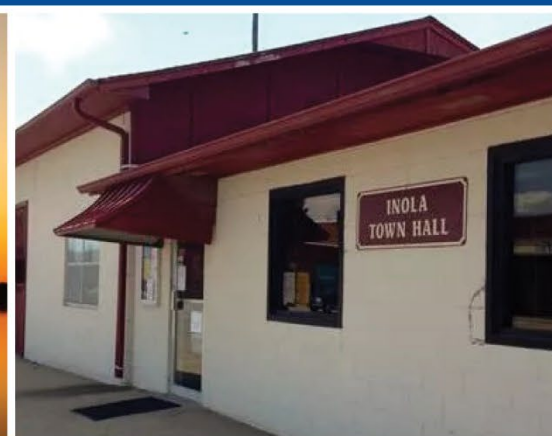




Benefit-Cost Analysis of MPDG US 412 Project

August 2023



OKLAHOMA
Transportation

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ACRONYMS

1. Introduction

The Oklahoma Department of Transportation (ODOT) is submitting a Priority Improvements for Interstate Designation Project Grant application for consideration under the Multimodal Project Discretionary Grant (MPDG) FY 2023-24 award cycle. This report documents the Benefit Cost Analysis (BCA) that evaluates the benefits resulting from the Priority Improvements for Interstate Designation Program of Projects (Project) which includes one new system to system interchange and five new full access service interchanges. In addition to the new structures, pavement reconstruction on a portion of US-412 will be completed. The BCA demonstrates the cost effectiveness of the Project measured in terms of a Benefit–Cost (B/C) ratio and Net Present Value (NPV).

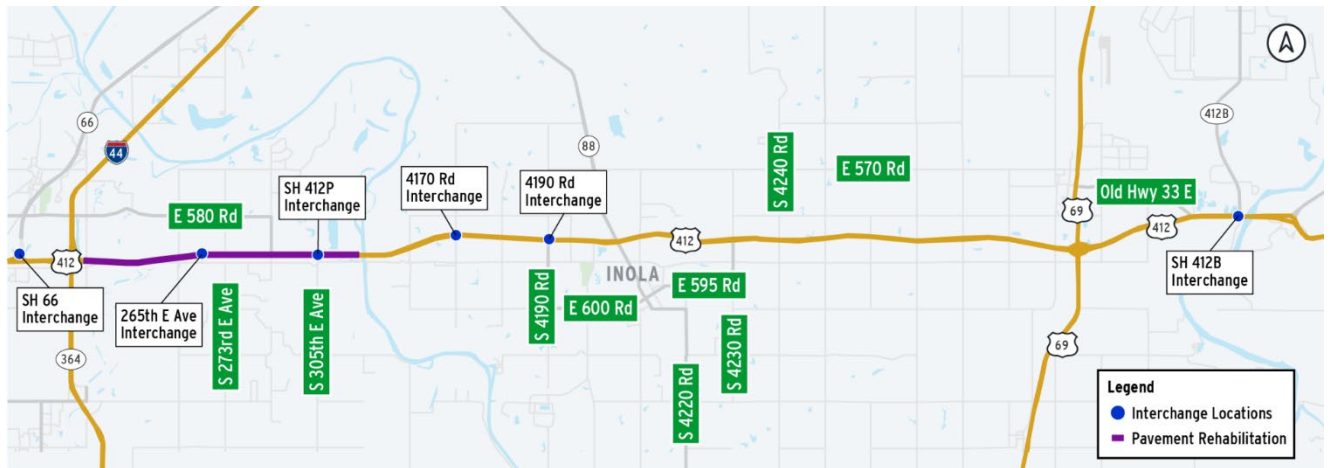
1.1. Priority Improvements for Interstate Designation Project

The Priority Improvements for Interstate Designation Project comprises the rehabilitation of seven individual pieces along US-412 between 412B and State Highway 66, as shown in Figure 1. The individual pieces are shown in the table below:

Table 1: Project Descriptions

Piece	Sub Project	Description
1	SH 412B Interchange	Eliminate the at-grade intersection and create a full service interchange to modernize the system to interstate standards.
2	4190 Rd Interchange	Eliminate the at-grade intersection and create a full service interchange to modernize the system to interstate standards.
3	4170 Rd Interchange	Eliminate the at-grade intersection and create a full service interchange to modernize the system to interstate standards.
4	Pavement Reconstruction	Reconstruct six miles of roadway to prepare for additional maintenance based on more extreme weather (including flooding, tornados, and cold weather events).
5	SH 412P Interchange	Eliminate the at-grade intersection and create a full service interchange to modernize the system to interstate standards.
6	265 E Ave Interchange	Eliminate the at-grade intersection and create a full service interchange to modernize the system to interstate standards.
7	SH 66 Interchange	Construct the ultimate interchange to accommodate future traffic volumes, increase safety and minimize localized congestion by improving the operation of the interchange.

Figure 1: Interchange & Pavement Rehab Location



1.2. Benefit Cost Analysis (BCA) Model Development

The BCA is based on this Project reducing all severity crashes and maintenance reduction. The location of all improvements is in a rural area with no clear congestion. To be conservative, no additional congestion, resiliency, or other benefits are quantified.

A spreadsheet-based BCA model was constructed for the purposes of this analysis. The model utilizes various region or corridor specific statistics in addition to global parameters provided by the United States Department of Transportation (USDOT) specifically for the purposes of completing BCAs in support of federal grant applications. Project inputs are discussed in Section III.

Using Project-specific inputs, the BCA model calculates life-cycle costs, life-cycle benefits, annual benefits, the NPV of quantifiable costs and benefits, and the resulting B/C ratio, utilizing a methodology that aligns with the most recent USDOT guidance.

1.3. Organization of BCA Memorandum

Section II describes the mechanisms that generate the benefits of the Project and the classes of benefits evaluated.

Section III describes the inputs to the BCA model.

Section IV describes the detailed methodology for computing Project benefits, including an illustration of the benefits calculated for an example year for the Project.

Section V summarizes the BCA results and the resulting B/C ratio.

Appendix A provides detailed tabulations of annual benefits and costs for the overall Project.

2. Project Benefits and Costs

2.1. Benefits of the Project

The Project aims to achieve US-412's full interstate potential and design standards. The Project will serve future passenger and freight traffic needs, improve safety along the Project corridor, strengthen the resiliency of the nation's east/west interstates, and facilitate economic growth and quality of life for the region.

The following benefits are quantified for this analysis:

1. Crash Cost Savings
2. Operations & Maintenance Savings

The following benefits are not quantified for this analysis in the Project area:

1. Avoided Operating Costs
2. Avoided Travel Delay
3. Bike/Ped
4. Emissions Cost Saving

The proposed improvements are occurring in locations that are largely rural and do not currently see recurring congestion. The proposed projects are primarily being constructed to accommodate known future growth at the Tulsa Ports of Inola, Catoosa and Port 33. There is also substantial private investment at the MidAmerica Industrial Park. All of these developments (see **Economic Outcome Criteria**) will increase the number of workers and freight movement coming in and out of these sites. Because these developments are occurring regardless of if improvements are made, the traffic increases at all project locations are assumed in both the build and no-build scenarios. Due to the vast expansions taking place, ODOT does expect significant delays in the future at the five proposed service interchange locations connected to US-412 if they remain at-grade intersections. Traffic modelling that can quantify the extent of delay is ongoing and not included in the analysis. Also, due to the nature and location of the projects, ODOT cannot reasonably assume Bike/Ped (health) or emissions cost savings to warrant calculation of any benefit.

The methodology for evaluating the benefits is discussed in Section IV.

Table 2: Project Matrix

Current Status / No-Build	
Build	The Build Scenario accounts for interchanges, rehab, and safety improvements.
Type of Impacts	Improved connections within the 412-surrounding area.
Affected Population	Residents of the US-412 surrounding community.
Economic Benefit	The BCA indicates that the Project avoids significant crash costs associated with overall corridor improvements.
Summary of Results	Benefit/Cost Ratio of more than 1.0 indicates that the Project generates certain benefits to society that exceeds its costs.

2.2. Costs of the Project

Project costs used in this analysis are estimated in 2023 dollars and converted to base year dollars using a Gross Domestic Product (GDP) deflator as summarized in Table 3. Project costs are spread between years 2021 to 2028 and include contingency.

Operating and maintenance (O&M) costs for bridges are considered as independent benefits due to the significant difference in Build and No-Build Conditions.

Table 3: Project Costs

Project Cost	Total Cost	Units
YOE Cost Estimate	\$221,028,507	YOES
Base Dollar Cost	\$210,850,740	2021\$
Discounted Cost	\$152,350,154	2020\$

2.3. Residual Value of the Project

The residual value of the project is estimated based on an estimated 50-year composite useful life of the improvements and is added to the project benefits for calculating the B/C ratio.

3. Project Inputs

3.1. Project Parameters

3.1.1. Project Schedule

This analysis considers a 30-year analysis period beginning in the opening year of the Project. Construction and rehabilitation work on the various interchanges and roadway is expected to be completed in various years (see Table 3 below) but to be conservative, this analysis assumes benefits begin in the following year.

Table 4: Project Schedule

Factor	Year
Design	2023-2024
Construction Start	
SH 412B	2025
4190 Rd	2025
4170 Rd	2027
Pavement Rehab	2026
SH 412P	2026
265th E. Ave	2026
SH 66	2024
Construction End	
SH 412B	2027
4190 Rd	2027
4170 Rd	2029
Pavement Rehab	2029
SH 412P	2029
265th E. Ave	2029
SH 66	2026
30-Year Analysis End	
SH 412B	2057

4190 Rd	2057
4170 Rd	2059
Pavement Rehab	2059
SH 412P	2059
265th E. Ave	2059
SH 66	2056
First Full Year of Benefits	
SH 412B	2028
4190 Rd	2028
4170 Rd	2030
Pavement Rehab	2030
SH 412P	2030
265th E. Ave	2030
SH 66	2027

3.1.2. Base Year of Analysis

Per USDOT BCA guidance, this analysis is conducted in constant 2021 dollars. All non-carbon costs and benefits are discounted to 2021 at a 7% discount rate. Carbon-related benefits are discounted to 2021 at a 3% discount rate.

3.2. Global Parameters

The following USDOT-provided parameters for BCAs and other global parameters are used in this analysis.

3.2.1. Crash Monetization

To monetize the impact from crash reduction, USDOT-provided unit values for fatalities and serious injuries are used, as summarized in Table 5. Serious injuries as reported by ODOT are assumed to correspond to incapacitating injuries defined by USDOT.

Table 5: Unit Value of Avoided Fatalities and Injuries

Factor	Value	Units
Incapacitating Injuries	\$564,300	2021\$/person
Fatalities	\$11,800,000	2021\$/person

Source: U.S. Department of Transportation, Benefit Cost Analysis Guidance for Discretionary Grant Programs, January 2023. Table A-1. Accessed from: <https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf>

3.2.2. Crash History and Severity

To convert every vehicle mile traveled into potential fatalities and serious injuries, ODOT’s 5-year crash data (2017 – 2021) were used to calculate the 2023 data summarized in Table 6. The example is specific to the Pavement Rehab Project.

Table 6: Fatalities and Serious Injuries per year

Factor	Rate	Units
Property Damage Only	4	persons/year
Possible Injury	1	persons/year
Non-Incapacitating Injury	1	persons/year
Incapacitating Injury	2	persons/year
Fatality	0	persons/year

Source: ODOT

3.2.3. Passenger Value of Time

To estimate the benefits associated with travel time savings, a real Gross Domestic Product (GDP) growth rate was applied to USDOT-provided factors for Value of Time (VOT). 2021 VOT values are shown in Table 7.

Table 7: Value of Time Factor (2021 Dollars)

Trip Purpose / Vehicle Type	Value	Units
In-Vehicle Travel, All Purposes	\$18.80	2021\$/ person-hour
Truck Drivers	\$32.40	2021\$/person-hour

Source: U.S. Department of Transportation, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, January 2023. Table A-3: Value of Travel Time Savings. Accessed at <https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf>

3.2.4. Average Vehicle Occupancy

To convert the cost per passenger to cost per vehicle or vice versa, USDOT-provided factors for Average Vehicle Occupancy were used, as summarized in Table 8.

Table 8: Average Vehicle Occupancy Factor

Vehicle Type	Value	Units
Passenger Vehicles	1.67	persons/automobile
Trucks	1.00	persons/truck

Source: U.S. Department of Transportation, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, January 2023. Table A-4. Accessed from: <https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf>

3.2.5. Vehicle Operating Costs

To estimate the avoided vehicle operating costs associated with a reduction in vehicle miles traveled, USDOT-provided factors for Vehicle Operating Cost were used, as summarized in Table 9.

Table 9: Vehicle Operating Cost Factor (2020 dollars)

Vehicle Type	Value	Units
Light Duty Vehicles	\$0.46	2021\$/ VMT
Commercial Trucks	\$1.01	2021\$/ VMT

Source: U.S. Department of Transportation, Benefit Cost Analysis Guidance for Discretionary Grant Programs, January 2023. Table A-5. Accessed from: <https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf>

3.2.6. Emission Rates

Emissions savings resulted in a \$0 benefit. The Build and No-Build Scenarios consisted of the same traffic growth expectations throughout the corridor due to the rural surroundings.

3.3. Vehicle Miles Traveled (VMT) Vehicle Hours Traveled (VHT) and Average Speed

The VMT, VHT and average speed were assumed to be the same in the No Build and Build scenarios due to the length of the corridor staying the same and there being no shift in the location of new interchanges compared to where the at-grade intersection currently exists.

4. Benefit-Cost Analysis Methodology

4.1. Benefit 1: Safety Cost Savings

The reduction in crash costs for users in the Build scenario is estimated based on the crashes avoided by the improved infrastructure along the US-412 corridor. The crash severity data is based on a 5-year analysis period between 2017 and 2021. Using the AADT growth rates, the crashes per year were calculated based on the probability of the respective severity happening based on ODOT 5-year data. These rates, relative crash modification factors (CMFs) based on improvements, and cost of each severity are used to develop the safety cost savings. Table 10 describes the methodology used to calculate the undiscounted benefit and shows the undiscounted benefit for the year 2029, for the Pavement Rehabilitation subproject as an example.

Table 10: Avoided Crash Costs Benefit for US 412 in 2029 – Pavement Rehab Project

Input		2029 Value	Units
ANNUAL CRASHES BY SEVERITY^A			
a	Property Damage Only	1.76	vehicles/100MVMT
b	Possible Injury	0.62	injuries/100MVMT
c	Non-Incapacitating Injury	0.62	injuries/100MVMT
d	Incapacitating Injury	0.72	injuries/100MVMT
e	Fatality	0.10	fatalities/100MVMT
UNIT VALUE OF CRASHES^D			
i	Property Damage Only	\$4,800	2021\$/person
j	Possible Injury	\$78,500	2021\$/person
k	Non-Incapacitating Injury	\$153,700	2021\$/person

l	Incapacitating Injury		\$564,300	2021\$/person
m	Fatality		\$11,800,000	2021\$/person
VALUE OF REDUCED CRASHES BENEFIT				
n	Property Damage Only	a*i	\$8,448	2021\$/year
o	Possible Injury	b*j	\$48,670	2021\$/year
p	Non-Incapacitating Injury	c*k	\$95,294	2021\$/year
q	Incapacitating Injury	d*l	\$406,296	2021\$/year
r	Fatality	e*m	\$1,180,000	2021\$/year
	All Crashes	n+o+p+q+r	\$1,782,376	2021\$/year

Source: A. See Table 6

Source: B. See Table 5

4.2. Benefit 1: Cost Savings from Operation and Maintenance Costs

The reduction in operation and maintenance costs is estimated based on the current at grade structures and the overall yearly pavement rehabilitation that occurs regularly for degrading pavement in Oklahoma. The current at grade intersections did not include maintenance costs for the No Build Scenario. Table 11 describes the methodology used to calculate the undiscounted benefit and shows the undiscounted benefit for the analysis period as an example.

Table 11: Avoided M&O Costs Benefit for US 412 for the analysis period – Pavement Rehab Project

Year	No Build	Build	Savings
ANNUAL O&M COSTS PER YEAR			
2028	\$12,000,000		\$12,000,000
2029			\$0
2030			\$0
2031			\$0
2032			\$0
2033	\$12,000,000		\$12,000,000
2034			\$0
2035			\$0

2036			\$0
2037			\$0
2038	\$12,000,000		\$12,000,000
2039			\$0
2040			\$0
2041			\$0
2042			\$0
2043	\$12,000,000		\$12,000,000
2044			\$0
2045			\$0
2046			\$0
2047			\$0
2048	\$12,000,000		\$12,000,000
2049			\$0
2050		\$9,000,000	-\$9,000,000
2051			\$0
2052			\$0
2053	\$12,000,000		\$12,000,000
2054			\$0
2055			\$0
2056			\$0
2057			\$0
2058			\$0
2059			\$0
Total	\$72,000,000	\$9,000,000	\$63,000,000

5. Benefit-Cost Analysis Results

5.1. Quantified Benefits

The BCA indicates that the Project will provide benefits by reducing crashes and operating costs. The Project produces a benefit/cost ratio of 0.33.

A summary of the discounted costs and benefits for the Project is shown in Table 12.

Table 12: Discounted Benefits and Costs (in millions)

Factor	US 412
Benefits	
Crash Cost Savings	\$21.7
Avoided Operating Costs	\$0.0
Avoided Travel Delay	\$0.0
Bike/Ped	\$0.0
Emissions Cost Saving	\$0.0
O&M Savings	\$21.2
plus Residual Value	\$6.9
Net Benefits	\$49.8
Total Costs	\$152.4
B/C Ratio	0.33
Net Present Value	-\$102.6

5.2. Nonquantifiable Benefits

The results presented above are considered conservative because they do not reflect certain benefits that could not be quantified as part of the BCA including:

- Travel time savings - The proposed improvements are occurring in locations that are largely rural and do not currently see recurring congestion. The proposed projects are primarily being constructed to accommodate known future growth at the Tulsa Ports of Inola, Catoosa and Port 33. There is also substantial private investment at the MidAmerica Industrial Park. All of these developments (see **Economic Outcome Criteria**) will increase the number of workers and freight movement coming in and out of these sites. Because these developments are occurring regardless of if improvements are made, the

traffic increases at all project locations are assumed in both the build and no-build scenarios. Due to the vast expansions taking place, ODOT does expect significant delays in the future at the five proposed service interchange locations connected to US-412 if they remain at-grade intersections. Traffic modeling that can quantify the extent of delay is ongoing and not included in the analysis.

- Future economic output – The Tulsa Ports of Inola, Catoosa and Port 33 as well as the MidAmerica Industrial Park are expanding thanks to hundreds of millions of dollars in private investments that will bring thousands of new workers to these sites, generating billions in annual economic output (see **Economic Outcome Criteria**). Upgrading at-grade intersections to interchanges and reconstructing pavement to handle the increased freight traffic is being done in support of these private developments. The US-412 corridor is primed to become an advanced technology and clean energy corridor that will be welcoming new industries all along the corridor in the coming years. ODOT must be responsive to this future growth.

Given the non-quantifiable benefits described above, ODOT feels that there are factors that can yield a higher BCA than presented. ODOT would appreciate the opportunity to discuss alternative inputs to put into the BCA with the USDOT.

6. APPENDIX A: Detailed Benefit–Cost Analysis

TABLE A-1: BCA SUMMARY

Costs and Benefits											
Year	Calendar Year	Initial Construction Costs	Other Costs	Residual Value	Crash Cost Savings	Avoided Operating Costs	Avoided Travel Delay	Bike/Ped	Emissions Cost Saving	Operations & Maintenance Savings	Total Benefits less Other Costs
0	2021	\$17,152,750	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	2024	\$9,514,238	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	2025	\$40,435,511	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	2026	\$57,430,318	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	2027	\$43,158,961	\$0	\$0	\$277,337	\$0	\$0	\$0	\$0	\$0	\$277,337
7	2028	\$43,158,961	\$0	\$0	\$282,832	\$0	\$0	\$0	\$0	\$12,000,000	\$282,832
8	2029	\$0	\$0	\$0	\$2,336,158	\$0	\$0	\$0	\$0	-\$142,000	\$2,336,158
9	2030	\$0	\$0	\$0	\$2,375,287	\$0	\$0	\$0	\$0	\$0	\$2,375,287
10	2031	\$0	\$0	\$0	\$2,415,085	\$0	\$0	\$0	\$0	\$0	\$2,415,085
11	2032	\$0	\$0	\$0	\$2,455,565	\$0	\$0	\$0	\$0	\$0	\$2,455,565
12	2033	\$0	\$0	\$0	\$2,496,737	\$0	\$0	\$0	\$0	\$12,000,000	\$2,496,737
13	2034	\$0	\$0	\$0	\$2,538,615	\$0	\$0	\$0	\$0	\$0	\$2,538,615
14	2035	\$0	\$0	\$0	\$2,581,210	\$0	\$0	\$0	\$0	\$0	\$2,581,210
15	2036	\$0	\$0	\$0	\$2,624,536	\$0	\$0	\$0	\$0	\$0	\$2,624,536
16	2037	\$0	\$0	\$0	\$2,668,604	\$0	\$0	\$0	\$0	\$0	\$2,668,604
17	2038	\$0	\$0	\$0	\$2,713,429	\$0	\$0	\$0	\$0	\$12,000,000	\$2,713,429
18	2039	\$0	\$0	\$0	\$2,759,023	\$0	\$0	\$0	\$0	-\$190,000	\$2,759,023
19	2040	\$0	\$0	\$0	\$2,805,400	\$0	\$0	\$0	\$0	\$0	\$2,805,400
20	2041	\$0	\$0	\$0	\$2,852,573	\$0	\$0	\$0	\$0	\$0	\$2,852,573

21	2042	\$0	\$0	\$0	\$2,900,557	\$0	\$0	\$0	\$0	\$0	\$2,900,557
22	2043	\$0	\$0	\$0	\$2,949,365	\$0	\$0	\$0	\$0	\$12,000,000	\$2,949,365
23	2044	\$0	\$0	\$0	\$2,999,014	\$0	\$0	\$0	\$0	\$0	\$2,999,014
24	2045	\$0	\$0	\$0	\$3,049,516	\$0	\$0	\$0	\$0	\$0	\$3,049,516
25	2046	\$0	\$0	\$0	\$3,100,887	\$0	\$0	\$0	\$0	\$0	\$3,100,887
26	2047	\$0	\$0	\$0	\$3,153,143	\$0	\$0	\$0	\$0	\$0	\$3,153,143
27	2048	\$0	\$0	\$0	\$3,206,300	\$0	\$0	\$0	\$0	\$12,000,000	\$3,206,300
28	2049	\$0	\$0	\$0	\$3,260,372	\$0	\$0	\$0	\$0	-\$255,000	\$3,260,372
29	2050	\$0	\$0	\$0	\$3,330,518	\$0	\$0	\$0	\$0	-\$9,000,000	\$3,330,518
30	2051	\$0	\$0	\$0	\$3,371,329	\$0	\$0	\$0	\$0	\$0	\$3,371,329
31	2052	\$0	\$0	\$0	\$3,428,247	\$0	\$0	\$0	\$0	\$0	\$3,428,247
32	2053	\$0	\$0	\$0	\$3,486,148	\$0	\$0	\$0	\$0	\$12,000,000	\$3,486,148
33	2054	\$0	\$0	\$0	\$3,545,049	\$0	\$0	\$0	\$0	\$0	\$3,545,049
34	2055	\$0	\$0	\$0	\$3,604,967	\$0	\$0	\$0	\$0	\$0	\$3,604,967
35	2056	\$0	\$0	\$13,086,783	\$3,665,920	\$0	\$0	\$0	\$0	\$0	\$3,665,920
36	2057	\$0	\$0	\$19,409,045	\$3,227,803	\$0	\$0	\$0	\$0	\$0	\$3,227,803
37	2058	\$0	\$0	\$0	\$3,280,937	\$0	\$0	\$0	\$0	\$0	\$3,280,937
38	2059	\$0	\$0	\$51,844,468	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$210,850,740	\$0	\$84,340,296	\$89,742,462	\$0	\$0	\$0	\$0	\$62,413,000	\$89,742,462

20	2041	0.258	\$737,159	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$737,159
21	2042	0.242	\$700,522	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$700,522
22	2043	0.226	\$665,711	\$0	\$0	\$0	\$0	\$2,708,558	\$0	\$0	\$3,374,269
23	2044	0.211	\$632,633	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$632,633
24	2045	0.197	\$601,202	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$601,202
25	2046	0.184	\$571,336	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$571,336
26	2047	0.172	\$542,957	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$542,957
27	2048	0.161	\$515,991	\$0	\$0	\$0	\$0	\$1,931,164	\$0	\$0	\$2,447,155
28	2049	0.150	\$490,367	\$0	\$0	\$0	\$0	-\$38,353	\$0	\$0	\$452,015
29	2050	0.141	\$468,147	\$0	\$0	\$0	\$0	-\$1,265,065	\$0	\$0	-\$796,918
30	2051	0.131	\$442,882	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$442,882
31	2052	0.123	\$420,896	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$420,896
32	2053	0.115	\$400,005	\$0	\$0	\$0	\$0	\$1,376,894	\$0	\$0	\$1,776,898
33	2054	0.107	\$380,152	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$380,152
34	2055	0.100	\$361,287	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$361,287
35	2056	0.094	\$343,361	\$0	\$0	\$0	\$0	\$0	\$0	\$1,225,747	\$343,361
36	2057	0.088	\$282,547	\$0	\$0	\$0	\$0	\$0	\$0	\$1,698,980	\$282,547
37	2058	0.082	\$268,410	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$268,410
38	2059	0.076	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,963,865	\$0
Total			\$21,701,760	\$0	\$0	\$0	\$0	\$21,174,372	\$152,350,154	\$6,888,591	\$42,876,131

Discount Benefit Summary	
Benefit Cost Ratio	0.33
Net Present Value	-\$102,585,431

