NCHRP 17-113 COUNTERMEASURES

Full To Partial Interchange Lighting

ROADWAY DEPARTURE

Full interchange lighting covers the entire interchange uniformly, while partial lighting targets only critical areas like ramps and intersections.

Implementation Strategy

How and Where to Apply

- Partial interchange lighting involves illuminating select areas of an interchange rather than the full layout.
- Focus is typically on ramp terminals, merge/diverge areas, and gore points where visibility is critical.
- It is most effective at rural or lower-volume interchanges with a history of nighttime crashes, limited ambient lighting, or complex geometry. Application is often based on crash data analysis, sight distance reviews, and cost-effectiveness.

Use in a Safe System Approach

This treatment supports the Safe System principles of improving visibility and reducing crash severity by enhancing driver awareness at critical points. By focusing light on potential conflict areas, it supports safer speeds and better lane discipline during low-light conditions.

Key Stakeholders

State DOTs, local law enforcement agencies

Proactive Implementation

Agencies can proactively identify candidate sites through systemic safety analysis, crash history evaluations, or visual inspection of nighttime driving conditions. Partial lighting is often a cost-efficient alternative where full interchange lighting may not be justifiable but targeted improvements are necessary.

Countermeasure Overview

Objective: Reduce the severity of the crash.

Strategy: Improve design of roadside hardware.

Targeted Solution

CONTRIBUTING FACTORS	▪ Reduced Visibility ▪ Difficulty in judging distances ▪ Speeds of Merging or exiting vehicles
TARGET CRASH TYPE	▪ Sideswipe ▪ Head-on ▪ Rear-end
ROAD FACILITY TYPE	▪ Principal arterial, other freeways and expressways
AREA TYPE	▪ Urban ▪ Suburban

Safety Linkage

NCHRP 500 Series

Head-on Crashes

SAFE SYSTEM APPROACH

Safe Roads

AASHTO'S TOWARD ZERO DEATHS

Safer Infrastructure

SAFE SYSTEM ROADWAY DESIGN

TIER 1
TIER 2
TIER 3
TIER 4

Tier 4

Selected Related Countermeasures

- CM1 Install Intersection Lighting
- CM2 High-Visibility Pavement Markings
- CM3 Advance Warning Flashers

Cost: High

Service Life: 15 years

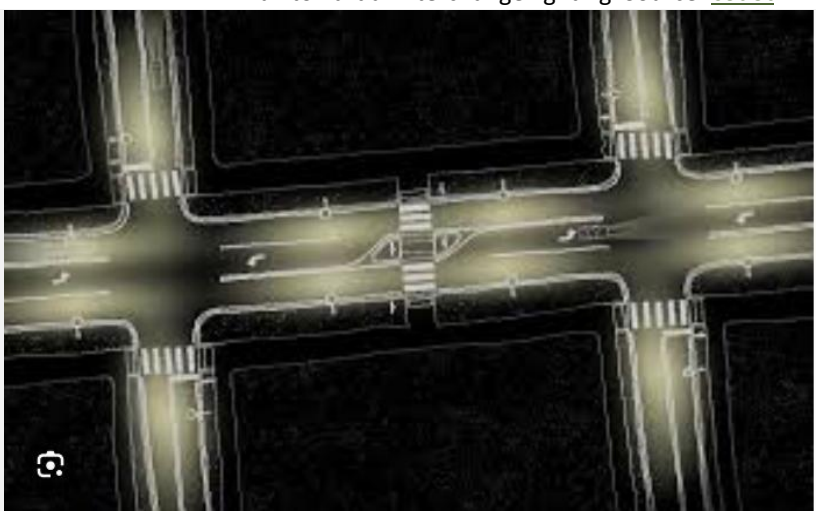
Full to Partial Interchange lighting. Source: codot

Safety Benefits

11% Reduces night-time crashes and injuries at interchanges.[1]

9% Reduces Day-time crashes and injuries at interchanges.[2]

[1]CMF ID: 2363
[2]CMF ID: 2361



Resources

- FHWA Roadway Lighting Handbook
- FHWA Guidelines for Roadway Lighting
- NCHRP Report 855: An Expanded Functional Classification System for Highway