

Gila County –Tonto Creek Bridge
TIGER Discretionary Grant Application
Benefit Costs Analysis Executive Summary
June 5, 2015

Introduction

The Benefit-Cost Analysis (BCA) was performed following the guidance provided in the TIGER Benefit-Cost Analysis (BCA) Resource Guide. Many of the benefits of this project do not easily translate to simple quantification. The economic benefits of connecting to private developable land on the east side of Tonto Creek and providing a safe and efficient transportation network for the region cannot be easily quantified beyond impacts of construction activities and the inquiries the County has received from real estate agents representing clients interested in developing land on the east side of Tonto Creek once they know this project will be constructed. Providing an improved transportation network in the region does make an impact in terms of improving the per capita income in this area of the state that is below the national average, which is a goal of the TIGER Discretionary Grant program.

Data was compiled, referenced, and analyzed using known or applicable monetary costs and benefits.

Current infrastructure within Tonto Basin (project area) mainly consists of unpaved two-lane rural roads with few paved roads. These roads are owned, operated, and maintained by either Gila County or the Tonto National Forest. Arizona State Route 188, a two-lane rural highway, runs parallel to Tonto Creek along the western edge of the project area and is the only road that provides the residents of Tonto Basin with access to Phoenix, Payson, and Globe. The Forest Service roads that cross Tonto Creek are at-grade dirt roads and provide the only access to SR 188.

The proposed project will construct a bridge, 1,980-ft in length, over Tonto Creek connecting the west side of Tonto Basin to the east side. Roadway improvements consisting of reconstruction and roadways leading up to the bridge are also included.

The Tonto Basin region of Gila County experiences seasonal flooding in the early winter and early spring. These events result in extended closures of the existing at-grade crossing of Tonto Creek. There are currently no structured crossings of Tonto Creek in the project area. Five fatalities have been attributed to individuals attempting to cross Tonto Creek since 1995. School children on the east side of the creek must cross Tonto Creek in unsafe conditions or miss school for weeks and even months at a time during flood events. Table 1 summarizes the findings of the BCA using a 3% and 7% discount.

personnel; Tonto National Forest personnel; and visitors and recreational enthusiasts from around Arizona and the Southwest utilizing Tonto Basin and Tonto National Forest amenities. Table 2 includes a summary of project benefits and costs as requested in the NOFA. Dollar values are estimated for the life of the improvement, 60 years.

Table 2 – Summary of Project Benefits

Current Status/Baseline & Problem to be Addressed	Change to Baseline/Alternatives	Type of Impact	Population Affected by Impacts	Economic Benefit	Summary of Results		
At-grade dirt road crossings of Tonto Creek	Construction of a bridge across Tonto Creek and associated approach roadway improvements will provide a year-round 100-yr dry crossing of Tonto Creek	Improved safety for local population and recreational visitors utilizing National Forest Lands	Tonto Basin region of Gila County - population of over 1,400	Improved safety by providing reliable transportation network and elimination of fatalities	\$26,393,661		
One half of area population live on east side of creek							
Flows/flooding of Tonto Creek render at-grade roads impassable							
Half of local population stranded until flows subside		Elimination of fatalities from creek crossings during high flow events	Recreational users of National Forest Lands on the east side of Tonto Creek	Improved Air and Water quality	Not Estimated		
Five fatalities have occurred over past 25 years from crossing during flow events							
County \$ expenditures for maintenance and flood response						Elimination of emergency rescue costs associated	\$1,167,762

Construction of the Tonto Creek Bridge will provide near-term construction jobs in economically distressed Gila County. The Tonto Creek Bridge will allow year-round tourism and recreational use of the surrounding area and facilities and provide safe and reliable access to the undeveloped private land located on the east side of Tonto Creek – the largest cluster of undeveloped land within Gila County. It will provide residents the ability to travel to work and school regardless of weather conditions. And finally, it will provide reliable, year-round access for law enforcement, fire, and emergency medical service personnel.

To the extent possible given the available data, the BCA prepared reflects the economic benefits in all of the five major long-term impact areas identified in the TIGER Discretionary Grant application. These include:

- State of Good Repair – The project will reduce yearly maintenance costs in addition to the emergency repair and reconstruction costs Gila County currently expends annually to maintain the at-grade dirt roads improved by the project. The 60-yr 7% discounted life cycle cost of the project is \$16,289,949 compared to the baseline benefits of \$28,152,823.
- Long Term Economic Competitiveness – Improved and reliable transportation facilities will eliminate residents’ lost works days based on their inability to travel to work due to

high creek flows and flooding. The year-round all-weather crossing of Tonto Creek also will provide greater opportunities to develop the existing large tracts of land into viable and sustainable residential and commercial facilities. Lost revenue from visitors and recreational users of the land in the region will also be greatly reduced with safe and reliable access. The area is well known for its year-round camping, hiking, mountain biking, boating, and fishing – 90% of which is accessed from the east side of Tonto Creek.

- Livability – Access to a safe transportation facility for the area that accommodates vehicles, pedestrians, bicyclists, hikers, and campers, as well as school children adds to the livability of the area. The project also provides enhanced job commuting options, improves connections between residential and commercial areas, and provides consistent access to emergency services.
- Environmental Sustainability – Air and water quality will be improved through the removal of at-grade vehicular traffic through Tonto Creek. Riparian habitat will re-establish with the removal of the at-grade crossings, which supports the Tonto Creek Riparian Unit's goal.
- Safety – Construction of the bridge will improve safety in a number of ways by providing:
 - A year-round, all-weather crossing for residents and visitors to the region.
 - A safe route to school for the students and teachers of Tonto Basin Elementary School.
 - Consistent access during emergency situations as fire fighters, police, and emergency personal will be able to access the east side of Tonto Creek regardless of the weather conditions.
 - Access for the Tonto National Forest to fight fires on lands located on the east side of Tonto Creek.
 - A means to eliminate fatalities experienced over the last 25 years from individuals attempting to cross the creek when the creek is flowing. As previously stated, five fatalities since 1995 have been attributed to the at-grade road crossings.

The total project cost is \$17,860,843. The land acquisition (right-of-way) has been completed and paid for by the County. Utility relocations are pending construction funding. With the securing of construction funding, the project schedule will allow construction to begin on or before September 2016. Table 3 summarizes the project costs and breakdown of financial commitment.

Table 3: Project Costs

Project Components	Breakdown		
	Costs	Gila County	TIGER Grant
Construction			
Land Acquisition	\$276,518	\$276,518	-
Utility Relocation	\$200,100	-	\$200,100
Construction	\$17,384,225	\$1,738,325	\$15,645,900
Total Project Cost:	\$17,860,843		
Construction Funding:		\$2,014,843	\$15,846,000
	100%	11%	89%

Discounting

The following life-cycle costs and baseline benefits have been discounted following the Office of Management and Budget Circulars A-4 and A-94 at 7% and 3%. The 7% discount rate represents the average expected return on private capital. The 3% discount rate represents the social rate of time preference for households and individuals. The 3% rate may be more appropriate for the long-term benefits that accrue to current households and future generations and to lower income households for whom long term wealth accumulation or future social benefits will be more highly valued.

Assumptions & Data

The assumption used for elimination of fatalities associated with crossing during moderate to high flow events is based on the five documented fatalities that have occurred since 1995. The safety analysis used a 25 year period from 1990 to 2015. The yearly average of fatalities due to crossing incidents is 0.20 or 5 divide by 25. For comparison one could look at the last 60 years, which is the timeframe used for the life-cycle cost analysis, and the average fatalities would obviously reduce to 0.083 per year (5 divided by 60). Using this yearly average at a 3% discount as described above for future long term social benefits the BCA ratio is 1.38.

Cost data for yearly maintenance and flooding related emergency response is from Gila County records. Construction data and costs is based on the current 100% plans, specifications and estimated completed for the project.

Life-Cycle Costs

Discounted life-cycle costs for the construction of the Tonto Creek Bridge is presented in Table 4 (attached at end of document). Yearly maintenance and future rehabilitation needs were estimated following the guidelines furnished by the Arizona Department of Transportation (ADOT) Bridge Group – Operations Services. The costs include yearly maintenance after year 10 of between 0.20% and 0.25% of the cost of the bridge. A value of 0.25% was used in the analysis. Bridge deck joints are assumed to require replacement every 15 years. Deck

rehabilitation is assumed to be required every 30 years. The total construction cost for the Tonto Creek Bridge project is \$17,860,843.

Benefit Costs

The baseline benefits of the project were developed using recent and historical data compiled by Gila County. An analysis with monetized benefits was performed using available County resources and data. For the purposes of the analysis presented, three specific and quantitative items were included as follows.

1. Costs associated with seasonal flooding
 - o Emergency Response
 - o Gila County Public Works
 - o Gila County Sheriff
2. Costs associated with yearly non-flood-related maintenance of the existing at-grade dirt roads across Tonto Creek
3. Costs associated with the loss of life from crossing-related fatalities

Costs associated with emergency response and rescue during major flooding since 2003 have totaled \$665,430 for three (3) total major floods. This is an average of \$221,810 per event. Major flooding of Tonto Creek occurs within the project area approximately every three years, and the value used for the baseline benefit for emergency response and rescue is \$83,179 per year. Costs associated with yearly non-flood-related road maintenance of the existing at-grade dirt roads across Tonto Creek in Tonto Basin average \$42,125. Construction of this project eliminates costs expended for this work.

Since 1990 (25-year period) five documented fatalities have been attributed to crossing Tonto Creek within Tonto Basin.

- 1995 – 1 man
- 1997 – 1 woman
- 2005 – 2 men
- 2008 – 1 woman

The costs associated with fatalities was determined following the recommendations presented in the TIGER Benefit-Cost Analysis (BCA) Resource Guide for *Guidance on Treatment of the Economic Value of a Statistical Life U.S. Department of Transportation Analyses – 2015*. This value is set at \$9,400,000 per fatality. Tonto Basin has averaged 0.2 crossing-related fatalities per year over the past 25 years. A value of \$1,880,000 per year was used in the baseline benefit calculation for avoided fatalities with the construction of the bridge. Table 5 (attached to end of document) presents the No Build Baseline Benefits used in the analysis.

To provide DOT with a reasonable and defensible BCA, several eligible project benefits described in Circulars A-4 and A-94 have not been monetized or included in our analysis. These include:

Valuation of Reduction in Health and Safety Risks to Children and Impacts on Children – The children that live in the area are subjected to the flooding and dangerous crossing conditions when going to school.

Potential loss of life from inability to respond to fire and emergency medical service calls on the east side of Tonto Creek – Data provided by the Tonto Basin Fire District indicates an average of 20 fire and 82 EMS related dispatches a year to the east side of Tonto Creek for first responders. Road closures due to flooding result in the existing at-grade crossings being closed an average of 26 days per year or 7% of the time. These closures equate to 1.4 non-responses for fire emergencies and almost 6 non-responses for EMS emergencies yearly. Assuming that 1% of all EMS calls are serious life-threatening emergencies resulting in death without assistance, this would equate to approximately 0.10 potential lives lost yearly and 6 over the life-span of the project.

Non-fatal Health and Safety Risks – Historical data on the average number of law enforcement incidents per year that require crossing of Tonto Creek is unavailable, but is likely to exceed the number of medical emergencies and is estimated at 100 per year. If Tonto Creek cannot be crossed 7 percent of the time without a bridge, the number of law enforcement incidents that cannot be responded to per year is 7.

Benefits from Improved Air and Water Quality – An estimated 101 tons of PM₁₀ will be removed from the air through the construction of the bridge and paving of the dirt roads (please see calculations in attached BCA spreadsheet).

Economic Development of Available Land on the East Side of Tonto Creek with Year-Round, Safe, Reliable Access – Developing the private land on the east side of Tonto Creek would provide Tonto Basin and Gila County with economic benefits in the form of higher land and tax values.

Loss of Worker Productivity – Specific data is not available for the number of lost work days or job terminations from the inability to cross Tonto Creek. A number of local residents have reported being terminated due to excessive work absence due to flooding.

Benefit Cost Analysis Summary

Table 6 summarizes the calculated costs and benefits, discounted at 3% and 7% for the items discussed above.

Table 6: Benefit-Cost Ratio and Net Present Value

	Present Value @ 3%	Present Value @ 7%
Costs:		
60-yr Life Cycle Cost of Bridge		
Tonto Creek	\$18,183,493	\$16,289,949
Benefits:		
Emergency Response Exp.		
Annual at-grade Maint. Exp.	\$55,497,912	\$28,152,823
Fatalities avoided (VSL)		
Benefit/Cost Ratio:	3.05	1.73

The above analysis indicates that the benefits of this project outweigh the costs. As shown throughout the TIGER Discretionary Grant application, this project meets all five of the primary selection criteria set by DOT. It also more importantly serves the needs of a rural and economically distressed region by providing much-needed improvements to transportation facilities and increasing the safety and wellbeing of countless citizens including children, low-income families, and the elderly.

Table 4 - Construction Costs for Tonto Creek Bridge¹

Roadway: \$5,518,211
 Bridge: \$8,657,428
 Other: \$3,685,204
 Total: \$17,860,843

1 - Source: 100% Construction Cost Estimate Kimley-Horn May 2015

2 - Source: Arizona Department of Transportation Bridge Group Operation & Roadway Design Group

Estimate of Future Annual Maintenance Costs of Roadway per Lane-Mile²

Annual Maintenance Cost Per Lane Mile Using PeCos Latest FY Data	
Category	Other Locations
1. Paved Surfaces & Shoulders	\$420
2. Roadside	\$230
3. Drainage & Environmental	\$100
4. Rest Areas	\$230
5. Traffic Operations - Signla & Lighting, Signing & Striping	\$935
6. Landscaping	\$85
7. Winter Storms	\$155
8. Emergency Response	\$30
9. Miscellaneous Maintenance	\$300
10. Support and Other Operating Expenses	\$1,165
11. Other Specialty Items	\$0
MCL = Maintenance Cost per Lane Mile	\$3,650
Annual Maintenance Cost of Project	
PW = Pavement Width	32
NL = Number of 12-ft Lanes	2.666666667
LP = Length of Project in Miles (1.18 miles less 2,012 ft bridge)	0.8
PMC = Current Project Maintenance Cost	\$7,787

Estimate of Future Maintenance Cost of Bridge²

Maintenance Cost of Bridge using ADOT Bridge Group Operaion Data	
Category	
Bridge Deck Replacement after 30 years	\$1,500,000
Bridge Joint Replacement after 15 years	\$50,000
Annual Maintenance after year 10	0.25%
Annual Maintenance Costs (0.25% x Construction Cost)	\$21,644

Costs - Construction & Maintenance

Year	Initial Constr.	Roadway Annual Maint.	Bridge Annual Maint.	Bridge Deck/Joint	Total Costs	3% Discount Rate	7% Discount Rate
2016	\$4,465,211	\$0	\$0	\$0	\$4,465,211	\$ 4,335,156	\$ 4,173,094
2017	\$13,395,632	\$0	\$0	\$0	\$13,395,632	\$ 12,626,668	\$ 11,700,264
2018	\$0	\$0	\$0	\$0	\$0	\$ -	\$ -
2019	\$0	\$7,787	\$0	\$0	\$7,787	\$ 6,918	\$ 5,940
2020	\$0	\$7,787	\$0	\$0	\$7,787	\$ 6,717	\$ 5,552
2021	\$0	\$7,787	\$0	\$0	\$7,787	\$ 6,521	\$ 5,189
2022	\$0	\$7,787	\$0	\$0	\$7,787	\$ 6,331	\$ 4,849
2023	\$0	\$7,787	\$0	\$0	\$7,787	\$ 6,147	\$ 4,532
2024	\$0	\$7,787	\$0	\$0	\$7,787	\$ 5,968	\$ 4,235
2025	\$0	\$7,787	\$0	\$0	\$7,787	\$ 5,794	\$ 3,958
2026	\$0	\$7,787	\$0	\$0	\$7,787	\$ 5,625	\$ 3,699
2027	\$0	\$7,787	\$0	\$0	\$7,787	\$ 5,461	\$ 3,457
2028	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 20,041	\$ 12,213
2029	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 19,457	\$ 11,414
2030	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 18,890	\$ 10,667
2031	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 18,340	\$ 9,969
2032	\$0	\$7,787	\$21,644	\$50,000	\$79,430	\$ 48,057	\$ 25,146
2033	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 17,287	\$ 8,707
2034	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 16,784	\$ 8,138
2035	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 16,295	\$ 7,605
2036	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 15,820	\$ 7,108
2037	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 15,359	\$ 6,643
2038	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 14,912	\$ 6,208
2039	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 14,478	\$ 5,802
2040	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 14,056	\$ 5,422
2041	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 13,647	\$ 5,068
2042	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 13,249	\$ 4,736
2043	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 12,863	\$ 4,426
2044	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 12,489	\$ 4,137
2045	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 12,125	\$ 3,866
2046	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 11,772	\$ 3,613
2047	\$0	\$7,787	\$21,644	\$1,550,000	\$1,579,430	\$ 613,351	\$ 181,226
2048	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 11,096	\$ 3,156
2049	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 10,773	\$ 2,949
2050	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 10,459	\$ 2,757
2051	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 10,154	\$ 2,576
2052	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 9,859	\$ 2,408
2053	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 9,571	\$ 2,250
2054	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 9,293	\$ 2,103
2055	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 9,022	\$ 1,965
2056	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 8,759	\$ 1,837
2057	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 8,504	\$ 1,717
2058	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 8,256	\$ 1,604
2059	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 8,016	\$ 1,499
2060	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 7,782	\$ 1,401
2061	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 7,556	\$ 1,310
2062	\$0	\$7,787	\$21,644	\$50,000	\$79,430	\$ 19,799	\$ 3,303
2063	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 7,122	\$ 1,144
2064	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 6,915	\$ 1,069
2065	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 6,713	\$ 999
2066	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 6,518	\$ 934
2067	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 6,328	\$ 873
2068	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 6,144	\$ 816
2069	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,965	\$ 762
2070	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,791	\$ 712
2071	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,622	\$ 666
2072	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,458	\$ 622
2073	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,299	\$ 581
2074	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 5,145	\$ 543
2075	\$0	\$7,787	\$21,644	\$0	\$29,430	\$ 4,995	\$ 508
						\$ 18,183,493	\$ 16,289,949

Table 5 - Project Benefits

Accidents - Tonto Creek crossing related deaths¹

Year	Fatalities	Year	Fatalities
1990	0	2001	0
1991	0	2002	0
1992	0	2003	0
1993	0	2004	0
1994	0	2005	2
1995	1	2006	0
1996	1	2007	0
1997	0	2008	1
1998	0	2009	0
1999	0	2010	0
2000	0	2011	0
		2012	0
		2013	0
		2014	0
			0.2

average/year over previous 25 yrs

\$9,400,000	Value of Statistical Life (VSL) per fatality
\$1,880,000	Average Annual VSL

Annual Maintenance Costs for Existing Dirt Roads¹

\$42,125 - Gila County Public Works

Flood Response Costs¹

Period:	2003-2008	2009	2010
Public Works:	\$191,210	\$0	\$198,520
Emergency Management:	\$104,950	\$0	\$146,500
Sherriff Office:	\$9,350	\$0	\$14,900
	\$305,510	\$0	\$359,920

Average Cost 8 yr period: \$83,179

1 - Source: Gila County Public Work and Emergency Management Division

Benefit - Eliminate Accidental Fatalities

Year	Average VSL	3% Discount Rate	7% Discount Rate
2016	\$1,880,000	\$1,825,243	\$1,757,009
2017	\$1,880,000	\$1,772,080	\$1,642,065
2018	\$1,880,000	\$1,720,466	\$1,534,640
2019	\$1,880,000	\$1,670,356	\$1,434,243
2020	\$1,880,000	\$1,621,705	\$1,340,414
2021	\$1,880,000	\$1,574,470	\$1,252,723
2022	\$1,880,000	\$1,528,612	\$1,170,770
2023	\$1,880,000	\$1,484,089	\$1,094,177
2024	\$1,880,000	\$1,440,863	\$1,022,595
2025	\$1,880,000	\$1,398,897	\$955,697
2026	\$1,880,000	\$1,358,152	\$893,174
2027	\$1,880,000	\$1,318,594	\$834,742
2028	\$1,880,000	\$1,280,189	\$780,133
2029	\$1,880,000	\$1,242,901	\$729,096
2030	\$1,880,000	\$1,206,700	\$681,399
2031	\$1,880,000	\$1,171,554	\$636,821
2032	\$1,880,000	\$1,137,431	\$595,160
2033	\$1,880,000	\$1,104,302	\$556,224
2034	\$1,880,000	\$1,072,138	\$519,836
2035	\$1,880,000	\$1,040,910	\$485,828
2036	\$1,880,000	\$1,010,593	\$454,045
2037	\$1,880,000	\$981,158	\$424,341
2038	\$1,880,000	\$952,580	\$396,580
2039	\$1,880,000	\$924,835	\$370,636
2040	\$1,880,000	\$897,898	\$346,388
2041	\$1,880,000	\$871,746	\$323,728
2042	\$1,880,000	\$846,355	\$302,549
2043	\$1,880,000	\$821,704	\$282,756
2044	\$1,880,000	\$797,771	\$264,258
2045	\$1,880,000	\$774,535	\$246,970

Benefit - Elimination of Annual Dirt Rd Crossings Maintenance

Year	Maint. \$	3% Discount Rate	7% Discount Rate
2016	\$42,125	\$40,898	\$39,369
2017	\$42,125	\$39,707	\$36,794
2018	\$42,125	\$38,550	\$34,387
2019	\$42,125	\$37,428	\$32,137
2020	\$42,125	\$36,337	\$30,035
2021	\$42,125	\$35,279	\$28,070
2022	\$42,125	\$34,251	\$26,233
2023	\$42,125	\$33,254	\$24,517
2024	\$42,125	\$32,285	\$22,913
2025	\$42,125	\$31,345	\$21,414
2026	\$42,125	\$30,432	\$20,013
2027	\$42,125	\$29,546	\$18,704
2028	\$42,125	\$28,685	\$17,480
2029	\$42,125	\$27,850	\$16,337
2030	\$42,125	\$27,038	\$15,268
2031	\$42,125	\$26,251	\$14,269
2032	\$42,125	\$25,486	\$13,336
2033	\$42,125	\$24,744	\$12,463
2034	\$42,125	\$24,023	\$11,648
2035	\$42,125	\$23,324	\$10,886
2036	\$42,125	\$22,644	\$10,174
2037	\$42,125	\$21,985	\$9,508
2038	\$42,125	\$21,344	\$8,886
2039	\$42,125	\$20,723	\$8,305
2040	\$42,125	\$20,119	\$7,761
2041	\$42,125	\$19,533	\$7,254
2042	\$42,125	\$18,964	\$6,779
2043	\$42,125	\$18,412	\$6,336
2044	\$42,125	\$17,876	\$5,921
2045	\$42,125	\$17,355	\$5,534

Benefit - Elimination of Emergency Flood Response Costs

Year	Maint. \$	3% Discount Rate	7% Discount Rate
2016	\$83,179	\$80,756	\$77,737
2017	\$83,179	\$78,404	\$72,652
2018	\$83,179	\$76,120	\$67,899
2019	\$83,179	\$73,903	\$63,457
2020	\$83,179	\$71,751	\$59,305
2021	\$83,179	\$69,661	\$55,426
2022	\$83,179	\$67,632	\$51,800
2023	\$83,179	\$65,662	\$48,411
2024	\$83,179	\$63,750	\$45,244
2025	\$83,179	\$61,893	\$42,284
2026	\$83,179	\$60,090	\$39,518
2027	\$83,179	\$58,340	\$36,932
2028	\$83,179	\$56,641	\$34,516
2029	\$83,179	\$54,991	\$32,258
2030	\$83,179	\$53,389	\$30,148
2031	\$83,179	\$51,834	\$28,176
2032	\$83,179	\$50,325	\$26,332
2033	\$83,179	\$48,859	\$24,610
2034	\$83,179	\$47,436	\$23,000
2035	\$83,179	\$46,054	\$21,495
2036	\$83,179	\$44,713	\$20,089
2037	\$83,179	\$43,410	\$18,775
2038	\$83,179	\$42,146	\$17,546
2039	\$83,179	\$40,918	\$16,398
2040	\$83,179	\$39,727	\$15,326
2041	\$83,179	\$38,570	\$14,323
2042	\$83,179	\$37,446	\$13,386
2043	\$83,179	\$36,355	\$12,510
2044	\$83,179	\$35,297	\$11,692
2045	\$83,179	\$34,269	\$10,927

2046	\$1,880,000	\$751,976	\$230,813
2047	\$1,880,000	\$730,074	\$215,713
2048	\$1,880,000	\$708,809	\$201,601
2049	\$1,880,000	\$688,164	\$188,412
2050	\$1,880,000	\$668,121	\$176,086
2051	\$1,880,000	\$648,661	\$164,567
2052	\$1,880,000	\$629,768	\$153,801
2053	\$1,880,000	\$611,425	\$143,739
2054	\$1,880,000	\$593,617	\$134,335
2055	\$1,880,000	\$576,327	\$125,547
2056	\$1,880,000	\$559,541	\$117,334
2057	\$1,880,000	\$543,243	\$109,658
2058	\$1,880,000	\$527,421	\$102,484
2059	\$1,880,000	\$512,059	\$95,779
2060	\$1,880,000	\$497,145	\$89,513
2061	\$1,880,000	\$482,665	\$83,657
2062	\$1,880,000	\$468,606	\$78,184
2063	\$1,880,000	\$454,958	\$73,070
2064	\$1,880,000	\$441,707	\$68,289
2065	\$1,880,000	\$428,841	\$63,822
2066	\$1,880,000	\$416,351	\$59,647
2067	\$1,880,000	\$404,224	\$55,744
2068	\$1,880,000	\$392,451	\$52,098
2069	\$1,880,000	\$381,020	\$48,689
2070	\$1,880,000	\$369,922	\$45,504
2071	\$1,880,000	\$359,148	\$42,527
2072	\$1,880,000	\$348,687	\$39,745
2073	\$1,880,000	\$338,531	\$37,145
2074	\$1,880,000	\$328,671	\$34,715
2075	\$1,880,000	\$319,098	\$32,444
SUM (ALL YEARS)		\$52,030,060	\$26,393,661

2046	\$42,125	\$16,849	\$5,172
2047	\$42,125	\$16,359	\$4,833
2048	\$42,125	\$15,882	\$4,517
2049	\$42,125	\$15,420	\$4,222
2050	\$42,125	\$14,971	\$3,946
2051	\$42,125	\$14,534	\$3,687
2052	\$42,125	\$14,111	\$3,446
2053	\$42,125	\$13,700	\$3,221
2054	\$42,125	\$13,301	\$3,010
2055	\$42,125	\$12,914	\$2,813
2056	\$42,125	\$12,538	\$2,629
2057	\$42,125	\$12,172	\$2,457
2058	\$42,125	\$11,818	\$2,296
2059	\$42,125	\$11,474	\$2,146
2060	\$42,125	\$11,139	\$2,006
2061	\$42,125	\$10,815	\$1,875
2062	\$42,125	\$10,500	\$1,752
2063	\$42,125	\$10,194	\$1,637
2064	\$42,125	\$9,897	\$1,530
2065	\$42,125	\$9,609	\$1,430
2066	\$42,125	\$9,329	\$1,336
2067	\$42,125	\$9,057	\$1,249
2068	\$42,125	\$8,794	\$1,167
2069	\$42,125	\$8,537	\$1,091
2070	\$42,125	\$8,289	\$1,020
2071	\$42,125	\$8,047	\$953
2072	\$42,125	\$7,813	\$891
2073	\$42,125	\$7,585	\$832
2074	\$42,125	\$7,365	\$778
2075	\$42,125	\$7,150	\$727
SUM (ALL YEARS)		\$1,165,833	\$591,401

2046	\$83,179	\$33,270	\$10,212
2047	\$83,179	\$32,301	\$9,544
2048	\$83,179	\$31,361	\$8,920
2049	\$83,179	\$30,447	\$8,336
2050	\$83,179	\$29,560	\$7,791
2051	\$83,179	\$28,699	\$7,281
2052	\$83,179	\$27,863	\$6,805
2053	\$83,179	\$27,052	\$6,360
2054	\$83,179	\$26,264	\$5,944
2055	\$83,179	\$25,499	\$5,555
2056	\$83,179	\$24,756	\$5,191
2057	\$83,179	\$24,035	\$4,852
2058	\$83,179	\$23,335	\$4,534
2059	\$83,179	\$22,656	\$4,238
2060	\$83,179	\$21,996	\$3,960
2061	\$83,179	\$21,355	\$3,701
2062	\$83,179	\$20,733	\$3,459
2063	\$83,179	\$20,129	\$3,233
2064	\$83,179	\$19,543	\$3,021
2065	\$83,179	\$18,974	\$2,824
2066	\$83,179	\$18,421	\$2,639
2067	\$83,179	\$17,884	\$2,466
2068	\$83,179	\$17,364	\$2,305
2069	\$83,179	\$16,858	\$2,154
2070	\$83,179	\$16,367	\$2,013
2071	\$83,179	\$15,890	\$1,882
2072	\$83,179	\$15,427	\$1,758
2073	\$83,179	\$14,978	\$1,643
2074	\$83,179	\$14,542	\$1,536
2075	\$83,179	\$14,118	\$1,435
SUM (ALL YEARS)		\$2,302,019	\$1,167,762