TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT):	Federal Highway Administrati	on (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	Transportation Pooled Fund Program - Report Period:
#TPF-5(478)	Quarter 1 (January 1 – March 31)
	☑ Quarter 2 (April 1 – June 30) [2024]
Note: Obligation transactions must be completed	Quarter 3 (July 1 – September 30)
prior to the project end date.	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.

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Lead Agency contact:	Other Project ID (i.e., contract #	
LaToya Johnson & Gina Ahlstrom	N/A	September 30, 2021
Original Project End Date:	Current Project End Date:	Number of Extensions:
October 30, 2026	October 30, 2026	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	\$1,000,186.000	\$1,025,000.00	\$	\$
AL		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
AZ		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
CA				\$40,000.00		
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	

Totals:	\$170,000.00	\$210,000.00	\$180,000.00	\$160,000.00	\$150,000.00	\$100,000.00
WI	\$10,000.00	\$10,000.00	\$20,000.00	\$10,000.00		
VT			\$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	
TN				\$16,666.00	\$16,666.00	\$16,666.00
PA	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
OR				\$10,000.00	\$20,000.00	\$20,000.00
OK		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
ND		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	
NY			\$20,000.00	\$10,000.00	\$10,000.00	\$10,000.00
MO	\$60,000.00					
MS	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
ME				\$10,000.00	\$10,000.00	\$10,000.00
LA		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
IA		\$50,000.00				
IL		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
ID	\$50,000.00					
HI	\$10,000.00		\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00

Table 2: Project Proposals by Agency

Age	ncy	Project	Project		Allocations		
		Proposals	Topics				
				2021	2022	2023	2024
1	AL	Finalized – Funding allocated (returned)	Asphalt - Balance Mix Design		\$250,000		
2	ΑZ	Finalized – Funding allocated	Resilience	\$200,000	\$50,000		
3	CA	Not Submitted yet	To be determined				
4	CO	Finalized – Funding allocated	Sustainability	\$250,000			
5	CT	Finalized – Funding allocated	Asphalt - Balance Mix Design			\$250,000	
6	GA	Submitted – Not active (to be removed)	Preservation				
7	HI	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				
8	ID	Not Submitted yet	To be determined				
9	IL	Finalized – Funding not requested	Performance				
10	IA	Finalized – Funding allocated	Foundations		\$250,000		
11	LA	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				\$75,000
12	ME	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				
13	MS	Not Submitted yet	To be determined				
14	MO	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design			\$250.000	
15	NY	Finalized – Funding allocated	Asphalt – performance tests			\$136,000	
16	ND	Finalized – Funding transferred	Asphalt - Balance Mix Design			\$350,000	
17	OK	Not Submitted yet	To be determined				
18	OR	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				\$250,000
19	PA	Not Submitted yet	To be determined				
20	TN	Finalized – Funding not yet allocated	Field Validation – Balance Mix				\$250,000
			Design				
21	TX	Finalized – Funding allocated	Asphalt - Balance Mix Design		\$250,000		
22	VT	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				\$200,000
23	WI	Finalized – Funding not yet allocated	Asphalt - Balance Mix Design				\$250,000
		Totals	s:	\$450,000	\$800,000	\$986,000	\$1,025,000

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	2024		
1	AL		\$50,000				
2	AZ		\$10,000	\$10,000			
3	CA			\$10,000	\$40,000		
4	CO		\$10,000	\$10,000			
5	CT			\$10,000	\$10,000		
6	GA	\$10,000	\$10,000	\$10,000	\$10,000		
7	HI	\$10,000		\$10,000			
8	ID	\$50,000					
9	IL		\$10,000	\$10,000	\$10,000		
10	IA		\$50,000				
11	LA						
12	ME			\$10,000	\$10,000		
13	MS	\$10,000	\$10,000	\$10,000	\$10,000		
14	MO	\$60,000					
15	NY			\$30,000			
16	ND		\$10,000	\$10,000	\$10,000		
17	OK		\$20,000		\$10,000		
18	OR						
19	PA	\$10,000	\$10,000	\$10,000	\$10,000		
20	TX	\$10,000	\$10,000	\$10,000	,		
21	VT			\$20,000			
22	WI	\$10,000	\$10,000	\$20,000			
	Totals:	\$170,000	\$210,000	\$190,000	\$120,000		

State Project Updates

Alabama: Alabama Department of Transportation (ALDOT)

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

Progress this Quarter:

- Overall construction was finished on Project STPAA-0055(519) including test sections.

Project Highlights:

- Constructing the project and testing the mixes is the next step.

Key Project Milestones:

- Mix designs are completed and approved. Construction has finished. Testing of mixes is to be finished next.
- Preliminary field performance measurements Spring/summer 2025
- Long term field performance measurements 2026 and beyond

Anticipated work next quarter:

- Mixes will be tested in the upcoming Q3 2024.

Significant Results:

There are no results to report currently.

Potential Implementation:

We do not have sufficient information for this.

Quarterly Project Statistics:

г		auterry 110 feet statistics.								
	State	Total Project Budget		Total Cost to Date for		Percentage of Work				
		, e		Project This Quarter		Completed to Date				
	AL:	AL: \$250,000.00		\$10,000.00		(TBD for Q4)				
	Total Project Expenses		Total Amount of Funds		Total Percentage of					
	and Percentage This Quarter		Expended		Time Used to Date					
	\$0.00		(TBD for Q4)		\$0%					
	Allocations:	2021	2022	2023	2024	2025	2026			

Circumstance affecting project or budget: none provided

Arizona: Arizona Department of Transportation (ADOT)

Project #1: Resilience: Pavement Performance and Climate Data Analysis

Project Highlights:

Key Project Milestones:

- Utilized the downloaded climate files to predict the changes in asphalt binder grades in Arizona.

Progress this Quarter:

- The downloaded climate files were used to evaluate the predicted changes in asphalt binder grades in Arizona.
- The future asphalt binder grade was predicted using two approaches. The first approach involved taking the difference between the current PG-grade high temperature and the LOCA observed high temperature, then using the projected mid-century and late-century LOCA temperatures to predict the asphalt binder grades in Arizona. The second approach incorporated traffic projections along with climatic projections to forecast future binder grades for the mid-century and late-century.
- Both approaches were verified and compared.
- ADOT personnel were contacted for more engineering details on the case study sites.

Anticipated work next quarter:

- Developing the Pavement ME File Creator to allow engineers to directly consider climate models in their predictions.
- Finalize analysis to examine the impact of heat waves and wildfires on pavement performance at select sites.

Significant Results:

- The state of AZ has been fully mapped to future climate data, and that data was used to predict the future asphalt binder grades in Arizona

Potential Implementation:

- Final outputs will develop draft design guidance and 'how to' videos on linking climate data and pavement design decision making.
- Future heat and precipitation (2100) analysis will contribute to drafting pavement design specifications.

Quarterly Project Statistics:

State	State Total Project Budget		Total Project Budget Total Cost to Date for		Percentage of Work	
			Project		Completed to Date	
AZ:	AZ: \$250,000.00		Original budget: \$300,000.00		15% money	
Total Project Expenses		Total Amount of Funds		Total Percentage of		
and Pe	and Percentage This Quarter		Expended		Time Used to Date	
			\$45,000.00		55%	
Allocations:	2021	2022	2023	2024	2025	2026
	\$200,000.00	\$50,000.00				

Circumstance affecting project or budget: None reported for Quarter 2.

Project #2: Arizona Roadway Wildfire Management Decision Support
Subject Matter: Vulnerability of Arizona roadways to wildfire and post-fire debris flow

Key Project Milestones:

- Task 1A: Fire and post-fire debris flow risk
- Task 1B: Vulnerability Assessment
- Task 2A: Review of existing watershed restoration studies and efforts in the Southwest
- Task 2B: Development of a resilience-based decision support framework

Progress this Quarter:

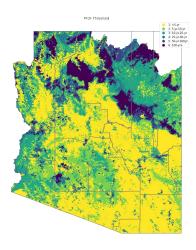
- Task 1A is in progress. We have implemented the M3 model from Staley et al 2017 for the entire state under current climate conditions. We have also collected and processed data for key parameters for future climate scenarios including future fire and precipitation data.
- Task 1B is also in progress. We have completed betweenness centrality calculations for all of the roadways in our dataset and have begun collecting and processing additional data layers for the vulnerability assessment.

Anticipated work next quarter:

- In the next quarter we plan to continue work on Task 1A and Task 1B. As part of Task 1A, we will run the model with future climate conditions.
- As part of Task 1B we will process additional data layers and overlay them with the current and future fire and debris flow risk model outputs.

Significant Results:

- Significant results thus far include preliminary outputs of the debris flow model for the entire state at the watershed level and at the roadway level.



Potential Implementation:

Quarterly Project statistics:

State	tate Total Project Budget		Total Cost	Total Cost to Date for		Percentage of Work	
				Project		ed to Date	
AZ:	AZ: \$200,000.00		\$55,000.00	\$55,000.00			
Total Project Expenses			Total Amount of Funds		Total Per	Total Percentage of	
and Per	rcentage This	Quarter	Expended		Time Use	d to Date	
\$30,000.00							
Allocations:	2021	2022	2023	2024	2025	2026	
	\$200,000.00	\$50,000.00					

Circumstance affecting project or budget: None reported for Quarter 2.

Connecticut: Connecticut Department of Transportation (CTDOT)

Project Highlights:

- Performance Test.

- Testing equipment Procurement.
- Training and Round robin testing.
- Shadow projects.
- Specification Development
- Initial Implementation (pilot project)

Progress this quarter:

- SGC delivered Auto saw shipped, not received. Blade received and paid.
- HWT set up by manufacturer, initial training in progress.
- Other equipment in works.
- IDEAL-CT testing weekly. Data base started. MATC CT & RT sample testing complete. HWT to start soon.

Anticipated work next quarter:

- MOU CAP Lab in progress

Significant Results:

- In this quarter, IDEAL-CT testing weekly, building data base.

Potential Implementation:

- Shadow projects 2024-2025
- First Pilot project targeted for 2026.
- Milestone #1 specification in place to require EPD Submittals met.

Quarterly Project Statistics:

State	Total Project B	udget	Total Cost to Date for		Percentage of Work	
			Project		Completed to Date	
CT:	\$312,500.00		\$115,319.00			
To	Total Project Expenses		Total Amount of Funds		Total Percentage of	
and P	ercentage This Qu	arter	Expended		Time Used to Date	
\$2,115.08	\$2,115.08				37.5%	
Allocations:	2021	2022	2023	2024	2025	2026

Colorado: Colorado Department of Transportation (CDOT)

Progress this Quarter:

- Continued work on benchmarking analysis of data in an effort to set future GWP thresholds primary focus was on concrete but outlined methodology on asphalt mixtures.
- Met with the Colorado concrete and asphalt industries to discuss benchmarking methodology proposed for establishing regional GWP benchmarks and reference limits to be used for future reporting on GHG reduction efforts over time.

Project Highlights:

- Milestone #1 Specification in place to require EPD submittals met.
- Milestone #2 Year 2 EPD submittal requirements for additional materials met, incorporated requirements for EPD submittals for structural steel and precast concrete products.

Anticipated work next quarter:

- No changes from initial

Significant Results:

- Began data analyzation and outlined methodology for establishing reference limits and GWP limits for concrete and asphalt materials.

Potential Implementation:

- Establishment of draft GWP materials thresholds limits based on Colorado materials/specification requirements.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for		Percentage of Work	
			Project		Completed to	o Date
CO:	\$312,000		\$129,794.00		28.7% (money only)	
Total Project Expenses and			Total Amount of Funds		Total Percentage of	
	age This Quarter		Expended		Time Used to Date	
\$40,159.00 - \$4	4,172 (Since May 2	2023)			100%	
Allocations:	2021	2022	2023	2024	2025	2026
	\$250,000.00					

Illinois: Illinois Department of Transportation (IDOT)

Project Highlights:

- Test benchmark profiler and urban and low-speed profiler at ICART.
- Determine upgrades that are necessary for both pieces of equipment.
- Upgrade the benchmark profiler for future use at ICART.
- Upgrade the urban and low-speed profiler for future use at ICART.
- Conduct final assessment of both pieces of equipment and determine if the ULSP can be used as a reference device.
- Draft a final report, detailing the testing, upgrades and results of the project.
- Update the user's manuals for both pieces of equipment.

Progress this Quarter:

- Upgrades to the ULSP are complete.
- Upgrades to the benchmark cart are 98% complete.

Anticipated work next quarter:

- We are scheduled to complete the final testing at ICART in September of 2024.

Significant Results:

- Significant progress has been made improving the speed and quality of the measurements.

Potential Implementation:

- Illinois DOT and FHWA has signed a Memorandum of Agreement to house the BP and ULSP at ICART for certification of equipment and further research on ride quality.

Quarterly Project Statistics:

State	Total Project B	udget	Total Cost to Date for		Percentage of Work		
			Project		Project Completed to Da		o Date
IL:	\$300,000 (Feder	al: \$250,000.00)	\$50,842.86		25%		
Total Project Expenses		Total Amount of Funds		Total Percentage of			
and Per	and Percentage This Quarter		Expended This Quarter		Time Used to Date		
\$50,842.86 (1	\$50,842.86 (17%)		\$50,842.86		80%		
Allocations:	2021	2022	2023	2024	2025	2026	

Circumstance affecting project or budget:

Illinois DOT added additional SPR Part B funds to the project in an amendment to the intergovernmental agreement with UMTRI. These funds were to increase the number of upgrades and extend the time to complete the project.

North Dakota: North Dakota Department of Transportation (NDDOT)

Project #1: Determining subgrade strength to improve sustainability & resilience in pavements.

Progress this Quarter:

- Hired a consultant and began testing for R-value and used the R-value to correlate to resilient modulus. Completed 16 R-value tests out of 100 budgeted.

Project Highlights:

- Hire a consultant to complete resilient modulus testing and provide training for staff: 2023-2025.
- Sample material from projects and complete testing for resilient modulus: 2023 2025.
- Incorporate information into pavement designs starting in 2024.

Anticipated work next quarter:

- Plan to continue completing R-value testing in 2024. Our summer drilling has started, and we will be sending out R-value samples for testing as the material is processed through our lab.

Significant Results:

- We have continued to find that the current resilient modulus values being used in design is less than the results of the R-value testing.

Potential Implementation:

- The outcome of the project is to obtain an accurate and reliable resilient modulus of the subgrade that will help ensure that future pavements are designed efficiently and sustainably.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
ND:	\$400,000-Pooled Fund: \$250,000.00		\$0		5%	
Tota	Total Project Expenses		Total Amount of Funds		Total Percentage of	
and Pe	and Percentage This Quarter		Expended This Quarter		Time Used to Date	
\$13,000.00	\$13,000.00		\$0		13%	
Allocations:	2021	2022	2023	2024	2025	2026
		\$250,000				

Circumstance affecting project or budget: None

Project #2: Benchmarking, Field Validation, Shadow Projects, Pilot Projects, Implementation.

Progress this Quarter:

- BMD Validation Project was bid in February 2024. This project will be constructed in Summer 2024. NCAT and NDDOT are developing a testing plan for the validation project.

Project Highlights:

- Hire a consultant to complete resilient modulus testing and provide training for staff: 2023.
- Sample material from projects and complete testing for resilient modulus: 2023 2025.
- Incorporate information into pavement designs starting in 2024.

Anticipated work next quarter:

- Constructing the BMD Validation project in 2024. Developing specifications for shadow projects in 2025.

Significant Results:

- BMD Benchmarking Results.

Potential Implementation:

- Using BMD performance tests in our mix design and construction process through specifications developed through this program.

Quarterly Project Statistics:

State	Total Project Budget		Total Cost to Date for Project		Percentage of Work Completed to Date	
ND:	\$350,000	\$350,000		\$24,779		
Total Project Expenses		Total Amount of Funds		Total Percentage of		
and Percentage This Quarter		Expended This Quarter		Time Used to Date		
\$5,451		\$0		40%		
Allocations:	2021	2022	2023	2024	2025	2026

New York: New York State Department of Transportation (NYSDOT)

Progress this Quarter:

- First round of testing completed, and data reviewed. Second round of testing has begun.

Project Highlights:

- Hamburg and Mixer delivered and installed in lab previous quarter. Initial research testing completed on 19 mm samples. Additional testing planned.

Anticipated work next quarter:

- Testing of top course mixes using different binder grades.

Significant Results:

- Testing of 19 mm samples at different binder grades to help create PEM criteria for PEM program.

Potential Implementation:

- Development for statewide PEM mix design requirements to be implemented in new specifications in development.

Quarterly Project Statistics:

State	9		Total Co Project			Percentage of Work Completed to Date	
NYS:	\$170,000.00)	\$20,000				
Total Project	Expenses an	d Percentage This (-	ount of Funds d This Quarter	Total Per Used to D	centage of Time Date	
			\$0		25%		
Allocations:	2021	2022	2023	2024	2025	2026	

*Texas: Texas Department of Transportation (TxDOT)*Documentation of Balanced Mix Design Performance in Texas - Comparison of BMD sections to control sections 2022

Progress this Quarter:

- 2024 revision of TxDOT Special Specification 3074 (SS3074) with IDEAL-CT & IDEAL-RT and associated thresholds tied to field performance.
- Mix design support for 6 TxDOT BMD multi-day shadow field projects (2-4 trial sections each)
- Construction and Characterization of first TxDOT BMD multi-day shadow field project
- Completion of annual performance monitoring of 2 TxDOT BMD field projects (6 sections) constructed 2019-2022

Project Highlights:

- Annual performance test validation through tie to field performance

Anticipated work next quarter:

- Construction of 3-5 TxDOT BMD multi-day field projects (approximately 2 sections each)

Significant Results:

Continued test validation and tie to field performance highlighted in Presentations. completed at:
 TX Update NRRA 4/30/2024
 MTD Level 2 Update 5/23/24

ISAP 6/5/2024

FHWA TFG 6/12/2024

Potential Implementation:

- Revision of TxDOT Special Specification 3074 (SS3074) with IDEAL-CT & IDEAL-RT and associated thresholds tied to field performance.

Quarterly Project Statistics:

State	•				•	Percentage of Work Completed to Date	
TX:	\$250,000.00	\$250,000.00		\$9,710.00		(TBD)	
Total Project Expenses and Percentage This		Total Amount of Funds		Total Per	Total Percentage of Time		
Quarter	-			Expended This Quarter		Used to Date	
(TBD)			(TBD)		55%	55%	
Allocations:	2021	2022	2023	2024	2025	2026	
		\$250,000.00					
Circumstance affecting project or hudget. None reported							

Circumstance affecting project or budget: None reported.

NOTE: Other state project progress snapshots expected, as provided by a respective participating state representative for Quarterly reporting.

Vermont: Vermont Department of Transportation (VtDOT)

Progress this Quarter:

- Initiated test equipment procurement
- Developed benchmark sampling plan for 2024
- Began sampling mix for 2024 BMD benchmark testing
- Review BMD Mix Design for first Pilot Project

Project Highlights:

- Identify and acquire testing equipment
- Benchmark BMD tests
- Develop BMD specifications
- Construct Pilot projects with BMD and Testing
- Conduct or participate in inter-lab studies for BMD
- Develop experimental pavement sections utilizing BMD
- Revise and finalize BMD specifications

Quarterly Project Statistics:

State	9		Total Cos Project			Percentage of Work Completed to Date	
VT:	\$200,000.00)					
Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter		Total Percentage of Time Used to Date		
Allocations:	2021	2022	2023	2024	2025	2026	

Circumstance affecting project or budget: None reported.

NOTE: Other state project progress snapshots expected, as provided by a respective participating state representative for Quarterly reporting. The quarterly reporting time frames are after the defined quarters outlined on page 1.