

**TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT**

for

**National Partnership to Determine the Life Extending Benefit Curves of Pavement
Preservation Techniques (MnROAD/NCAT Joint Study – Phase II)**

Lead Agency: Minnesota Department of Transportation

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

| | | |
|---|--|---|
| Transportation Pooled Fund Program Project # TPF-5(375) http://www.pooledfund.org/Details/Study/627 | | Report Period: Year 2023 Quarter 1 (January 1 – March 31, 2023) |
| Project Title: National Partnership to Determine the Life Extending Benefit Curves of Pavement Preservation Techniques (MnROAD/NCAT Joint Study – Phase II) http://www.dot.state.mn.us/mnroad/ncatpartnership/index.html | | |
| Project Manager(s): Ben Worel (MnDOT) Jack Jernigan (FHWA) | Phone Number: (651) 366-5522 (202) 493-3363 | E-Mail ben.worel@state.mn.us Jack.Jernigan@dot.gov |
| Lead Agency Project ID: None | Other Project ID (i.e., contract #): None | Project Start Date: January 1, 2019 |
| Original Project End Date: December 30, 2023 (60 months) | Current Project End Date: December 30, 2023 (60 months) NCAT Contract – June 30, 2022 | Number of Extensions: 1 (18-month extension for NCAT till December 30, 2023) |

Project schedule status → On schedule

Overall Project Statistics:

| Total Project Budget | Total Costs obligated to Date for Project | Percentage of Time and Funding Completed to Date |
|---|---|--|
| Commitments (State SPR + FHWA + FP2 Partnership with MnDOT) \$5,150,000 (see last page for member breakdown) | MnDOT Contracted Tasks \$ 4,564,034 MnDOT Payments to those Tasks \$ 4,018,084 (88%) | Time (54/60 months) 90% |

Project Description:

Background:

Our nation has one of the best roadway transportation system in the world but overtime as with any investment, preservation is required to maximize the benefits and provide out citizens with long term pavement performance with little traffic disruptions. Currently the American Society of Civil Engineers report that one in every five miles of roads are in poor condition and the system is chronically underfunded. Minnesota Department of Transportation has also documented it cannot keep up with the costs of expansion, rehabilitation, and maintenance of its network because the remaining service life of our roads have gone from 13.7 years in 2000 to 9.4 years in 2013. This is one example why additional information is needed by agencies/pavement owners to develop a better understanding how different asphalt pavement preservation techniques can be used on a national scale.

The Minnesota DOT Road Research Project (MnROAD) and National Center for Asphalt Technology (NCAT) formed a partnership in 2015 to evaluate Pavement Preservation treatments on a national scale. Following the success of the Lee Road 159 preservation treatments, in 2015, NCAT constructed a high-volume test sections on US 280. MnDOT in conjunction with the northern DOT's (in the pooled fund) have constructed similar test sections in 2016 on US-169 (high volume) and CSAH-8 (low volume) in Mille Lacs County Minnesota. This provided the study with four test decks consisting of low and higher volume roadways in both Minnesota (cold / hard freeze) and Alabama (hot / non-freeze). These test decks were built and supported by pooled fund studies lead by the Alabama DOT for NCAT. MnROAD was a partner in the last pooled fund study TPF-5(269) and was supported by 14 states around the country including the Foundation for Pavement Preservation, National Center for Pavement Preservation, and a number of other vendors. This initial study documented the construction of 25 test sections on Lee Road 159, 35 test section on US-280 in Alabama and 30 test sections on county state aid highway (CSAH-8) and 29 test sections on US-169 in Minnesota. Each test deck was constructed by one contractor using local materials and monitoring is completed in consistent manners by both NCAT and MnROAD staffing. Preservation treatments were also consistent for all four locations which included crack seals, fog seals, chip seals, cape seals, microsurfacing, thinlays and different combinations of each of them. Initial monitoring has started but additional time is required to determine the benefits of each treatment over time. That is the main purpose of the second phase of this research. The initial pooled fund was for 3 years from 2015-2018 and was led by NCAT and phase-2 will be over the next five years lead by MnROAD with MnDOT being the lead state.

Objectives:

MnROAD and NCAT are seeking organizations to join the partnership for the second phase of research efforts. Main objectives include:

1. Determining the life cycle cost of various pavement preservation alternatives in a highly controlled experiment that will provide state Departments of Transportation (DOTs) with the financial foundation to begin to build a decision tree for their own maintenance program
2. Develop quality assurance QA field testing protocols to correlate construction practices with long term performance of pavement preservation techniques.
3. Technology transfer - Answering practical questions posed by research sponsors through formal (i.e., reports & technical papers) & informal (e.g., one-on-one responses to sponsor inquiries) technology transfer on how these life extending benefits can be best utilized in each state.

Scope of Work:

This second phase (2019-2024) will be used to continue to monitor and analyze data from the low and high-volume pavement preservation sections built both in Alabama and Minnesota since many of the test sections were built in 2016 and not had enough time to show what rate of deterioration they will have. MnDOT will lead this portion of the pooled fund study and will again partner with NCAT but now they will be the subcontractor doing the data collection in Alabama and the majority of the data analysis.

We have established the following overall tasks that we are still working to define with our members. These include:

- Task 1 - Field Performance data collection and initial data validation
- Task 2 - Website updates - online systems (Fall 2019 Start)
- Task 3 - Yearly performance summaries (Dec 31st)
- Task 4 - 2020 "Peer" Exchange
- Task 5 - 2020 Mid-Project Report
- Task 6 - Sponsor Meetings (held every 6 months)
- Task 7 - Pooled Fund Implementation - Assist industry/agencies implement findings / better communication of efforts already underway by NCHRP, UNR, and ISSA)
- Task 8 - 2021 End-Project Report

Key Staffing Includes:

NCAT (Contracted by MnDOT)

- Adriana Vargas (Project Investigator)
- Buzz Powell (Project Support)
- Jason Nelson (Data Collection)

MnROAD (Lead State)

- Jerry Geib (Northern Lead Investigator)
- Ben Worel (MnROAD Operations Engineer)
- Michael Vrtis (Data Collection)

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

To date 23 agencies have become members to share their expertise and are learning about pavement preservation. Building off PG1 (Phase-I) here is the activities that were completed this quarter.

Joint Activities

- Article submitted for PP Journal Spring issue
- Paper presented at TRB
- Presentation given at AKT20 Committee Meeting
- Two bi-monthly online meetings held (micro surfacing and dense-graded thinlays)
- Two papers accepted for presentation at T&DI Conference
- One paper accepted for presentation at LVR Conference
- Presentation given at SCAPA winter conference
- Presentation given at HAPI annual conference
- Presentation given at ISSA Slurry Systems Workshop
- Presentation given at AEMA-ARRA-ISSA annual meeting

NCAT Activities (South)

- Data collection continues US-280 and Lee Road 159
- Continued development of the process to analyze the data
- Southern section performance data updated on NCAT's website

MnDOT Activities (North)

- Field data collection on US-169 and CSAH-8
- Working to develop a process for the Pathways Autocrack to help in the research

Anticipated work next quarter:

The following is expected to be completed for next quarter.

Joint Activities

- Present at T&DI Conference in June
- Prepare article submission for PP Journal Summer issue
- Hold bi-monthly online meeting in May (UTBWCs & OGFCs)
- Hold spring sponsor meeting in Auburn (May)

NCAT Activities (South)

- Data collection continues US-280 and Lee Road 159
- Continued development of the process to analyze the data

MnDOT Activities (North)

- Spring data collection on US-169 and CSAH 8

Significant Results:

Currently this pooled fund is working well for all the members and discussion was reported at the Fall Sponsor Meeting in September.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems)

States/participating members are supporting the three-year contract with NCAT be extended for an additional two years for the full length of this pooled fund. Many of the states have committed for the full 5 years and the process has been initiated to extend NCAT's contract for the final 2 years of this effort or calendar year 2022 and 2023. MnDOT will be coordinating with the TAP on future funding and providing support to the next phase being proposed solicited.

Potential Implementation: Being developed under Task-8

Funding Summary Using Pooledfund.org and MnDOT Reports as of April 2023

National Partnership to Determine the Life Extending Benefit Curves of Pavement Preservation - TPF-5(375)

| Agency | Type | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Total |
|---------|-----------------------|---------|-----------|-----------|---------|---------|---------|-----------|
| AL | Commitments | 50,000 | 50,000 | 50,000 | | 50,000 | 50,000 | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | | 50,000 | | 200,000 |
| AR | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | | 200,000 |
| CO | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| FHWA | Commitments | | 50,000 | 100,000 | 50,000 | | | 200,000 |
| | Payments | | 50,000 | 100,000 | | | | 150,000 |
| FP2* | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| GA | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 300,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| IL | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| KS | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| KY | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| MD | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | | 200,000 |
| MI | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| MN | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 300,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| MO | Commitments | | 150,000 | | | | | 150,000 |
| | Payments | | 150,000 | | | | | 150,000 |
| MS | Commitments | | 50,000 | 50,000 | | 50,000 | | 150,000 |
| | Payments | | 50,000 | 50,000 | | 50,000 | | 150,000 |
| NC | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| NY | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | | 200,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | | 200,000 |
| OK | Commitments | 50,000 | 50,000 | 50,000 | | | | 150,000 |
| | Payments | | 50,000 | 50,000 | | | | 100,000 |
| PA | Commitments | | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| | Payments | | 50,000 | 50,000 | 50,000 | 50,000 | | 200,000 |
| SC | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | | 250,000 |
| TN | Commitments | 50,000 | 50,000 | | | 50,000 | | 150,000 |
| | Payments | 50,000 | 50,000 | | | 50,000 | | 150,000 |
| TX | Commitments | 50,000 | 50,000 | 50,000 | | 50,000 | 50,000 | 250,000 |
| | Payments | 50,000 | 50,000 | 50,000 | | 50,000 | | 200,000 |
| WI | Commitments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 300,000 |
| | Payments | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 300,000 |
| Summary | Commitments (PF Site) | 550,000 | 1,200,000 | 1,050,000 | 800,000 | 950,000 | 600,000 | 5,150,000 |
| | Payments (PF Site) | 500,000 | 1,200,000 | 1,050,000 | 750,000 | 950,000 | 250,000 | 4,700,000 |

* Agreement (MnDOT Partnership with FP2)

Agency Commitment waiting for payment

Pooled Fund Website (Partner Commitments/Payments/Additonal Payments)

| | | |
|--|--------------|-------|
| Total Commitments by partners (Web Site) | \$ 5,150,000 | A |
| Total Payments by partners (Web Site) | \$ 4,700,000 | B |
| Future Payments to be paid by partners | \$ 450,000 | (A-B) |

Contracted Efforts

updated: April 2023

| Expenses | Contracted | Payments | Remaining to be invoiced |
|---|---------------------|---------------------|--------------------------|
| NCAT Original Contract - 1032194 | \$ 1,750,000 | \$ 1,750,000 | \$ - |
| NCAT Original 18-mo Extension - 1032194 | \$ 945,545 | \$ 630,363 | \$ 315,181.64 |
| NCAT 70th Street Contract - 103417 (Northern Recycling Construction Cost) | \$ 589,600 | \$ 589,600 | \$ - |
| MnDOT Salaries Original Effort | \$ 1,190,000 | \$ 959,232 | \$ 230,767.83 |
| MnDOT Salaries 18-mo Extension \$200K /Move to PG3 | | \$ - | \$ - |
| Expenses - Traffic Control/Shipping + 20K ext | \$ 88,889 | \$ 88,889 | \$ - |
| Totals | \$ 4,564,034 | \$ 4,018,084 | \$ 545,949.47 |
| | C | | |

Overall Summary

| | | |
|---|-------------------|--------------|
| Total Commitments by partners (Web Site) | \$ 5,150,000 | A |
| Total Dollars Contracted by MnDOT | \$ 4,564,034 | C |
| Remaining Dollars to be discussed with TAP | \$ 585,966 | (A-C) |