

Research Need Statement 642

I. Need Statement Champions and Information

I.A. Need Statement Champion Information

I.A.1. First and Last Name of Research Champion: **Greg Ous**

I.A.2. Research Champion's Office: **MnDOT District 7**

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

I.A.4. Research Champion's Email: greg.ous@state.mn.us

I.B. Research Co-Champion

I.A.1. First and Last Name of Research Co-Champion:

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

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

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

I.C. Research Needs Title (115 Characters): **Effective Strategies to Extend Remaining Life of ASR-Affected Pavements**

I.D. Project Sponsor: **MnDOT Research Program**

II. Research Need Background and Description

II.A. Research Need Background

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

Minnesota has addressed ASR problem by modifying concrete mix design (e.g., limiting total alkali content, addition of SCMs) for new construction. Before these changes were implemented, pavement sections had been built using reactive aggregates; some of these pavements are still in service. Some sections of I-90 and US 169 built in late 1980s and early 1990s have shown premature deterioration due to ASR. The extent of deterioration has been varying. To keep these pavements in good riding condition and prolong the remaining service life, various strategies (e.g., chip seal) have been implemented. Moreover, some sections deteriorated severely and were overlaid, prematurely. The outcomes of these strategies have not been documented qualitatively or quantitatively, hence; the effectiveness of these strategies is unknown.

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?

Identify effective maintenance and rehabilitation strategies that lead to cost-effective management of ASR-Affected pavement sections.

III. Strategic Priorities, Benefits, and Expected Outcomes

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

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: Identifying effective maintenance and rehabilitation strategies will lead to cost-effective management of pavement sections built with reactive aggregate. Extending remaining service life.

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
- New or improved technical standard, plan, or specification
- 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 **Improved quality of construction**

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 **Products with longer lifespan**

III.C.6. Operations and Maintenance Savings **Reduced materials used**

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.

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

Your Project Advisor is: Marcus Bekele, (651)366-3903, marcus.bekele@state.mn.us