NCHRP 17-113 COUNTERMEASURES

Provide Flashing Beacons at Stop-controlled Intersections

PEDESTRIANS AND BICYCLISTS

A pedestrian safety device with flashing yellow LEDs that activate at marked, uncontrolled crosswalks to alert drivers and improve pedestrian visibility.

Implementation Strategy

How and Where to Apply

- Install at uncontrolled, marked crosswalks on multilane roads or locations with high pedestrian activity and limited traffic gaps, as recommended by FHWA guidance. Not suitable for locations with very low pedestrian volumes or at fully signalized intersections.
- Mount RRFBs on both sides of the roadway, aligned with crosswalk and signs, activated by push button or detection to ensure visibility and compliance.
- The MUTCD requires compliance with Interim Approval IA-21, including pedestrian signs, yellow LEDs, and push-button or automated activation.

Use in a Safe System Approach

Flashing beacons support Safe Road Users and Safe Roads by enhancing driver awareness and reducing stop sign violations through improved visibility, reinforcing the principle that deaths and serious injuries are unacceptable.

Key Stakeholders

State DOTs, MPOs, law enforcement agencies, consultants, active road users, advocacy groups.

Proactive Implementation

Flashing beacons should be proactively installed at stop-controlled intersections where limited visibility, high approach speeds, or increasing crash trends indicate a need for enhanced driver alertness. Selection of appropriate sites should be based on detailed analysis of crash history, approach volumes, sight distance limitations, and field conditions to ensure the beacons effectively reduce the risk of stop sign violations and collisions.

Countermeasure Overview

Objective: Reduce Pedestrian Exposure to Vehicular Traffic.
Strategy: Install or Upgrade Traffic and Pedestrian Signals.

Targeted Solution

CONTRIBUTING FACTORS	▪ Reduce Visibility ▪ Driver Inattention ▪ Failure to yield
TARGET CRASH TYPE	▪ Angle ▪ Rear-end ▪ Turning
ROAD FACILITY TYPE	▪ N/A
AREA TYPE	▪ All

Safety Linkage

NCHRP 500 Series

Pedestrians and bicyclists

AASHTO'S TOWARD ZERO DEATHS

Improved Safety Management

SAFE SYSTEM APPROACH

Safe Roads

SAFE SYSTEM ROADWAY DESIGN

TIER 1
TIER 2
TIER 3
TIER 4

Tier 4

Selected Related Countermeasures

- CM1 LED-enhanced stop signs
- CM2 Advance stop sign warning signs
- CM3 Rumble strips on approaches

Cost: $$$ (Moderate to High)
Service Life: 10 years
Benefit-Cost Ratio: 2.0:1

Safety Benefits

58% Reduces angle crashes across all severity levels on all two-lane roads (CMF ID: 456)

10% Reduces all crash types and severity levels A, B, and C on all two-lane roads (CMF ID: 447)

Resources

- FHWA pedestrian safety
- TechSheet_RRFB_2018.pdf

Flashing Pedestrian Beacon. Source: Iowa State University.