APPENDIX B

GUARDRAIL USE GUIDELINES FOR BENEFIT/COST = 3

Table B1: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Severe Slope Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8				10-46	46-100
7	0	-2	8				10-37	37-100
7	2L	0	8				10-37	37-100
7	2L	-2	8			10-19	19-46	46-100
12	0	0	8				10-28	28-100
12	0	0	12				10-28	28-100
12	0	-2	8				10-28	28-100
12	0	-2	12			10-19	19-28	28-100
12	2L	0	8			10-19	19-28	28-100
12	2L	0	12			10-19	19-28	28-100
12	2L	-2	8				10-28	28-100
12	2L	-2	12			10-19	19-28	28-100
18	0	0	8			10-19	19-37	37-100
18	0	0	12			10-19	19-37	37-100
18	0	0	20			10-19	19-37	37-100
18	0	-2	8			10-19	19-37	37-100
18	0	-2	12			10-19	19-37	37-100
18	0	-2	20			10-19	19-37	37-100
18	2L	0	8			10-28	28-37	37-100
18	2L	0	12			10-19	19-37	37-100
18	2L	0	20			10-19	19-37	37-100
18	2L	-2	8			10-19	19-37	37-100
18	2L	-2	12			10-19	19-37	37-100
18	2L	-2	20			10-19	19-37	37-100
26	0	0	8			10-37		37-100
26	0	0	12			10-28	28-37	37-100
26	0	0	20			10-19	19-37	37-100
26	0	-2	8			10-37		37-100
26	0	-2	12			10-28	28-37	37-100
26	0	-2	20			10-28	28-46	46-100
26	2L	0	8			10-37		37-100
26	2L	0	12			10-37		37-100
26	2L	0	20			10-28	28-46	46-100
26	2L	-2	8			10-46		46-100
26	2L	-2	12			10-37		37-100
26	2L	-2	20			10-37	37-46	46-100
32	0	0	8			10-37		37-100
32	0	0	12			10-37		37-100
32	0	0	20			10-28	28-46	46-100
32	0	-2	8			10-46		46-100
32	0	-2	12			10-37		37-100
32	0	-2	20			10-28	28-46	46-100
32	2L	0	8			10-46		46-100
32	2L	0	12			10-46		46-100
32	2L	0	20			10-46		46-100
32	2L	-2	8			10-46		46-100
32	2L	-2	12			10-46		46-100
32	2L	-2	20			10-37	37-55	55-100

Table B2: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Moderately Severe Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			10-28	28-37	37-100
7	0	-2	8			10-37		37-100
7	2L	0	8			10-37		37-100
7	2L	-2	8			10-37		37-100
12	0	0	8			10-37		37-100
12	0	0	12			10-37		37-100
12	0	-2	8			10-37		37-100
12	0	-2	12			10-37		37-100
12	2L	0	8			10-37		37-100
12	2L	0	12			10-46		46-100
12	2L	-2	8			10-37		37-100
12	2L	-2	12			10-46		46-100
18	0	0	8			10-55		55-100
18	0	0	12			10-46		46-100
18	0	0	20			10-46		46-100
18	0	-2	8			10-55		55-100
18	0	-2	12			10-46		46-100
18	0	-2	20			10-46		46-100
18	2L	0	8			10-55		55-100
18	2L	0	12			10-55		55-100
18	2L	0	20			10-55		55-100
18	2L	-2	8			10-55		55-100
18	2L	-2	12			10-46		46-100
18	2L	-2	20			10-46	46-55	55-100
26	0	0	8			10-73		73-100
26	0	0	12			10-64		64-100
26	0	0	20			10-64		64-100
26	0	-2	8			10-82		82-100
26	0	-2	12			10-64		64-100
26	0	-2	20			10-64		64-100
26	2L	0	8			10-73		73-100
26	2L	0	12			10-82		82-100
26	2L	0	20			10-64		64-100
26	2L	-2	8			10-73		73-100
26	2L	-2	12			10-73		73-100
26	2L	-2	20			10-64		64-100
32	0	0	8			10-91		91-100
32	0	0	12			10-91		91-100
32	0	0	20			10-64		64-100
32	0	-2	8			10-82		82-100
32	0	-2	12			10-82		82-100
32	0	-2	20			10-73		73-100
32	2L	0	8			10-100		
32	2L	0	12			10-82		82-100
32	2L	0	20			10-73		73-100
32	2L	-2	8			10-91		91-100
32	2L	-2	12			10-100		
32	2L	-2	20			10-73		73-100

Table B3: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Moderate Slope Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8		10-100			
7	0	-2	8		10-100			
7	2L	0	8		10-100			
7	2L	-2	8		10-100			
12	0	0	8		10-100			
12	0	0	12		10-100			
12	0	-2	8		10-100			
12	0	-2	12		10-100			
12	2L	0	8		10-100			
12	2L	0	12		10-100			
12	2L	-2	8		10-100			
12	2L	-2	12		10-100			
18	0	0	8		10-100			
18	0	0	12		10-100			
18	0	0	20		10-100			
18	0	-2	8		10-100			
18	0	-2	12		10-100			
18	0	-2	20		10-100			
18	2L	0	8		10-100			
18	2L	0	12		10-100			
18	2L	0	20		10-100			
18	2L	-2	8		10-100			
18	2L	-2	12		10-100			
18	2L	-2	20		10-100			
26	0	0	8		10-100			
26	0	0	12		10-100			
26	0	0	20		10-100			
26	0	-2	8		10-100			
26	0	-2	12		10-100			
26	0	-2	20		10-100			
26	2L	0	8		10-100			
26	2L	0	12		10-100			
26	2L	0	20		10-100			
26	2L	-2	8		10-100			
26	2L	-2	12		10-100			
26	2L	-2	20		10-100			
32	0	0	8		10-100			
32	0	0	12		10-100			
32	0	0	20		10-100			
32	0	-2	8		10-100			
32	0	-2	12		10-100			
32	0	-2	20		10-100			
32	2L	0	8		10-100			
32	2L	0	12		10-100			
32	2L	0	20		10-100			
32	2L	-2	8		10-100			
32	2L	-2	12		10-100			
32	2L	-2	20		10-100			

Table B4: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			10-100		
7	0	0	12			28-64, 82-91	10-28, 64-82, 91-100	
7	0	0	20			10-100		
7	0	-2	8			10-64, 82-100		64-82
7	0	-2	12			10-55, 73-100	55-73	
7	0	-2	20			10-82		82-100
7	2L	0	8			10-100		
7	2L	0	12			10-100		
7	2L	0	20			10-100		
7	2L	-2	8			10-100		
7	2L	-2	12			10-100		
7	2L	-2	20			10-100		
12	0	0	8			10-19	19-28	28-100
12	0	0	12			10-100		
12	0	0	20			10-100		
12	0	-2	8				10-28	28-100
12	0	-2	12			10-100		
12	0	-2	20			10-100		
12	2L	0	8			10-100		
12	2L	0	12			10-100		
12	2L	0	20		10-19	19-100		
12	2L	-2	8			10-100		
12	2L	-2	12			10-91		91-100
12	2L	-2	20			28-91	10-28	91-100
18	0	0	8		10-19	37-55	19-37, 55-91	91-100
18	0	0	12			10-19	19-100	
18	0	0	20			10-100		
18	0	-2	8			10-46, 73-82	82-100	46-73
18	0	-2	12			28-46	10-28, 91-100	46-91
18	0	-2	20			10-100		
18	2L	0	8		10-28	28-100		
18	2L	0	12		10-28	28-100		
18	2L	0	20		10-19	19-100		
18	2L	-2	8		10-37	37-100		
18	2L	-2	12		10-28	28-100		
18	2L	-2	20		10-19	19-100		
26	0	0	8		10-19	19-100		
26	0	0	12		10-28	28-100		
26	0	0	20		10-19	19-100		
26	0	-2	8		10-28	28-100		
26	0	-2	12		10-28	28-100		
26	0	-2	20		10-19	19-100		
26	2L	0	8	10-100				
26	2L	0	12	10-37, 55-64, 91-100	37-55	64-91		
26	2L	0	20	10-19	19-46	46-100		
26	2L	-2	8					
26	2L	-2	12	10-46, 64-73	46-64, 91-100	73-91		
26	2L	-2	20	10-19	19-73	73-100		
32	0	0	8	10-46, 73-100	46-55	55-73		
32	0	0	12		10-19	19-100		
32	0	0	20		10-19	19-100		
32	0	-2	8	10-19, 46-73	19-28	28-46, 73-100		
32	0	-2	12		10-37	37-100		
32	0	-2	20		10-28	28-100		
32	2L	0	8	10-100				
32	2L	0	12	10-100				
32	2L	0	20	10-100				
32	2L	-2	8	10-100				
32	2L	-2	12	10-100				
32	2L	-2	20	10-73	91-100	73-91		

Table B5: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Moderately Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			10-100		
7	0	0	12			10-100		
7	0	0	20			10-73, 91-100		73-91
7	0	-2	8			10-100		
7	0	-2	12			10-100		
7	0	-2	20			10-100		
7	2L	0	8			10-100		
7	2L	0	12			10-100		
7	2L	0	20			10-100		
7	2L	-2	8			10-100		
7	2L	-2	12			10-100		
7	2L	-2	20			10-100		
12	0	0	8			10-64, 82-100		64-82
12	0	0	12			10-100		
12	0	0	20			10-100		
12	0	-2	8			10-100		
12	0	-2	12			10-100		
12	0	-2	20			10-100		
12	2L	0	8			10-100		
12	2L	0	12			10-100		
12	2L	0	20		10-19	19-100		
12	2L	-2	8		10-19	19-100		
12	2L	-2	12			10-100		
12	2L	-2	20			10-100		
18	0	0	8			10-28	28-46, 73-100	46-73
18	0	0	12			10-100		
18	0	0	20			10-100		
18	0	-2	8			10-28, 46-64	64-100	28-46
18	0	-2	12			10-100		
18	0	-2	20			10-100		
18	2L	0	8	46-55	10-28	28-46, 55-100		
18	2L	0	12		28-37	10-28, 37-100		
18	2L	0	20		10-37	37-100		
18	2L	-2	8	10-28, 46-55	28-46, 55-64	64-100		
18	2L	-2	12		10-28	28-100		
18	2L	-2	20			10-100		
26	0	0	8		10-28	28-100		
26	0	0	12		10-28	28-46, 64-100		46-64
26	0	0	20		10-28	28-100		
26	0	-2	8			10-100		
26	0	-2	12			10-100		
26	0	-2	20		10-19	19-100		
26	2L	0	8	10-100				
26	2L	0	12	10-73, 91-100		73-91		
26	2L	0	20	10-19	19-64	64-100		
26	2L	-2	8	10-100				
26	2L	-2	12	10-100				
26	2L	-2	20		10-37, 55-64, 91-100	37-55, 64-91		
32	0	0	8	10-28, 46-100		28-46		
32	0	0	12	10-28	28-37	37-100		
32	0	0	20		10-28	28-100		
32	0	-2	8	10-100				
32	0	-2	12	28-37	10-28, 37-55, 73-82	55-73, 82-100		
32	0	-2	20		10-28	28-82	82-91	91-100
32	2L	0	8	10-100				
32	2L	0	12	10-100				
32	2L	0	20	10-100				
32	2L	-2	8	10-100				
32	2L	-2	12	10-100				
32	2L	-2	20	10-100				

Table B6: Guardrail Use Guidelines for Freeway, Benefit-Cost Greater Than 3

Moderate Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			10-100		
7	0	0	12			10-100		
7	0	0	20			10-100		
7	0	-2	8			10-100		
7	0	-2	12			10-100		
7	0	-2	20			10-100		
7	2L	0	8	10-37, 55-91		37-55, 91-100		
7	2L	0	12	10-64		64-100		
7	2L	0	20	10-46, 64-73, 91-100		46-64, 73-91		
7	2L	-2	8	10-46, 91-100		46-91		
7	2L	-2	12	10-46, 64-82		46-64, 82-100		
7	2L	-2	20	10-28, 46-100		28-46		
12	0	0	8		10-19	19-100		
12	0	0	12		10-19	19-100		
12	0	0	20		10-19	19-100		
12	0	-2	8			10-100		
12	0	-2	12		10-19	19-100		
12	0	-2	20			10-100		
12	2L	0	8	10-64, 82-100	64-82			
12	2L	0	12	10-82		82-100		
12	2L	0	20	10-28, 46-91	28-46, 91-100			
12	2L	-2	8	10-100				
12	2L	-2	12	10-37, 73-100		37-73		
12	2L	-2	20	10-82		82-100		
18	0	0	8	10-19, 37-64		19-37, 64-100		
18	0	0	12		10-28	28-100		
18	0	0	20		10-28	28-100		
18	0	-2	8	10-64, 91-100		64-91		
18	0	-2	12		10-28	28-100		
18	0	-2	20		10-28	28-100		
18	2L	0	8	10-100				
18	2L	0	12	10-100				
18	2L	0	20	10-100				
18	2L	-2	8	10-100				
18	2L	-2	12	10-100				
18	2L	-2	20	10-100				
26	0	0	8	10-100				
26	0	0	12	10-100				
26	0	0	20	10-100				
26	0	-2	8	10-100				
26	0	-2	12	10-100				
26	0	-2	20		10-46	46-100		
26	2L	0	8	10-100				
26	2L	0	12	10-100				
26	2L	0	20	10-100				
26	2L	-2	8	10-100				
26	2L	-2	12	10-100				
26	2L	-2	20	10-100				
32	0	0	8	10-100				
32	0	0	12	10-100				
32	0	0	20	10-91	91-100			
32	0	-2	8	10-100				
32	0	-2	12	10-100				
32	0	-2	20	10-100				
32	2L	0	8	10-100				
32	2L	0	12	10-100				
32	2L	0	20	10-100				
32	2L	-2	8	10-100				
32	2L	-2	12	10-100				
32	2L	-2	20	10-100				

Table B7: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Severe Slope Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			2.5-50		
7	0	-3	8			2.5-50		
7	4L	0	8			2.5-50		
7	4L	-3	8			2.5-50		
12	0	0	8			2.5-50		
12	0	0	12			2.5-50		
12	0	-3	8			2.5-50		
12	0	-3	12			2.5-50		
12	4L	0	8			2.5-50		
12	4L	0	12			2.5-50		
12	4L	-3	8			2.5-50		
12	4L	-3	12			2.5-50		
18	0	0	8			2.5-50		
18	0	0	12			2.5-50		
18	0	0	20			2.5-50		
18	0	-3	8			2.5-50		
18	0	-3	12			2.5-50		
18	0	-3	20			2.5-50		
18	4L	0	8			2.5-50		
18	4L	0	12			2.5-50		
18	4L	0	20			2.5-50		
18	4L	-3	8			2.5-50		
18	4L	-3	12			2.5-50		
18	4L	-3	20			2.5-50		
26	0	0	8			2.5-50		
26	0	0	12			2.5-50		
26	0	0	20			2.5-50		
26	0	-3	8			2.5-50		
26	0	-3	12			2.5-50		
26	0	-3	20			2.5-50		
26	4L	0	8			2.5-50		
26	4L	0	12			2.5-50		
26	4L	0	20			2.5-50		
26	4L	-3	8			2.5-50		
26	4L	-3	12			2.5-50		
26	4L	-3	20			2.5-50		
32	0	0	8		2.5-50			
32	0	0	12		2.5-35.75	35.75-50		
32	0	0	20		2.5-50			
32	0	-3	8		2.5-50			
32	0	-3	12		2.5-31	31-50		
32	0	-3	20		2.5-21.5	21.5-50		
32	4L	0	8		2.5-50			
32	4L	0	12		2.5-31	31-50		
32	4L	0	20		2.5-7.25	7.25-50		
32	4L	-3	8		2.5-50			
32	4L	-3	12		2.5-45.25	45.25-50		
32	4L	-3	20			2.5-50		

Table B8: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Rural Arterial Moderately Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8			2.5-50		
7	0	-3	8			2.5-50		
7	4L	0	8			2.5-50		
7	4L	-3	8			2.5-50		
12	0	0	8			2.5-50		
12	0	0	12			2.5-50		
12	0	-3	8			2.5-50		
12	0	-3	12			2.5-50		
12	4L	0	8			2.5-50		
12	4L	0	12			2.5-50		
12	4L	-3	8			2.5-50		
12	4L	-3	12			2.5-50		
18	0	0	8		2.5-35.75	35.75-50		
18	0	0	12		2.5-21.5	21.5-50		
18	0	0	20		2.5-16.75	16.75-50		
18	0	-3	8		2.5-26.25	26.25-50		
18	0	-3	12		2.5-16.75	16.75-50		
18	0	-3	20		2.5-12	12-50		
18	4L	0	8		2.5-50			
18	4L	0	12		2.5-12	12-50		
18	4L	0	20			2.5-50		
18	4L	-3	8		2.5-50			
18	4L	-3	12		7.25-12	2.5-7.25, 12-50		
18	4L	-3	20			2.5-50		
26	0	0	8		2.5-50			
26	0	0	12		2.5-50			
26	0	0	20		2.5-50			
26	0	-3	8		2.5-50			
26	0	-3	12		2.5-50			
26	0	-3	20		2.5-50			
26	4L	0	8		2.5-50			
26	4L	0	12		2.5-50			
26	4L	0	20		2.5-50			
26	4L	-3	8		2.5-50			
26	4L	-3	12		2.5-50			
26	4L	-3	20		2.5-50			
32	0	0	8		2.5-50			
32	0	0	12		2.5-50			
32	0	0	20		2.5-50			
32	0	-3	8		2.5-50			
32	0	-3	12		2.5-50			
32	0	-3	20		2.5-50			
32	4L	0	8		2.5-50			
32	4L	0	12		2.5-50			
32	4L	0	20		2.5-50			
32	4L	-3	8		2.5-50			
32	4L	-3	12		2.5-50			
32	4L	-3	20		2.5-50			

Table B9: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Rural Arterial Moderate Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
7	0	0	8		2.5-5			
7	0	-3	8		2.5-5			
7	4L	0	8		2.5-5			
7	4L	-3	8		2.5-5			
12	0	0	8		2.5-5			
12	0	0	12		2.5-5			
12	0	-3	8		2.5-5			
12	0	-3	12		2.5-5			
12	4L	0	8		2.5-5			
12	4L	0	12		2.5-5			
12	4L	-3	8		2.5-5			
12	4L	-3	12		2.5-5			
18	0	0	8		2.5-5			
18	0	0	12		2.5-5			
18	0	0	20		2.5-5			
18	0	-3	8		2.5-5			
18	0	-3	12		2.5-5			
18	0	-3	20		2.5-5			
18	4L	0	8		2.5-5			
18	4L	0	12		2.5-5			
18	4L	0	20		2.5-5			
18	4L	-3	8		2.5-5			
18	4L	-3	12		2.5-5			
18	4L	-3	20		2.5-5			
26	0	0	8		2.5-5			
26	0	0	12		2.5-5			
26	0	0	20		2.5-5			
26	0	-3	8		2.5-5			
26	0	-3	12		2.5-5			
26	0	-3	20		2.5-5			
26	4L	0	8		2.5-50			
26	4L	0	12		2.5-50			
26	4L	0	20		2.5-50			
26	4L	-3	8		2.5-50			
26	4L	-3	12		2.5-50			
26	4L	-3	20		2.5-50			
32	0	0	8	2.5-16.75	16.75-50			
32	0	0	12	2.5-50				
32	0	0	20	2.5-12	12-50			
32	0	-3	8	2.5-12	12-50			
32	0	-3	12	2.5-50				
32	0	-3	20		2.5-50			
32	4L	0	8	2.5-50				
32	4L	0	12	2.5-50				
32	4L	0	20	2.5-16.75	16.75-50			
32	4L	-3	8	2.5-50				
32	4L	-3	12	2.5-50				
32	4L	-3	20	2.5-12	12-50			

Table B10: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	8		2.5-40.5	40.5-50		
5	0	0	12		2.5-45.25	45.25-50		
5	0	0	20		2.5-45.25	45.25-50		
5	0	-3	8		2.5-35.75	35.75-50		
5	0	-3	12		2.5-40.5	40.5-50		
5	0	-3	20		2.5-35.75	35.75-50		
5	4L	0	8		2.5-50			
5	4L	0	12		2.5-50			
5	4L	0	20		2.5-50			
5	4L	-3	8		2.5-50			
5	4L	-3	12		2.5-50			
5	4L	-3	20		2.5-50			
8	0	0	8		2.5-35.75	35.75-50		
8	0	0	12		2.5-40.5	40.5-50		
8	0	0	20		2.5-50			
8	0	-3	8		2.5-31	31-50		
8	0	-3	12		2.5-35.75	35.75-50		
8	0	-3	20		2.5-50			
8	4L	0	8		2.5-50			
8	4L	0	12		2.5-40.5	40.5-50		
8	4L	0	20		2.5-50			
8	4L	-3	8		2.5-35.75	35.75-50		
8	4L	-3	12		2.5-31	31-50		
8	4L	-3	20		2.5-35.75	35.75-50		
12	0	0	8		2.5-31	31-50		
12	0	0	12		2.5-16.75		16.75-50	
12	0	0	20		2.5-50			
12	0	-3	8		2.5-26.25	26.25-50		
12	0	-3	12		2.5-12		12-50	
12	0	-3	20		2.5-50			
12	4L	0	8		2.5-50			
12	4L	0	12		2.5-50			
12	4L	0	20		2.5-45.25	45.25-50		
12	4L	-3	8		2.5-50			
12	4L	-3	12		2.5-50			
12	4L	-3	20		2.5-35.75	35.75-50		
18	0	0	8	2.5-50				
18	0	0	12		2.5-50			
18	0	0	20		2.5-50			
18	0	-3	8	2.5-50				
18	0	-3	12		2.5-40.5	40.5-50		
18	0	-3	20		2.5-50			
18	4L	0	8	2.5-50				
18	4L	0	12	2.5-50				
18	4L	0	20	2.5-50				
18	4L	-3	8	2.5-50				
18	4L	-3	12	2.5-50				
18	4L	-3	20	2.5-50				
24	0	0	8	2.5-50				
24	0	0	12	2.5-50				
24	0	0	20		2.5-50			
24	0	-3	8	2.5-50				
24	0	-3	12	2.5-50				
24	0	-3	20		2.5-50			
24	4L	0	8	2.5-50				
24	4L	0	12	2.5-50				
24	4L	0	20	2.5-50				
24	4L	-3	8	2.5-50				
24	4L	-3	12	2.5-50				
24	4L	-3	20	2.5-50				

Table B11: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Moderately Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	8		2.5-35.75	35.75-50		
5	0	0	12		2.5-40.5	40.5-50		
5	0	0	20		2.5-35.75	35.75-50		
5	0	-3	8		2.5-31	31-50		
5	0	-3	12		2.5-31	31-50		
5	0	-3	20		2.5-31	31-50		
5	4L	0	8		2.5-50			
5	4L	0	12		2.5-50			
5	4L	0	20		2.5-50			
5	4L	-3	8		2.5-50			
5	4L	-3	12		2.5-50			
5	4L	-3	20		2.5-50			
8	0	0	8		2.5-50			
8	0	0	12		2.5-40.5	40.5-50		
8	0	0	20		2.5-35.75	35.75-50		
8	0	-3	8		2.5-35.75	35.75-50		
8	0	-3	12		2.5-40.5	40.5-50		
8	0	-3	20		2.5-31	31-50		
8	4L	0	8		2.5-50			
8	4L	0	12		2.5-50			
8	4L	0	20		2.5-50			
8	4L	-3	8		2.5-50			
8	4L	-3	12		2.5-35.75	35.75-50		
8	4L	-3	20		2.5-40.5	40.5-50		
12	0	0	8		2.5-40.5	40.5-50		
12	0	0	12		2.5-21.5		21.5-50	
12	0	0	20		2.5-50			
12	0	-3	8		2.5-35.75	35.75-50		
12	0	-3	12		2.5-16.75		16.75-50	
12	0	-3	20		2.5-50			
12	4L	0	8	2.5-50				
12	4L	0	12	2.5-50				
12	4L	0	20		2.5-50			
12	4L	-3	8	2.5-50				
12	4L	-3	12	2.5-50				
12	4L	-3	20		2.5-50			
18	0	0	8	2.5-50				
18	0	0	12	2.5-16.75	16.75-50			
18	0	0	20		2.5-50			
18	0	-3	8	2.5-50				
18	0	-3	12	2.5-12	12-35.75		35.75-50	
18	0	-3	20		2.5-50			
18	4L	0	8	2.5-50				
18	4L	0	12	2.5-50				
18	4L	0	20	2.5-50				
18	4L	-3	8	2.5-50				
18	4L	-3	12	2.5-50				
18	4L	-3	20	2.5-50				
24	0	0	8	2.5-50				
24	0	0	12	2.5-50				
24	0	0	20	2.5-16.75	16.75-50			
24	0	-3	8	2.5-50				
24	0	-3	12	2.5-50				
24	0	-3	20	2.5-16.75	16.75-50			
24	4L	0	8	2.5-50				
24	4L	0	12	2.5-50				
24	4L	0	20	2.5-50				
24	4L	-3	8	2.5-50				
24	4L	-3	12	2.5-50				
24	4L	-3	20	2.5-50				

Table B12: Guardrail Use Guidelines for Rural Arterial, Benefit-Cost Greater Than 3

Moderate Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	8		2.5-50			
5	0	0	12		2.5-50			
5	0	0	20		2.5-50			
5	0	-3	8		2.5-50			
5	0	-3	12		2.5-50			
5	0	-3	20		2.5-50			
5	4L	0	8	2.5-50				
5	4L	0	12	2.5-50				
5	4L	0	20	2.5-50				
5	4L	-3	8	2.5-50				
5	4L	-3	12	2.5-50				
5	4L	-3	20	2.5-50				
8	0	0	8		2.5-50			
8	0	0	12		2.5-50			
8	0	0	20		2.5-50			
8	0	-3	8		2.5-50			
8	0	-3	12		2.5-50			
8	0	-3	20		2.5-50			
8	4L	0	8	2.5-50				
8	4L	0	12	2.5-50				
8	4L	0	20	2.5-50				
8	4L	-3	8	2.5-50				
8	4L	-3	12	2.5-50				
8	4L	-3	20	2.5-50				
12	0	0	8	2.5-50				
12	0	0	12	2.5-50				
12	0	0	20		2.5-50			
12	0	-3	8	2.5-50				
12	0	-3	12	2.5-50				
12	0	-3	20		2.5-50			
12	4L	0	8	2.5-50				
12	4L	0	12	2.5-50				
12	4L	0	20	2.5-50				
12	4L	-3	8	2.5-50				
12	4L	-3	12	2.5-50				
12	4L	-3	20	2.5-50				
18	0	0	8	2.5-50				
18	0	0	12	2.5-50				
18	0	0	20	7.25-12	2.5-7.25, 12-50			
18	0	-3	8	2.5-50				
18	0	-3	12	2.5-50				
18	0	-3	20		2.5-7.25, 7.25-50			
18	4L	0	8	2.5-50				
18	4L	0	12	2.5-50				
18	4L	0	20	2.5-50				
18	4L	-3	8	2.5-50				
18	4L	-3	12	2.5-50				
18	4L	-3	20	2.5-50				
24	0	0	8	2.5-50				
24	0	0	12	2.5-50				
24	0	0	20	2.5-50				
24	0	-3	8	2.5-50				
24	0	-3	12	2.5-50				
24	0	-3	20	2.5-50				
24	4L	0	8	2.5-50				
24	4L	0	12	2.5-50				
24	4L	0	20	2.5-50				
24	4L	-3	8	2.5-50				
24	4L	-3	12	2.5-50				
24	4L	-3	20	2.5-50				

Table B13: Guardrail Use Guidelines for Rural LC, Benefit-Cost Greater Than 3

Rural LC Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		0.5-5			
5	0	0	6		0.5-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	10L	0	3		0.5-5			
5	10L	0	6		0.5-5			
5	10L	-6	3		0.5-5			
5	10L	-6	6		0.5-5			
8	0	0	3		0.5-5			
8	0	0	6		0.5-5			
8	0	0	12		0.5-5			
8	0	-6	3		0.5-5			
8	0	-6	6		0.5-5			
8	0	-6	12		0.5-5			
8	10L	0	3		0.5-5			
8	10L	0	6		0.5-5			
8	10L	0	12		0.5-5			
8	10L	-6	3		0.5-5			
8	10L	-6	6		0.5-5			
8	10L	-6	12		0.5-5			
12	0	0	3		0.5-5			
12	0	0	6		0.5-5			
12	0	0	12		0.5-5			
12	0	-6	3		0.5-5			
12	0	-6	6		0.5-5			
12	0	-6	12		0.5-5			
12	10L	0	3		0.5-5			
12	10L	0	6		0.5-5			
12	10L	0	12		0.5-5			
12	10L	-6	3		0.5-5			
12	10L	-6	6		0.5-5			
12	10L	-6	12		0.5-5			
18	0	0	3		0.5-5			
18	0	0	6		0.5-5			
18	0	0	12		0.5-5			
18	0	-6	3		0.5-5			
18	0	-6	6		0.5-5			
18	0	-6	12		0.5-5			
18	10L	0	3		0.5-5			
18	10L	0	6		0.5-5			
18	10L	0	12		0.5-5			
18	10L	-6	3		0.5-5			
18	10L	-6	6		0.5-5			
18	10L	-6	12		0.5-5			
24	0	0	3		0.5-5			
24	0	0	6		0.5-5			
24	0	0	12		0.5-5			
24	0	-6	3		0.5-5			
24	0	-6	6		0.5-5			
24	0	-6	12		0.5-5			
24	10L	0	3		0.5-5			
24	10L	0	6		0.5-5			
24	10L	0	12		0.5-5			
24	10L	-6	3		0.5-5			
24	10L	-6	6		0.5-5			
24	10L	-6	12		0.5-5			

Table B14: Guardrail Use Guidelines forRural LC, Benefit-Cost Greater Than 3

Rural LC Moderately Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		0.5-5			
5	0	0	6		0.5-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	10L	0	3		0.5-5			
5	10L	0	6		0.5-5			
5	10L	-6	3		0.5-5			
5	10L	-6	6		0.5-5			
8	0	0	3		0.5-5			
8	0	0	6		0.5-5			
8	0	0	12		0.5-5			
8	0	-6	3		0.5-5			
8	0	-6	6		0.5-5			
8	0	-6	12		0.5-5			
8	10L	0	3		0.5-5			
8	10L	0	6		0.5-5			
8	10L	0	12		0.5-5			
8	10L	-6	3		0.5-5			
8	10L	-6	6		0.5-5			
8	10L	-6	12		0.5-5			
12	0	0	3		0.5-5			
12	0	0	6		0.5-5			
12	0	0	12		0.5-5			
12	0	-6	3		0.5-5			
12	0	-6	6		0.5-5			
12	0	-6	12		0.5-5			
12	10L	0	3		0.5-5			
12	10L	0	6		0.5-5			
12	10L	0	12		0.5-5			
12	10L	-6	3		0.5-5			
12	10L	-6	6		0.5-5			
12	10L	-6	12		0.5-5			
18	0	0	3		0.5-5			
18	0	0	6		0.5-5			
18	0	0	12		0.5-5			
18	0	-6	3		0.5-5			
18	0	-6	6		0.5-5			
18	0	-6	12		0.5-5			
18	10L	0	3		0.5-5			
18	10L	0	6		0.5-5			
18	10L	0	12		0.5-5			
18	10L	-6	3		0.5-5			
18	10L	-6	6		0.5-5			
18	10L	-6	12		0.5-5			
24	0	0	3		0.5-5			
24	0	0	6		0.5-5			
24	0	0	12		0.5-5			
24	0	-6	3		0.5-5			
24	0	-6	6		0.5-5			
24	0	-6	12		0.5-5			
24	10L	0	3		0.5-5			
24	10L	0	6		0.5-5			
24	10L	0	12		0.5-5			
24	10L	-6	3		0.5-5			
24	10L	-6	6		0.5-5			
24	10L	-6	12		0.5-5			

Table B15: Guardrail Use Guidelines for Rural LC, Benefit-Cost Greater Than 3

Rural LC Moderate Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-0.95	0.95-5			
5	0	0	6	0.5-1.4	1.4-5			
5	0	-6	3		0.5-5			
5	0	-6	6	0.5-0.95	0.95-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
8	0	0	3	0.5-1.4	1.4-5			
8	0	0	6	0.5-1.4	1.4-5			
8	0	0	12	0.5-1.4	1.4-5			
8	0	-6	3	0.5-0.95	0.95-5			
8	0	-6	6	0.5-0.95	0.95-5			
8	0	-6	12	0.5-0.95	0.95-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-5				
12	0	0	12	0.5-5				
12	0	-6	3	0.5-5				
12	0	-6	6	0.5-5				
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B16: Guardrail Use Guidelines for Rural LC, Benefit-Cost Greater Than 3

Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-0.95	0.95-5			
5	0	0	6	0.5-0.95	0.95-5			
5	0	0	12	0.5-0.95	0.95-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	0	-6	12		0.5-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-1.4	1.4-5			
8	0	0	6	0.5-1.4	1.4-5			
8	0	0	12	0.5-1.4	1.4-5			
8	0	-6	3	0.5-0.95	0.95-5			
8	0	-6	6		0.5-0.95			
8	0	-6	12		0.5-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.8-2.3, 3.2-5	2.3-3.2			
12	0	0	6	0.5-2.3, 4.1-5	2.3-4.1			
12	0	0	12	0.5-1.85, 4.55-5	1.85-4.55			
12	0	-6	3	0.5-0.95	0.95-5			
12	0	-6	6	0.5-0.95	0.95-5			
12	0	-6	12	0.5-0.95	0.95-5			
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-2.3, 3.2-5	2.3-3.2			
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B17: Guardrail Use Guidelines for Rural LC, Benefit-Cost Greater Than 3

Moderately Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-0.95	0.95-5			
5	0	0	6	0.5-1.4	1.4-5			
5	0	0	12	0.5-0.95	0.95-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	0	-6	12		0.5-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-1.4	1.4-5			
8	0	0	6	0.5-0.95	0.95-5			
8	0	0	12	0.5-1.4	1.4-5			
8	0	-6	3		0.5-5			
8	0	-6	6	0.5-0.95	0.95-5			
8	0	-6	12	0.5-0.95	0.95-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-2.3, 3.2-5	2.3-3.2			
12	0	0	12	0.5-5				
12	0	-6	3	0.5-1.4	1.4-5			
12	0	-6	6	0.5-1.4	1.4-5			
12	0	-6	12	0.5-1.4	1.4-5			
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B18: Guardrail Use Guidelines for Rural LC, Benefit-Cost Greater Than 3

Moderate Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-5				
5	0	0	6	0.5-5				
5	0	0	12	0.5-5				
5	0	-6	3	0.5-1.85, 4.1-4.55	1.85-4.1, 4.55-5			
5	0	-6	6	0.5-1.4, 3.2-5	1.4-3.2			
5	0	-6	12	0.5-2.3, 4.1-5	2.3-4.1			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-5				
8	0	0	6	0.5-5				
8	0	0	12	0.5-1.4, 3.2-5	1.4-3.2			
8	0	-6	3	0.5-5				
8	0	-6	6	0.5-5				
8	0	-6	12	0.5-5				
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-2.3, 3.2-5	2.3-3.2			
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-1.4, 3.2-5	1.4-3.2			
12	0	0	3	0.5-5				
12	0	0	6	0.5-5				
12	0	0	12	0.5-5				
12	0	-6	3	0.5-5				
12	0	-6	6	0.5-5				
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B19: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Urban Arterial Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3			5-80		
5	0	0	6			5-80		
5	0	-3	3			5-80		
5	0	-3	6			5-80		
5	6L	0	3			5-80		
5	6L	0	6			5-80		
5	6L	-3	3			5-80		
5	6L	-3	6			5-80		
8	0	0	3			5-80		
8	0	0	6			5-80		
8	0	0	12			5-80		
8	0	-3	3			5-80		
8	0	-3	6			5-80		
8	0	-3	12			5-80		
8	6L	0	3			5-80		
8	6L	0	6			5-80		
8	6L	0	12			5-80		
8	6L	-3	3			5-80		
8	6L	-3	6			5-80		
8	6L	-3	12			5-80		
12	0	0	3			5-80		
12	0	0	6			5-80		
12	0	0	12			5-80		
12	0	-3	3			5-80		
12	0	-3	6			5-80		
12	0	-3	12			5-80		
12	6L	0	3			5-80		
12	6L	0	6			5-80		
12	6L	0	12			5-80		
12	6L	-3	3			5-80		
12	6L	-3	6			5-80		
12	6L	-3	12			5-80		
18	0	0	3		5-12.5	12.5-80		
18	0	0	6		5-12.5	12.5-80		
18	0	0	12		5-12.5	12.5-80		
18	0	-3	3			5-80		
18	0	-3	6			5-80		
18	0	-3	12			5-80		
18	6L	0	3			5-80		
18	6L	0	6			5-80		
18	6L	0	12			5-80		
18	6L	-3	3			5-80		
18	6L	-3	6			5-80		
18	6L	-3	12			5-80		
24	0	0	3			5-80		
24	0	0	6			5-80		
24	0	0	12			5-80		
24	0	-3	3			5-80		
24	0	-3	6			5-80		
24	0	-3	12			5-80		
24	6L	0	3		5-80			
24	6L	0	6		5-80			
24	6L	0	12			5-80		
24	6L	-3	3		5-80			
24	6L	-3	6		5-80			
24	6L	-3	12			5-80		

Table B20: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Urban Arterial Moderately Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3			5-80		
5	0	0	6			5-80		
5	0	-3	3			5-80		
5	0	-3	6			5-80		
5	6L	0	3			5-80		
5	6L	0	6			5-80		
5	6L	-3	3			5-80		
5	6L	-3	6			5-80		
8	0	0	3			5-80		
8	0	0	6			5-80		
8	0	0	12			5-80		
8	0	-3	3			5-80		
8	0	-3	6			5-80		
8	0	-3	12			5-80		
8	6L	0	3		5-12.5	12.5-80		
8	6L	0	6			5-12.5		12.5-80
8	6L	0	12			5-80		
8	6L	-3	3			5-80		
8	6L	-3	6			5-12.5		12.5-80
8	6L	-3	12			5-80		
12	0	0	3		5-42.5	42.5-80		
12	0	0	6		5-27.5	27.5-80		
12	0	0	12		5-20	20-80		
12	0	-3	3		5-35	35-80		
12	0	-3	6		5-42.5, 57.5-80	42.5-57.5		
12	0	-3	12			5-80		
12	6L	0	3		5-80			
12	6L	0	6		5-12.5			12.5-80
12	6L	0	12			5-80		
12	6L	-3	3		5-80			
12	6L	-3	6		5-12.5			12.5-80
12	6L	-3	12			5-80		
18	0	0	3		5-80			
18	0	0	6		5-80			
18	0	0	12		5-72.5	72.5-80		
18	0	-3	3		5-80			
18	0	-3	6		5-80			
18	0	-3	12		5-72.5	72.5-80		
18	6L	0	3		5-80			
18	6L	0	6		5-80			
18	6L	0	12		5-80			
18	6L	-3	3		5-80			
18	6L	-3	6		5-80			
18	6L	-3	12		5-80			
24	0	0	3		5-80			
24	0	0	6		5-80			
24	0	0	12		5-80			
24	0	-3	3		5-80			
24	0	-3	6		5-80			
24	0	-3	12		5-80			
24	6L	0	3		5-80			
24	6L	0	6		5-80			
24	6L	0	12		5-80			
24	6L	-3	3		5-80			
24	6L	-3	6		5-80			
24	6L	-3	12		5-80			

Table B21: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Urban Arterial Moderate Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		5-80			
5	0	0	6		5-80			
5	0	-3	3		5-80			
5	0	-3	6		5-80			
5	6L	0	3		5-80			
5	6L	0	6		5-80			
5	6L	-3	3		5-80			
5	6L	-3	6		5-80			
8	0	0	3		5-80			
8	0	0	6		5-80			
8	0	0	12		5-80			
8	0	-3	3		5-80			
8	0	-3	6		5-80			
8	0	-3	12		5-80			
8	6L	0	3		5-80			
8	6L	0	6		5-80			
8	6L	0	12		5-80			
8	6L	-3	3		5-80			
8	6L	-3	6		5-80			
8	6L	-3	12		5-80			
12	0	0	3		5-80			
12	0	0	6		5-80			
12	0	0	12		5-80			
12	0	-3	3		5-80			
12	0	-3	6		5-80			
12	0	-3	12		5-80			
12	6L	0	3		5-80			
12	6L	0	6		5-80			
12	6L	0	12		5-80			
12	6L	-3	3		5-80			
12	6L	-3	6		5-80			
12	6L	-3	12		5-80			
18	0	0	3		5-80			
18	0	0	6		5-80			
18	0	0	12		5-80			
18	0	-3	3		5-80			
18	0	-3	6		5-80			
18	0	-3	12		5-80			
18	6L	0	3	5-80				
18	6L	0	6		5-80			
18	6L	0	12		5-80			
18	6L	-3	3	5-35, 50-80	35-50			
18	6L	-3	6		5-80			
18	6L	-3	12		5-80			
24	0	0	3		5-80			
24	0	0	6		5-80			
24	0	0	12		5-80			
24	0	-3	3		5-80			
24	0	-3	6		5-80			
24	0	-3	12		5-80			
24	6L	0	3	5-80				
24	6L	0	6	5-80				
24	6L	0	12	5-80				
24	6L	-3	3	5-80				
24	6L	-3	6	5-80				
24	6L	-3	12	5-35, 50-65	35-50, 65-80			

Table B22: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		5-27.5	27.5-80		
5	0	0	6		5-35	35-80		
5	0	0	12		5-35	35-80		
5	0	-3	3		5-20	20-80		
5	0	-3	6		5-27.5	27.5-80		
5	0	-3	12		5-27.5	27.5-80		
5	6L	0	3		5-80			
5	6L	0	6		5-80			
5	6L	0	12		5-80			
5	6L	-3	3		5-80			
5	6L	-3	6		5-80			
5	6L	-3	12		5-80			
8	0	0	3		5-35	35-80		
8	0	0	6		5-65	65-80		
8	0	0	12		5-72.5	72.5-80		
8	0	-3	3		5-27.5	27.5-80		
8	0	-3	6		5-57.5	57.5-80		
8	0	-3	12		5-65	65-80		
8	6L	0	3		5-80			
8	6L	0	6		5-80			
8	6L	0	12		5-80			
8	6L	-3	3		5-80			
8	6L	-3	6		5-80			
8	6L	-3	12		5-80			
12	0	0	3		5-80			
12	0	0	6		5-72.5	72.5-80		
12	0	0	12		5-80			
12	0	-3	3		5-80			
12	0	-3	6		5-80			
12	0	-3	12		5-80			
12	6L	0	3		5-80			
12	6L	0	6		5-80			
12	6L	0	12		5-80			
12	6L	-3	3		5-80			
12	6L	-3	6		5-80			
12	6L	-3	12		5-80			
18	0	0	3		5-80			
18	0	0	6		5-80			
18	0	0	12		5-80			
18	0	-3	3		5-80			
18	0	-3	6		5-80			
18	0	-3	12		5-80			
18	6L	0	3	5-80				
18	6L	0	6	5-80				
18	6L	0	12	5-35	35-80			
18	6L	-3	3	5-80				
18	6L	-3	6	5-80				
18	6L	-3	12	5-35	35-80			
24	0	0	3	5-12.5	12.5-80			
24	0	0	6		5-80			
24	0	0	12		5-80			
24	0	-3	3		5-80			
24	0	-3	6		5-80			
24	0	-3	12		5-80			
24	6L	0	3	5-80				
24	6L	0	6	5-80				
24	6L	0	12	5-80				
24	6L	-3	3	5-80				
24	6L	-3	6	5-80				
24	6L	-3	12	5-80				

Table B23: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Moderately Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		5-42.5	42.5-80		
5	0	0	6		5-35	35-80		
5	0	0	12		5-35	35-80		
5	0	-3	3		5-35	35-80		
5	0	-3	6		5-27.5	27.5-80		
5	0	-3	12		5-27.5	27.5-80		
5	6L	0	3		5-80			
5	6L	0	6		5-80			
5	6L	0	12		5-80			
5	6L	-3	3		5-80			
5	6L	-3	6		5-80			
5	6L	-3	12		5-80			
8	0	0	3		5-72.5	72.5-80		
8	0	0	6		5-80			
8	0	0	12		5-80			
8	0	-3	3		5-65	65-80		
8	0	-3	6		5-65	65-80		
8	0	-3	12		5-65	65-80		
8	6L	0	3		5-80			
8	6L	0	6		5-80			
8	6L	0	12		5-80			
8	6L	-3	3		5-80			
8	6L	-3	6		5-80			
8	6L	-3	12		5-80			
12	0	0	3		5-80			
12	0	0	6		5-80			
12	0	0	12		5-80			
12	0	-3	3		5-80			
12	0	-3	6		5-80			
12	0	-3	12		5-80			
12	6L	0	3	5-27.5	27.5-80			
12	6L	0	6		5-80			
12	6L	0	12		5-80			
12	6L	-3	3	5-20	20-80			
12	6L	-3	6		5-80			
12	6L	-3	12		5-80			
18	0	0	3	5-12.5	12.5-80			
18	0	0	6		5-80			
18	0	0	12		5-80			
18	0	-3	3		5-80			
18	0	-3	6		5-80			
18	0	-3	12		5-80			
18	6L	0	3	5-80				
18	6L	0	6	5-80				
18	6L	0	12	5-80				
18	6L	-3	3	5-80				
18	6L	-3	6	5-80				
18	6L	-3	12	5-80				
24	0	0	3	5-27.5	27.5-80			
24	0	0	6	5-12.5	12.5-80			
24	0	0	12		5-80			
24	0	-3	3	5-20	20-80			
24	0	-3	6	5-12.5	12.5-80			
24	0	-3	12		5-80			
24	6L	0	3	5-80				
24	6L	0	6	5-80				
24	6L	0	12	5-80				
24	6L	-3	3	5-80				
24	6L	-3	6	5-80				
24	6L	-3	12	5-80				

Table B24: Guardrail Use Guidelines for Urban Arterial, Benefit-Cost Greater Than 3

Moderate Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	5-12.5	12.5-80			
5	0	0	6	5-12.5	12.5-80			
5	0	0	12	5-12.5	12.5-80			
5	0	-3	3		5-80			
5	0	-3	6		5-80			
5	0	-3	12	5-12.5	12.5-80			
5	6L	0	3	5-80				
5	6L	0	6	5-80				
5	6L	0	12	5-80				
5	6L	-3	3	5-80				
5	6L	-3	6	5-80				
5	6L	-3	12	5-80				
8	0	0	3	5-80				
8	0	0	6	5-20	20-80			
8	0	0	12	5-35	35-80			
8	0	-3	3	5-80				
8	0	-3	6	5-20	20-80			
8	0	-3	12	5-20	20-80			
8	6L	0	3	5-80				
8	6L	0	6	5-80				
8	6L	0	12	5-80				
8	6L	-3	3	5-80				
8	6L	-3	6	5-80				
8	6L	-3	12	5-80				
12	0	0	3	5-80				
12	0	0	6	5-80				
12	0	0	12	5-27.5	27.5-80			
12	0	-3	3	5-80				
12	0	-3	6	5-80				
12	0	-3	12	5-27.5	27.5-80			
12	6L	0	3	5-80				
12	6L	0	6	5-80				
12	6L	0	12	5-80				
12	6L	-3	3	5-80				
12	6L	-3	6	5-80				
12	6L	-3	12	5-80				
18	0	0	3	5-80				
18	0	0	6	5-80				
18	0	0	12	5-80				
18	0	-3	3	5-80				
18	0	-3	6	5-80				
18	0	-3	12	5-80				
18	6L	0	3	5-80				
18	6L	0	6	5-80				
18	6L	0	12	5-80				
18	6L	-3	3	5-80				
18	6L	-3	6	5-80				
18	6L	-3	12	5-80				
24	0	0	3	5-80				
24	0	0	6	5-80				
24	0	0	12	5-80				
24	0	-3	3	5-80				
24	0	-3	6	5-80				
24	0	-3	12	5-80				
24	6L	0	3	5-80				
24	6L	0	6	5-80				
24	6L	0	12	5-80				
24	6L	-3	3	5-80				
24	6L	-3	6	5-80				
24	6L	-3	12	5-80				

Table B25: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Urban LC Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		0.5-5			
5	0	0	6		0.5-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	10L	0	3		0.5-5			
5	10L	0	6		0.5-5			
5	10L	-6	3		0.5-5			
5	10L	-6	6		0.5-5			
8	0	0	3		0.5-5			
8	0	0	6		0.5-5			
8	0	0	12		0.5-5			
8	0	-6	3		0.5-5			
8	0	-6	6		0.5-5			
8	0	-6	12		0.5-5			
8	10L	0	3		0.5-5			
8	10L	0	6		0.5-5			
8	10L	0	12		0.5-5			
8	10L	-6	3		0.5-5			
8	10L	-6	6		0.5-5			
8	10L	-6	12		0.5-5			
12	0	0	3		0.5-5			
12	0	0	6		0.5-5			
12	0	0	12		0.5-5			
12	0	-6	3		0.5-5			
12	0	-6	6		0.5-5			
12	0	-6	12		0.5-5			
12	10L	0	3		0.5-5			
12	10L	0	6		0.5-5			
12	10L	0	12		0.5-5			
12	10L	-6	3		0.5-5			
12	10L	-6	6		0.5-5			
12	10L	-6	12		0.5-5			
18	0	0	3		0.5-5			
18	0	0	6		0.5-5			
18	0	0	12		0.5-5			
18	0	-6	3		0.5-5			
18	0	-6	6		0.5-5			
18	0	-6	12		0.5-5			
18	10L	0	3		0.5-5			
18	10L	0	6		0.5-5			
18	10L	0	12		0.5-5			
18	10L	-6	3		0.5-5			
18	10L	-6	6		0.5-5			
18	10L	-6	12		0.5-5			
24	0	0	3		0.5-5			
24	0	0	6		0.5-5			
24	0	0	12		0.5-5			
24	0	-6	3		0.5-5			
24	0	-6	6		0.5-5			
24	0	-6	12		0.5-5			
24	10L	0	3		0.5-5			
24	10L	0	6		0.5-5			
24	10L	0	12		0.5-5			
24	10L	-6	3		0.5-5			
24	10L	-6	6		0.5-5			
24	10L	-6	12		0.5-5			

Table B26: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Urban LC Moderately Severe Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3		0.5-5			
5	0	0	6		0.5-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
8	0	0	3	0.5-0.95	0.95-5			
8	0	0	6		0.5-5			
8	0	0	12	0.5-0.95	0.95-5			
8	0	-6	3		0.5-5			
8	0	-6	6		0.5-5			
8	0	-6	12		0.5-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-1.4	1.4-5			
12	0	0	6	0.5-1.4	1.4-5			
12	0	0	12	0.5-1.4	1.4-5			
12	0	-6	3	0.5-0.95	0.95-5			
12	0	-6	6		0.5-5			
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-2.75, 4.55-5	2.75-4.55			
18	0	-6	12	0.5-2.75	2.75-5			
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B27: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Urban LC Moderate Slope Functional Class				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-5				
5	0	0	6	0.5-5				
5	0	-6	3	0.5-5				
5	0	-6	6	0.5-5				
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-5				
8	0	0	3	0.5-5				
8	0	0	6	0.5-5				
8	0	0	12	0.5-5				
8	0	-6	3	0.5-5				
8	0	-6	6	0.5-5				
8	0	-6	12	0.5-5				
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-5				
12	0	0	12	0.5-5				
12	0	-6	3	0.5-5				
12	0	-6	6	0.5-5				
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B28: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-1.4	1.4-5			
5	0	0	6	0.5-1.4	1.4-5			
5	0	0	12		0.5-5			
5	0	-6	3	0.5-1.4	1.4-5			
5	0	-6	6		0.5-5			
5	0	-6	12		0.5-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-1.4, 3.2-5	1.4-3.2			
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-2.3, 3.2-5	2.3-3.2			
8	0	0	6	0.5-1.85, 4.55-5	1.85-4.55			
8	0	0	12	0.5-5				
8	0	-6	3	0.5-0.95	0.95-5			
8	0	-6	6	0.5-0.95	0.95-5			
8	0	-6	12	0.5-0.95	0.95-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-5				
12	0	0	12	0.5-5				
12	0	-6	3	0.5-2.3, 3.2-5	2.3-3.2			
12	0	-6	6	0.5-2.75, 4.55-5	2.75-4.55			
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B29: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Moderately Severe Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-0.95	0.95-5			
5	0	0	6	0.5-0.95	0.95-5			
5	0	0	12	0.5-0.95	0.95-5			
5	0	-6	3		0.5-5			
5	0	-6	6		0.5-5			
5	0	-6	12		0.5-5			
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-0.95, 3.2-5	0.95-3.2			
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-1.4	1.4-5			
8	0	0	6	0.5-0.95	0.95-5			
8	0	0	12	0.5-1.4	1.4-5			
8	0	-6	3		0.5-5			
8	0	-6	6	0.5-0.95	0.95-5			
8	0	-6	12	0.5-0.95	0.95-5			
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-2.3, 3.2-5	2.3-3.2			
12	0	0	12	0.5-5				
12	0	-6	3	0.5-1.4	1.4-5			
12	0	-6	6	0.5-1.4	1.4-5			
12	0	-6	12	0.5-1.4	1.4-5			
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				

Table B30: Guardrail Use Guidelines for Urban LC, Benefit-Cost Greater Than 3

Moderate Point Hazard				Range of Traffic Volumes Where Barrier is Optimal				
Hazard Offset	Curvature	Grade %	Offset to Slope	No Treatment	TL-2	TL-3	TL-4	TL-5
5	0	0	3	0.5-5				
5	0	0	6	0.5-5				
5	0	0	12	0.5-5				
5	0	-6	3	0.5-5				
5	0	-6	6	0.5-5				
5	0	-6	12	0.5-5				
5	10L	0	3	0.5-5				
5	10L	0	6	0.5-5				
5	10L	0	12	0.5-5				
5	10L	-6	3	0.5-5				
5	10L	-6	6	0.5-2.3, 3.2-5	2.3-3.2			
5	10L	-6	12	0.5-5				
8	0	0	3	0.5-5				
8	0	0	6	0.5-5				
8	0	0	12	0.5-1.85, 3.2-5	1.85-3.2			
8	0	-6	3	0.5-5				
8	0	-6	6	0.5-5				
8	0	-6	12	0.5-5				
8	10L	0	3	0.5-5				
8	10L	0	6	0.5-5				
8	10L	0	12	0.5-5				
8	10L	-6	3	0.5-5				
8	10L	-6	6	0.5-5				
8	10L	-6	12	0.5-5				
12	0	0	3	0.5-5				
12	0	0	6	0.5-5				
12	0	0	12	0.5-5				
12	0	-6	3	0.5-5				
12	0	-6	6	0.5-5				
12	0	-6	12	0.5-5				
12	10L	0	3	0.5-5				
12	10L	0	6	0.5-5				
12	10L	0	12	0.5-5				
12	10L	-6	3	0.5-5				
12	10L	-6	6	0.5-5				
12	10L	-6	12	0.5-5				
18	0	0	3	0.5-5				
18	0	0	6	0.5-5				
18	0	0	12	0.5-5				
18	0	-6	3	0.5-5				
18	0	-6	6	0.5-5				
18	0	-6	12	0.5-5				
18	10L	0	3	0.5-5				
18	10L	0	6	0.5-5				
18	10L	0	12	0.5-5				
18	10L	-6	3	0.5-5				
18	10L	-6	6	0.5-5				
18	10L	-6	12	0.5-5				
24	0	0	3	0.5-5				
24	0	0	6	0.5-5				
24	0	0	12	0.5-5				
24	0	-6	3	0.5-5				
24	0	-6	6	0.5-5				
24	0	-6	12	0.5-5				
24	10L	0	3	0.5-5				
24	10L	0	6	0.5-5				
24	10L	0	12	0.5-5				
24	10L	-6	3	0.5-5				
24	10L	-6	6	0.5-5				
24	10L	-6	12	0.5-5				