

Improve Street Lighting Illuminance Uniformity



Improving street lighting means enhancing brightness and uniform light coverage on roads and walkways

Implementation Strategy

How and Where to Apply

- Implement on roadway segments and intersections with high rates of nighttime crashes, especially where poor visibility, dark spots, or glare have been identified as contributing factors.
- Prioritize locations with significant pedestrian activity, including school zones, public transit stops, commercial corridors, and mixed-use areas where improved lighting can enhance safety and comfort.
- The **FHWA** states that this marking can be used "Improved roadway lighting is one of the most effective infrastructure treatments for reducing nighttime crashes."

Use in a Safe System Approach

Supports SSA by enhancing safe roads and safe road users. Uniform and well-illuminated environments reduce the risk of crashes and make the system more forgiving of human errors under low-light conditions.

Key Stakeholders

State and local transportation agencies, municipal public works departments, utility companies.

Proactive Implementation

Proactive implementation involves upgrading to LED lights with full-cutoff optics to reduce glare and improve light distribution. It includes optimizing pole spacing, height, and fixture angles to meet IES guidelines, ensuring adequate lighting for both roadways and pedestrian zones. These improvements should be guided by photometric analysis and integrated into broader street redesign or resurfacing projects.

Countermeasure Overview

Objective: Improve Sight Distance and/or Visibility Between Motor Vehicles and Pedestrians

Strategy: Eliminate screening by physical obstructions such as vegetation, parked vehicles, and street furniture

Selected Related Countermeasures

- CM1** High-Visibility Crosswalk Enhancements
- CM2** Roadway Segment Lighting
- CM3** Intersection Conflict Warning Systems

Cost: \$ (Moderate)

Service Life: 4-5 years

Benefit-Cost Ratio: 26:8

Targeted Solution



CONTRIBUTING FACTORS

- Low visibility
- Driver distraction
- Reduced reaction time



TARGET CRASH TYPE

- Nighttime
- Crossing



ROAD FACILITY TYPE

- All



AREA TYPE

- All

Safety Linkage



NCHRP 500 Series

Pedestrians and bicyclists



SAFE SYSTEM APPROACH

Safe Road Users



AASHTO'S TOWARD ZERO DEATHS

Safer Vulnerable Users

SAFE SYSTEM ROADWAY DESIGN

TIER 1

TIER 2

TIER 3

TIER 4

Tier 4

Street Lighting . Source: eco ledmart

Safety Benefits

42%

Improves pedestrian safety by reducing injury-related crashes in low-light conditions¹.

28%

Reduces crash rates at intersections and along both rural and urban roadways².

¹CMF ID: 11027

²FHWA-SA-21-050

Resources

- FHWA Lighting Handbook
- ANSI/IES – RP-8-18 Practice for Design and Maintenance of Roadway and Parking Facility Lighting (No CEU)

