I. Background

What are the needs/problems/benefits that justify the initiative?

With advancements in paving and material technologies, the use of thin overlays has become a standard option for pavement preservation projects. The useful life of a pavement structure can be lengthened by treating or milling the surface of the pavement and placing such an overlay at a fraction of the cost of a full-depth replacement. Examples of these overlays include seal coats, microsurfacing, and application of hot mix asphalt.

However, the use of these two treatments (rumble strips and thin overlays) in conjunction with each other and with existing rumble strip installations is a new process. There is no existing standard guidance on how to effectively treat existing rumble strips prior to placement of the overlay, remill rumble strips after the overlay has been placed, or install new rumble strips onto an overlay. These concerns apply directly to the constructability, cost, and longevity of the proposed rumble strips. It is also possible that the different types of overlays will each require separate guidance for installation.

Installation of centerline and edgeline rumble strips has been found to be the most cost effective treatment for reducing highway fatalities in the Commonwealth. Over the past ten years, head-on fatalities have been reduced over 50% (317 in 2002 to 148 in 2012), saving over 150 lives per year. Pennsylvania has about 10,000 miles of rumble strips which may potentially lose their effectiveness or be eliminated gradually as a result of the new thin pavement overlay initiative. Centerline and edge-line rumble strips are most vulnerable.

Who experiences the problem or would benefit from the initiative?

PennDOT experiences the problem when using thin overlays on roadways with existing centerline and edgeline rumble strips. It is clearly not in the best interest of the driving public to cover existing rumble strips and not re-mill or re-install the rumble strips. It may also place PennDOT at risk for increased tort claims resulting from crashes on roadways that used to have rumble strips. Please refer to the accompanying charts showing the benefits that PA has experienced using centerline and edgeline rumble strips.

II. Purpose

What is the purpose of the initiative?

The ultimate objectives of this synthesis are a) a list of best practices for reinstalling milled rumble strips onto thin pavement overlays atop existing rumble strip locations, and b) a list of best practices for installing new milled rumble strips concurrent with thin pavement overlays. It would be beneficial for PennDOT to be able to reference a standardized, accepted list of best practices to ensure a uniform, proper, and reliable treatment is achieved where these scenarios occur. The timing is critical as these concurrent installations are already being placed. The Safety TAG is not aware of any other State or national organization developing a synthesis on this topic.

Implementation of the best practices would be left to the discretion of PennDOT Bureau of Maintenance and Operations (BOMO). BOMO would need to coordinate a proposed implementation approach with FHWA, the Bureau of Project Delivery, and the Engineering District Offices. Any changes to PennDOT’s standards, manuals, and specifications would be vetted through the Clearance Transmittal process.
What immediate or long-range results are expected?
The long term results would be to continue the positive safety performance of centerline rumble strips and edgeline rumble strips since 2005 as depicted in the charts.

III. Outcomes

What is the estimated cost of implementing the initiative?
A synthesis of best practices is estimated to cost $100,000.

What is the estimated time line to deploy the initiative?
Nine (9) months.

What performance measure(s) would gauge success?
The “output” performance measures as identified in the charts would be a continued increase in mileage of centerline and edgeline rumble strips. The “outcome” performance measures would be a continued decrease in head-on fatalities and single-vehicle run-off-road fatalities.

Who would be involved in implementing the idea?
The synthesis of best practices would be performed by a qualified engineering consulting firm or University. Implementation of the recommended approach for Pennsylvania would be a coordinated effort by PennDOT’s Bureaus of Maintenance and Operations and Project Delivery, PennDOT Engineering Districts, and FHWA.

IV. Options

Is there more than one option for deploying the initiative?
The synthesis of best practices will help determine the best approach for a) treating the existing rumble strips prior to the overlay project, b) re-installing the rumble strips after the overlay project is complete, and c) installing new rumble strips onto a new thin overlay roadway surface. The recommended treatments may be different depending on factors such as overlay thickness and type of material.

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