NCHRP 17-113 COUNTERMEASURES

Install Intersection Safety Devices

INTERSECTIONS

Intersection safety devices—such as red-light cameras or warning systems—enhance safety by detecting violations and encouraging driver compliance at high-risk intersections.

Implementation Strategy

How and Where to Apply

- These devices are typically applied at signalized intersections or high-crash unsignalized locations with frequent violations.
- They are most effective at urban or suburban intersections with documented red-light running or rear-end crashes.
- Best suited for high-crash locations, rural intersections with poor visibility, and spots with high red-light running to prevent accidents; avoid at low-volume intersections where signals may be disregarded.

Use in a Safe System Approach

Installing Intersection Safety Devices supports the Safe Roads element of the SSA by accommodating human mistakes and vulnerabilities. By providing redundant warnings and controls, it builds redundancy and upholds the principle that death and serious injuries are unacceptable.

Key Stakeholders

State DOTs, MPOs, traffic engineers, safety advocacy groups, community associations.

Proactive Implementation

Intersection safety devices can be deployed proactively at intersections identified through systemic crash analysis, violation tracking, or risk-based screening. Agencies may use speed and red-light cameras, warning beacons, or automated enforcement in corridors with documented noncompliance. Public education and data-sharing partnerships can enhance program effectiveness.

Countermeasure Overview

Objective: Reduce operating speeds on specific intersection approaches.
Strategy: Provide traffic calming on intersection approaches through a combination of geometrics and traffic control devices.

Targeted Solution

CONTRIBUTING FACTORS	▪ Limited sight distance ▪ Driver inattention/ distraction.
TARGET CRASH TYPE	▪ Angle ▪ Rear-end ▪ Turning
ROAD FACILITY TYPE (ARTERIAL, COLLECTOR, LOCAL)	▪ Urban arterial
AREA TYPE	▪ Urban ▪ Suburban

Safety Linkage

NCHRP 500 Series

Intersection Crashes

AASHTO'S TOWARD ZERO DEATHS

Safer Infrastructure

SAFE SYSTEM APPROACH

Safe Roads

SAFE SYSTEM ROADWAY DESIGN

TIER 1
TIER 2
TIER 3
TIER 4

Tier 4

Selected Related Countermeasures

CM1 Red-light running cameras
CM2 Intersection conflict warning systems
CM3 Intersection conflict warning systems

Cost: $$$ (Moderate)
Service Life: 10 years
Benefit-Cost Ratio: 4.1-12.4

Intersection Safety Devices. Source: Howard County, MD.

Safety Benefits

29% Reduces angle crashes and K, A, B, C severities on roads (CMF ID: 11111)

25% Reduces all types of crashes and K, A, B, C severities on roads (CMF ID: 11109)

Resources

- Safety Evaluation At Signalized Intersections
- INTERSECTION SAFETY STRATEGIES