

Research Need Statement 583

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):

Driver Comprehension of Flashing Yellow Arrows

I.D. Project Sponsor: Joint MnDOT and Local Road Research Board

II. Research Need Background and Description

II.A. Research Need Background

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

Left turns are considered one of the most difficult maneuvers drivers can make. Errors in left turns can lead to serious angle crashes or failures to yield to pedestrians. Better understanding and supporting drivers as they make left turns could help to reduce multiple types of left-turn intersection crashes.

Flashing yellow arrows are frequently deployed to control left-turn movements at signalized intersections. While FHWA considers the flashing yellow arrow as a dramatic safety improvement over the green ball because it is understood to be more intuitive to drivers, driver complaints about their confusing state and some high profile crashes call into question their mainstream comprehension. An added complication is the various light arrangements (e.g., vertical stack or 5 light cluster) may add to confound their intuitiveness and ultimate efficacy. Additionally, agencies have received requests years after initial installation of flashing yellow arrows to install "LEFT TURN YIELD ON FLASHING YELLOW ARROW" signing on traffic signals to clarify the operation.

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.

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

Research is needed to examine driver comprehension of the flashing yellow arrow in different light arrangements and the role of signage. The research could determine what level of education and outreach might be needed to improve driver comprehension of the flashing yellow arrow.

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: **Intent of the research is to increase driver comprehension of flashing yellow arrows to reduce crash potential.**

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 Reduction of crash severity and frequency

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.

Vic Lund – St. Louis County

Kristi Sebastian – Dakota County

Joe Gustafson – Washington County

Brad Estochen – Ramsey County

Jerry Kotzenmacher – MnDOT Traffic Signals

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