Research Need Statement 658

I. Need Statement Champions and Information

I.A. Need Statement Champion Information

I.A.1. First and Last Name of Research Champion: Bernard Izevbekhai
I.A.2. Research Champion's Office: Office of Materials & Road Research
I.A.3. Research Champion's Phone Number: 651-366-5454
I.A.4. Research Champion's Email: Bernard.izevbekhai@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): A Synthesis of Usage and Performance of Daylighted Bases in Comparison to Edge Drains

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.

Despite the myriad of efforts and initiatives into drainable bases and the use of edge drains, there is a paucity of information about their respective and relative performances. Pavement bases provide various benefits ranging from a suitable platform for construction of the surfacing, to actual pavement layer moduli (especially in flexible pavements), to uniform supports (especially in rigid pavements). In all cases the performance characteristics of the pavements are rapidly altered by drainage or lack of it. The base provides most of the required subsurface drainage.

As the MnDOT Districts and the Local Governments have used drainable bases to varying degrees, there is a plethora of decision processes implicit in the logical selection of drainable bases. These drainage types are also ramified in daylighted drains versus edge drains or systems that are tied to edge drains. As the technologies include Open Graded Aggregate Base (OGAB), Drainable Stable Base (DSB), Class 5 Q and Geocomposite Joint Drain (GJD), it has become necessary to examine the various drainable base types in use,

their frequency of usage and basic performance characteristics. Consequently, a synthesis is deemed relevant.

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?

A synthesis that will accentuate the relative and respective performances of various bases when they are daylighted versus when they are enhanced with edge drains.

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:

IIIA.2. Advancing Equity:

III.A.3. Asset Management:

The state of the practice implicit in a great synthesis provides a coalescence of various isolated advantages into a potentially synergistic process. It will be beneficial to District Materials and Construction Engineers as well as the Cities and Counties. Mistakes and substandard approaches will continue unless attention is drawn to relative performance of various practices over time.

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 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.

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