NCHRP 17-113 COUNTERMEASURES

Increase Separation Distance Between Driveway Exit and Downstream U-turn by 10%

INTERSECTIONS

Increasing driveway-to-U-turn spacing reduces crashes by allowing safer merging and fewer conflicts.

Implementation Strategy

How and Where to Apply

- Apply on multilane divided roadways with high driveway density and frequent U-turn movements, especially in suburban commercial corridors where quick lane changes cause crashes.
- Extend the distance between driveways and downstream U-turn openings by at least 10%, using access management principles and geometric design standards to ensure adequate space for lane changes and decision-making.
- Best suited for corridors with frequent driveways and U-turn movements; avoid where right-of-way or geometric constraints limit the ability to extend separation safely.

Use in a Safe System Approach

Increasing the separation between driveway exits and downstream U-turns supports the Safe Roads element by addressing human mistakes and vulnerability in complex maneuvers. Added spacing provides redundancy and reinforces that death and serious injuries are unacceptable.

Key Stakeholders

State DOTs, MPOs, engineering consultants, business owners, community associations.

Proactive Implementation

Proactive implementation involves reviewing access spacing along corridors with frequent crashes involving left turns or U-turns near driveways. Planners and engineers should use traffic data and roadway design standards to identify locations where short separation distances create safety risks. By increasing spacing before crash patterns develop, agencies can improve traffic flow and reduce the likelihood of sudden lane changes and collisions.

Countermeasure Overview

Objective: Improve access management near signalized intersections.

Strategy: Restrict access to properties using driveway closures or turn restrictions.

Selected Related Countermeasures

- CM1 Access consolidation
- CM2 Raised medians with restricted openings
- CM3 Right-in/right-out driveway design

Cost: $(Low)
Service Life: 20 years

Targeted Solution

CONTRIBUTING FACTORS
- Misjudgment of safe gaps
- Insufficient distance for safe lane change

TARGET CRASH TYPE
- Indirect left turn
- Angle collision
- Rear end

ROAD FACILITY TYPE (ARTERIAL, COLLECTOR, LOCAL)
- Principal Arterial
- Other

AREA TYPE
- All

Safety Linkage

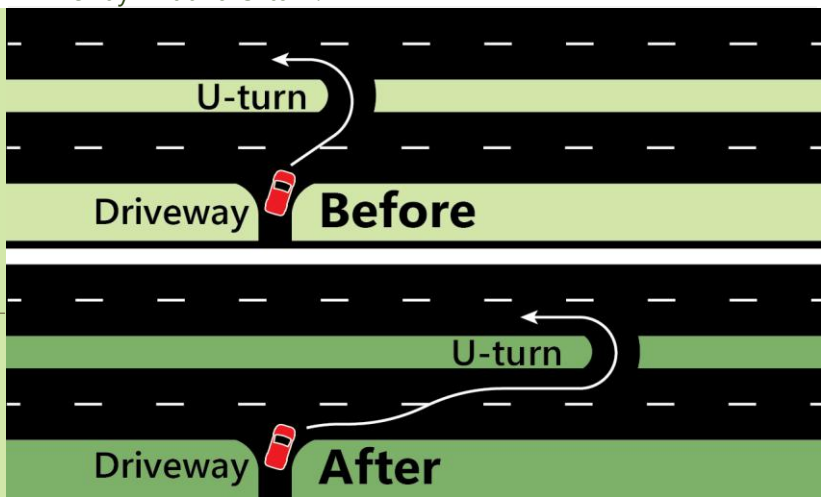
NCHRP 500 Series
Signalized Intersection

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

Driveway Exit and U-turn.



Safety Benefits

5%

Reduce all crash types across all severity types, especially on principal arterial roadways (CMF ID: 2215)

Resources

- FHWA Safety Research
- Safety effects of the separation distances between driveway exits and downstream U-turn locations, Liu et al (2007)