

Mn/DOT's County Road Safety Plans (CRSP)

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In 2007, the Minnesota Department of Transportation (Mn/DOT) developed the statewide Strategic Highway Safety Plan (SHSP). The SHSP included a key interim goal of reducing traffic related fatalities to below 400 by 2010 as part of the State Toward Zero Deaths initiative. Using the SHSP to guide safety investments and decisions related to this goal, Mn/DOT has implemented a variety of safety-related strategies on roadways under the agency's jurisdiction, with positive results of reducing traffic fatalities.

Mn/DOT determined that continued decreases in traffic fatalities would require addressing local roads, where more than half of traffic fatalities in Minnesota occur. Local roads also have higher fatality rates than the state highways and interstates. Counties own and operate rural highways—where the traffic fatality problem is greatest. Because of this, Mn/DOT recognized that further reductions in traffic fatalities and serious injury crashes in Minnesota requires more effectively engaging local highway agencies in the safety planning process. While county staff have a long tradition of supporting local-level safety initiatives, they generally have less experience in conducting system-wide crash analysis or linking crash causes with mitigation strategies at specific locations on their system.

In response, Mn/DOT began work on a statewide initiative to develop a roadway safety plan for each of the 87 counties in Minnesota in 2009. A team managed by CH2M HILL that also includes SRF Consulting Group and Professional Engineering Services was selected by Mn/DOT to develop and implement the County Road Safety Plan (CRSP) process.

The CRSP process concentrates on information specific to individual county roadway networks, and identifies opportunities to reduce the number of fatal and serious injury crashes. The planning process used to develop each CRSP involves performing crash analyses and conducting a system-wide risk assessment. The information obtained from this exercise is used by Mn/DOT and its partners to identify unique, low-cost infrastructure-based safety projects that can be proactively deployed across a county, and developing safety plans for each county in the state. Using this analytical technique, Mn/DOT is providing each county



Good Shoulder, Good Clear Zone



No Shoulder, Good Clear Zone



Good Shoulder, No Clear Zone



No Shoulder, No Clear Zone

Example of roadway edges. This demonstrates various risk levels, from least risk at the top to highest risk at the bottom. Safety projects were often recommended for roads with higher edge risks. (Images courtesy of Mn/DOT Video Log Database)

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with a risk assessment of its roadway network and a list of recommended, low-cost strategies for specific at-risk roads within its jurisdiction.

This project is unprecedented in scope, with Mn/DOT's engagement of every Minnesota county and funding Safety Plans for county road systems across the entire state. The CRSP project is also breaking new ground by developing new methodologies and analytical techniques to address the overrepresentation of local roads in fatal and severe crashes. This includes refining the technique used to identify candidate locations for safety projects based on road and traffic characteristics. Development of an analytical technique using surrogates was necessary to address the challenge associated with having too few severe crashes at any specific location on the local system to reliably predict the degree of hazard based solely on crashes.

The first phase of the study was completed in the fall of 2010. This phase included preparation of safety plans for 20 counties in Mn/DOT Districts 3 and 6. These plans identified a total of roughly \$70 million worth of projects (an average of around \$3.5 million of projects per county. Around 90 percent of these projects focused on road departure crashes while roughly 10 percent focused on angle crashes at rural STOP controlled intersections.



This photo shows a high risk, rural curve with a relatively small radius and a visual trap (courtesy of Mn/DOT).

Characteristics that increase the risk of crashes involving curves have been found to include:

- 1) average daily traffic (ADT)
- 2) curve radius (the majority of crashes are found to occur on curves with radii ranging between 500' and 1,500')
- 3) history of severe crashes on the curve
- 4) the presence of an intersection or a visual trap on a curve

Project Highlights

- Unprecedented development of safety plans for all Minnesota counties
- Refinement of analytical processes to identify the most at-risk elements of rural systems where the majority of severe crashes are occurring—not locations with unusually high numbers of crashes
- Development of new methodologies and techniques to address overrepresentation of fatal and severe crashes on local highways