NCHRP 17-113 COUNTERMEASURES

Conversion of Intersection into High-Speed Roundabout

INTERSECTIONS

High-speed roundabouts are circular intersections that manage fast approaches and reduce the severity of crashes compared to traditional designs.

Implementation Strategy

How and Where to Apply

- High-speed roundabouts are best suited for rural or suburban intersections with moderate-to-high approach speeds and a history of severe crashes.
- They are commonly used as alternatives to stop- or signal-controlled intersections on high-speed corridors.
- According to **FHWA** guidance, they are effective where reducing crash severity and managing fast vehicle approaches are key safety priorities.

Use in a Safe System Approach

High-speed roundabouts support Safe Roads and Safe Speeds by eliminating high-speed crossing conflicts. Their design reduces the angle and speed of impact during crashes and promotes yielding behavior, making them more forgiving of driver error.

Key Stakeholders

State and local transportation agencies
Traffic safety engineers and designers

Proactive Implementation

High-speed roundabouts can be proactively implemented at intersections identified through systemic safety analysis, especially those with patterns of angle or high-speed turning crashes. These sites often lack turn lanes, have poor sight distance, or involve complex driver decisions. Integrating roundabout conversion into corridor-level safety upgrades or during scheduled reconstruction allows agencies to address multiple safety issues cost-effectively. This approach supports long-term crash reduction and improved network performance.

Countermeasure Overview

Objective: Reduce frequency and severity of intersection conflicts through geometric improvements
Strategy: Construct special solutions

Selected Related Countermeasures

- CM1 Intersection Conflict Warning Systems
- CM2 Median U-turn or RCUT treatments
- CM3 Enhanced lighting and warning signs

Cost: $ (High)

Service Life: 20 years

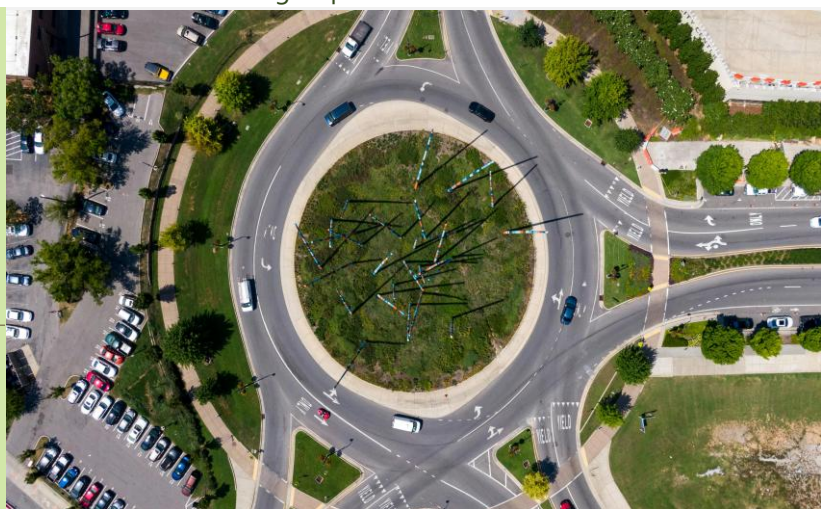
Benefit-Cost Ratio: 16.8:1

Targeted Solution

CONTRIBUTING FACTORS	▪ Faiure to yield
TARGET CRASH TYPE	▪ Angle ▪ Rear-end ▪ Turning
ROAD FACILITY TYPE	▪ All
AREA TYPE	▪ All

Safety Linkage

NCHRP 500	SAFE SYSTEM APPROACH
Intersection Crashes	Safe Roads
AASHTO'S TOWARD ZERO DEATHS	SAFE SYSTEM ROADWAY DESIGN
Safer Infrastructure	Tier 1



High-Speed Roundabout. Source: Pexels

Safety Benefits

96% Reduces fatal, serious injury, minor injury, possible injury severity crashes. [1]

41% Reduce all crash types on all roads.[2]

[1] CMF ID: 10437
[2] CMF ID: 10434

Resources

- ROUNDABOUTS: AN INFORMATIONAL GUIDE
- FHWA Proven Safety Countermeasures