

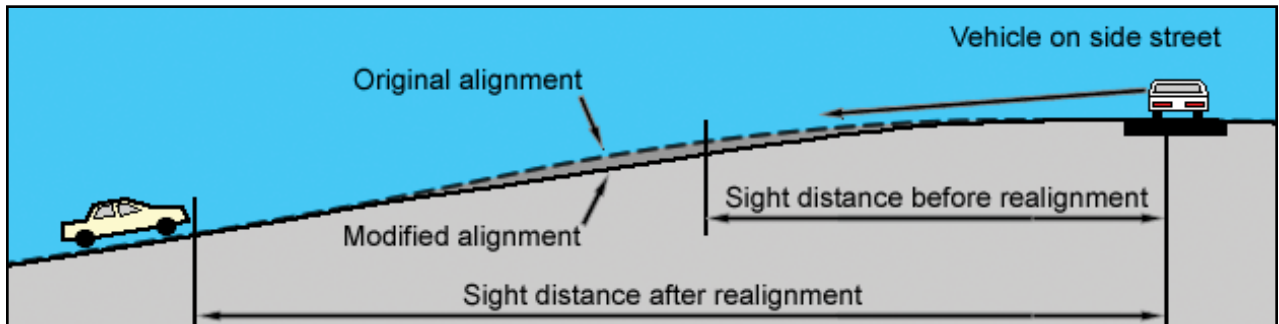
UNSIGNALIZED INTERSECTION SAFETY STRATEGIES



Change Horizontal and/or Vertical Alignment of Approaches to Provide More Sight Distance

WHERE TO USE

Unsignalized intersections with restricted sight distance due to horizontal and/or vertical geometry and with patterns of crashes related to that lack of sight distance that cannot be ameliorated by less expensive methods.



This graphic depicts how changes in the vertical alignment can affect sight distance. Even small changes in grade can have a significant impact.

DETAILS

Adequate sight distance for drivers at stopped approaches to intersections has long been recognized as among the most important factors contributing to overall intersection safety. Recent research has established design requirements for intersection sight distance based on driver and vehicle functional requirements. *NCHRP Report 383: Intersection Sight Distance* provides design guidelines that have been incorporated in the current edition of the *AASHTO Policy on Geometric Design of Highways and Streets (2001)*. *NCHRP Report 383* provides a gap-acceptance-based approach to sight distance requirements based on actual driver behavior at intersections. Previous strategies addressed sight distance improvements that can be achieved at relatively low cost by clearing sight triangles. This strategy addresses more costly geometric improvements that involve changing the horizontal or vertical alignment of the intersecting roadways. Such strategies should generally be considered only at intersections with a persistent crash pattern that cannot be ameliorated by less expensive methods.

KEY TO SUCCESS

Effectively diagnose whether a specific crash pattern observed at an intersection is, in fact, related to restricted sight distance. Currently this is a judgment made by an experienced safety analyst.

Because adjacent properties may be affected by the redesign, all the stakeholders should be involved early in the planning process.



ISSUES

The most difficult aspect of this strategy is the potential impact on adjacent property of making improvements to the horizontal or vertical geometry. Because of the potential impacts and the relatively high costs involved, this strategy should generally be considered only when less expensive strategies involving clearing of specific sight obstructions or modifying traffic control devices have been tried and have failed to ameliorate the crash patterns. If additional right-of-way is required, there may be significant environmental issues, as well.

TIME FRAME ●●●

Projects involving changing the horizontal and/or vertical alignment to provide more sight distance are quite extensive and usually take from 1 to 3 years to accomplish. If additional right-of-way is required, these projects will also involve discussions with owners of adjacent properties, which may require a substantial period of time.

COSTS ●●●●

Projects involving changing the horizontal and/or vertical alignment are generally high cost, especially if additional right-of-way is required.

EFFECTIVENESS

TRIED: There is no research that adequately quantifies the effectiveness of improving sight distance at unsignalized intersections. Based on existing literature, it has been estimated that if the available sight distance in any quadrant of an intersection is less than or equal to the design sight distance for a speed of 12 mph less than the actual 85th-percentile speed of the approach, then the frequency of related crashes at the intersection would be increased by approximately 5%. Each additional quadrant accounts for an approximate 4% decrease in crashes. Thus, a project may be 5 to 17% effective in reducing related crashes, depending upon the severity of the existing sight restriction and the number of intersection quadrants affected.

COMPATIBILITY

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

SUPPLEMENTAL INFORMATION

This strategy should be incorporated in highway design policies and highway maintenance manuals.

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

For more information contact:

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