

Androscoggin Valley Consortium TIGER Grant Application

Cost Benefit Analysis

The TIGER grant funds will provide the Androscoggin Valley region with a tremendous improvement in road condition while simultaneously delivering impressive cost savings over a ten-year period and beyond. This analysis is limited to a ten-year period because forecasts beyond that time horizon are very uncertain.

Presently, the average pavement condition index rating for the region is approximately 59 and deteriorating fast. The region is faced with three distinct options for road management and expenditure over the next ten years:

Scenario A – The Proposed Plan: This is the proposed plan utilizing TIGER grant funds. This option involves the rapid expenditure of funds to reconstruct the roadway network where needed and bring the overall condition to excellent/good very quickly. This will produce the lowest cost over time as well as the best roads soonest. This plan will expend \$22.214 million of TIGER grant funds in each of the first two years and then \$1.582 million per year for years 3 through 10, for a total expenditure of \$57.08 million. The average Pavement Condition Index (PCI) will be in the high 80s to low 90s over the ten year window.

Scenario B – “Worst First” Catch-Up Plan: This is a hypothetical plan where \$7.5 million is spent to repair the worst road segments in each of the ten years for a total of \$75 million. This level of spending is set to achieve a PCI approximately equal to that produced in Scenario A by the end of the ten-year window.

Scenario C – “Worst First” Maintain Plan: This is a hypothetical plan where \$5.708 million is spent in each of the ten years for a total of \$57.08 million, equaling the total expenditure of Scenario A. This plan will only marginally improve the road condition as the PCI is estimated to be about 76 at the end of ten years.

The proposed plan will realize \$17.92 million in savings over ten years versus the “worst first” catch-up plan. Alternatively, the proposed plan will deliver a road network in very good to excellent condition versus network with a PCI approximately 11 points lower utilizing the same monetary resources in the “worst-first” maintain plan.

Potential Undiscounted Cost Savings

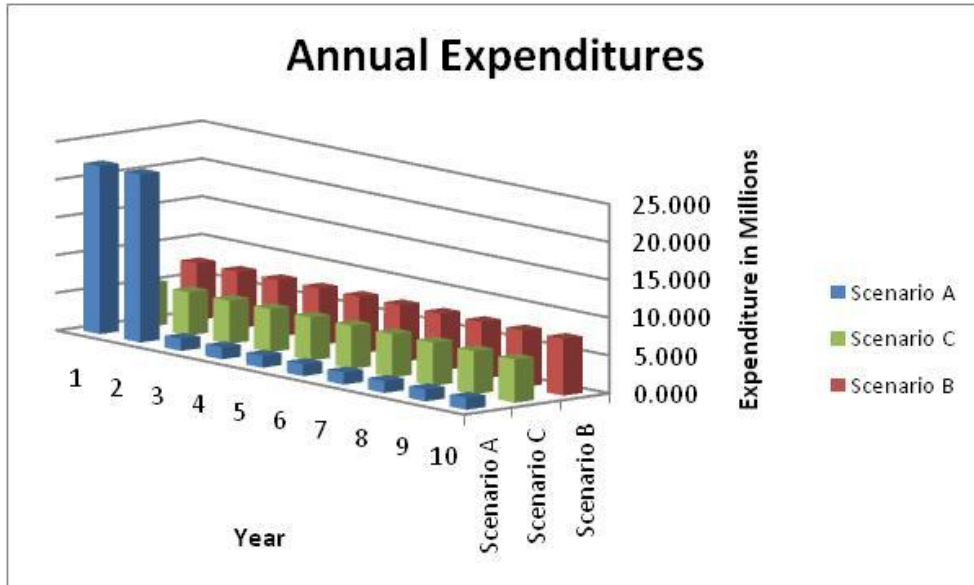
Plan	Cost/Savings
“Worst First” Catch-up	75,000,000
Proposed Plan	57,080,000
10-Year Savings	17,920,000

The following table and graph illustrate the differences in expenditure over ten years for each scenario.

Annual Expenditures

Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Scenario A	22.214	22.214	1.582	1.582	1.582	1.582	1.582	1.582	1.582	1.582	\$ 57.08
Scenario B	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500	7.500	\$ 75.00
Scenario C	5.708	5.708	5.708	5.708	5.708	5.708	5.708	5.708	5.708	5.708	\$ 57.08

(millions of dollars)

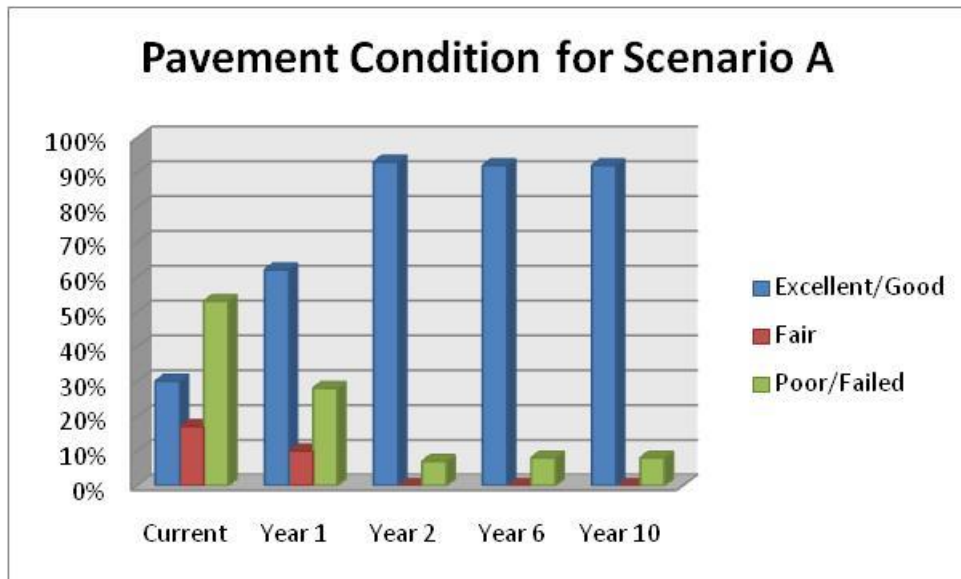


The following table and graphs illustrate the pavement condition over ten years for each scenario.

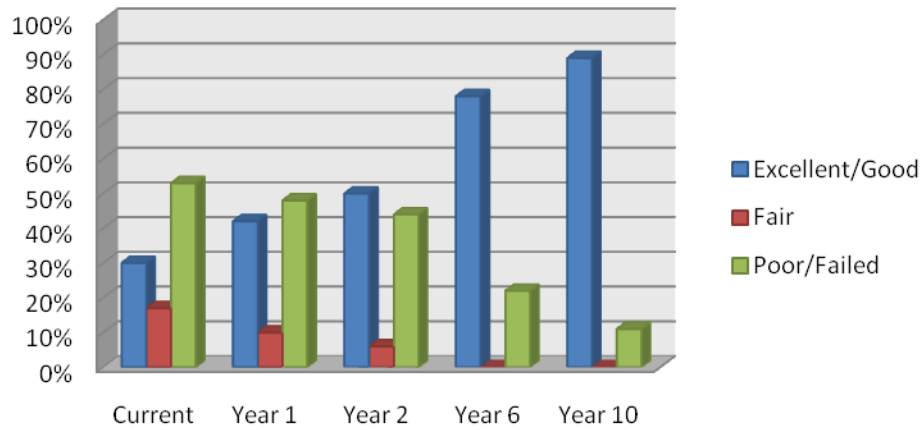
Scenario A - Proposed Plan					
Column1	Current	Year 1	Year 2	Year 6	Year 10
Excellent/Good	30%	62%	93%	92%	92%
Fair	17%	10%	0%	0%	0%
Poor/Failed	53%	28%	7%	8%	8%

Scenario B - "Worst First" Catch-Up Plan					
Column1	Current	Year 1	Year 2	Year 6	Year 10
Excellent/Good	30%	42%	50%	78%	89%
Fair	17%	10%	6%	0%	0%
Poor/Failed	53%	48%	44%	22%	11%

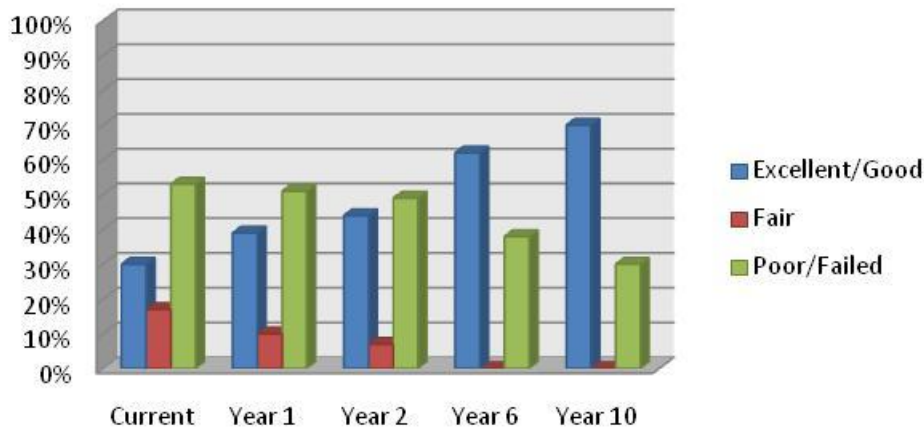
Scenario C - "Worst First" Maintain Plan					
Column1	Current	Year 1	Year 2	Year 6	Year 10
Excellent/Good	30%	39%	44%	62%	70%
Fair	17%	10%	7%	0%	0%
Poor/Failed	53%	51%	49%	38%	30%



Pavement Condition for Scenario B



Pavement Condition for Scenario C



The following table presents an alternative way to show annual average PCI each year.

Average PCI

Column1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Average
Scenario A	76.71	96.58	95.56	94.35	92.61	91.30	90.27	89.33	88.68	88.06	90.35
Scenario B	66.84	67.19	67.62	71.03	79.01	81.52	82.11	83.89	85.37	86.86	77.14
Scenario C	65.71	63.77	63.50	64.09	63.09	65.72	69.81	71.74	73.14	76.7	67.73

The following tables present the discount analysis results of the three scenarios.

Potential Cost Savings			
	No Discount	3% Discount	7% Discount
"Worst First" Catch-Up	\$ 75,000,000	\$ 63,976,521	\$ 52,676,862
Proposed Plan	\$ 57,080,000	\$ 52,973,488	\$ 48,414,337
10 Year Savings	\$ 17,920,000	\$ 11,003,034	\$ 4,262,525

Annual Expenditures

Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Scenario A	22.2140	22.2140	1.5820	1.5820	1.5820	1.5820	1.5820	1.5820	1.5820	1.5820	\$ 57.08
Scenario B	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	7.5000	\$ 75.00
Scenario C	5.7080	5.7080	5.7080	5.7080	5.7080	5.7080	5.7080	5.7080	5.7080	5.7080	\$ 57.08

(millions of dollars)

Annual Expenditures Discounted at 3%

Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Scenario A	21.57	20.94	1.45	1.41	1.36	1.32	1.29	1.25	1.21	1.18	\$ 52.97
Scenario B	7.28	7.07	6.86	6.66	6.47	6.28	6.10	5.92	5.75	5.58	\$ 63.98
Scenario C	5.54	5.38	5.22	5.07	4.92	4.78	4.64	4.51	4.37	4.25	\$ 48.69

(millions of dollars)

Annual Expenditures Discounted at 7%

Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Scenario A	20.76	19.40	1.29	1.21	1.13	1.05	0.99	0.92	0.86	0.80	\$ 48.41
Scenario B	7.01	6.55	6.12	5.72	5.35	5.00	4.67	4.37	4.08	3.81	\$ 52.68
Scenario C	5.33	4.99	4.66	4.35	4.07	3.80	3.55	3.32	3.10	2.90	\$ 40.09

(millions of dollars)