



Research Need Statement 582

I. Need Statement Author and Information

I.A. Need Statement Author Information

I.A.1. First and Last Name of Need Statement Author: **Victor Lund**

I.A.2. Statement Author's Office: **St. Louis County Public Works**

I.A.3. Statement Author's Phone Number: **218/625.3873**

I.A.4. Statement Author's Email: LundV@stlouiscountymn.gov

I.B. Research Champion

I.A.1. First and Last Name of Research Champion: **Same as above.**

I.A.2. Research Champion's Office:

I.A.3. Research Champion's Phone Number:

I.A.4. Research Champion's Email:

I.C. Research Needs Title (115 Characters):

Transverse Rumble Strips at Rural Intersections

I.D. Project Sponsor: Local Road Research Board

II. Research Need Background and Description

II.A. Research Need Background

II.A.1. Describe the problem or opportunity.

Crashes at rural intersections come at a high societal and financial cost. Minnesota's Department of Public Safety's Crash Facts provide National Safety Council estimates of \$90,000 for serious injury crashes and \$1,542,000 for fatal crashes in 2016. Rural intersection crashes in 2018 cost the state of Minnesota an estimated \$90,000,000 (MnDPS, 2018). Working to better deploy and maximize the efficacy of low-cost treatments like transverse rumble strips are important for reducing the number and high costs of these crashes.



Transverse rumble strips are typically deployed at rural side-street stop controlled intersections to help reduce serious and fatal crashes. However, FHWA lists them as "tried" rather than "proven" due to conflicting research findings.

It is understood that most crashes at rural side-street stop intersections are due to drivers selecting a poor gap in the major street to complete their maneuver. Transverse rumble strips are intended to aid in driver recognition of the stop condition, but they do not assist the driver in selecting a gap in the major street. Many agencies deploy transverse rumble strips as a best attempt to address problem intersections when the problem is generally due to gap selection. It is likely for this reason that the transverse rumble strips are listed as "tried" rather than proven. The research need is to isolate the effects of transverse rumble strips to identify the best designs for placement (one or more transverse rumble strip tables; spacing of transverse rumble strip tables to the stop condition) and pattern (geometry of grooves; length of rumble strip table). A better understanding of an optimal design of transverse rumble strips could lead to utilization at intersections with known issues of drivers running the STOP sign. Additionally, there may be a benefit of including optimally designed transverse rumble strips at all intersections as a method to address all contributing factors of crashes.

II.A.2. If applicable, describe how this project will build on previous research.

II.A.3. If applicable, include the title/s or previous research.

[County Highway Intersection Safety & Stop Condition Rumble Strips](#) by Brown County

[Safety Evaluation of Transverse Rumble Strips on Approaches to Stop-Controlled Intersections in Rural Areas](#) by FHWA

II.A.4. What is the **objective** of the proposed research?

Further research is needed to determine the role that transverse rumble strips have in alerting distracted/unaware/or fatigued drivers of upcoming intersections and if the lack of efficacy is more related to improper gap selection. The study should examine the placement (one or more transverse rumble strip tables; spacing of rumble strip tables to the stop condition) and pattern (geometry of grooves; length of rumble strip table) to determine how to best ensure their intended message is perceived by drivers and determine what the best practice is to achieve the purpose of rumble strips.

III. Strategic Priorities, Benefits, and Expected Outcomes

Section III. is for MnDOT sponsored and co-sponsored projects only; all LRRB projects proceed to section I.V.



III.A. MnDOT Strategic Priorities

Instructions: Briefly describe how the project aligns with the following MnDOT Research Strategic Priorities. Complete all that apply.

III.A.1. Innovation & Future Needs:

III.A.2. Advancing Equity:

III.A.3. Asset Management:

III.A.4. Safety:

III.A.5 Climate Change & Environment:

III.B. Expected Outcomes

Instructions: Check all expected direct outcomes of this research.

- New or improved technical standard, plan, or specification
- New or improved manual, handbook, guidelines, or training
- New or improved policy, rules, or regulations
- New or improved business practices, procedure, or process
- New or improved tool or equipment
- New or improved decision support tool, simulation, or model/algorithm (software)
- Evaluation of a new commercial product
- Other. Please specify below:

III.C. Expected Benefits

Instructions: Select all expected benefits that may be realized if the findings and recommendations from this research is adopted or implemented



III.C.1. Construction Savings Choose an item.

III.C.2. Decrease Engineering/Administrative Costs Choose an item.

III.C.3. Environmental Aspects Choose an item.

III.C.4. MnDOT Policy Choose an item.

III.C.5. Lifecycle Choose an item.

III.C.6. Operations and Maintenance Savings Choose an item.

III.C.7. Reduce Risk Choose an item.

III.C.8. Reduce Road User Cost Choose an item.

III.C.9. Safety Choose an item.

III.C.10. Technology Choose an item.

III.C.11. Other, please describe below:



IV. Technical Advisory Panel

Instructions: Please list the name and affiliation of individuals to consider for the Technical Advisory Panel.

- Tim Stall – Jackson County
- Jed Nordin - Hubbard County
- Vic Lund – St. Louis County
- Scott Thompson – MnDOT D7
- Mark Vizecky – MnDOT State Aid
- Rich Sanders – Polk County
- Tara Olds – MnDOT State Aid
- Joe Gustafson – Washington County
- Kristi Sebastian – Dakota County
- Brad Estoche – Ramsey County

Your assigned Project Advisor is available to answer questions and provide guidance (assigned by the Office of Research & Innovation).

Your Project Advisor is: Brent Rusco (651)366-3767 brent.rusco@state.mn.us