

Safety at High-Speed Intersections

Many rural intersections occur at locations with approach operating speeds of 45 mph or greater. These locations often occur on rural or urbanized two-lane or multi-lane highways. When such an intersection is under signalized control, less alert drivers may be forced to execute rapid stopping maneuvers. This unexpected deceleration can result in a high number of rear-end or angle crashes. In the United States and Oregon, crashes at high-speed signalized intersections are a significant safety concern. The Oregon Transportation Safety Action Plan specifically cites these high-speed signalized intersection crashes as a key safety emphasis area. ODOT actively continues to examine visibility, management, and decision zone requirements for high-speed intersections.

A 2010 study for ODOT by researchers at the Oregon State University School of Civil and Construction Engineering titled, *Evaluating Safety and Operations of High-Speed Signalized Intersections*, examined effective means for improving safety at isolated, high-speed, signalized intersections with posted speed limits of 45 mph or greater and at least one approach isolated by one mile or greater distance. The study created a guide for roadway designers seeking incremental measures that can enhance intersection safety. These measures include improved advanced signing, extended amber or all-red clearance intervals, modified decision

zones based on alternative reaction times, enhanced signal visibility, and other technologies that can further increase safe vehicle operations at these locations.

Tools provided by this study include:

- Average expected percentages and companion crash rates for four-leg isolated high-speed signalized intersections, which allow for easy detection of overrepresented crash types at a given intersection;
- A hierarchy of strategies to treat a given overrepresentation of specific crash types at such an intersection; and
- A logical reporting format, which allows for efficient diagnosis and guidance mitigation.

The study report contains case studies with example applications of this procedure for eight sample intersections.

The research team recommended that ODOT use this general template as a tool for evaluating and improving the safety of Oregon's isolated high-speed signalized intersections by implementing a system requiring periodic analysis. This arrangement would ensure that irregular crash

trends are quickly recognized and appropriately treated.





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The final report for this project was published in March 2010 and is available on the
Research Section web page:
http://www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/2010/Signalized_Intersections.pdf