TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT
for
National Road Research Alliance (NRRA)

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(341) *http://www.pooledfund.org/Details/Study/590*	**Report Period:** Quarter 1 (January 1 – March 31, 2019)	
Project Title: National Road Research Alliance – NRRA http://www.dot.state.mn.us/mnroad/nrra/index.html		
Project Manager(s): Glenn Engstrom (MnDOT) Robert Orthmeyer (FHWA)	**Phone Number:** (651) 366-5531 (708) 283-3533	**E-Mail** glenn.engstrom@state.mn.us Robert.orthmeyer@dot.gov
Lead Agency Project ID: None	**Other Project ID (i.e., contract #):** None	**Project Start Date:** February 22, 2016
Original Project End Date: September 30, 2018 (29 months)	**Current Project End Date:** February 22, 2021 (60 months)	**Number of Extensions:** 1 (Approved - Dec 2017 by NRRA Executive Committee)

Project schedule status → On schedule

Overall Project Statistics:

Total Project Budget	Total Costs obligated to Date for Project	Percentage of Tim and Funding Completed to Date
$4,400,000 (State SPR Funds) Includes 150K - WI partnership funding MnDOT also has a separate state partnership fund for groups joining in as associate members – not covered in this pooled fund reporting.	SPR Funding Budgeted $4,146,669 (94%) SPR Funding Available to use $253,331 (6%) Funds Used/Paid Out $1,175,316 (26.7%)	Time = 60% (36/60 months)

Project Description:
This pooled fund is open for new states and they can join at any time. This pooled fund will help direct and compliment the use of the MnROAD test track for local, regional and national research, tech transfer and implementation needs. Road owner agencies will provide input and participate in the decision making needed for future MnROAD construction and research scheduled in 2017. MnDOT and Missouri have funded construction in both states. MnDOT funded 2017 construction of test sections at MnROAD to support common goals. Industry and academia will also play an important role to provide critical input on long-term future trends in research and barriers to implementation, including working with their customers and members who play a direct role in implementation.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):
To date eight (8) state agencies and over fifty-five (55+) industry, associations, consultants, and academic institutions have become NRRA members to share their expertise and are learning about new tools and methods to improve and expand upon transportation systems nationally.

- NRRA short and long term research projects are all under contract and work is progressing from 2017
- Long and Short term research projects all have separate online project pages under the teams that are supporting these efforts.
- NRRA members/Teams have met every monthly again this quarter which also acts as TAP meetings for each teams short and long term research efforts.
- Executive Committee meeting October (See team page)
    - Iowa joined (8 states total)
    - Budget approved for years 4 and 5
    - Teams Updates / new project ideas
- 3 Research pays off webinars have been completed
- New Projects Ideas developed by the teams using 4-5 dollars
    - 12 new long term research efforts
    - 4 new tech transfer topics
    - Contracting is done/well into the process on these projects
- Budget sheet is attached at the end of this report.
- See the NRRA website for details on all the teams' activities.

Anticipated work next quarter:
The following is expected to be completed for next quarter.

- Data collection will start very soon in April (spring). Sensors are collecting information and pictures are taken as thermal cracks develop over the winter. Expect performance field activities to increase in April.
- Continue to update MnROAD database with data from 2017/2018 including performance & material testing data.
- 8 Long Term Research Contracts efforts will continue with the technical advisory panels (TAP) leading the technical direction – team pages will be updated to show the progress.
- 6 Technical teams will meet once every month that will also include TAP meetings for each short and long term project expected. New team added and being developed.
- New Projects Ideas to be developed into contracts
    - 12 new long term research efforts (12 contracts)
    - 4 new tech transfer topics (one contract)
- NRRA Research Pays-Off and Newsletters will be done each month.
- May 21-23 Workshop is being worked on by the pooled fund team and will take place next quarter.
- NRRA Executive Committee meetings will be scheduled during the NRRA workshop in May 2019
- Budget – Executive committee will cover funds available for a call for innovation based off funding savings from projects, funds not assigned yet, and efforts that are not expected to happen (not contracted).
- Executive Committee – Meeting face to face in May 2019

Significant Results:
Currently this pooled fund is working well for all the members. We have shared resources and technology with each other related to intelligent construction and have discuss a number to topics in the technical teams. More formal documentation will start to be developed at the contracts are awarded and this work begins.

NRRA is up to 8 state members and at 55+ associate members. NRRA Agencies and Associates members make up the now 6 teams that play an important technical role in setting both the technology transfer and long term research needs. Each team has been active this summer meeting every two weeks to develop and prioritize ideas that fall into each of these categories above to meet both local, state, regional and national research needs. The teams report directly to the NRRA executive committee.

The initial push by each of the NRRA technical teams is to develop long term research needs and the MnROAD test sections that will be used to support these initiatives. MnDOT is providing $3.1 million of construction funding to support NRRA long term research needs to be built at MnROAD in the summer of 2017. Each team is working to get the final designs and special provisions to MnDOT so the plans can be developed and a formal construction project can be let in March 2017. Long term research includes researching HMA overlays of PCC, enhancing HMA compaction, fiber reinforced concrete, effects of diamond grinding on questionable aggregates, PCC early opening to strength, optimizing PCC cement content, compacted concrete pavements for city streets, cold central plant recycling, recycled aggregate bases, large stone subbases, maintaining HMA and PCC roadways, and PCC partial depth repair. Each topic/test section will provide a resource for future research contracts that are under development by teach team.

Other important team activities include the formation of technology transfer topics. The NRRA technology transfer team has been approved by the executive committee to fund 2 technology transfer topics from each of the four technical teams. Each topics goal is to pull together the existing state and national state of practice so that a common practice or specification can be developed by the members. Prioritized topics include longitudinal joint construction performance, tack coats, design and performance of concrete unbonded overlays, repair of concrete joint related distress, large unbound subbase materials, subgrade design, surface characteristics of diamond ground PCC, and pavement preservation approaches to lightly surfaced roadways. Currently the teams are updating the problem statements so that a MnDOT hired contractor can be hired to complete the work.

More information on these efforts including the long term research and technology transfer topics can be found under each of the team member's webpage.

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)

None

Potential Implementation:
See the NRRA team pages for implementation topics that are being developed – TAP members of each of the contracts and teams will be asked to help the development of implementation for the technology transfer team to push with its members. This is a focus area that is probably the hardest part of successful research. The technology transfer team will be focused on this topic in the upcoming months.

NRRA Budget Summary (March 31, 2019)

Description	Total Funding (A)	Approved Contract Funding (B)	Percent Contracted (B/A)	Avalible for new projects (A-B)	Paid Invoices (D)	Percent Invoiced (D/B)	Comment
SPR - Pooled Funds (8 States) - Pooled Fund + Future	$ 4,250,000	$ 3,996,345	94%	$ 253,655	$ 1,175,316	29%	CA short $100K in 2017
Wisconsin Partnership (State Funding used instead of SPR)	$ 150,000	$ 150,000	100%	$ -	$ 0	0%	PCC Early Opening - Pitt
SPR Totals=	**$ 4,400,000**	**$ 4,146,345**	94%	$ 253,655	$ 1,175,316	28%	PCC Early Opening - Pitt
Research Partnership Donations	$ 125,000						MoDOT CCP
Construction Partnership Donations	$ 3,257,681						MnDOT and MODOT
Associate Member Donations (MnDOT Partnerships Funds)	$ 204,000	$ 141,561	69%	$ 62,439	$ 51,000	36%	MnDOT Report T791270
	$ 7,986,681						

Item (Letter.#)	Project Charge	General Outcome / Deliverable	Vendors	Funding Budget	Percent Complete	SPR Budget	SPR Spent	Partnerships Budget	Partnerships Spent	Agency Self Funds Spent	Agency Self Funds Who
M1.1	TPF15341A	MNDOT Labor - (Website, Monthly Newsletter, Written Documents/Marketing)	MnDOT	125,000	75%	125,000	93,580				
T1.1	TPF15341	Agency travel / meals / meeting room costs	MNDOT PO	115,000	23%	115,000	26,106				
T1.2		Communication (Written, Newsletter, video, Website)	TBD	40,000	0%	40,000	0				
T1.3.1	TPF15341	Tack Coats	2016 State of Practice (SRF)	95,626	100%	95,626	62,054	These are the top two topics from each team established in 2016			
		Longitudinal Joint Construction Performance			100%						
		Design and Performance of Concrete Unbonded Overlays			50%						
		Repair of Joint Associated Distress Pavements			50%						
		Larger Subbase Materials - Done by Iowa State			100%						
		Subgrade Design for New and Reconstructed			5%						
		Surface Characteristics of Diamond Ground PCC Surfaces			50%						
		Pavement preservation approaches for lightly surfaced roadways			5%						
		Partial Depth Repairs of Concrete			5%						
		E-Ticketing			95%						
T1.3.2	TPF15341B	Tech transfer write-ups (MnDOT Labor) - Topics Below	MnDOT	30,000	11%	30,000	3,256				
T1.4	Partnership	Equipment	TBD	-	0%			-	-		
	TPF15341	HMA – Asphalt Mixture Rejuvenator Synthesis	2019 State of Practice (WSB)	92,302	0%	92,302	0	These are the top two topics from each team established in 2019			
		PM - NRRA Spray on Rejuvenator Synthesis			0%						
		PM - Concrete Pavement Restoration (CPR) for Bonded Concrete Overlays of Asphalt (BCOA)			0%						
		PM - Service Life Enhancement of Substrates Overlaid with Thin Overlays (UTWBC, Chip Seals & Microsurfacing)			0%						
T1.6		Implementaton of National Resarch Efforts - Innovative Products?	TBD	200,000		200,000					
R1.1	TPF15341	2017 MnROAD Constrruction Sensor Purchases	MnDOT PO	184,672	100%	159,130	184,672				
		2018 CCP Missouri Sensor Purchases - broken off the 60K avalible				25,542					
R1.2		Sample Buckets and Shipping	MnDOT PO	4,000	0%						
R1.3	TPF15341C	Inspection (MnDOT) - MnDOT approved operating funds for any additonal costs over the initial budget - MnDOT fund from Dec 17 budget report	MnDOT	100,021	100%	50,400	100,021	49,621			
R1.4	TPF15341D	MnROAD Staff - Construction, Sensors and Performance Monitoring MnDOT approved operating funds for additonal costs - 120K approved by EC - MnDOT fund from Dec 17 budget report	MnDOT	866,258	53%	279,318	434,061	40,940			
R2.4		Approved $120K extra funding for monitoring 2018				120,000					
R3.4		Approved $200K extra funding for monitoring 2019				200,000					
R4.4		Approved $200K extra funding for monitoring 2020				200,000					
R1.8		Missouri Sensor Labor Costs for 2018 installs - CCP - broken off the 60K avalible				26,000					
R1.5	TPF15341	PCC Sampling/Testing	AET Consultant	61,514	100%	20,000	61,514				
R2.5		Additional Funding Approved (low initial estimate)				41,514					
R1.6		HMA Performance Testing (75K original Estimate)	TBD	75,000	0%	75,000	0				
R1.7		Partial Depth Repairs Construction (not in construction contract)	Diamond Surfacing	78,662	100%	40,000	78,662				
R2.7		Additional Funding Approved				38,662					
R1.8		Compacted Concrete Pavement Construction (not in construction) - $50K original	Missouri DOT								
		Missouri CCP Construction, Testing, Monitoring Contract (Missouri Hired)	Hired University	125,000	NA					125,000	MoDOT
R1.9		Diamond Grinding Construction (not in construction contract) - $50K	**Not Done**								
R1.10		HMA Overlay and Rehab of Concrete and Methods of Enhancing Compaction	UNH	169,970	6%	169,970	10,755				
R1.11		Cold Central Plant Recycling	AET Consultant	99,997	14%	99,997	14,442				
R1.12		Fiber Reinforced Concrete Pavements	UMD	149,999	11%	149,999	16,048				
R1.13		Long Term Effects of Diamond Grinding - $75k	**Not Done**								
R1.14		Conctete Early Opening Strength to Traffic	UofPitt	149,999	0%			149,999	0		
R1.15		Optimizing the Concrete Mix Components for Contractors	Iowa State	147,627	16%	147,627	23,096				
R1.16		Compacted Concrete Pavements for Local Streets - $80K - Did do in Missouri	**Not Done**								
R1.17		Recycled Aggregates in Aggregate Base and Larger Subbase Materials	Iowa State	225,000	13%	225,000	30,370				
R1.18		Maintaining Poor Pavements	SRF	77,963	32%	77,963	24,735				
R1.19		Partial Depth Repair	Braun Inertec	72,295	17%	72,295	11,945				
R1.20		Uretk Funding - new number	Uretk	20,000	0%	-	-				
R1.21	TPF15341	HMA – Asphalt Mix Rejuvenator Test Sections	Contracting	120,000	0%	120,000					
R1.22		PM - Spray on Rejuvenator Test Sections	Contracting	100,000	0%	100,000					
R1.23		ICT - Levels 3-4 Intelligent Compaction Measurement Values (ICMV) for Soils Subgrade/Aggregate Subbase	Contracting	155,000	0%	155,000					
R1.24		ICT - Support Importing, Viewing and Analysis of Dielectric Constant Data in Veta	Contracting	45,000	0%	45,000					
R1.25		ICT - HD and VHD Seismic Approaches for Roadway Evaluation	Contracting	300,000	0%	300,000					
R1.26		Geo - Mechanistic Load Restriction Decision Platform for Pavement Systems Prone to Moisture Variations	Contracting	90,000	0%	90,000					
R1.27		Geo - Environmental Impacts on the Performance of Pavement Foundation Layers	Contracting	35,000	0%	35,000					
R1.28		Geo - Permeability of Base Aggregate and Sand	Contracting	30,000	0%	30,000					
R1.29		Geo - Improve material inputs into mechanistic design properties for reclaimed HMA Roadways	Contracting	30,000	0%	30,000					
R1.30		PCC - Construction Report for Jointless FRC Roundabout in Minnesota	Contracting	50,000	0%	50,000					
R1.31		PCC - Incorporate Joint Faulting Model Into BCOA-ME	Contracting	25,000	0%	25,000					
R1.32		PCC - Engineered Dowel & Tie Bars combined with LTPP SPS-2 Determination of Causes for Cracking Over Dowel Bars	Contracting	100,000	0%	100,000					
M1.2	MnDOT	2017 MnDOT Funding of **~36 - 500' equivalent test cells**	C.S. McCrossan	3,132,681						3,132,681	MnDOT
M1.3	MODOT	2018 Missouri CCP Construction Costs	Missour Best	150,000						150,000	MoDOT
			Totals =	**7,518,586**		**3,996,345**	**1,175,316**	**240,560**	**0**	**3,257,681**	
						(B)	(D)	Research		Agency	