

TABLE 8-1 Cost-Benefit Analysis of Highway Construction Project

		Quantity	Price/Value	Total
Costs	Asphalt	1 million bags		
	Labor	1 million hours		
	Maintenance	\$10 million/year		
			First-year cost:	
			Total cost over time:	
Benefits	Driving time saved	500,000 hours/year		
	Lives saved	5 lives/year		
			First-year benefit:	
			Total benefit over time:	
			Benefit over time minus cost over time:	
The renovation of the turnpike in your state has three costs: asphalt, labor, and future maintenance. There are two associated benefits: reduced travel time and reduced fatalities. The goal of cost-benefit analysis is to quantify these costs and benefits.				

TABLE 8-2 Cost-Benefit Analysis of Highway Construction Project

		Quantity	Price/Value	Total
Costs	Asphalt	1 million bags	\$100/bag	\$100 million
	Labor	1 million hours	\$10/hour	\$10 million
	Maintenance	\$10 million/year	7% discount rate	\$143 million
				First-year cost: \$110 million
				Total cost over time: \$253 million
Benefits	Driving time saved	500,000 hours/year		
	Lives saved	5 lives/year		
				First-year benefit:
				Total benefit over time:
				Benefit over time minus cost over time:
<p>The cost of the asphalt for this project is dictated by the market price for asphalt, \$100 per bag. The cost of labor depends not on the wage, but on the full opportunity cost of the labor, which incorporates the current unemployment of any workers who will be used on the project. The cost of future maintenance is the present discounted value of these projected expenditures.</p>				

TABLE 8-3 Cost per Life Saved of Various Regulations

Regulation Concerning ...	Year	Agency	Cost per Life Saved (millions, in 2020 dollars)
Childproof lighters	1993	CPSC	\$0.14
Food labeling	1993	FDA	0.58
Reflective devices for heavy trucks	1999	NHTSA	1.29
Children's sleepwear flammability	1973	CPSC	3.17
Rear/up/shoulder seatbelts in cars	1989	NHTSA	6.33
Asbestos	1972	OSHA	7.91
VALUE OF STATISTICAL LIFE			10.8
Benzene	1987	OSHA	31.65
Asbestos ban	1989	EPA	112.21
Solid waste disposal facilities	1991	EPA	143.865
Cattle feed	1979	FDA	244.57

Data from: [Morrall \(2003\)](#), Table 2, updated to 2020 dollars.

Government safety regulations increase costs and save lives, and these costs and benefits can be compared to compute an implicit cost per life saved. These values range from a low of \$140,000 (\$0.14 million) per life saved for childproof lighters to a high of more than \$143,865 million per life saved for solid waste disposal facility regulations.

TABLE 8-4 Cost-Benefit Analysis of Highway Construction Project

		Quantity	Price/Value	Total
Costs	Asphalt	1 million bags	\$100/bag	\$100 million
	Labor	1 million hours	\$10/hour	\$10 million
	Maintenance	\$10 million/year	7% discount rate	\$143 million
				First-year cost: \$110 million
				Total cost over time (7% discount rate): \$253 million
Benefits	Driving time saved	500,000 hours/year	\$22.70/hour	\$11.4 million
	Lives saved	5 lives/year	\$10.5 million/life	\$52.5 million
				First-year benefit: \$63.9 million
				Total benefit over time (7% discount rate): \$912.9 million
				Benefit over time minus cost over time: \$659.9 million
The time savings from this project is most appropriately valued by the revealed preference valuation of time, which is \$22.70/hour. The life savings is most appropriately valued by the revealed preference value of life, which averages \$10.5 million. The present discounted value of costs for this renovation project is \$253 million, while the <i>PDV</i> of benefits for this project is \$912.9 million. Because benefits exceed costs by \$659.9 million, the project should clearly be undertaken.				

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