Crash Reduction Factors (as of 02/14/2014)
Florida Department of Transportation

Note: Use of CRFs based on less than 5 projects (Column C) are not recommended for use in B/C analysis. Positive CRFs imply reduced crashes. Negative CRFs imply increased crashes.

ID	Improvement	Potential Controlling Criteria Application														Number of Projects	Total	Fatal	Injury	PDO	Urban	Rural	Night	Day	Rear-End	Angle	Left-Turn	Right-Turn	Sideswipe	Fixed-Object	Head-On	Pedestrian	Ran-Off-Road	Wet Surface
		DS	LW	SW	BW	HA	SE	VA	G	SSD	CS	VC	HC	SC	Other																			
1	**New signal at channelized intersection**									x						***31***	12	15	20	-1	13	7	4	16	-51	53	16	70	10	-40	53	-90	-90	20
2	**New signal at non-channelized intersection**									x						***11***	15	58	15	14	20	-27	21	13	-5	11	34	23	23	51	-46	13	26	11
3	**Add signal and channelization**									x						***19***	19	-8	25	13	17	21	-41	31	-8	40	50	26	-16	-3	48	58	51	34
4	**Modify signal at channelized intersection**									x						***7***	11		31	-18	11		-13	18	29	20	17	7	-4	-272	-272	7	-86	22
5	Modify signal at non-channelized intersection									x						2	-99	-23	-118	-85	38	-141	-126	-73	-48	-94	-188	100	-23	38				-48
6	**Modify both signal and channelization**									x						***15***	24	50	33	13	25	-20	7	29	6	30	66	-4	4	4	-59	34	-164	33
7	**Modify signal and add channelization**									x						***10***	28	-87	27	29	28	30	-1	35	11	37	49	25	-42	-20	-87		38	-17
8	Remove signal														x	0																		
9	Add flashing warning signal (signalization)					x		x		x						4	-2	100	-37	28		-2	59	-22	80	-30	-117	100	-63	100			100	46
10	Interconnect traffic signals	x														0																		
11	**New LT channelization w/ LT phase (signalized)**	x														***9***	17	59	36	-9	16	44	16	19	5	16	50	-42	12	-1	15	29	68	18
12	**New LT channelization w/o LT phase (signalized)**	x														***10***	31	79	35	26	31	39	33	30	18	46	61	42	39	-26	38	41	12	49
13	**New LT channelization (nonsignalized intersection)**	x														***46***	3	61	9	-6	-6	20	-26	9	-5	7	24	42	1	-19	-26	6	0	21
14	**Modify intersection at signalized intersection**					x				x			x			***28***	6	-24	13	0	5	78	1	8	7	10	28	11	3	21	-9	16	24	18
15	**Modify intersection at non-signalized intersection**					x				x			x			***5***	18	66	32	6	18	100	13	15	10	25	59	43	31	-53	39	-2	-2	17
16	Modify channelization and add signal		x	x												2	22		21	22	22		-131	18	11	16	39	33	-6	58	-68	16	-26	5
17	**Increase storage lane**														x	***8***	11	-76	15	9	20	-10	-9	17	0	8	15	-36	7	1	-68	17	-6	17
18	**Add turn bay**		**x**	**x**				x		x						***8***	10	52	16	-1	10	10	1	11	5	6	21	36	20	-222	-190		36	48
19	**Add right turn**	x	**x**	**x**												***8***	9	67	9	8	0	52	-6	3	11	16	37	1	-20	-39	-33	-49	100	16
20	Add LT (T-intersection)	x	**x**	**x**												3	42	9	56	31	42	43	-39	61	37	84	84	-81	55	-55	100		48	-81
21	Add LT (Y-intersection)	x	**x**	**x**												1	42	-118	53	31	42		24	56	52	48	84	46	17	32	69	-118	27	64
22	**Add 2nd LT lane in same direction as existing**		**x**	**x**											x	***15***	4	0	13	-3	1	92	0	2	1	22	30	45	-33	28	-135	-25	13	15
23	Guardrail at bridges end				x								**x**			0																		
24	Guardrail at steep embankments		x	x									**x**			3	-5	-3	3	-16	-2	-19	-63	2	3	-184	-55		74	-120	100		5	-9
25	Guardrail at steep embankments with curve		x	x			x						**x**			1	-256		-78			-256		-167					100				11
26	Guardrail at roadside obstacles (piers, sign posts, poles, etc.)		x	x									**x**			1	52		60	37	52		27	62	44	100			68	37	100	100		54
27	Guardrail end treatments		x	x									**x**			0																		
28	Guardrail relocation		x	x									**x**			0																		
29	Guardrail removal		x	x									**x**			0																		
30	Add painted median		**x**	**x**											x	2	43	78	43	40		43	-273	25	33	14	68	66	62	-72	57	83	-15	39
31	**Add raised median**		**x**	**x**											x	***18***	20	38	19	20	20		22	19	2	29	48	23	41	-2	45	22	-37	27
32	Increase median width		**x**	**x**									x			4	-2	-12	0	-3	-10	100	-19	3	3	-43	5	3	-28	30	-699	-224	60	45
33	**Add two-way LT lanes**	x	**x**	**x**												***12***	41	35	45	39	40	44	33	44	58	32	36	32	38	34	18	-24	27	24
34	Install concrete median barrier		**x**	**x**									x			1	-37	56	-27	-46	-37		-71	-36	-46	-407	56	94	29	-112	9	-58	-73	-48
35	**Install double sided guardrail on wider median**		x	x									**x**			***12***	-16	33	1	-38	-29	1	-15	-17	3	-4	2		19	-83	61	-96	28	-54
36	Install attenuator type (IBC) barrier			x	x								**x**			0																		
37	Upgrade to concrete median barrier			x	x								**x**			0																		
38	Upgrade to attenuator barrier			x	x								**x**			0																		
39	Pavement deslicking										x	x				4	-3	-30	-13	2	-2	-20	-34	3	17	-24	-7	8	-43	8	-399	35	-127	30
40	**Skid Hazard overlay**										x	x				***95***	-6	-53	-5	-6	-5	-19	-11	-3	2	-35	0	5	-11	-9	-19	-13	-7	18
41	Pavement grooving										x	x				0																		
42	Eliminate parking		x	x						x				x		4	12	100	11	12	12		8	13	2	29	32	46	25	14	13	63		26
43	Change two-way operation to one-way		**x**	**x**												0																		
44	Prohibit turns									x						2	-190	100	-99	-309	-190		-43	-360	-198	-138				-19	-19	-19		-99
45	Modify speed limit (increase or decrease)	**x**					x	x		x				x		1	52	56	50	53		52		54	-18	75	85		71	56			100	78
46	Delineation of right edge lines		x	x												0																		
47	Delineation of painted median edge lines		x	x												1	-76		-18	-155	-76		-65	-85	-85	7	-85		31	-410				
48	Centerline striping		x													0																		
49	Delineation of no passing stripes		x			x		x		x						0																		
50	Delineation of reflectorized guide markers		x	x		x										0																		
51	Delineation of reflectorized raised pavement markers (center line)		x			x										1	10	23	11	5		21	16	3	7	7	-62	100	81	-36	38	100	25	7
52	Delineation of general pavement markings (stop bar, ped. crossing, code 46-51)		x	x						x						0																		
53	Delineation of guide posts on curves					x	x									0																		
54	Intersection delineation		x			x				x						0																		

ID	Improvement	Potential Controlling Criteria Application														Number of Projects	Total	Fatal	Injury	PDO	Urban	Rural	Night	Day	Rear-End	Angle	Left-Turn	Right-Turn	Sideswipe	Fixed-Object	Head-On	Pedestrian	Ran-Off-Road	Wet Surface
		DS	LW	SW	BW	HA	SE	VA	G	SSD	CS	VC	HC	SC	Other																			
55	Curve warning Signing	x				x	x									2	35		6	49	44	-306	56	21	72	-2	32		49	49	-2			-19
56	Chevrons Signing	x				x	x									1	30		12	63		30	-120	78	-120		100		100	-65	100	100	45	-120
57	All-way stops Signing									x						0																		
58	Overhead directional (where to turn) Signing														x	3	-7	100	-9	-5	-7		-17	-4	-15	16	9	41	14	-13	-383	-45		-11
59	Roadside directional (where to turn) Signing														x	0																		
60	Overhead lane designation Signing														x	0																		
61	Minor leg stop control Signing					x				x						0																		
62	Yield sign					x				x						0																		
63	Advanced warning signs				x	x	x	x	x	x		x		x	x	1	60		60			60		60			100							
64	Intersection directional or warning signs					x									x	0																		
65	**New roadway segment lighting**							x		x			x			***58***	2	23	10	-9	2	26	14	-5	-2	-4	25	20	1	-16	-11	33	16	6
66	**Upgrade roadway segment lighting**							x		x			x			***7***	-12	15	-11	-14	-12	100	0	-18	-22	-27	23	57	-1	-8	-39	-1	12	0
67	**New lighting at intersection**							x		x			x			***9***	-2	5	-11	8	-4	-1	31	-15	-30	-15	9	41	12	24	-42	-279	41	-26
68	Upgrade lighting at intersection							x		x			x			0																		
70	Bridge approach lighting			x	x								x			1	9		-5	21		9		32	-42				62	37			-26	24
71	Underpass lighting											x				0																		
72	Intersection flashers four leg red-yellow					x				x						2	-59			100		-59		36		-91	52							
73	Intersection flashers three leg red-yellow					x				x						0																		
74	Intersection flashers four way red					x				x						0																		-105
76	Advanced warning flashers (curve & intersection)					x	x			x						1																		
77	**Install flashing warning signal (flashing beacon)**					x				x						***5***	-29		-65	-12	-52	23	-111	-11	-80	-55	6	48	11	-48	100		29	-46
78	**Obstacle Removal/Hazard Mitigation**												**x**			***5***	25	28	37	5	26	19	33	19	22	37	44	14	4	19	6	-38	61	28
79	Relocate obstacle 30 feet from road												**x**			0																		
80	Convert to breakaway												**x**			0																		
81	Cushion attenuators												**x**			0																		
82	**Install guardrail**			x	x								**x**			***9***	-38	43	-9	-77	-57	16	-44	-37	-19	-37	19	100	-32	-82	-49	27	-6	-67
83	Upgrade substandard bridgerail			x	x								**x**			1	25		100	-125	25		100	-12						-12				
84	Realignment					**x**		x		x						3	60	50	71	50	-50	100	33	60	57	100	100			-200				0
85	Superelevation					x	**x**									1																		
86	**Modify/Close median openings**	x								x						***27***	18	40	26	9	18	92	6	21	6	29	58	25	11	-18	-46	-25	45	20
87	Relocate drives						x			x					x	0																		
88	Curtail turning movements									x					x	0																		
89	Increase radii at intersection					x				x						2	38	100	16	58		57	21	44	-5	48	-5					100		-109
90	Widen travel way		**x**				x									2	-52	27	-31	-66		-2	-149	-40	7	-56	-136	-164	-27	-10	45	-10	-147	-65
91	Widen shoulder			**x**						x						1	-9	26	-11	-11		16	-845	-18	5	-178	-48	-233	72	-39	-48		-78	1
92	Add 4 foot shoulders (bike lane)			**x**												1	6		15	3	6		-95	17	-15	-37	57	59	51	-173			67	-18
93	Construct grade separation					x		x		x					x	0																		
94	**Widen bridge (min. of 6 feet)**		x	x	**x**											***5***	55	-39	19	73	-39	65	7	61	48	-109	54	100	69	51	30	30	79	25
95	**Reconstruct road & shoulders**		**x**	**x**			**x**		**x**							***10***	-11	-99	-13	-8	-23	66	-41	-2	-1	-51	-9	9	-10	-35	-43	-29	-73	12
96	Reconstruct curve					**x**	**x**									3	42	100	53	43	40	54	28	53	23	27	58	100	78	48	100	17	64	27
97	Construct interchange					x		x		x						1	-60	100	-188	-24		100	100	-99	-61				-13	-50			25	-126
98	Lengthen accel/decel lanes	x								x						1																		
99	Extend drop lane	x								x						0																		
100	**Install rumble strips**		x	x	x	x	x			x						***9***	22	50	19	22	4	23	38	7	0	14	17	-56	48	4	36	-56	46	20
101	Flatten side slopes			x									**x**			0																		
102	Install Accel/Decel lane	x								x						2	20	100	9	8		20	52	10	39	22	-7		46			100	57	-115
103	**Upgrade signal and add pedestrian feature**									x					x	***17***	-5	10	16	-20	-5		-7	-7	-20	-20	19	-9	0	19	-78	0	37	-2
104	Sight distance improvements					x				**x**						3	25	-93	38	10	24	25	61	4	13	49	81		52	100				4
105	Minor structures replaced or improved for safety												x	**x**		1	14		32	-23	14		23	5	3	22	45	56	-14	56	100	-17		-86
106	Lanes added to travel way		**x**	**x**												4	13	69	18	5	13		26	5	-2	35	72	6	-15	-26	-214	-183	53	6
107	Upgraded guardrail			x	x								**x**			1	-22	-46	-16	-33	2	-44	8	-44	-25	-7	-155	-292	29	-85	-370	74	-10	-1
108	**Sidewalk construction**														x	***15***	-11	-9	1	-29	-11		2	-19	-16	-11	14	3	-34	-2	43	15	-15	1
109	Over/Under passes for pedestrians and/or bicycles														x	2	37		7	67	37		31	35	20	100			57		13			48
110	Fencing or other pedestrian barriers												x		x	2	-4	100	11	-43	-4		-61	4	3	10	27	100	-107	-12	3	-45		1
111	Ramps on existing curbs														x	0																		
112	New bikeway/multi-use path construction														x	0																		
113	Bicycle non-construction improvements														x	0																		
114	Impact Attenuators			x	x								**x**			3	2		16	-27	2		-14	4	-3	-14	45	-36	26	-70	-2	-2	74	2

ID	Improvement	Potential Controlling Criteria Application														Number of Projects	Total	Fatal	Injury	PDO	Urban	Rural	Night	Day	Rear-End	Angle	Left-Turn	Right-Turn	Sideswipe	Fixed-Object	Head-On	Pedestrian	Ran-Off-Road	Wet Surface
		DS	LW	SW	BW	HA	SE	VA	G	SSD	CS	VC	HC	SC	Other																			
115	**Signing and Pavement Markings**		x	x	x		x				x					***11***	11	1	11	11	11	6	0	13	10	5	20	4	-21	13	23	-14	8	15
116	Install Traffic Calming Features	**x**														2	8	100	3	-16	8		13	20	42	36			42	-132	100		71	42
117	**Add paved shoulders**			**x**			x				x					***21***	5	-6	12	-9	8	2	9	2	-1	-5	22	40	11	-2	-2	24	4	19
118	**Add turn lane/s & pavement resurfacing**		**x**	**x**			x				x					***6***	35	3	47	21	35		45	31	49	20	53	51	-15	3	51	3	-46	33
119	Reconstruct bicycle/multi-use path														x	1	37	100	40	33	37		64	24	17	38	52	4	61	36	52			71
120	Construct median, add signal, & pavmnt.resurfacing		**x**	**x**			x				x					4	9	-104	34	-30	9		-6	13	31	4	22	-53	-55	-13	32		100	33
121	**Reconstruct median/median improvments**		**x**	**x**												***16***	-14	56	-6	-27	-25	40	0	-19	-31	-57	14	13	-27	-5	-10	-26	26	-23
122	**Construct LT and RT lanes**		**x**	**x**												***5***	-8	-7	-4	-12	-12	39	5	-8	-1	-76	11	-22	-107	5	-114	20	47	19
123	Paved shoulders & rumble strips		x	**x**			x				x					3	3	69	8	-17	-79	51	-1	11	-38	-57	62	65	-5	-10	25	100	5	24
124	Upgrade traffic signal									x		x			x	3	16		21	12	16		20	11	34	14	-27	-45	-31	30	-24	31		35
125	Traffic signals, guardrail, signing & lighting									x			**x**		x	0																		
126	Traffic signals, resurfacing, turn lanes, lighting		**x**	**x**				x					x			4	-51	100	-27	-87	-36	-158	-105	-48	-52	-32	-47	-67	-80	-128	-42	-24	29	-37
127	Resurface, guardrail, signing & pavt. markings		x	x			x				x		**x**			1	-23		25	-161	-23		-112	2	-71	16	76			100			-96	-96
128	Add Ped crossing mid-block with signals														x	3	-23	-93	-21	-24	-23		-25	-16	-60	-19		-286	4	4		52		-148
129	Add Ped crossing mid-block without signals														x	1	-52	-46	-27	-108	-52		-37	-58	-70	-22	19	-191	-154	-240	-122	-73	100	-37
130	Add roundabout to intersection	x			x					x						2	46	100	58	32	46		41	47	65	17	76	-90	44	5	-1607	-8	100	66
131	Convert shldr inverted rumble to audible edgeline			x												0																		
132	**New inverted AUDIBLE marking on CL or edgeline**		x	x		x	x				x					***12***	6	4	14	-6	-5	11	3	9	-19	18	35	21	55	15	17	15	40	4
133	Use of ITS safety system device(s)														x	1	-16		52	-42	-16		-3	-8	-267	31	-3	-106	-158	-3	83	100		-106
134	High friction surface treatment (tyregrip, etc.)					x	x		x		x					1																		
135	Modify signal timing and phasing	x													x	2	14		30	-1	14		-9	20	-22	31	66	-20	-17	33	100	-141		36

1. Source of Crash Data: The Department of Highway Safety and Motor Vehicles (DHSMV) is the official custodian of the crash reports. The numbers that DHSMV reports are the official numbers. The Florida Department of Transportation (FDOT) Safety Office maintains its own database with crash data obtained from DHSMV, and conducts analyses based on this data for internal FDOT purposes.

2. Use Restrictions: The information on the Traffic Safety Web Portal has been compiled from information collected for the purpose of identifying, evaluating or planning safety enhancements. It is used to develop highway safety construction improvements projects which may be implemented utilizing Federal Aid Highway funds. Any document displaying this notice shall be used only for the purposes deemed appropriate by the Florida Department of Transportation. See Title 23, United States Code, Section 409.

3. Crash Reduction Factors Parameters - ID: 465, From Year: Any Year, To Year: 2009, Before Month: 36, Min. Before Month: 12, After Month: 36, Min. After Month: 12

DS - Design Speed
LW - Lane Width
SW - Shoulder Width
BW - Bridge Width
HA - Horizontal Alignment
SE - Superelevation
VA - Vertical Alignment
G - Grade
SSD - Stopping Sight Distance
CS - Cross Slope
VC - Vertical Clearance
HC - Horizontal Clearance
SC - Structural Capacity