven percent was used in the discounting of the benefits and costs. An alternative real discount rate of three percent was also applied in the sensitivity analysis (presented in the next section).

Table 11: Benefit-Cost Analysis Results (in millions of 2016$)*

Benefit and Cost Metrics	2018-2041 Totals	
	Discounted at 7%	Before Discounting
Project Benefits		
Travel Time Savings	$89.2	$256.4
Vehicle Operating Cost Savings	$23.5	$66.8
Emission Savings (Carbon)	$0.6	$1.6
Emission Savings (non-Carbon)	$1.0	$2.1
Safety	$22.4	$63.6
Residual Value	$5.8	$29.3
Total Benefits	$142.4	$419.9
Project Costs		
Capital	$52.3	$62.1
O&M Costs	$0.8	$2.0
Total Project Costs	$53.1	$64.1
Total Benefits less Total Costs (NPV)	**$89.3**	NA
Benefit-Cost Ratio**	**2.71**	NA
Internal Rate of Return	**17.3%**	NA
Breakeven Year	**2029**	NA

** Unless specified otherwise. **Note that the Benefit-Cost Ratio was calculated as: (Benefits – O&M Costs) / Capital Costs, in compliance with the latest BCA Guidance for INFRA*

Considering all monetized benefits and costs, the estimated internal rate of return of the project is 17.3 percent. Applying a seven percent real discount rate, the investment in the proposed interchange can be expected to yield a net present value of $89.3 million, and a Benefit-Cost ratio of 2.71, indicating that the project returns $2.71 in benefits for every dollar of capital costs. The breakeven year for this investment is 2029.

Among the project benefits totaling $142.4 million (in present value terms), the travel time savings (at $89.2 million) are projected to be the largest category, followed by savings in vehicle operating costs ($23.5 million), then safety benefits ($22.4 million), residual value ($5.8 million), and emission savings ($1.6 million overall).

8. BCA Sensitivity Analysis

The key assumption in this benefit cost analysis was the real discount rate of seven percent (as per the BCA Guidance for INFRA documentation).

The higher the discount rate, the less influential/valued future long-range costs and benefits become when compared to near-term costs and benefits. As the bulk of the costs of this project are projected to be borne upfront, in the early years of the project, while benefits grow over time, the use of a higher discount rate reduces the project's NPV and BCR. As an alternative assumption of a lower interest rate was tested, the BCA results using a three percent real discount rate are presented in Table 12.

Table 12: Benefit-Cost Analysis Results, Discounted at 3% (in millions of 2016$)*

Benefit and Cost Metrics	2018-2041 Totals Discounted at 3%
Project Benefits	
Travel Time Savings	$158.8
Vehicle Operating Cost Savings	$41.6
Emission Savings (Carbon)	$1.0
Emission Savings (non-Carbon)	$1.5
Safety	$39.6
Residual Value	$14.4
Total Benefits	$256.9
Project Costs	
Capital	$57.6
O&M Costs	$1.3
Total Project Costs	$58.9
Total Benefits less Total Costs (NPV)	**$198.0**
Benefit-Cost Ratio**	**4.44**
Internal Rate of Return	**17.3%**
Breakeven Year	**2028**

** Unless specified otherwise. **Note that the Benefit-Cost Ratio was calculated as: (Benefits – O&M Costs) / Capital Costs, in compliance with the latest Benefit-Cost Guidance for INFRA*

With a three percent real discount rate, the net present value of the project would substantially increase to $198.0 million (or by about $109 million relative to the seven percent discounting), for a Benefit/Cost ratio of 4.44, and also with an earlier breakeven year of 2028.

9. Aggregate Annual Benefits and Costs

This section reports the aggregate benefits and costs associated with the proposed I-75 Interchange at Overpass Road project in annual terms. Table 13 shows the total benefits and costs in undiscounted terms (2016$), as well the net benefits (the difference between the total benefits and total costs) both in undiscounted and discounted (at seven percent) terms. As can be seen in the table, the net discounted benefits start in the minus $11.2 million to $16.0 million range in the initial four years of investment before the benefits start accruing. The net benefits then increase to a positive range of $6.4 million to $7.1 million per year from 2022 to 2040, and with the $12.1 million value in 2041, including the residual value.

Table 14 presents the aggregate monetized annual benefits, before discounting, in terms of the five long-term outcome criteria (State of Good Repair, Economic Competiveness, Quality of Life, Environmental Sustainability, and Safety). Please note that some of the expected benefits, such as those pertaining to improved jobs access under the quality of life category are not monetized, and hence not included in the table below.

User benefits for travelers in the region (travel time savings and vehicle operating cost savings), amounting to $323.2 million, account for the large majority of total monetized benefits, and are included in the economic competitiveness category. Safety benefits, at $63.6 million, are projected to be the second largest category of benefits generated by this project, followed by state of good repair (with the residual value of $29.3 million), and environmental sustainability, totaling about $3.8 million.

Table 13: Annual Projections of Total Project Benefits and Costs (in millions of 2016$)

Calendar Year	Project Year	Total Benefits	Total Costs	Net Benefits (before discounting)	Discounted Net Benefits (@7%)
2018	1	$0.00	$13.20	($13.20)	($12.34)
2019	2	$0.00	$14.67	($14.67)	($12.81)
2020	3	$0.00	$19.56	($19.56)	($15.97)
2021	4	$0.00	$14.67	($14.67)	($11.19)
2022	5	$9.01	$0.10	$8.91	$6.35
2023	6	$9.91	$0.10	$9.81	$6.53
2024	7	$10.84	$0.10	$10.73	$6.68
2025	8	$11.80	$0.10	$11.69	$6.81
2026	9	$12.79	$0.10	$12.69	$6.90
2027	10	$13.81	$0.10	$13.71	$6.97
2028	11	$14.87	$0.10	$14.77	$7.02
2029	12	$15.97	$0.10	$15.86	$7.04
2030	13	$17.10	$0.10	$16.99	$7.05
2031	14	$18.28	$0.10	$18.17	$7.05
2032	15	$19.49	$0.10	$19.39	$7.03
2033	16	$20.75	$0.10	$20.64	$6.99
2034	17	$22.04	$0.10	$21.94	$6.94
2035	18	$23.37	$0.10	$23.27	$6.88
2036	19	$24.74	$0.10	$24.64	$6.81
2037	20	$26.16	$0.10	$26.06	$6.73
2038	21	$27.62	$0.10	$27.52	$6.65
2039	22	$29.12	$0.10	$29.02	$6.55
2040	23	$30.67	$0.10	$30.56	$6.45
2041	24	$61.60	$0.10	$61.50	$12.12
Totals (2018-2041)		**$419.91**	**$64.14**	**$355.77**	**$89.26**

Table 14: Annual Projections of Total Project Monetized Benefits by Major Outcome Category (before discounting, in millions of 2016$)

Calendar Year	Project Year	State of Good Repair	Economic Competitiveness	Environmental Sustainability	Safety	Total Monetized Benefits
2018	1	$0.00	$0.00	$0.00	$0.00	$0.00
2019	2	$0.00	$0.00	$0.00	$0.00	$0.00
2020	3	$0.00	$0.00	$0.00	$0.00	$0.00
2021	4	$0.00	$0.00	$0.00	$0.00	$0.00
2022	5	$0.00	$7.28	$0.24	$1.49	$9.01
2023	6	$0.00	$8.04	$0.23	$1.64	$9.91
2024	7	$0.00	$8.82	$0.22	$1.79	$10.84
2025	8	$0.00	$9.63	$0.21	$1.95	$11.80
2026	9	$0.00	$10.47	$0.20	$2.12	$12.79
2027	10	$0.00	$11.34	$0.19	$2.28	$13.81
2028	11	$0.00	$12.23	$0.19	$2.45	$14.87
2029	12	$0.00	$13.16	$0.18	$2.63	$15.97
2030	13	$0.00	$14.11	$0.17	$2.81	$17.10
2031	14	$0.00	$15.10	$0.17	$3.00	$18.28
2032	15	$0.00	$16.12	$0.18	$3.19	$19.49
2033	16	$0.00	$17.18	$0.18	$3.39	$20.75
2034	17	$0.00	$18.27	$0.18	$3.59	$22.04
2035	18	$0.00	$19.39	$0.18	$3.80	$23.37
2036	19	$0.00	$20.55	$0.18	$4.01	$24.74
2037	20	$0.00	$21.75	$0.18	$4.23	$26.16
2038	21	$0.00	$22.98	$0.18	$4.46	$27.62
2039	22	$0.00	$24.26	$0.17	$4.69	$29.12
2040	23	$0.00	$25.57	$0.17	$4.93	$30.67
2041	24	$29.34	$26.93	$0.16	$5.17	$61.60
Totals (2018-2041)		**$29.34**	**$323.18**	**$3.76**	**$63.64**	**$419.91**