

APPENDIX E: RETURN- ON-INVESTMENT (ROI) ANALYSIS

ROI Summary

Concept	Total Cost	Safety Benefit	20-Yr ROI
Spot Improvements	\$10,770,000	\$63,000,000	5.85
2 + 1 Widening*	\$41,880,000	\$105,400,000	2.52
		\$24,400,000	0.58
4-Lane Widening	\$225,389,000	\$64,100,000	0.28

*First option is based on crash reduction for all crash types. Second option considers only head on, rear end, and sideswipe crashes.

CMF Analysis: Spot Improvements

Spot	MP	Horiz	Vert	Description	CMF ID	Star	CMF	Type	Severity	Crashes (2018 - 2022)			Crashes Reduced	5-Yr Savings	20-Yr Savings
										Fatal	Injury	PDO			
1	15 - 16	4.70%	2.80%	Flatten Horizontal	9651	4	0.259	All	KABC	0	2		1.5	\$273,319	\$1,093,277
2	0.2	4%	1%				0.259			1	2		2.2	\$7,876,274	\$31,505,097
3	4.4	5.50%	1.50%				0.259			1	0		0.7	\$7,602,955	\$30,411,820
Total													\$16,000,000	\$63,000,000	

CMF Analysis: 2+1 Roadway

Description	CMF ID	Star	CMF	Type	Severity	Crashes (2018 - 2022)			Crashes Reduced	5-Yr Savings	20-Yr Savings	
						Fatal	Injury	PDO				
Provide short 2+1	10267	4	0.53	All	All	5	23	49	36.2	\$26,352,255	\$105,409,019	\$105,400,000
	10268	4	0.51	O, RE,	All	1	11	13	12.3	\$6,089,880	\$24,359,521	\$24,400,000

CMF Analysis: Four-Lane Widening

Description	CMF ID	Star	CMF	Type	Severity	Crashes (2018 - 2022)			Crashes Reduced	5-Yr Savings	20-Yr Savings	
						Fatal	Injury	PDO				
Convert 2 lane roadway to 4 lane divided	7574	4	0.714	All	All	5	23	49	22.0	\$16,035,627	\$64,142,509	\$64,100,000

Crash Costs

Crash Severity	Cost
PDO	\$10,711
Injury	\$184,426
Fatal	\$10,260,398

FHWA KY-specific comprehensive costs