

UNSIGNALIZED INTERSECTION SAFETY STRATEGIES



Provide Full-Width Paved Shoulders in Intersection Areas

WHERE TO USE

Unsignalized intersections on divided highways with no shoulder or shoulder widths less than 8 feet that experience a high proportion of run-off-road crashes as a result of avoidance maneuvers or a high proportion of rear-end crashes that could have been avoided had a full-width paved shoulder been provided.



DETAILS

Well-designed and properly maintained shoulders in intersection areas provide

- space for the motorist to avoid potential crashes or reduce crash severity,
- improved lateral placement of vehicles and space for encroachment of vehicles,
- space for pedestrian and bicycle use, and
- space to park disabled vehicles out of the traveled way.

Furthermore, the sense of openness created by shoulders of adequate width contributes to driving ease and freedom from strain. Finally, full-width shoulders can be used for temporary storage of snow that is plowed from the road during times of heavy snowfall, allowing the full width of the lanes to be available for moving traffic and minimizing the potential sight obstruction of plowed snow.

KEY TO SUCCESS

Make sure that full-width paved shoulders are operationally justified on the basis of an existing crash pattern.



ISSUES

There are three potential difficulties associated with this strategy. The first difficulty concerns recognizing a crash pattern for which this strategy is applicable. This may require reviewing police crash reports to determine why a vehicle ran off the road or whether a rear-end crash could have been avoided had a shoulder been present. Second, vehicles turning right may use a full-width shoulder as a pseudo right-turn lane, which may or may not be desirable. Third, when full-width paved shoulders increase the overall width of the intersection, the additional width may cause potential problems for pedestrians crossing the intersection. One possible solution to this third issue is to provide a pedestrian refuge island in the median.

TIME FRAME ●●○

Implementing this strategy may take from 3 months to 4 years. At some locations, full-width shoulders are already provided and simply need to be paved. At other locations, acquisition of additional right-of-way may be needed. Where right-of-way is required or where the environmental process requires analysis and documentation, project design and implementation periods can become lengthy.

COSTS ●●○○

Costs are highly variable. Where paving an existing full-width shoulder is possible, the costs are relatively low. Costs may be moderate where both grading and paving are needed. Higher costs will be incurred where right-of-way must be acquired.

EFFECTIVENESS

TRIED: The published literature on the safety effectiveness of shoulder widening and paving deals primarily with shoulders with roadway segments rather than shoulders at intersections. One research project concluded that the expected reduction in run-off-road and opposite-direction crashes from shoulder-widening projects ranged from 6 to 21%, depending upon the amount of widening. Other past research has concluded that shoulder widening on higher-volume, two-lane roadways reduces total crashes by 2.8% per foot of additional shoulder width. It was also concluded that there is a small safety benefit to paving existing unpaved shoulders. The magnitude of this benefit increases with increasing shoulder width. The results of these studies are not directly applicable to quantify the safety effectiveness of providing full-width paved shoulders at intersections. However, the results do provide an indication that providing full-width paved shoulders at intersections may improve safety.

COMPATIBILITY

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

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

For more information contact:

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