

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Federal Highway Administration (FHWA)

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(478)	Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input checked="" type="checkbox"/> Quarter 4 (October 1 – December 31)
---	--

Project Title:

Accelerated Implementation and Deployment of Pavement Technologies (AIDPT) Pooled Fund

Pooled Fund Study Description:

Background:

Since 2013, FHWA’s Accelerated Implementation and Deployment of Pavement Technologies (AIDPT) Program, in partnership with State Departments of Transportation (DOTs), academia and industry, has identified asphalt and concrete paving advancements and seek to implement effective strategies for rapid deployment of new and promising technologies. Through the leveraging of Federal investments with State DOT partnerships, the AIDPT Pooled Fund study aims to advance deployment of engineering design criteria and specifications for new and efficient practices, products, and materials that support processes of importance to FHWA and State DOT partners.

The AIDPT Pooled Fund Study is an opportunity for participating states to advance deployment of the innovative technologies in interest areas including, but not limited to, Balanced Mix Design (BMD) for asphalt, performance engineered mixture (PEM) for concrete, pavement preservation, sustainability, resiliency or any other pavement management strategy that improves decision-making processes, technical frameworks, education efforts, and stakeholder engagement.

As this pooled fund is designed, FHWA collaborates with each DOT to define the parameters of each state pavement technology project. The above-mentioned topics were identified in the initial solicitation; however, as noted, other topics are considered when proposed by participating DOTs. The study provides up to \$250,000, up to 100 hours of technical assistance, and resources for developing case study reports and videos for each selected pavement technology project. Additionally, FHWA plans to host a website for publishing case studies and other relevant project documents, as well as peer exchanges for showcasing lessons learned and best practices from the projects. Each state DOT is expected to participate in pooled fund meeting opportunities and actively collaborate with other states and FHWA to advance these initiatives. The state DOT will complete a report documenting the initiative and outcomes of selected state DOT accelerated pavement technologies projects.

Name of State DOT Point of Contact:	Phone Number:	E-Mail
AL: Zane Hartzog	(334) 206-2360	HartzogZ@dot.state.al.us
AZ: Steven Olmsted		SOlmsted@azdot.gov
CA: Tom Pyle		Tom.Pyle@dot.ca.gov
CO: Craig Wieden		Craig.Wieden@state.co.us
GA: Ryan Kellett	(706)741-3543	RKellett@dot.ga.gov

HI: Kristi M. Grilho		Kristi.M.Grilho@hawaii.gov
ID: John Arambarri		John.Arambarri@itd.idaho.gov
IL: John Senger		John.Senger@Illinois.gov
IA: Chris Brakke		Chris.Brakke@iowadot.us
MS: Robert Vance		RVance@mdot.ms.gov
MO: Jason Blomberg		Jason.Blomberg@modot.mo.gov
ND: Tyler Wollmuth		TWollmuth@nd.gov
OK: Ron Curb		RCurb@odot.org
PA: Halley Cole		HalCole@pa.gov
TX: Enad Mahmoud		Enad.Mahmoud@txdot.gov
WI: Erik Lyngdal		Erik.Lyngdal@dot.wi.gov
Name of FHWA Technical Liaison:	Phone Number:	E-Mail
Tim Aschenbrener, Asphalt	(720)963-3247	Timothy.Aschenbrener@dot.gov
Migdalia Carrion, Sustainability	(787)771-2515	Migdalia.Carron@dot.gov
Austin Jarrell, Resilience		Austin.Jarell@dot.gov
Michael Praul, Concrete	(207)512-4917	Michael.Praul@dot.gov
Tom Van, Preservation	(202)366-1341	Thomas.Van@dot.gov
Tom Yu, Design	(202)366-1198	Tom.Yu.@dot.gov
Christy Poon-Atkins	(202)893-0559	Christy.Poon-Atkins@dot.gov
Lead Agency contact: LaToya Johnson & Gina Ahlstrom	Other Project ID (i.e., contract #): N/A	Project Start Date: September 30, 2021
Original Project End Date: October 30, 2026	Current Project End Date: October 30, 2026	Number of Extensions: N/A

Project schedule status:

On schedule On revised schedule Ahead of schedule Behind schedule

Overall Study Funding:

Table 1: Funding Commitments by Agency

Agency	Commitments					
	2021	2022	2023	2024	2025	2026
FHWA	\$1,504,000.00	\$1,000,000.00	\$_____	\$_____	\$_____	\$_____
AL		\$50,000.00				
AZ		\$10,000.00	\$10,000.00			
CA			\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
CO	\$10,000.00		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
CT			\$10,000.00	\$10,000.00	\$10,000.00	
GA	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
HI	\$10,000.00					
ID	\$50,000.00					
IL		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
IA		\$50,000.00				
MS	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
MO	\$60,000.00					
ND		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
OK		\$20,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
PA	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
TX	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	

WI	\$10,000.00	\$10,000.00	\$10,000.00			
Totals:	\$180,000.00	\$200,000.00	\$120,000.00	\$100,000.00	\$100,000.00	\$50,000.00

Table 2: Project Proposals by Agency

Agency	Project Proposals	Project Topics	Allocations	
			2021	2022
AL	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design		
AZ	Finalized – Funding allocated	Resilience	\$200,000	\$50,000
CA	Not Submitted yet	To be determined		
CO	Finalized – Funding allocated	Sustainability	\$250,000	
GA	Submitted – In review	Preservation		
HI	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design		
ID	Not Submitted yet	To be determined		
IL	Submitted – In review	Performance		
IA	Finalized – Funding allocated	Foundations		\$250,000
MS	Not Submitted yet	To be determined		
MO	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design		
ND	Finalized – Funding allocated	Asphalt - Balance Mix Design		
OK	Not Submitted yet	To be determined		
PA	Not Submitted yet	To be determined		
TX	Finalized – Funding allocated	Asphalt - Balance Mix Design		\$250,000
WI	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design		
Totals:			\$450,000	\$550,000

Note: Pooled fund study project funding is sent to participating agencies via allocation memos. Allocation memos are sent to the DOT once project proposals have been submitted and finalized. Project proposals are typically in one of the following statuses: Not Submitted yet, Submitted-In review, Finalized – Funding not yet allocated, Finalized – Funding allocated. Additional project information is included in this report for agencies that have finalized project proposals and receive funding allocations, as provided with the project summaries included.

Table 3: Funding Transfers by Agency

Agency	Transfers		
	2021	2022	2023
AL		\$50,000	
AZ		\$10,000	\$10,000
CA			\$10,000
CO	\$10,000		\$10,000
CT			\$10,000
GA	\$10,000	\$10,000	\$10,000
HI	\$10,000		
ID	\$50,000		
IL		\$10,000	\$10,000
IA		\$50,000	
MS	\$10,000	\$10,000	\$10,000
MO	\$60,000		
ND		\$10,000	\$10,000
OK		\$20,000	\$10,000

PA	\$10,000	\$10,000	\$10,000
TX	\$10,000	\$10,000	\$10,000
WI	\$10,000	\$10,000	\$10,000
Totals:	\$180,000	\$200,000	\$120,000

State Project Updates

Alabama: Alabama Department of Transportation (ALDOT)

Progress this Quarter:

Project Highlights: Balanced Mixture Design (BMD): Pilot and Field Sections, Long term field evaluation of BMD test sections for benchmarking and determination of performance testing variability during production

ALDOT is currently preparing to use a special specification for hot mix asphalt balanced mix design to evaluate the pavement behavior through a long-term trial.

Key Project Milestones:

- The Specifications are written.
- Two (2) possible locations identified.
- Initial testing of possible locations to begin soon.

Anticipated work next quarter:

We plan to let the project for construction in the second quarter of 2023.

Significant Results:

There are no results to report currently.

Potential Implementation:

We do not have sufficient information for this.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project This Quarter		Percentage of Work Completed to Date	
AL:	\$250,000.00		Original budget: \$250,000.00		(TBD for Q4)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended		Total Percentage of Time Used to Date	
\$0.00			(TBD for Q4)		\$0%	
Allocations:	2021	2022	2023	2024	2025	2026

Circumstance affecting project or budget: Our greatest concern at this time is testing the possible project locations using a profiler and by drilling cores to ensure that the experimental mixes will be place on reasonably similar underlying layers.

Arizona: Arizona Department of Transportation (ADOT)

Progress this Quarter:

Project Highlights: Resilience: Pavement Performance and Climate Data Analysis

It is anticipated that the effort would measurably advance FHWA / State DOT state of the practice and tools testing as it relates to linking climate models, climate data, pavement, materials, and sustainability and resilience for weather and natural hazard risk.

Key Project Milestones:

- Initial climate model data downloaded in 2022.
- ADOT initiated the following activities during the 3rd quarter and identify the activities as ongoing for the 4th quarter. Climate model data synthesis and starting analysis.

FHWA CMIP 5 with LOCA data sets was utilized.

https://www.fhwa.dot.gov/engineering/hydraulics/software/cmip_processing_tool_version2.cfm

Data consists of 5.9 terabytes (TB) of high resolution extracted from eighteen (18) General Circulation Models (GCM).

- o The current efforts are focused on sorting through pavement corridor case study candidates and acquiring historical as-builts for identified pavement sections.
- o Narrowed the case study pool to ten system locations but need to get to four locations as scoped in the proposal.

Anticipated work next quarter:

No updated information provided. ADOT will continue working on the key project activities noted in the key milestones.

Significant Results:

No updated information provided.

Potential Implementation:

Future heat and precipitation (2100) analysis will contribute to drafting pavement design specifications.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
AZ:	\$300,000.00		Original budget: \$300,000.00		15% money	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended		Total Percentage of Time Used to Date	
\$20,000.00 [7%]			\$45,000.00		30%	
Allocations:	2021	2022	2023	2024	2025	2026
	\$200,000.00	\$50,000.00				

Circumstance affecting project or budget: None reported for Quarter 4.

Colorado: Colorado Department of Transportation (CDOT)

Progress this Quarter:

Project Highlights: Benchmarking Transportation Sector Green House Gas (GHG) Emissions, EPDs
 Colorado HB 21-1303 “Buy Clean Colorado Act” directs the Office of State Architecture and Colorado Department of Transportation (CDOT) to establish policies that reduce greenhouse gas emissions over

time by accounting for and limiting the global warming potential (GWP) of key construction materials in state-funded building and transportation projects.

The Office of the State Architect is responsible for Section 117 of the bill, which covers building construction, and CDOT is responsible for Section 118 of the bill, which covers transportation infrastructure that includes road, highway, and bridge construction. The eligible construction materials listed under Section 118 of the bill are asphalt and asphalt mixtures, cement and concrete mixtures, and steel.

- Milestone #1 - Specification in place to require EPD submittals by July 1, 2022 – met.
- Milestone #2 - Year 2 EPD submittal requirements for additional materials - July 2023.
 - Finalization of CDOT project support tools to determine EPD collection requirements based on materials quantities/bid items consistent with protocol document.
 - Issuance of Construction Bulletin to CDOT staff conveying support tools and relevant information meeting.
 - EPD Quantity Conversion Spreadsheet Version 1 created and shared with CDOT staff in August.
 - Conducted a Contractor EPD Workshop on August 16, 2022. Attendees from Steel, Asphalt, and Concrete provided perspective, in addition to the CDOT EPD Team.
 - Created internal EPD Database in OnBase in August.
 - Began Precast Industry Stakeholder Outreach Meetings in September.

Anticipated work next quarter:

- Continue outreach to industries targeted for EPD data collection in Year 2/Year 3 of program (pre-cast concrete/steel). Colorado specific ACPA/NCPA Meeting date: December 15, 2022.
- November 14 meeting with UL on CDOT’s Steel PCR comments
- Continue planning and discussion on how to address disengaged and unsupportive contractors.
- Prepare CDOT Annual EPD Report

Significant Results:

Developed methodology for collecting, reviewing and cataloging GHG’s emissions through Environmental Product Declarations for various construction materials used on CDOT projects, focusing on Concrete, Asphalt, and Steel materials. Specification approved through CDOT process and incorporated into eligible projects. EPD website developed and maintained at <https://www.codot.gov/business/designsupport/materials-and-geotechnical/epd>. Specification and protocol document approved.

Potential Implementation:

As part of HB 21-1303 “Buy Clean Colorado Act”, CDOT began collecting EPD data on eligible construction materials (i.e. asphalt and asphalt mixtures, cement and concrete mixtures, and steel) on July 1, 2022. By January 1, 2025, the bill specifically requires CDOT to establish a policy that sets maximum acceptable global warming potential (GWP) benchmark limits for the eligible materials. CDOT has developed a protocol for collection of EPD data, and that protocol currently limits the EPD data collection to the cradle-to-gate life cycle modules (A1-A3) and requests single-facility EPDs. There are three distinct types of EPDs: an industrywide (also known as an industry average) EPD; a company-wide (i.e., representing multiple facilities) EPD; and a single-facility EPD, which reports the environmental profile of a specific product (e.g., a specific asphalt mixture produced at a specific facility). The CDOT EPD protocol requests contractors provide single-facility EPDs since they typically have higher resolution and are better suited to derive meaningful regionally applicable benchmarks.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
CO:	\$300,854.00 (Fed.\$250,000.00)		\$129,794.00		28.7% (money only)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended		Total Percentage of Time Used to Date	
\$40,159.00			(TBD for Q4)		50%	
Allocations:	2021	2022	2023	2024	2025	2026
	\$250,000.00					

Circumstance affecting project or budget: None reported for Quarter 4.

Georgia:

Progress this Quarter:

Project Highlights: Crack Mitigation/ Pavement Preservation Techniques

GDOT will have meetings with the State Maintenance Office, Office of Transportation Data, and Office of Materials and Testing for input on developing a workplan. GDOT plans to send a scheduled commitment during FY2023 4th quarter.

Anticipated work next quarter:

To Be Determined, based on Project Approval.

Significant Results:

N/A.

Potential Implementation:

N/A.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
GA:	\$250,000 (Federal: \$250,000.00)		(TBD for Q4)		(TBD for Q4)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
(TBD for Q4)			(TBD for Q4)		(TBD for Q4)	
Allocations:	2021	2022	2023	2024	2025	2026

Circumstance affecting project or budget: There was a lack of good mapping for cracking distresses along the project location prior to preservation treatments. Therefore, GDOT determined that it would be best to identify new pavement locations or to identify a new project.

Idaho:

Progress this Quarter:

Project Highlights: The Idaho Transportation Department (ITD) is still working to finalize a specific project focus. However, during the November 9-10, 2022, Technical Advisory Committee (TAC), ITD did mention an interest in balanced mix design (BMD) along with exploring rejuvenators, depending on balance of mix quantities used. Additional information on ITD’s AIDPT participation is included in the TAC meeting summaries provided at the end of the report.

Anticipated work next quarter:

To Be Determined, based on Project Approval.

Significant Results:

N/A.

Potential Implementation:

N/A.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
ID:	TBD		TBD		TBD	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
TBD			TBD		TBD	
Allocations:	2021	2022	2023	2024	2025	2026

Circumstance affecting project or budget: N/A.

Illinois: Illinois Department of Transportation (IDOT)

Progress this Quarter:

Project Highlights: Profiler Comparison - Benchmark Profiler vs. the Urban Low Speed Profiler

Repair/Upgrade profilers, setup track at ICART, complete testing at ICART, Analyze testing results, draft report on results, track setup, and conclusions, create operators manuals for both benchmark and urban low speed profilers.

IDOT does not report progress on the project scope of work this quarter. The primary progress is related to working final coordination to get the AIDPT project contract in place.

Federal FY2023 commitment contribution transfer planned (to be sent to FHWA during FY2023 2nd quarter).

Anticipated work next quarter:

When a contract is in place, work will begin on assessing the two pieces of equipment and beginning the repairs/upgrades.

Significant Results:

None to date.

Potential Implementation:

The urban low speed profiler will be utilized as a reference device or potentially a benchmark device at ICART if it is proven to meet the repeatability and accuracy results.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
IL:	\$300,000 (Federal: \$250,000.00)		\$0		0%	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
0			\$0		0%	
Allocations:	2021	2022	2023	2024	2025	2026

Circumstance affecting project or budget: The biggest concern is getting the contract in place so that we can start on the upgrades and repairs of the devices during the winter months. We hope to be testing the two devices in the spring at ICART.

Iowa: Iowa Department of Transportation (IowaDOT)**Progress this Quarter: No change from Quarter 2****Project Highlights:** Foundations

Iowa DOT is in the first year of a 5-year plan to implement the technologies and field training that will allow for rapid measurement, real-time construction compaction monitoring, and modulus-based field control, as implemented on four Spring 2022 pavement construction/grading projects (FY 2022 – 4 to 5 projects). Currently deploying VIC monitoring, e-construction compaction reporting, and APLT modulus measurement technology on two pilot projects currently under construction. The state supports performance-based specifications.

Anticipated work next quarter:

Validated Intelligent Compaction (VIC) and Automated Plate Load Testing (APLT): Continue VIC monitoring deployment, e-construction compaction reporting, APLT modulus measurement technology on two pilot projects currently under construction and ten additional projects are anticipated for FY2023.

Significant Results:

Utilized the Iowa DOT STIC and AID in-situ measurement projects to pilot two innovative technologies that previously were not used in the state of Iowa, which includes modulus-based measurements. Outcomes include model specifications, training materials, and workflow processes to assist agencies in developing a roadmap for modulus-based pavement foundation construction in their state.

Potential Implementation:

The DOT is committed to moving foundation construction requirements from the current Method specification to performance-based requirements. The objective of this project will be to support the implementation of technologies on additional projects for performance-based specifications.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
IA:	TBD (Federal: \$250,000.00)		(TBD for Q4)		(TBD for Q4)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
(TBD for Q4)			(TBD for Q4)		(TBD for Q4)	
Allocations:	2021	2022	2023	2024	2025	2026
		\$250,000.00				

Circumstance affecting project or budget: None reported for Quarter 4

North Dakota: North Dakota Department of Transportation (NDDOT)

Progress this Quarter:

Project Highlights: Implementing Balanced Mix Design

Project start 12/16/2022, Final Closeout 2027.

National Center for Asphalt Technology (NCAT) is finalizing the research proposal with a planned project start date of 12/16/2022 for the project kickoff.

Anticipated work next quarter:

Project has not started yet.

Significant Results:

Project has not started yet.

Potential Implementation:

Implementation of BMD through Pilot Projects.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
ND:	\$250,000 (Federal: \$250,000.00)		\$0		0%	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
0			\$0		0%	
Allocations:	2021	2022	2023	2024	2025	2026
		\$250,000				

Circumstance affecting project or budget: None reported for Quarter 3

Pennsylvania: Pennsylvania Department of Transportation (PennDOT)

Progress this Quarter:

Project Highlights: Implementation of Mastics at the Pennsylvania DOT

The PennDOT determined the best area of pavement management program support to be using mastic materials for preservation activities that would evolve in developing statewide application specific specifications. The PennDOT State Transportation Innovation Council (STIC) was a source for supporting equipment acquisitions during the earlier phases of mastic material application. The AIDPT project component of the ongoing PennDOT efforts will include technical assistance and collaboration to determine the extent of mastic materials use.

Research applications, new equipment, and specifications used by other states Summer 2023 Develop PennDOT draft specification Fall 2023 Finalize PennDOT specification Summer 2024.

- a. Submission recently provided to FHWA.

Anticipated work next quarter:

Submission recently provided to FHWA.

Significant Results:

Submission recently provided to FHWA.

Potential Implementation:

- a. Research applications, new equipment, and specifications used by other states Summer 2023
- b. Develop PennDOT draft specification Fall 2023
- c. Finalize PennDOT specification Summer 2024.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
PA:	TBD (Federal: Tech. assistance)		(TBD for Q4)		(TBD for Q4)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
(TBD for Q4)			(TBD for Q4)		(TBD for Q4)	
Allocations:	2021	2022	2023	2024	2025	2026

Circumstance affecting project or budget: None reported for Quarter 4.

Texas: Texas Department of Transportation (TxDOT)

Progress this Quarter: No change from Quarter 2

Project Highlights: Asphalt - Balance Mix Design

Several balanced mix design sections are being constructed to compare a control mix design with several balanced mixed designs that encompassing several factors: recycled materials, rejuvenators, different binder grades, ... etc. Testing plan: the project team will locate all TxDOT Balanced Mix Design initiative sections and provide a performance assessment plan based on the sections age, for example: annual

performance documentation for sections constructed in the past 3 years, semi-annual performance documentation for sections constructed between 3 and 6 years ago. TxDOT is currently working to complete a balanced mix design initiative by 8/31/2022.

Anticipated work next quarter:

TxDOT will complete a balanced mix design initiative by 8/31/2022.

Significant Results:

Identified a diverse set of pavement locations to pilot, through which to obtain the pavement design details, any material details that are known, traffic levels, condition history if available, any of the sites were designed using Pavement ME, and localized weather data.

Potential Implementation:

Documenting the performance of balanced mix design sections in the state of Texas. Constructed several balanced mix design sections to compare a control mix design with several balanced mixed designs encompassing several factors such as: recycled materials, rejuvenators, different binder grades, ... etc.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
TX:	TBD (Federal: \$250,000.00)		(TBD for Q4)		(TBD for Q4)	
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date	
(TBD for Q4)			(TBD for Q4)		(TBD for Q)	
Allocations:	2021	2022	2023	2024	2025	2026
		\$250,000.00				

Circumstance affecting project or budget: None reported for Quarter 4.

NOTE: Other state project progress snapshots expected for Quarter 3, as project proposals are finalized and projects commence work activities.

Technical Advisory Committee (TAC) meeting: November 9-10, 2022

Group collaboration report outs in the order presented:

- **Day 1: ND, PA, CA, ID, IA, OK, AL, TX**
- **Day 2: GA, WI, CO, IL, AZ, MO, HI, MS**

Attendance:

State Agencies: John Arambarri, Cathrina Barros, Jason Blomberg, Chris Brakke, Halley Cole, Kristi M. Grilho, Zane Hartzog, David Howley, Ryan Kellett, Erik Lyngdal, Steven Olmsted Travis Patton, John Senger, Craig Wieden, Tyler Wollmuth

- **State contractor:** Amy Martin

Federal:

- **Division Office:** Dennis Bachman, Brian Dabling, Waseem Fazal, Kristy Harris, Ammon Heier, Kyle Holman, Mike McGee, James Pffor, Lisa Powell, Chu Wei, Yathi Yathepan

- **Headquarters:** Gina Ahlstrom, Migdalia Carrion, Austin Jarrell, LaToya Johnson, Christy Poon-Atkins
- **Pooled Fund Program Manager:** Patricia Sergeson

Day 1:

North Dakota (NDDOT): Currently working on Part One activities which include benchmarking application specific pavement mix designs, which will include routine cases for projects (construction, reconstruction, rehabilitation, repair, or other preservation) throughout the state. Part One will be the basis of the project sections that are monitored during subsequent parts of the project. For Part Two activities, NDDOT will further verify optimal pavement mix for specific applications through monitored test sections comparisons, under average to limit traffic conditions. Part Three will include developing balanced mix design (BMD) specifications and performance testing. Throughout the phase of performance testing, distresses for observed conditions will be tracked with the location corresponding weather conditions to help form a basis for regional determinations. The NDDOT further noted the State Transportation Innovation Council (STIC) as a source for supporting testing equipment for completing the Hamburg and Ideal CT. The AIDPT project efforts will also include the impacts of aging, with weather, loadings, and construction quality for condition and performance assessments. The NDDOT project update is included in this Quarterly Report.

Pennsylvania Department of Transportation (PennDOT): The PennDOT determined the best area of pavement management program support to be using mastic materials for preservation activities that would evolve in developing statewide application specific specifications. For example, PennDOT has 40k miles of state-owned pavement where crack sealing was targeted to further inform specification development. The PennDOT further noted the State Transportation Innovation Council (STIC) as a source for supporting equipment acquisitions. The AIDPT project component of the ongoing PennDOT efforts will include technical assistance and collaboration to determine the extent of mastic materials use. However, PennDOT does not foresee additional funding needs to complete the project, as the development of specifications would benefit the PennDOT pavement management program through improved operational efficiency that contributes to maximized pavement lifecycles. The PennDOT project update is included in this Quarterly Report.

California Department of Transportation (Caltrans): The Caltrans AIDPT project is currently at the earliest initial project kickoff stage with the assignment of a new project manager. The Caltrans AIDPT project has yet to be determined. Various options that have been discussed include continuous density measurement, use of the falling weight deflection (FWD) for early site investigation to assist in deployment of recycling technologies, or furthering BMD at Caltrans. Caltrans is open to receiving ideas from other states. Caltrans also expressed preparedness to collaborate with other states to advance BMD efforts.

Idaho Transportation Department (ITD):

To date, ITD has not identified a specific project to pursue under the AIDPT pooled fund. Our current expectation is we'd pursue work that aligns with the development and implementation of Balanced Mix Design (BMD) for hot mix asphalt.

The Idaho Transportation Department is in the initial stages of balanced mix design development. In May, ITD hosted workshop on developing and implementing a BMD roadmap. This workshop was led by FHWA Headquarters technical specialist assisted and helped introduce BMD concepts to our contracting community and ITD district staff. ITD is continues to identify, recruit and engage BMD champions within the agency and contracting community.

ITD has two research projects developed in our development of BMD approaches: [RP 261 \(completed\)](#) *Development and Evaluation of Performance Measures to Augment Asphalt Mix Design in Idaho* and [RP 292 \(underway\)](#) *Implementation of Balanced Mix Design of Asphalt Mixtures Prepared with Reclaimed Asphalt Pavements*. To date, our work is steering us toward Hamburg Wheel Test for rutting performance and parameters obtained from the IDEAL Cracking Test for cracking performance.

We look forward to our continued participation in Pooled Fund TPF-5(478).

Iowa (IowaDOT): The Iowa DOT AIDPT project focus is on advancing pavement life with new pavement technologies to help take care of the roadway infrastructure systems better, while improving pavement foundations. (*See: Project summary form*) The agency seeks to build foundations to the level that was projected in the pavement was designed. IDOT contributed 750k of state matching funds to help implement projects that support the effort. Furthermore, Transportation Asset Management Plan (TAMP) funding levels increased to help meet targets. However, long term needs are outpacing investments. IDOT determined that there was a need to focus on pavement replacement.

The IDOT in-place roadway pavement inventory has a few pavement locations that have reached 100yrs old with 5-6 overlays. IDOT has also replaced several pavements that have not reached anywhere near the longest pavement life. With experience with pavements that deteriorate more than anticipated and pavements that last far beyond design, Iowa DOT determined that there is a need to be cost effective using maximized pavement designs with permanent foundations. The Iowa DOT position is that it is too costly to rebuild the foundation every time that a project is programmed for work along an existing roadway. Therefore, it is a priority to work towards improving performance with focus on the foundations.

There is opportunity to invest in the lower layers of pavement structures. The Iowa DOT efforts started with a STIC project, where a library of in-situ properties was built. The Iowa DOT tests in-situ soils collect data for PMED. The Iowa DOT measures construction quality; collecting data on 6 sites for demonstrating consistent results; plate load test to calibrate a roller. The Iowa DOT construction projects achieve design capacity on 30% of the projects, which was Iowa DOT's basis for ramping up the focus for projects to achieve design. During the Iowa DOT open house, Iowa DOT decided to establish a Technical Working Group (TWG) to help with the AIDPT project. The Iowa DOT expect to meet on Tuesday, Nov. 15, 2022, to finalize the TWG.

Oklahoma Department of Transportation (ODOT): The ODOT TAC members did not attend the meeting, but the technical specialist provided input for the ODOT report-out. [Due to resource changes that reduced workforce capacity, ODOT informed the technical specialist that continued participation in the AIDPT pooled fund study may not be feasible.]

Alabama (ALDOT): ALDOT is currently preparing to use a special specification for hot mix asphalt balanced mix design to evaluate the pavement behavior through a long-term trial. The agency is finalizing plans for a test section project near River Falls, AL. The project section is located along SR 55 between mile marker (MM) 30 to MM48 and is scheduled for construction during the 2023 paving season, where the trial pavement special provision will be used. ALDOT has determined that the AIDPT project will consist of three (3) BMD trial sections and six (6) test sections. Additionally, there is one volumetric design control to dense grade mix that meets the specification score. ALDOT's data collection for the last two years has been shared with the National Center for Asphalt Technology (NCAT).

The initial efforts to optimize the pavement design with consideration of location specific conditions was designed as volumetric mixes but verifications have proven that it is possible to meet the new specification criteria.

Texas (TxDOT): The focus for the TxDOT AIDPT project is related to achieving an optimized balanced mix design (BMD), for which TxDOT has been working for three years with multiple districts. Until 2019, the Hamburg test was used for overlays. Based on reliable test results, specialty mixtures will now be used for Superpave mixtures. The TxDOT efforts will allow TxDOT to benchmark or set specification criteria. The study includes nine field projects with rap content. There are thirty-four test sections on which performance monitoring will be performed. To better align factors to produce optimized specifications, TxDOT considers the test method variability; literature review on tests; component, aging, soft and virgin binders, acceptance criteria for TX sections along with older test track sections.

The current TxDOT efforts will allow more benchmarking than previous, define sampling tolerance, and help revise specifications. The pavement cracking and rutting distresses will be used for performance monitoring and testing. TxDOT is moving towards statewide specification implementation, for which the field monitoring is used to the group. The latest TxDOT assessment of the test sections is that all sections seem to be doing well but TxDOT is still monitoring the condition and performance. TxDOT is currently working to finalize an interagency contract to continue to allocate resources to continue monitoring for updates to the specification. The TxDOT districts will be allowed to use the specification, as determined appropriate. The TX Division Office will further coordinate with TxDOT to finalize specifics.

Day 2:

Georgia (GDOT): The GDOT determined crack mitigation techniques to be the most appropriate focus for the GDOT AIDPT project. However, after further evaluation of the initially selected pavement locations, GDOT realized that the initial pavement locations selected for the study would

be limited in the information needed for evaluations. The issue with limited information to support the project objectives arose with a previous project that was completed two years ago along the same location. The selected pavement section has already received preservation treatments. With the preservation treatments, GDOT noticed that there was not a good mapping of the previous cracking. Therefore, GDOT decided to determine new pavement locations or a new project.

Wisconsin Department of Transportation (WisDOT): The WisDOT balanced mix design (BMD) was able to accelerate advancement, considering the initial project was started in 2014. The WisDOT BMD project was a continuation of the earlier project, as the input to the AIDPT project was able to benefit from high recycle test projects. The WisDOT has advanced to benchmarking with a pilot, where WisDOT monitored critical factors impacting cracking in HMA pavements. WisDOT is going to be implementing the Hamburg Wheel Tracker and CT Index as the BMD performance tests. Hamburg testing does not seem appropriate for project level quality assurance. More investigation into rutting test that could be conducted more quickly is desired. Thus far, WisDOT is tracking key take-aways from Hamburg testing, field aging study, and aging protocol, as the WisDOT pilot specification is being used on BMD.

With respect to the CT and Hamburg; benchmarking: mixes, tests, analysis, WisDOT is working with industry to determine the details that they can agree on. a few hundred mixes tested for low, medium, and high traffic volumes for SMA mixes. The percent within limit (PWL) projects are larger projects, where the reflective cracking and benchmarking process are performed with a contractor and at WisDOT's central lab for all plant mix materials. WisDOT is evaluating database details and results for logic. The database has 51 columns of mixture design and project information that are imported into a spreadsheet. All results are recorded as data distribution by binder grade and traffic level, which shows with a wide distribution regardless of binder or traffic.

S binder range widely working to understand the reason for the broad range base on low to high traffic volumes. The AIDPT funds were intended to be used for the test section, but WisDOT will now look at using the funds for growth in analysis. WisDOT has six (6) sections that have been identified and will be constructed this construction season.

WisDOT will monitor rut resistance throughout the traffic range from high volumes to low volumes and polymer mod with performance criteria. STH69 south of Madison; falling weight deflection (FWD) is measured along the project location to verify consistency with sampling on existing projects. WisDOT has ten (10) projects for collecting representative data to analyze. The National Center for Asphalt Technology (NCAT) was able to add the original project into the study. WisDOT is open to the idea of assisting other states in the AIDPT study with advancing BMD efforts. *The AIDPT project can provide funding support for the training and technical assistance needs associated with the WisDOT project to supplement the progress attained with the local project.*

Colorado (CDOT):

The CDOT AIDPT project focuses on Sustainability. CDOT project considers the requirements included in the July 2021 State legislation related to environmental product declarations (EPD). CDOT is working to develop more sustainable practices associated with the use of various materials including, asphalt, steel, and concrete. CDOT completed a specification for projects, which has been included on 18 projects since the specification was developed and required for those projects advertised after July 1, 2022. However, CDOT has not yet received any EPDs, as

related to the respective project scope of work and construction schedule. CDOT will be benchmarking GWP using EPDs collected over the over the next 2 1/2 years. Based on the progress schedule, the AIDPT project will be 50% complete by Jan. 1, 2023. The total project cost includes 250k AIDPT funding + 62k state funding. In addition to collecting EPDs on asphalt, steel, and concrete, CDOT expects to expand EPD collection to other industry products such as precast concrete products, both underground and structural by July 2023. They hope to also begin collecting EPDs on cold roll steel such as corrugated metal pipe and guardrail by July 2023. The CDOT EPD specification requires submittal of EPDs a minimum of 2 weeks prior to material placement.

CDOT is looking forward to setting up "Focus Groups" to help support the EPD development process, which could help enable other agencies to advance EPD development on projects, and they also look forward to the focus group on BMD implementation to learn from other states.

Illinois (IDOT): The IDOT AIDPT project focuses on pavement surface condition technologies for improved data quality, where the IDOT new certification track will be used for testing. The IDOT project will evaluate the Benchmark Profiler (BP) (2013) [[TPF-5\(063\)](#)] vs. Urban Low Speed Profiler (ULSP) (2015) to create a more mobile benchmark device that also meet high speed data collection needs. The ULSP is in the non-destructive test equipment category, where the speed can go up to 60mph. The International Roughness Index (IRI) is the focus for this AIDPT project, as other benefits may be realized upon completion. The BP developed in conjunction with the University of Michigan is a low-speed profiler that was built to have high repeatability. The project team hopes to find that the new device is like the previous device with demonstrating high repeatability, as noncontact measuring devices. The test track consists of 3 lanes: (1) CRCP; diamond grooving, diamond grinding; skid testing (2) HMA full depth; SMA; micro surfacing outside of the wheelpath, 9.5mm dense graded HMA, high friction surface treatment; (3) 8.5 JCP, dowel, no faulting, artificial faulting, tinning; aggressive chip seal; SMA open graded mix 12.5mm surface; 9.8mm HMA; turf drag jointed sections; smooth CRCP no texture. IDOT is currently finalizing coordination with the IDOT budget office about specifics on the intergovernmental agreement. The AIDPT project will evaluate equipment to bring back to operational status. [During the TAC meeting: AZ proposed to coordinate with IDOT on a specification; IL agreed to share diamond grinding specifications with CO.].

Arizona (ADOT): The ADOT AIDPT project is an activity related to the 2021 State legislative requirements to help limit the global warming impacts. The ADOT is working with climate models to introduce linkage with comprehensive models. The ADOT continues to build upon the results from the Sustainable Program that started in 2016. An outcome of the AIDPT project would also benefit factors for maximizing surface treatments and designs. For broad consistency, ADOT references the Earth by Latitude and Longitude locations managed by the United Nations. The ADOT data and fundamental information are integrated with underlying assumptions to build a model. Regional Concentration Pathway (RCP); Climate model for the entire state; precipitation assumed; climate model data looking at heat and precipitation general and extreme heat; freestyle dynamics; also looking at binder grade choice, which is a little behind. The ADOT determined six (6) road segments to perform case studies, reverse engineer the original as-builts, and assume some of the dynamics in the original design

Some anticipated resources that will be produced with the project include: (1): climate data into PMS, (2): link to as built relate to new design decision-making, and (3): how-to guidance.

The ADOT will also focus on design specifications to evaluate how the data was reviewed in relation to internal design requirements.

The ADOT plans to promote regional consideration. In the State of Arizona there are some progressive counties that would benefit progress. Additionally, there is benefit with having climate response expectations written in the law, although the legislative requirements are gentle expectations for climate to be more incorporated.

Missouri Department of Transportation (MoDOT): The MoDOT AIDPT pooled fund study project focus combines balanced mix design (BMD) with intelligent compaction. A highlight of the MoDOT project is that the MoDOT study location provides an opportunity to assess traffic (concentrated along one lane vs. distributed along two lanes) with consideration of driver behavior. Additionally, the MoDOT study location enables MoDOT to assess construction quality, material behavior, and resulting distresses with overall condition and performance, as both study locations were constructed within the same construction period, used the same pavement mix design, and facilitate approximately the same traffic volume. The MoDOT has noted some preliminary performance observations. The MoDOT hopes to attain specification improvements with consideration of ensuring the pavement layers are rolled at the proper temp to achieve the right density. The MoDOT will use the rutting test (RT) Index or Hamburg, while evaluating the factors that affect the performance. This project is the 1st time that MoDOT will evaluate a pavement asset test location relating field performance to the cracking tolerance (CT) Index. The MoDOT is working to determine a starting point for the CT Index numbers and the most appropriate pay deductions to use.

The MoDOT has tested samples enough to learn that reheating does affect the CT Index. MoDOT plans to work with the Missouri Asphalt Pavement Association (MAPA) to further evaluate the variability in the CT index, as the sampling approach could impact the specimen collected. MoDOT has determined multiple project test sections with the National Road Research Alliance (NRRRA) and the National Center for Asphalt Technology (NCAT), as reflective cracking is a challenge for MoDOT. The MoDOT will need to adjust their project summary to add the new project with the NRRRA / NCAT. Intelligent compaction technology is used to validate the contractor's location throughout the rolling operation. MoDOT plans to use the thermal profile to validate the contractor's work. As a result, MoDOT project scope of work will produce QA/QC lessons learned and specification improvements.

The NRRRA is a pooled fund study [TPF-5(466)] led by Minnesota Department of Transportation (MinnDOT) with Glenn Engstrom as the lead contact [email: glenn.engstrom@state.mn.us; phone: (651)366-5531], as designated in Feb. 2021. The study is scheduled to end on Jan. 31, 2026.

Hawaii Department of Transportation (HDOT): The HDOT initiated their AIDPT balanced mix design (BMD) project with defining resource needs as well as roles and responsibilities. The HDOT staffing, equipment, and space are being determined to ensure all resources are properly identified, as the HDOT pavement management leads are still learning required processes. The

HDOT recently completed a virtual workshop with FHWA, as part of their process to kickoff project activities. The HDOT determined that there is a need to hire a consultant to assist with the project. Although there is not sustainability focused legislation in Hawaii, the HDOT administration has been pushing for the use of more sustainable materials.

The HDOT is currently involved in a pilot project to try plastics in asphalt. The HDOT has formed a team with a contractor and university to test the mix. [Tim A. suggested North Dakota procurement process where they streamlined procurement: The NDDOT used AIDPT pooled funds with a direct transfer to another pooled fund project (TPF-5(465), Consortium for Asphalt Pavement Research and Implementation (CAPRI)) then the other pooled fund project (CAPRI) will use the funds to pay the National Center for Asphalt Technology (NCAT). The HDOT expects to join the CAPRI Pooled Fund project soon.

The CAPRI pooled fund study is being led by Alabama Department of Transportation (ALDOT) with Kidada Dixon as the lead study contact [email: dixonk@dot.state.al.us; phone: (334)353-6940], as designated in October 2020. The ALDOT AIDPT pooled fund study lead, Zane Hartzog, offered to assist HDOT with the funds transfer process to the CAPRI Pooled Fund Study.].

Mississippi Department of Transportation (MDOT): The MDOT TAC members did not attend the meeting, but the technical specialist provided input for the MDOT report-out. [The MDOT will need to be contacted to verify the final decision for the AIDPT project focus area. The MDOT will be able to provide more information for the upcoming in-person TAC meeting.]