



# Centerline Rumble Stripe Fact Sheet

May 2015

## Towards Zero Deaths

- MnDOT implemented a Rumble Policy in 2011 to reduce Lane Departure crashes systematically and proactively.
- The Policy requires that CLRS be placed on all rural, undivided roadways with a posted speed limit of 55 mph or higher where the paved surface is constructed, reconstructed or overlaid.
- Target crashes for CLRS are head-on, sideswipe opposing, and run-off-the-road left – statewide there were 1855 fatal and life-changing injury crashes of these types between 2008-2012.
- Lane Departure crashes occur on all types of roadways; however, there are some common factors that were used to determine roads covered in the Policy:
  - **Driver related** - Young drivers, fatigued & drowsy drivers, distracted driving, and higher speeds.
  - **Road and environmental related** - Two-lane, undivided roads; rural, high speed roads; horizontal and vertical curves; adverse weather conditions such as rain, sleet, snow, & fog; and night-time.
- There are well over 800 miles of CLRS installed on the State Highway system (as of 2012).

CLRS reduce crashes (rural 2-lane roads):

Multi-state data (NCHRP 641)

9% Total  
 12% All Fatal & Injury  
 39% Total Cross-over  
 44% Fatal & Injury Cross-over

MN State Highway Data - control-treatment evaluation

29% Total  
 51% All Fatal & Injury  
 19% Total Cross-over  
 45% Fatal & Injury Cross-over

## Noise Concerns

- One of the designed intents of the rumble is to get the driver's attention through noise – this can be disturbing to residences near CLRS.
- Due to the noise concerns, MnDOT conducted a noise study and modified the Rumble Policy to allow more flexibility in gapping rumbles near residences and to reduce the depth of the rumble so the resulting noise would be reduced.

For rumbles to be effective:  
 Vehicle interior noise increase of 6-15dB needed.  
 Current MnDOT CLRS design results in a 15dB increase.

## New Design – Sinusoidal Rumble

- MnDOT is actively researching an alternative rumble design used in Northern European countries called a sinusoidal rumble that has been shown to have less exterior noise. California and Pennsylvania have also started testing slight variations of this design.
- Test sections using two different sinusoidal rumble patterns were studied in 2014. The results were promising with a significant reduction of external nuisance noise.
- A modified California design will be installed on some roads in MN this year
- MnDOT is now conducting a **Sinusoidal Rumble Design Optimization** research project to investigate rumble patterns that:
  - Will be tested for safety for motorcycles and other non-traditional vehicles
    - This will be tested in May/June 2015 at MNROAD
  - Will minimize the external noise as much as possible, while being attention-getting within the vehicle
    - This will be tested in the summer and fall of 2015
  - New MnDOT Sinusoidal Rumble Strip design expected in late 2015

Exterior noise increase is variable, and depends on distance and environmental factors. One MnDOT study of rumble noise found the following noise levels near shoulder rumbles (existing MN design):

50' away 82 dB  
 100' away 75 dB  
 200' away 67 dB  
 300' away 62 dB

For equivalence:  
 80 dB – Heavy Truck Traffic  
 70 dB – Business Office  
 60 dB – Conversational Speech

*Your Destination...Our Priority*

