

SAFE SYSTEM CASE STUDY

Centerline rumble strips in Minnesota

KEY TAKEAWAY: Treating centerline rumble strips as a default systemwide treatment, rather than a spot fix, reduces the risk of serious injuries and fatalities from head-on collisions on rural roads throughout Minnesota.

SAFETY LEVER



Since 2012, the Minnesota Department of Transportation (MnDOT) has required that centerline rumble strips be placed on all rural, undivided roads with speed limits of 50 mph or greater whenever the pavement is constructed, reconstructed or overlaid.



A traditional rumble strip IHS-HLDI



A Minnesota "mumble strip" MnDOT

Instead of adding rumble strips on a case-by-case basis ...

... Minnesota made rumble strips the default

Implementing centerline rumble strips selectively

Risky roadway environments go unaddressed until enough crashes accumulate. Priorities can be driven by random crash variation rather than by underlying injury risk.

Systematic implementation of centerline rumble strips

The potential for head-on crashes is proactively reduced throughout the network of rural, undivided, high-speed roads, rather than waiting for seemingly random crashes to accumulate. Traffic volume can help prioritize placement of centerline rumble strips. MnDOT found that above 2,300 vehicles per day, severe crashes shift from mostly road departure to head-on.

Instead of giving up when faced with objections ...

... Minnesota found a solution

Removing a treatment when residents complain

Community pushback sometimes overrides the use of proven countermeasures. Safety improvements depend on who objects rather than on injury risk.

Addressing community concerns while preserving safety treatments

When some communities objected to the noise from centerline rumble strips, MnDOT did not discontinue the treatment. Instead, they tested and adopted sinusoidal "mumble" strips, which reduce exterior noise. This shift allowed MnDOT to preserve systemwide deployment of an effective safety countermeasure.

What lever did this intervention pull?

 **PRIMARY:** Adding centerline rumble strips reduced the **likelihood of a crash** by alerting drivers when they drift over the centerline, allowing them to steer back into their lane and avoid a collision. This intervention is known to cut head-on impacts, a crash type that commonly results in serious injuries.

State and local DOTs can reduce crash injuries by lowering one or more of the following

SAFETY LEVERS:



EXPOSURE

how much people drive



SEVERITY

how fast vehicles travel and how heavy they are



LIKELIHOOD OF A CRASH

how often road users come into conflict

What else can be done?

Policy/process trigger: When rumble strip installation is triggered, consider widening centerline pavement markings to 6 inches to improve delineation. Where further reductions in head-on collisions are needed, raised tube delineators, 2-12-foot centerline buffers, or cable barriers could be a next step.

Data collection: Track reductions in head-on collisions on roads where centerline rumble strips have been installed. Investigate whether surrogate data on lane departures is available from telematics data.