

UNSIGNALIZED INTERSECTION SAFETY STRATEGIES



Provide Longer Right-Turn Lanes at Intersections

WHERE TO USE

Unsignalized intersections with an existing right-turn lane that is not long enough to store all right-turning vehicles and that are experiencing a high frequency of rear-end crashes resulting from the conflict between vehicles waiting to turn right and following vehicles.



Photo by: Texas Transportation Institute

DETAILS

The provision of exclusive right-turn lanes minimizes crashes related to right-turn maneuvers, particularly on high-volume and high-speed major roads. However, if the length of a right-turn lane is inadequate, vehicles waiting to turn may be doing so from the through-traffic lane, thus increasing the potential for rear-end crashes. If long enough, right-turn lanes provide sheltered locations for drivers decelerating or waiting to make a right-turn maneuver. Design criteria for selecting an appropriate right-turn lane length are presented in the *AASHTO Policy on Geometric Design for Highways and Streets* and in the policies of individual highway agencies.

KEY TO SUCCESS

Make sure that a longer right-turn lane is warranted or justified on the basis of right-turn volumes or an existing pattern of right-turn crashes.

If access to adjacent properties will potentially be affected, it will be important to include the stakeholders early in the planning process.

ISSUES

If a right-turn lane is excessively long, through drivers may enter the lane by mistake without realizing it is a right-turn lane. Effective signing and marking of the upstream end of the right-turn lane may remedy this difficulty.



Also, a decision may be made to provide a longer right-turn lane by restriping a shoulder and through lane. In such cases, part of the safety benefits from the improvement may be lost due to the loss of shoulder, the greater proximity of through or right-turning traffic to roadside objects, and possible a reduction in intersection sight distance, as well.

Lengthening of a right-turn lane on an intersection approach may involve restricting right turns in and out of driveways on that intersection approach. Such restrictions may be implemented by signing or by provision of a median. Approaches to dealing with such issues are discussed in connection with Strategy A2.

TIME FRAME ●●○

Implementation may require from 3 months to 4 years. At some locations, right-turn lanes can be lengthened simply by restriping the roadway. Others may require widening the roadway, cutting further into a median, or acquiring additional right-of-way. Such projects require a substantial time for development and construction.

COSTS ●●○○

Costs are highly variable. Where restriping within an existing roadway is possible, the costs are nominal. Where widening and/or reconstruction are necessary, costs may be significantly higher.

EFFECTIVENESS

TRIED: This strategy should reduce rear-end crashes resulting from the conflict between vehicles waiting to turn right and following vehicles during the period when demand exceeds the storage capacity of the lane. When a queue of vehicles overflows the right-turn lane and extends into the through lanes of the intersection approach, rear-end crashes are likely. Lengthening of right-turn lanes may also reduce the potential for rear-end collisions between right-turning vehicles by providing longer entering taper and deceleration lengths.

While there is no consensus on a quantitative estimate of the safety effectiveness of lengthening right-turn lanes, one study indicated that crashes could be reduced up to 15%. This effectiveness is likely to depend on the existing length of the right-turn lane, the proportion of time during which the storage capacity of the lane is exceeded, the volume and speed of traffic on the intersection approach, and the available sight distance to the rear of the right-turn queue.

COMPATIBILITY

This strategy can be used in conjunction with other strategies for improving safety at unsignalized intersections.

SUPPLEMENTAL INFORMATION

Optimal operation and safety of right-turn lanes require appropriate design. This includes sufficient length of lane and taper.

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

For more information contact:

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