

SIGNALIZED INTERSECTION SAFETY STRATEGIES



U.S. Department
of Transportation
**Federal Highway
Administration**

Improve Visibility of Signals and Signs at Intersections

WHERE TO USE

Signalized intersections with a high frequency of right-angle and rear-end crashes occurring because drivers are unable to see traffic signals and signs sufficiently in advance to safely negotiate the intersection being approached.



Photo by: FHWA

DETAILS

Lack of visibility of traffic control devices may contribute to crash experience at signalized intersections. Visibility of traffic signals and signs at intersections may be obstructed by physical objects or may be obscured by weather conditions. Also, a driver's attention may be focused on other objects at the intersection, such as extraneous signs. Poor visibility of signs and signals may result in vehicles not being able to stop in time for a signal change or otherwise violating the intended message of a regulatory or directional sign. Providing adequate visibility of signs and signals also aids in drivers' advance perception of the upcoming intersection. The Federal Highway Administration (FHWA) *Older Driver Highway Design Handbook* should be consulted to ensure that improvements to visibility of traffic control devices will be adequate for older drivers (www.tfhr.gov).

In addition to potentially restricting driver sight lines, large numbers of appurtenances and signage not associated with the driving task in the vicinity of an intersection can impose a high workload. This visual clutter can make it difficult for the driver to extract the information from the signs required to execute the driving task.

Maintenance of signals and signs is important to the visibility of the devices. If visibility of traffic control devices is considered to be a potential factor in crashes, a field review should be performed to determine if part of a sign's message is covered, obliterated, or blocked, as well as to check the reflectivity of the sign.

Methods for improving visibility of traffic signals and signs include the following:

- installing an additional signal head;
- providing visors to shade signal lenses from sunlight;
- providing louvers, visors, or special lenses so drivers are able to view signals only for their approach;



- installing backplates;
- installing larger (12-inch) signal lenses;
- removing or relocating unnecessary signs; and
- providing supplemental near-side and/or far-side signal faces.

Additional information on improving signal visibility to reduce red-light running can be found in *Making Intersections Safer: A Toolbox of Engineering Countermeasures to Reduce Red-Light Running* (available from safety.fhwa.dot.gov).

KEY TO SUCCESS

Visibility and clarity of the signal should be improved without creating additional confusion for drivers. Additional signing to warn drivers should not clutter the intersection and should not present confusing or conflicting messages to drivers.

ISSUES

Care should be taken to ensure that new or relocated signs do not present additional sight distance, roadside, or driver' distraction hazards. If some of the devices recommended are not maintained properly, the expected benefits may be lost.

TIME FRAME ●○○○

Implementation time will be relatively short for procedures to install new signs, improve signals, and remove or relocate signs.

COSTS ●○○○

Costs will be low for most procedures to install or upgrade signs and signals to improve visibility and awareness of the traffic control devices. Ongoing maintenance costs should be included when considering use of these devices.

EFFECTIVENESS

TRIED/PROVEN: Improved visibility and awareness of traffic control information are expected to reduce conflicts related to drivers not being able to see the device well or in enough time to comply with the signal indication or sign message (such as those resulting in rear-end and right-angle crashes). Various studies have indicated that installing larger (12-inch) signal lenses may result in an 11% decrease in crashes, installing backplates may result in a 13% decrease in crashes, converting from pedestal-mounted to mast arm-mounted signals may reduce crashes by up to 49%, and installing additional heads may reduce crashes by up to 28%.

COMPATIBILITY

Actions taken to improve visibility of signals are compatible with most other strategies to improve signalized intersection safety.

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>



U.S. Department of Transportation
Federal Highway Administration



Safe Roads for a Safer Future
Investment in roadway safety saves lives