

SIGNALIZED INTERSECTION SAFETY STRATEGIES



Provide or Improve Right-Turn Channelization

WHERE TO USE

Signalized intersections with a high frequency of rear-end collisions resulting from conflicts between: (1) vehicles turning right and following vehicles; and (2) vehicles turning right and through vehicles coming from the left on the cross street.



Photo by: Texas Transportation Institute

DETAILS

Right-turn lanes can minimize collisions between vehicles turning right and following vehicles, particularly on high-volume and high-speed major roads. A right-turn lane may be appropriate in situations where a high number of rear-end collisions on a particular approach occur.

Key issues addressed in design guides include entering taper, deceleration length, and storage length. Design criteria for selecting an appropriate right-turn lane length are presented in the *AASHTO Policy on Geometric Design for Highways and Streets*, the *Manual on Uniform Traffic Control Devices*, and the policies of individual highway agencies.

Installation of a right-turn lane can create other safety or operational problems. For example, vehicles in the right-turn lane of the through road may block the cross-street right-turning drivers' view of through traffic (especially if right turn on red is permitted on the cross street). Channelization of the right turn with a raised or painted island can provide larger turning radii and an area for pedestrian refuge. Design details of channelizing islands for turning roadways can be found in *AASHTO's Policy on Geometric Design for Highways and Streets*.

Where curbed islands are provided, they offer a refuge for pedestrians. Where pedestrians use right-turn triangular channelization islands, crossing paths should be clearly delineated. The island itself should be made as visible as possible to passing motorists.

Removing small channelizing islands may improve right-turn channelization. Often, these islands were installed in urban areas for signal pole placement. Right-turning drivers may not see this island when approaching the intersection and may stop suddenly, increasing the potential for rear-end collisions.



Lengthening a right-turn lane can help improve operations and safety by providing additional sheltered space for vehicles to decelerate or wait to turn. Providing longer entering tapers and deceleration lengths can reduce the potential for rear-end collisions.

KEY TO SUCCESS

Properly designing the right-turn lane is paramount. Visibility of channelizing islands is also very important. Islands can be difficult for drivers to see, especially at night and in inclement weather. Raised islands have proven more effective than flush-painted islands at reducing nighttime collisions.

ISSUES

Older drivers benefit from channelization that better indicates the proper use of intersection travel lanes. However, older drivers find that making a right turn without an acceleration lane on the crossing street is particularly difficult. Using curbed islands is discouraged on high-speed roads.

Right-turn lanes can reduce the safety of pedestrian crossings. Elderly and mobility-impaired pedestrians may have difficulty crossing intersections with large corner radii.

Other issues to consider when designing a right-turn lane include provision of clear sight triangles, potential conflicts between turning vehicles and cyclists proceeding through the intersection, and potential need to move the stop bar on the cross street. Transit stops may also need to be moved from the near side to the far side of an intersection due to possible conflicts.

TIME FRAME ●●●○

Where no changes to existing pavement or no new construction is needed, implementation can take only weeks or months. Where redesign or restriping of approaches is performed, the need to reposition or change the location of traffic signal heads or other hardware may require more time.

COSTS ●●○○

Where reallocation of available width by restriping is all that is needed, costs can be relatively low. Where redesign and construction are necessary, costs will be moderate. Costs may include upgrading and/or relocating traffic signals and other hardware and right-of-way acquisition.

EFFECTIVENESS

PROVEN: One study has indicated that installing a right-turn lane on one approach to a signalized intersection can reduce crashes by 4% and by 8% on two approaches.

COMPATIBILITY

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

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

For more information contact:

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