

## EXHIBIT 10-E COLLISION REDUCTION FACTOR AND IMPROVEMENT LIFE

## Collision Reduction Factor and Improvement Life

Type Of Improvement	Collision Reduction Factor (CRF)	Improvement Life (Years)
Roadway Illumination (where no lighting exists)	0.15 <sup>(1)</sup>	15
Relocation or Breakaway Utility Poles	0.2	10
Traffic Signs (General)	0.05	6
Curve Warning Arrows	0.2	6
Advance Curve Warning with Advisory Speed	0.2	6
4-Way Stop	0.5	6
Upgrade with Breakaway Supports	0.2	10
Upgrade Median Barrier (includes new median barrier)	0.2	15
Remove Obstacles	0.2	20
New Traffic Signals	0.2	15
Upgrade Guardrail (include new guardrail)	0.2	10
Impact Attenuators	0.2	10
Upgrade Traffic Signals (includes interconnection)	0.2	15
Sight Distance Improvement	0.2	10
Construct Raised Median for Traffic Separation	0.2	20
Groove Pavement for Skid Treatment	0.1	10
Turning Lanes (except for new left-turn lane) and Traffic Channelization	0.15	15
New left-turn lane at signalized intersection (with no left-turn phase)	0.15	15
New left-turn lane at signalized intersection (with left-turn phase)	0.35	15
New left-turn lane at nonsignalized intersection	0.35	15
Two-way left-turn lane	0.25	15
Pavement Markings and Delineation	0.05	2
Widen or Improve Shoulder	0.2	20
Flatten Side Slopes	0.2	20
Realign Roadway	0.5	10
Overlay for Skid Treatment	0.1	10
Rumble Strip	0.5 <sup>(2)</sup>	10
Superelevation Improvement	0.5 <sup>(3)</sup>	15
Truck Escape Ramp	0.75 <sup>(4)</sup>	20
Reconstruction (combinations & miscellaneous)	0.2	10

Source: 2001 Hazard Elimination Safety Program Guidelines supplemented by 2002 Caltrans Highway Safety Improvement Program.

- (1) Applies to nighttime collisions only.
- (2) Applies to drift-off-the-road collisions only.
- (3) Applies to run-off-the-road collisions only.
- (4) Applies to run-away truck collisions only.

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