

SIGNALIZED INTERSECTION SAFETY STRATEGIES



Improve Visibility of Intersections on Approach(es)

WHERE TO USE

Signalized intersections with a high frequency of crashes attributed to drivers being unaware of the presence of the intersection.



Photo by: FHWA, Texas Transportation Institute

DETAILS

Some crashes at signalized intersections may occur because drivers are unaware of the presence of an intersection or are unable to see the traffic control device in time to comply. The ability of approaching drivers to perceive signalized intersections immediately downstream can be enhanced by signing, delineation, lighting, and warning devices.

Improve Signing and Delineation. Installing or upgrading signs and pavement markings on intersection approaches can help better prepare drivers for the intersection ahead. This may include advance guide signs, advance street name signs, warning signs, pavement markings, overhead street signing, and post-mounted delineators. Advance warning signs, with or without flashers, can also alert drivers to an intersection. Installing advance warning signs on both sides of the roadway (signing redundancy) may be appropriate in some situations. Street name and lane assignment signs in advance of the intersection prepare drivers for choosing and moving into the lane they need. Signs and flashers warning drivers of a red signal might improve awareness of the intersection and the red signal. Providing a break in pavement markings at intersections also helps to alert drivers.

Install Larger Signs. Installing signs with larger letters can enhance the visibility of intersections with existing regulatory and warning signs and the ability of drivers to perceive signs. The Federal Highway Administration (FHWA) *Older Driver Highway Design Handbook* encourages installation of larger signs to benefit older drivers.

Provide Intersection Lighting. Providing lighting at the intersection or at both the intersection and on its approaches can enhance driver awareness of the intersection and reduce nighttime crashes.

Install Rumble Strips on Approaches. Rumble strips can be installed on intersection approaches transverse to the travel direction to alert drivers to the intersection and the traffic control used. Rumble strips are particularly appropriate on intersections where a pattern of crashes related to lack of driver recognition of the signal's presence is evident, often on high-speed approaches. This



strategy should be used sparingly. Rumble strips are normally applied when less intrusive measures have been tried but failed to correct the crash pattern.

Install Advance Detection Systems. Two techniques that have been tried on rural high-speed approaches are “queue detection” and “dilemma zone protection”. The former can be used where the ends of potentially long queues may not be visible to approaching drivers due to sight distance problems. The latter can assist drivers (esp. heavy vehicle operators) caught in the dilemma zone by extending green times.

KEY TO SUCCESS

A key to success with this strategy is to select a combination of signing and delineation techniques appropriate to specific conditions. This engineering assessment should, where possible, be accompanied by a human-factors assessment of signing and delineation needs.

ISSUES

Care should be taken not to overuse traffic signing, which would cause drivers not to recognize intersections. Maintenance of signs and pavement markings is also important to the strategy's success. Retroreflectivity of older pavement markings and signs should be checked periodically.

TIME FRAME ●○○○

This strategy does not require a long development process. Signing and delineation improvements can typically be implemented in three months or less.

COSTS ●○○○

Costs to implement signing and delineation are relatively low. An agency's maintenance costs may increase. Crash data should be studied to ensure that safety at the intersection could be improved by providing lighting. The costs involved with intersection lighting may be moderately expensive.

EFFECTIVENESS

TRIED: Making drivers aware of approaching an intersection through the use of enhanced signing and delineation should improve safety by alerting drivers to potential vehicles on the cross streets. This heightened awareness will quicken drivers' reaction times when conflicts occur. The Institute of Transportation Engineers has reported that installing advance warning signs for signalized intersections can reduce all crashes by up to 22% and right angle crashes by 35%. One study concluded that providing advanced dilemma zone protection on rural high-speed approaches may reduce crashes by up to 39%.

COMPATIBILITY

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

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>

