

Appendix A-1
Programming Estimates (0 – 30%)
Table Roadway
(Values updated in year 2022)

Project Type	Units for Calculation	Median Cost per Unit	Low Cost	High Cost
Crack Seal	ELM			
Pavement Resurfacing (1.5")	ELM***	\$280,000	\$162,000	\$433,000
Interstate 4R	Mile**	\$3,500,000	\$3,300,000	\$3,700,000
Roadway Reconstruction	Lane-Mile*	\$1,550,000	\$1,300,000	\$2,000,000
Reclaim Non-Interstate	Lane-Mile*	\$600,000	\$500,000	\$700,000
Rumble Strip	Mile	\$3,300	\$2,900	\$3,600
Guardrail Project	FT	\$85	\$75	\$95
Roundabout-Single Lane	Each	\$1,600,000	\$950,000	\$2,300,000
Interchange	Each			
Intersection widening	Each			
Signalizing an Intersection	4 leg, T or Y	\$1,000,000	\$700,000	\$1,500,000
Sidewalks (standalone) –	Foot	\$250	\$225	\$300

All costs above are for standalone project that has the main purpose of constructing that specific element. If one of these element are part of a larger project then there will be some reduction in the cost of that specific element when considering how it contributes to the overall cost.

*Assumes full width of pavement and an equivalent lane mile

**Length of project. Do not double for both barrels

***ELM (Equivalent Lane Mile) is calculated....ELM is the number of 12'x5280' rectangles that will fit in the area the paving limits occupy, including shoulders.

$$\frac{\text{Pavement Area in } ft^2}{(12ft \times \frac{5,280ft}{1mi})} = ELM \text{ mi}$$

Estimate the construction cost for a resurfacing project.

Example: A proposed project to resurface a 3-mile stretch of roadway with two 11-foot wide travel lanes and one 4-foot wide outside shoulder in each direction.

First step- Calculate ELM.

2 lanes x 3 miles = 12 Equivalent Lane Miles

$$\frac{2 * (11 ft + 4 ft) * 3 mi * 5,280 ft/mi}{12 ft * 5,280 ft/mi} = 7.5 ELM$$

Second step - Estimate the project's construction costs using the ranges shown in the table above.

\$162,000/ELM x 7.5 lane-miles = \$1,215,000 (low end)

\$433,000/ELM x 7.5 lane-miles = \$3,247,500 (high end)

\$280,000/ELM x 7.5 lane-miles = \$2,100,000 (median)

Using these ranges estimate the project cost by considering cost factors like; pavement thickness and width, size of project, location of project (typically by Maintenance District), material availability, complexity of traffic control, day vs. night work, scope (guardrail, drainage), etc.

Normally Construction Engineering of 6% is used for resurfacing projects.

Estimate the construction cost for a roadway reconstruction project

Example: A proposed project to reconstruct 1.8 miles of roadway to include three 11' travelled lanes and two 5' shoulders.

First step- Consider travel lanes and shoulders to calculate the number of lane miles.

3-11' lanes and 2-5' shoulders = $43'/12$ (average lane width) = 3.58 lanes x 1.8 miles = 6.45 lane-miles.

Second step - Estimate the project's construction costs using the ranges shown in the table above.

\$1,300,000/lane-mile x 6.45 lane-miles = \$8,385,000 (low end)

\$2,000,000/lane-mile x 6.45 lane-miles = \$12,900,000 (High end)

\$1,550,000/lane-mile x 6.45 lane-miles = \$9,997,500 (median)

Using these ranges estimate the project cost by considering cost factors like; size of project, location of project, material availability, complexity of traffic control, etc.

Estimate the construction cost for a 4R project on the interstate.

Example: A proposed project to rehabilitate 7.8 miles of 2 lane interstate.

Estimate the project's construction costs as a range.

\$3,300,000/mile x 7.8 miles = \$25,740,000 (low end)

\$3,700,000/mile x 7.8 miles = \$28,000,000 (high end)

\$3,500,000/mile x 7.8 miles = \$27,300,000 (median)

Using these ranges estimate the project cost by considering cost factors like; location of project (urban/rural), number of interchanges, complexity of traffic control, etc. Bridge work can influence these costs and should be confirmed early in the estimating.

Estimate the construction cost for a centerline rumble strip project.

Example: A proposed project to install centerline rumble strip along a 50.0-mile long highway.

Estimate the project's construction costs as a range.

\$2,900/mile x 50.0 miles = \$145,000 (low end)

\$3,600/mile x 50.0 miles = \$180,000 (high end)

\$3,300/mile x 50.0 miles = \$165,000 (median)