



PLANNING-LEVEL CRASH REDUCTION FACTOR (CRF) LIST

Version 1.0

July 22, 2019

Questions can be emailed to DOT-SafetyAnalysis@iowadot.us

23 U.S.C. § 409: Discovery and Admission as Evidence of Certain Reports and Surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

PLANNING-LEVEL CRF LIST

Version 1.0

| CRF # | Existing Facility Type | Countermeasure Type | Countermeasure Name | Intersection or Roadway Type | Prior Condition | Area Type | Crash Type | Crash Severity | CRF Value |
|--------|---------------------------|---------------------|--|------------------------------|---|-----------|--------------------------|----------------------------|-----------|
| US-01 | Unsignalized Intersection | Signs and Markings | Install Flashing Beacon on Existing Stop Signs | 4-leg | Stop-Controlled | All | All | All | 5 |
| US-05 | Unsignalized Intersection | Signs and Markings | Implement Systemic Signing and Marking Improvements | 3-leg, 4-leg | Unsignalized | All | All | All | 8 |
| US-10 | Unsignalized Intersection | Rumble Strips | Install Transverse Rumble Strips | 3-leg, 4-leg | Stop-Controlled | Rural | All | All | 13 |
| US-20 | Unsignalized Intersection | Lighting | Install Destination Lighting | 3-leg, 4-leg | Stop-Controlled Intersection without Lighting | Rural | Dark Lighting Conditions | All | 50 |
| US-30 | Unsignalized Intersection | Traffic Control | Convert to All-Way Stop-Controlled when Warranted | 4-leg | Two-Way Stop-Controlled | All | All | All | 55 |
| US-30A | Unsignalized Intersection | Traffic Control | Convert to All-Way Stop-Controlled when Warranted | 4-leg | Two-Way Stop-Controlled | All | All | Fatal and Injury (K,A,B,C) | 70 |
| US-33 | Unsignalized Intersection | Traffic Control | Install Traffic Signal when Warranted | 3-leg, 4-leg | Unsignalized | All | All | All | 0 |
| US-35 | Unsignalized Intersection | Traffic Control | Install Intersection Conflict Warning System (ICWS) | 4-leg 2-lane or 4-lane | Two-Way Stop-Controlled | Rural | All | All | 25 |
| US-35A | Unsignalized Intersection | Traffic Control | Install Intersection Conflict Warning System (ICWS) | 4-leg 2-lane or 4-lane | Two-Way Stop-Controlled | Rural | All | Fatal and Injury (K,A,B,C) | 30 |
| US-40 | Unsignalized Intersection | Lanes | Install Left-Turn Lane on Major Approach(es) when Warranted | 3-leg, 4-leg | Minor Approach Stop-Controlled | Rural | All | All | 30 |
| US-41 | Unsignalized Intersection | Lanes | Install Left-Turn Lane on Major Approach(es) when Warranted | 3-leg, 4-leg | Minor Approach Stop-Controlled | Urban | All | All | 35 |
| US-42 | Unsignalized Intersection | Lanes | Install Offset Left-Turn Lanes when Warranted | 4-leg | Minor Approach Stop-Controlled without Left-Turn Lanes | Rural | All | All | 35 |
| US-43 | Unsignalized Intersection | Lanes | Install Right-Turn Lanes on Major Approaches when Warranted | 3-leg, 4-leg | Minor Approach Stop-Controlled | All | All | All | 15 |
| US-44 | Unsignalized Intersection | Lanes | Install Offset Right-Turn Lanes on Major Approaches when Warranted | 4-leg | Minor Approach Stop-Controlled without Right-Turn Lanes | Rural | All | All | 20 |
| US-50 | Unsignalized Intersection | Geometry | Install Reduced Conflict Intersection | 3-leg, 4-leg | Stop-Controlled | Rural | All | All | 30 |
| US-50A | Unsignalized Intersection | Geometry | Install Reduced Conflict Intersection | 3-leg, 4-leg | Stop-Controlled | Rural | All | Fatal and Injury (K,A,B,C) | 45 |

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| US-60 | Unsignalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Unsignalized | Rural | All | All | 65 |
| US-60A | Unsignalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Unsignalized | Rural | All | Fatal and Injury (K,A,B,C) | 85 |
| US-61 | Unsignalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Unsignalized | Urban | All | All | 45 |
| US-61A | Unsignalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Unsignalized | Urban | All | Fatal and Injury (K,A,B,C) | 75 |

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| SI-01 | Signalized Intersection | Signs and Markings | Install Advanced Street Name Signs | 3-leg, 4-leg | Signalized | All | All | All | 0 |
| SI-10 | Signalized Intersection | Signal Visibility | Add Retroreflective Sheeting to Signal Backplates | - | - | Urban | All | All | 5 |
| SI-11 | Signalized Intersection | Signal Visibility | Upgrade to 12-inch Lenses | - | 8-inch Lenses | All | All | All | 3 |
| SI-12 | Signalized Intersection | Signal Visibility | Add Additional Signal Heads and Upgrade to 12-inch Lenses | 4-leg | - | Urban | All | All | 15 |
| SI-13 | Signalized Intersection | Signal Visibility | Convert Signal to Mast-Arm-Mounted | - | Pedestal-Mounted Signal | Urban | All | All | 20 |
| SI-20 | Signalized Intersection | Signal Phasing | Convert to Flashing Yellow Arrow Left-Turn Display | 3-leg, 4-leg | Permissive Left-Turn Phasing | Urban | All | All | 10 |
| SI-21 | Signalized Intersection | Signal Phasing | Change to Protected Left-Turn Phasing on Major Approach(es) when Warranted | 3-leg, 4-leg 45 mph or greater | Permissive or Protected-Permissive Left-Turn Phasing | Urban? | All | All | 25 |
| SI-41 | Signalized Intersection | Lanes | Install Left-Turn Lane on Major Approach when Warranted | 4-leg | Signalized | Urban | All | All | 25 |
| SI-43 | Signalized Intersection | Lanes | Install Right-Turn Lane on Major Approach when Warranted | 3-leg, 4-leg | Signalized | All | All | All | 6 |
| SI-61 | Signalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Signalized | Urban | All | All | 20 |
| SI-61A | Signalized Intersection | Roundabouts | Install Roundabout | 3-leg, 4-leg | Signalized | Urban | All | Fatal and Injury (K,A,B,C) | 65 |

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| RS-01 | Road Segment | Signs and Markings | Install 4-inch Edgeline Pavement Markings | 2-lane | No Edgelines | Rural | All | All | 10 |
| RS-02 | Road Segment | Signs and Markings | Install 6-inch Edgeline Pavement Markings | 2-lane | 4-inch Edgelines | Rural | All | All | 7 |
| RS-10 | Road Segment | Rumble Strips | Install Centerline Rumble Strips | Undivided | No Centerline Rumble Strips | Rural | All | All | 10 |
| RS-11 | Road Segment | Rumble Strips | Install Edgeline Rumble Strips or Shoulder Rumble Strips | - | No Edgeline Rumble Strips or Shoulder Rumble Strips | Rural | All | All | 15 |
| RS-12 | Road Segment | Rumble Strips | Install Centerline Rumble Strips and Edgeline/Shoulder Rumble Strips | Undivided | No Rumble Strips | Rural | All | All | 20 |
| RS-20 | Road Segment | Barriers | Install Cable Median Barrier | Freeway and Expressway | No Cable Median Barrier | All | All | Fatal and Serious Injury (K,A) | 40 |
| RS-20A | Road Segment | Barriers | Install Cable Median Barrier | Freeway and Expressway | No Cable Median Barrier | All | All | Minor Injury, Possible Injury, and PDO (B,C,O) | -60 (an increase) |
| RS-30 | Road Segment | Shoulder Treatments | Add or Widen Paved Shoulder (to no greater than 10 feet) | 2-lane | Unpaved Shoulder or Partially Paved Shoulder | Rural | All | All | 1% reduction per foot widened (max 10%) |
| RS-31 | Road Segment | Shoulder Treatments | Install Safety Edge | - | No Safety Edge | Rural | All | All | 6 |
| RS-35 | Road Segment | Lanes | Convert to 3-lane Roadway with Two-Way Left-Turn Lane | Undivided | 4-lane | All | All | All | 30 |
| RS-36 | Road Segment | Lanes | Add Two-Way Left-Turn Lane | Undivided | 2-lane | All | All | All | 25 |
| RS-38 | Road Segment | Lanes | Provide Passing Lane | 2-lane | No Passing Lanes | Rural | All | All | 25 |
| RS-40 | Road Segment | Lanes | Increase Lane Widths (to no greater than 12 feet) | 2-lane? | Lane Widths less than 12 Feet | Rural | All | All | 4% Reduction per foot widened (max 8%) |
| RS-50 | Road Segment | Pavement | Resurfacing | Undivided | Poor Pavement Conditions | Rural | All | All | 0 |
| RS-55 | Road Segment | Pavement | Diamond Grinding | All | - | All | All | All | 5 |

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| RS-56 | Road Segment | Pavement | Microsurfacing | All | - | All | All | All | 0 |
| RS-67 | Road Segment | Roadside | Flatten Foreslope to 4:1 | 2-lane | 2:1 or 3:1 Foreslope | Rural | All | All | 6 |
| RS-68 | Road Segment | Roadside | Flatten Foreslope to 6:1 | 2-lane | 4:1 Foreslope | Rural | All | All | 6 |
| RS-69 | Road Segment | Roadside | Flatten Foreslope to 6:1 | 2-lane | 2:1 or 3:1 Foreslope | Rural | All | All | 12 |

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| CS-01 | Curve Segment | Signs and Markings | Upgrade Existing Chevron and Curve Warning Signs (Fluorescent Sheeting and/or Oversized Signs) | - | Curve Warning Sign and Chevron Signs | Rural | All | All | 10 |
| CS-02 | Curve Segment | Signs and Markings | Install Chevron Signs when Warranted | - | Curve Warning Sign but no Chevron Signs | Rural | All | All | 15 |
| CS-03 | Curve Segment | Signs and Markings | Install Chevron and Curve Warning Signs when Warranted | - | No Curve Delineation Treatment | Rural | All | All | 20 |
| CS-55 | Curve Segment | Pavement | Install High-Friction Surface Treatment | All | History of Friction-Related Crashes | All | All | All | 25 |
| IN-50 | Interchange | Geometry | Install Grade-Separated Interchange | 4-leg | At-Grade Intersection | All | All | All | 45 |
| RR-30 | Railroad | Traffic Control | Install Flashing Lights | At-Grade Railroad Crossing | Signs Only | All | Vehicle/Train | All | 60 |
| RR-31 | Railroad | Traffic Control | Install Automatic Gates | At-Grade Railroad Crossing | Flashing Lights and Signs | All | Vehicle/Train | All | 45 |
| RR-32 | Railroad | Traffic Control | Install Automatic Gates | At-Grade Railroad Crossing | Signs Only | All | Vehicle/Train | All | 85 |
| BP-30 | Pedestrian | Traffic Control | Install Pedestrian Countdown Timer | Signalized | - | - | Vehicle/Pedestrian | All | 45 |
| BP-31 | Pedestrian | Traffic Control | Install Rectangular Rapid Flashing Beacon (RRFB) | Minor Arterial | No RRFB | Urban | Vehicle/Pedestrian | All | 40 |
| BP-32 | Pedestrian | Traffic Control | Install a Pedestrian Hybrid Beacon (PHB or HAWK) | Minor Arterial | No PHB or HAWK | Urban | Vehicle/Pedestrian | All | 60 |
| BP-40 | Bicycle | Lanes | Install On-Street Bike Facility | - | No Bike Lanes | Urban | Vehicle/Bicycle | All | 40 |