

Change Right-turn Lane Geometry to Increase Line of Sight



Modifying the geometry of right-turn lanes to improve the driver's line of sight is a safety-focused design strategy aimed at reducing crash risk, particularly between vehicles and pedestrians or bicyclists.

Implementation Strategy

How and Where to Apply

- Apply at intersections or approach levels with documented pedestrian or cyclist crashes where drivers make free-flow or channelized right turns without adequate visibility of crosswalks.
- Use at skewed or high-speed approaches where turning angles and visual obstructions limit drivers' view of cross traffic.
- Not recommended at low-volume roads or where redesign requires major property impacts, right-of-way acquisition, or offers minimal safety benefits.

Use in a Safe System Approach

Changing right-turn lane geometry improves sight distance, enhances safe roads and users, addresses human mistakes, reduces severe conflicts, and ensures proactive, redundant protection through design, markings, and signals, aligning with Safe System principles.

Key Stakeholders

State DOTs, MPOs, engineering consultants, urban planners and traffic engineers, active road users.

Proactive Implementation

Proactive implementation involves identifying intersections with potential visibility issues or pedestrian conflict risks even in the absence of high crash history and redesigning right-turn lanes to improve sightlines, reduce speeds, and enhance safety. This approach supports Vision Zero goals by anticipating human error and addressing risk factors before severe incidents occur, especially during routine upgrades or signal projects.

Countermeasure Overview

Objective: Reduce the frequency and severity of intersection conflicts through geometric design improvements.

Strategy: Provide offset right-turn lanes at intersections or realign intersection approaches.

Selected Related Countermeasures

- CM1 Right-Turn on Red (RTOR) Restriction
- CM2 Corner Extensions (Curb Extensions/Bulb-outs)
- CM3 Curb Radius Reduction

Cost: \$\$\$ (Moderate to High)

Service Life: 20 years

Benefit-Cost Ratio: 13.8:1

Targeted Solution



CONTRIBUTING FACTORS

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



TARGET CRASH TYPE

- Right-turn



ROAD FACILITY TYPE

- All



AREA TYPE

- All

Safety Linkage



NCHRP 500

Unsignalized Intersection



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 1

60%

At approach level this reduces right-turn crashes and all severity levels ([CMF ID: 8499](#))

44%

At approach level this reduces crashes for all types and K, A, B, C severities on all types of road ([CMF ID: 8497](#))

Resources

- FHWA – Proven Safety Countermeasure
- FHWA – Handbook for Designing Roadways
- TxDOT – Roadway Design Manual



Right-turn Lane Geometry to Increase Line of Sight. Source: FHWA.

