

**American Association of State Highway and Transportation Officials
Special Committee on Research and Innovation**

FY2021 NCHRP PROBLEM STATEMENT OUTLINE

1. Problem Title

Rumble and Mumble Strip Preservation Treatment Options

2. Background

Centerline and shoulder rumble and mumble strips have long served as a safety treatment tool to alert motorists to realign their vehicles to the driving lane. As part of the 2018 Midwest and Southeast Pavement Preservation Research Survey, rumble strip preservation was identified a research need.

Many rumble and mumble strips are installed as part of contract overlay projects where pavement thicknesses can be as thin as 1 inch. Rumbles are then ground into to the new overlay effectively reducing the thickness in the grounded areas to ½" or less. In addition As a result the ground pavement area making up the rumble strip generally displays premature deterioration and requires ongoing maintenance to keep the roadway free of pot holes. The purpose of this research are five (5) fold.

- Threshold for minimum thickness of pavement or pavement overlay for rumble and mumble strips to be milled.
- Threshold for the age of pavement or pavement overlay for rumble and mumble strips to be milled.
- Effects of preservation strategies on pavement markings that are maintained or preserved on rumble and mumble strips.
- Effects of sealers, rejuvenators and other preservation strategies on the performance of rumble and mumble strips.
- Strategies to maintain and preserve rumble and mumble strips to meet the design life of the pavement or pavement overlay.

3. Literature Search Summary

Much of the research done on the topic references the performance of rumble strips on how they perform their function in keeping motorists in their driving lane. More research is needed to determine the effects of rumble strips on older pavements and thin lift pavement overlays and offer solutions to owner agencies on how to maintain and preserve them for the life of the pavement. Please see literature search below for more information.

State of the Practice for Shoulder and Center Line Rumble Strip Implementation on Non-Freeway Facilities (FHWA, 2017)

<https://www.fhwa.dot.gov/publications/research/safety/17026/17026.pdf>

Rumble Strips and Stripes – Pavement Maintenance (FHWA, 2016)

https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/pavement-and-maintenance.cfm

Safety Evaluation of Centerline Plus Shoulder Rumble Strips (FHWA, 2015)

<http://www.fhwa.dot.gov/publications/research/safety/15048/15048.pdf>

Rumble Strip Implementation Guide: Addressing Pavement Issues on Two-Lane Roads (FHWA, 2015)

https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/media/RumbleStripGuide_Pavement/pavement_bpg.pdf

Practice of Rumble Strips and Rumble Stripes (NCHRP synthesis 490, 2017)

<http://www.trb.org/Main/Blurbs/174393.aspx>

Centerline rumble strips safety and maintenance impacts Georgia (2014)

<https://rosap.ntl.bts.gov/view/dot/35629>

Evaluation of Non-Freeway Rumble Strips—Phase II (MDOT, 2015)

<https://rosap.ntl.bts.gov/view/dot/28882>

Rumble Strips vs. Mumble Strips: Noise Comparison (Video) (MnDOT, 2015)

<https://mntransportationresearch.org/2014/06/10/rumble-strips-vs-mumble-strips-noise-comparison-video/>

4. Research Objective

The objective of this research is to develop a guide to maintain and preserve rumble and mumble strips that last as long as the main line pavement where they were installed.

5. Urgency and Potential Benefits

The value of this research could be used by DOTs, Canadian Provinces and Local Agencies that maintain rumble strips on their highway systems. Here is a summary of centerline rumble strip (CLRS) inventories currently found in a recently conducted literature search:

By state

CA, HI, NC, RI, VT: Unspecified number of miles. Source: 2017 FHWA report, pages 42-43

CT: Installed 15 miles of CLRSs in 2014, installed 25 mi in 2015, and plans to install 200 miles in 2017. Source: 2017 FHWA report, pages 42-43

GA: Over 150 miles of centerline rumble strips installed in 2005 and 2006. Source: 2014 GADOT report, page 1

ID: Idaho has about 330 miles of highway where centerline rumble strips have been used in no passing zones for horizontal curves, vertical curves and other locations of site restrictions. Due to the gaps between these no passing zones the actual miles of centerline rumble strips is only a portion of the 330 miles. Source: Ohio DOT Survey 2014

LA: Installed 2,000 mi of rumble strips on new asphalt on rural two-lane roadways consisting of 6-inch rumble with thermoplastic striping and raised pavement markers. Source: 2017 FHWA report, pages 42-43

MT: Plans to ramp up CLRS installation by installing 4,000 miles over the next 4 years. Source: 2017 FHWA report, pages 42-43

PA: 4,376 cumulative edgeline rumble strip miles in 2014; 5,182 cumulative centerline strip miles in 2014. Source: NCHRP synthesis 2017, page 24

VA: 200 miles of CLRSs and SRSs. Source: 2017 FHWA report, pages 42-43

All states: A survey found a total CLRS mileage of approximately 11,333 miles (not including the states of Texas and Colorado). Results indicate that 36 states reported the use of CLRS. 2011 Journal of the TRF article, page 101

6. Implementation Considerations and Supporters

In order to maximize timely deployment of the research results, problem statement submitters should identify

The implementation plan will include the creation of a reference guide for owner agencies to utilize to address the design best practices, construction specifications and preservation strategies for rumble and mumble strips. In addition a training webinar will developed and available for use by owner agencies and others as needed. Lastly findings from this research is anticipated to be shared at the AASHTO MAC meeting and at the NCPP regional pavement preservation partnership meetings.

- Target Audience → All State DOTs, Canadian Provinces and Local Agencies
- Decision-makers → Maintenance Engineers and Administrators
- AASHTO Committee → MAC committee
- Early Adopters → State DOT's, Canadian Provinces, Local Municipalities

7. Recommended Research Funding and Research Period

Research Funding: \$250,000

Research Period: 12 months

8. Problem Statement Author(s)

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9. Others Supporting the Problem Statement

AASHTO Committee on Maintenance
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10. Potential Panel Members

11. Person Submitting the Problem Statement

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AASHTO Committee on Maintenance