

SIGNALIZED INTERSECTION SAFETY STRATEGIES



Restrict or Eliminate Turning Maneuvers (Including Right Turns on Red)

WHERE TO USE

Signalized intersections with a high frequency of crashes related to turning maneuvers. For right turn on red (RTOR), the target of this strategy is right-turning vehicles that are involved in rear-end or angle crashes with cross-street vehicles approaching from the left or vehicles turning left from the opposing approach, and crashes involving pedestrians.



Photos by: FHWA

DETAILS

Safety at some signalized intersections can be enhanced by restricting or prohibiting turning maneuvers. This strategy can be applied during certain periods of the day or by prohibiting particular turning movements altogether. This strategy may be appropriate where a turning movement is considered to be “high risk” and other strategies are impractical or not possible to implement.

Turn restrictions and prohibitions can be implemented by channelization or signing. However, signing alone will most likely require some periodic enforcement.

Prohibition of RTOR can help reduce crashes related to limited sight distance and pedestrians that involve right-turning vehicles. This strategy can also help reduce the frequency and severity of crashes between vehicles turning right on red and vehicles approaching from the left on the cross street or turning left from the opposing approach. This strategy can be implemented with signing although enforcement is often needed. Prohibition of RTOR at specific intersections can be implemented during certain times of the day. Supplemental sign plaques prohibiting RTOR when pedestrians are present have been used to help protect pedestrians.

KEY TO SUCCESS

One key to success is providing for safe and adequate alternative locations to make the turn in close proximity to the intersection where the prohibition is placed. A careful traffic engineering study should be made to ensure that the safety and operational problems calling for the prohibition are not merely relocated.



It will be important to include stakeholders in the planning and implementation of this strategy (e.g., law enforcement, property owners in the affected area, and transit agencies).

With respect to RTOR prohibition, a key to success is to establish that prohibition of RTOR is justified due to an existing pattern of right-turn collisions.

ISSUES

Prohibition of left turns at a major intersection may be difficult to justify unless the left-turn volumes are very low. It is generally preferred to more safely accommodate the turning movement at the point where the driver desires to turn than to displace the turn activity to an alternative location. Issues in implementing turn prohibitions become more complex at higher-volume suburban and urban signalized intersections. Drivers familiar with the intersection might fail to notice the prohibition of RTOR when the restriction is first put into place.

TIME FRAME ●○○○

Implementation of the turn restriction or prohibition could vary from a few days to a few months, depending upon the extent of public information and education (PI&E) provided.

COSTS ●○○○

Costs may be variable. Turn restrictions can be implemented with low-cost signing, but enforcement of the regulation and PI&E campaigns regarding the new regulation will increase costs.

EFFECTIVENESS

TRIED: One study in Florida concluded that prohibiting left turns at intersections (signalized and unsignalized) can reduce all crashes by 45% and left turn crashes by 90%.

That same study determined that prohibiting right-turn-on-red can reduce right angle crashes by 30% and rear-end crashes by 20%.

COMPATIBILITY

This strategy can be used in conjunction with other strategies for improving safety at signalized intersections. Refer to *NCHRP Report 500: Volume 10* for a range of strategies aimed at pedestrian safety, many of which can work in concert with the implementation of turn restrictions, specifically RTOR prohibition.

SUPPLEMENTAL INFORMATION

When planning turn restrictions, it is important to include public transit agencies due to the potential effects on bus transit.

For more details on this and other countermeasures: <http://safety.transportation.org>

For more information contact:

FHWA Office of Safety Design
E71, 1200 New Jersey Avenue SE
Washington, D.C. 20590
(202) 366-9064
<http://safety.fhwa.dot.gov>

FHWA Resource Center - Safety and Design Team
19900 Governor's Drive, Suite 301
Olympia Fields, IL 60461
(708) 283-3545
<http://www.fhwa.dot.gov/resourcecenter>

