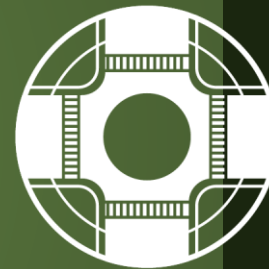


NCHRP 17-113 COUNTERMEASURES Install Intersection Conflict Warning Systems (ICWS) for Four-lane at Two-lane Intersections



ICWS are dynamic systems deployed at unsignalized intersections—specifically where a four-lane major road intersects a two-lane minor road.

Implementation Strategy

How and Where to Apply

- Apply ICWS at rural or suburban intersections where a two-lane minor road intersects a high-speed, four-lane divided highway.
- Use at unsignalized crossings where signal installation is not justified but drivers experience difficulty judging safe gaps due to multilane traffic and limited visibility.
- The **FHWA** states “Intersection Conflict Warning Systems have been proven to reduce crashes at unsignalized intersections by providing timely alerts to drivers about potential conflicts.”

Use in a Safe System Approach

This treatment aligns with the Safe System Approach by improving driver awareness at conflict points and reducing high-severity crashes. It supports Safer Intersections and Safer People by recognizing human limitations in complex crossing scenarios and providing advanced warning before conflict occurs.

Key Stakeholders

State and Local Departments of Transportation (DOTs), Traffic Engineers and Planners.

Proactive Implementation

ICWS involves identifying intersections with crash risks or operational challenges—before severe incidents occur—using crash data, traffic volume, and gap acceptance analysis. It prioritizes prevention by deploying warning systems at unsignalized crossings, especially where traditional signal warrants are unmet but multilane traffic complicates safe crossing decisions.

Countermeasure Overview

Objective: Improve driver awareness of intersections as viewed from the intersection approach.

Strategy: Install larger regulatory and warning signs at intersections.

Selected Related Countermeasures

- CM1** Intersection Lighting Enhancements
- CM2** Offset Minor Road Improvements
- CM3** Dynamic Speed Feedback Signs

Cost: Moderate

Service Life: 10 years

Benefit-Cost Ratio: 27:1

Targeted Solution



CONTRIBUTING FACTORS

- Failure to yield
- Misjudgment of safe gaps
- Limited sight distance



TARGET CRASH TYPE

- Angle
- Rear-end
- Turning



ROAD FACILITY TYPE

- N/A



AREA TYPE

- Rural

Safety Linkage



NCHRP 500

Unsignalized Intersection



SAFE SYSTEM APPROACH

Safe Roads



AASHTO'S TOWARD ZERO DEATHS

Safer Infrastructures

SAFE SYSTEM ROADWAY DESIGN

TIER 1
TIER 2
TIER 3
TIER 4

Tier 4

Street Lighting . Source: [eco ledmart](#)

Safety Benefits

45%

Reduces injury crashes at rural, stop-controlled four-lane by two-lane intersections.¹

28%

Reduces all types of crashes at rural, stop-controlled four-lane by two-lane intersections.²

¹CMF ID: 8448

²CMF ID: 8447

Resources

- FHWA: [Safety Evaluation of Intersection](#)
- NCHRP Report 841: [Development of Crash Modification Factors](#)
- FHWA: [Proven Safety Countermeasures](#)

