MDT Project: Minutes of Meeting

Project Name:	Assessing the impacts of truck platooning on highway infrastructure in Montana	**Date:**	01/02/2015
Purpose:	Project Kick-off Meeting	**Start:**	11:30 am CST
Location:	Hybrid (MS Teams / 2701 Prospect Ave, Helena, MT)	**End:**	12:25 pm CST

Attendees:

Eric Belford, Stephanie Brandenberger, Vaneza Callejas, Sherif Gaweesh, Jason Hughey, Mike Poole, Rebecca Ridenour, and Mike Warren.

Agenda:

1. Introductions (a. Panel Chair, b. Panel Members, c. Research Team, and d. Research Project Manager)
2. Project Management (Vaneza)
3. Review of Project Scope, Schedule (Sherif)
4. Discussion (All)
5. Next Steps (All)

Notes:

- The latest revision for the project proposal has been approved.
- The notice to proceed and the signed contract have now been secured.
- Sherif provided an overview of the project, detailing its goals, objectives, tasks, and scope.
- Eric highlighted that Montana has drafted a specific bill addressing truck platoons, and the legislative review could support potential amendments to the draft.
- The committee requested that the document developed for the first task be sent to Vaneza, who will distribute it to the other panel members.
- Due to time constraints, the committee agreed on a streamlined review process for the submitted documents, with a review period of approximately 10 days.
- Reports should be shared via Teams to ensure all committee members can review and provide comments collaboratively.
- Rebecca and Vaneza clarified that quarterly meetings will be scheduled to discuss and communicate the progress of the report.

Action Items:

Sherif will submit the drafted report to Vaneza by the end of this week.

Next Meeting:

Purpose:	Quarterly Progress Meeting	**Date**:	TBD
Location:	Hybrid (MS Teams / 2701 Prospect Ave, Helena, MT)	**Time**:	TBD

ASSESSING THE IMPACTS OF TRUCK PLATOONING ON HIGHWAY INFRASTRUCTURE IN MONTANA

MDT Champion: Jason Hughey

Transportation Program and Policy Analyst - Rail, Transit and Planning Division

Montana Department of Transportation

PI: Sherif M. Gaweesh

Assistant Professor of Civil Engineering - College of Engineering & Mines

University of North Dakota

Team (GRAs):

Kobena Ebo Gyan Eghan

Md Ashik Mahamud

Rebecca Frimpomaah

PROJECT OVERVIEW

GOALS AND KEY OBJECTIVES

Assist the State of Montana Department of Transportation in preparing for the safe and efficient testing and deployment of truck platooning technologies.

1. Identifying the needs for efficient testing and deployment.
2. Evaluating the anticipated challenges associated with its implementation.

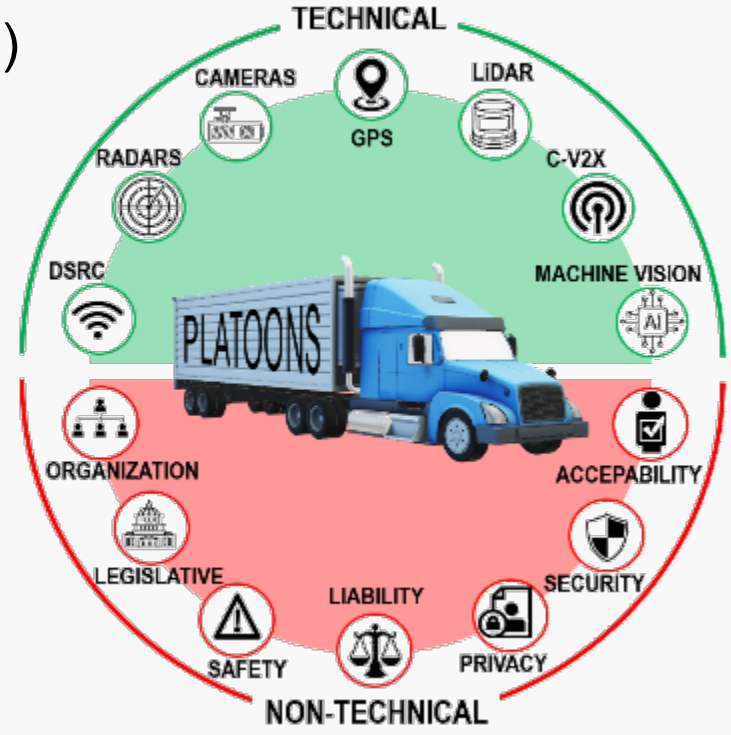
Objectives:

- Review the current state-of-the-practice of national, state, and legislations.
- Synthesize the needs for infrastructure, traffic management, and roadway design and standards.
- Identify platooning impacts on the safety and mobility of the highway system.
- Identify public acceptability of truck platooning

PROJECT OVERVIEW

TASKS

- Task 1: Review for Legislations and Regulations (comprehensive review, Identify any inconsistencies and limitations, and Propose recommendations)
- Task 2: Impact and Needs (Infrastructure, Road Design, and TCD)
- Task 3: Expert Review of Findings and Recommendations
- Task 4: Collecting Institutional Review Board (IRB) Approvals
- Task 5: Collect Expert Perception of Deploying Truck Platoons
- Task 6: Collect Public Acceptability of Truck Platoons
- Task 7: Develop Final Deliverables and Products



Overview of Tasks

Task1: Review for Legislations and Regulations

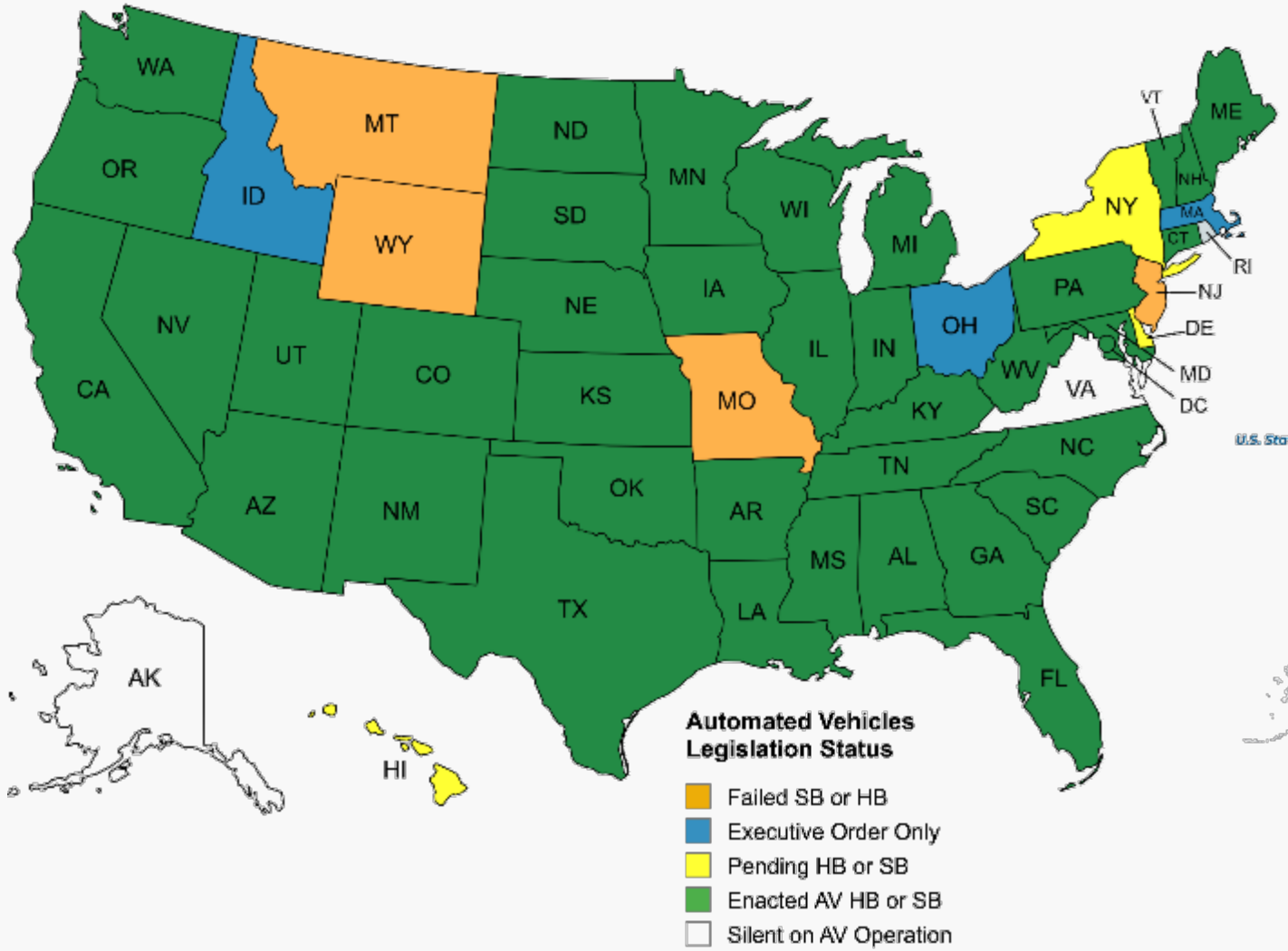
1.1. Conduct a comprehensive review of current state and federal legislations and regulations related to truck platooning.

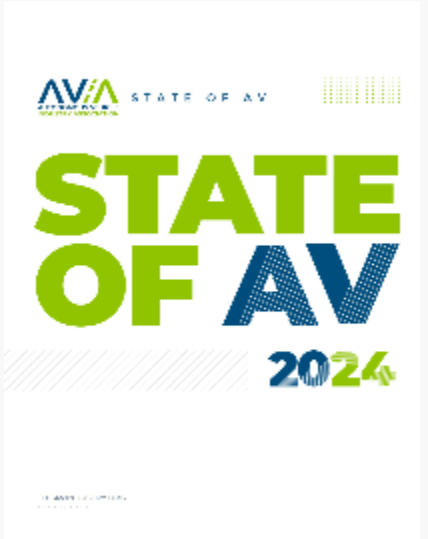
1.2. Identify any inconsistencies, or limitations within the existing regulatory framework.

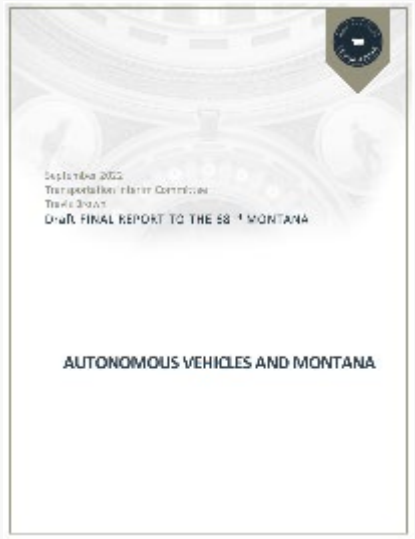
1.3. Propose recommendations for legislative or regulatory adjustments to facilitate safe and efficient implementation of truck platooning in Montana.

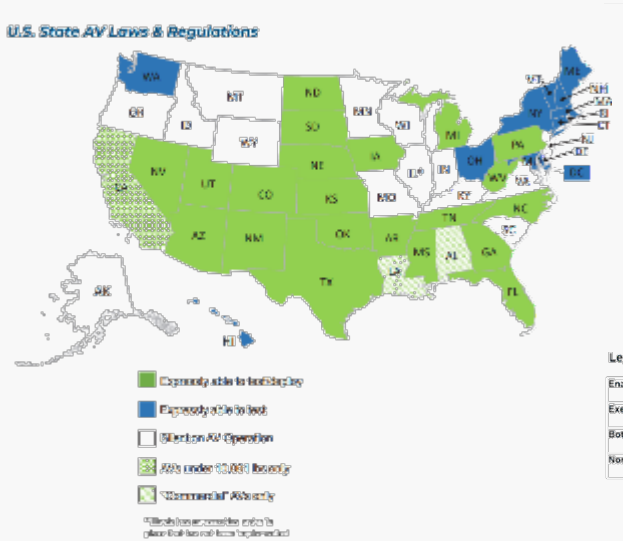
Task 1: Legislations and Regulations

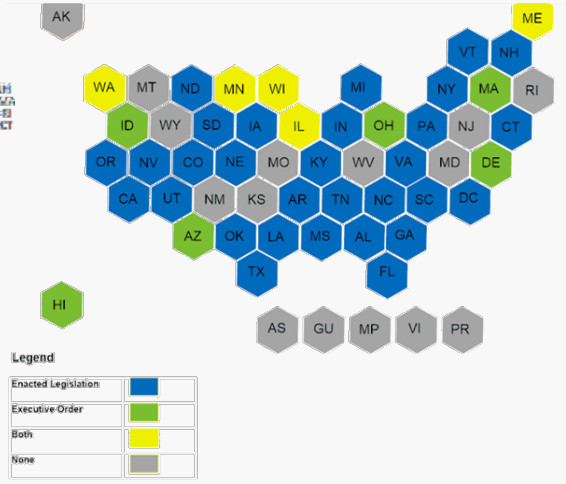
CAV LEGISLATIONS





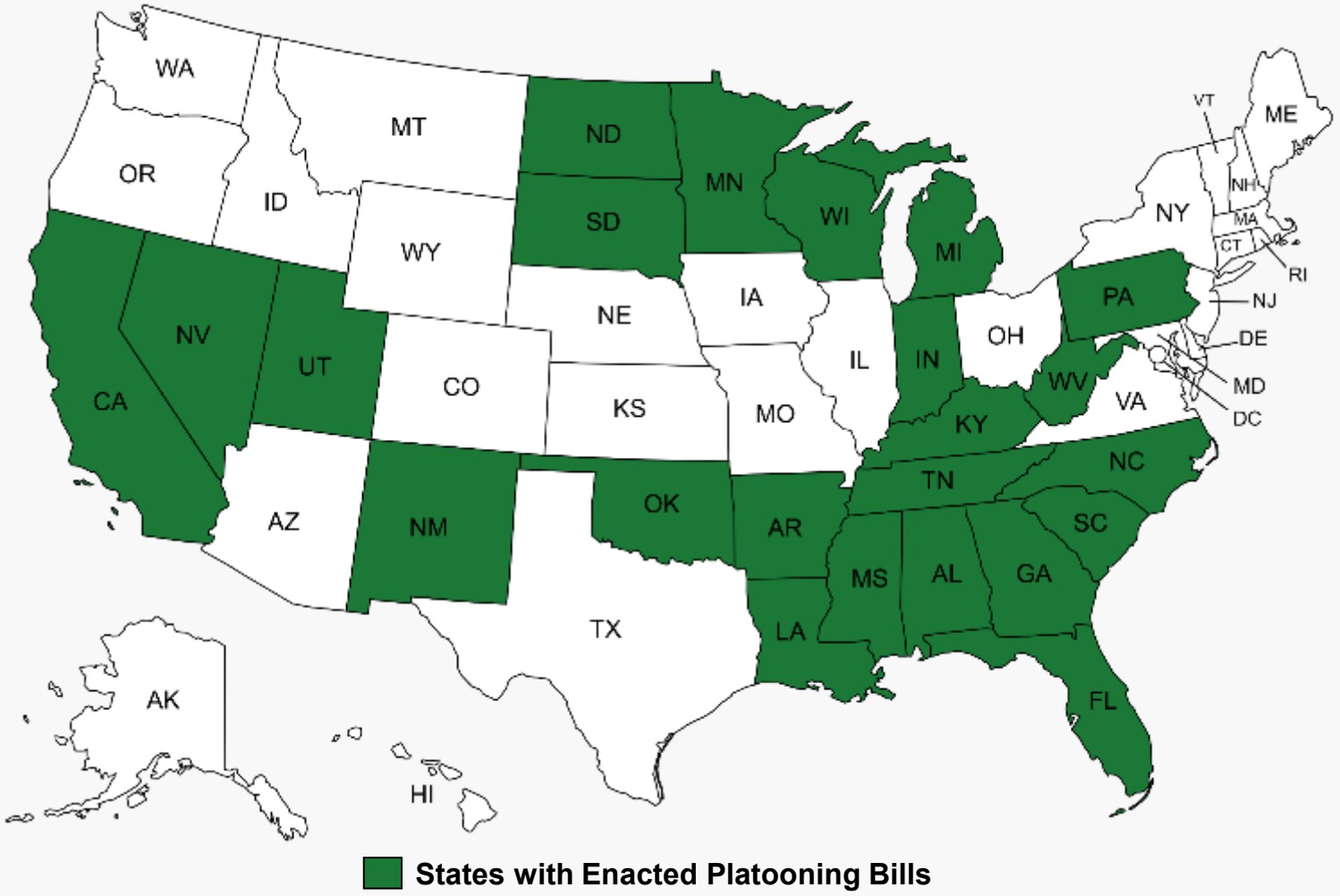


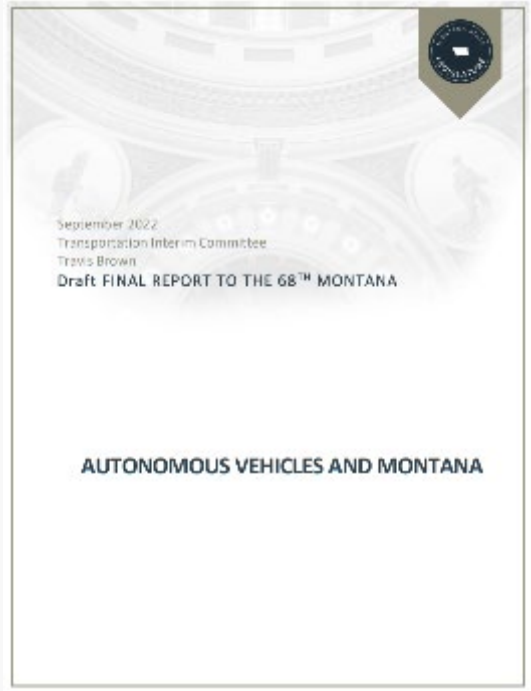




Task 1: Legislations and Regulations

PLATOONING LEGISLATIONS

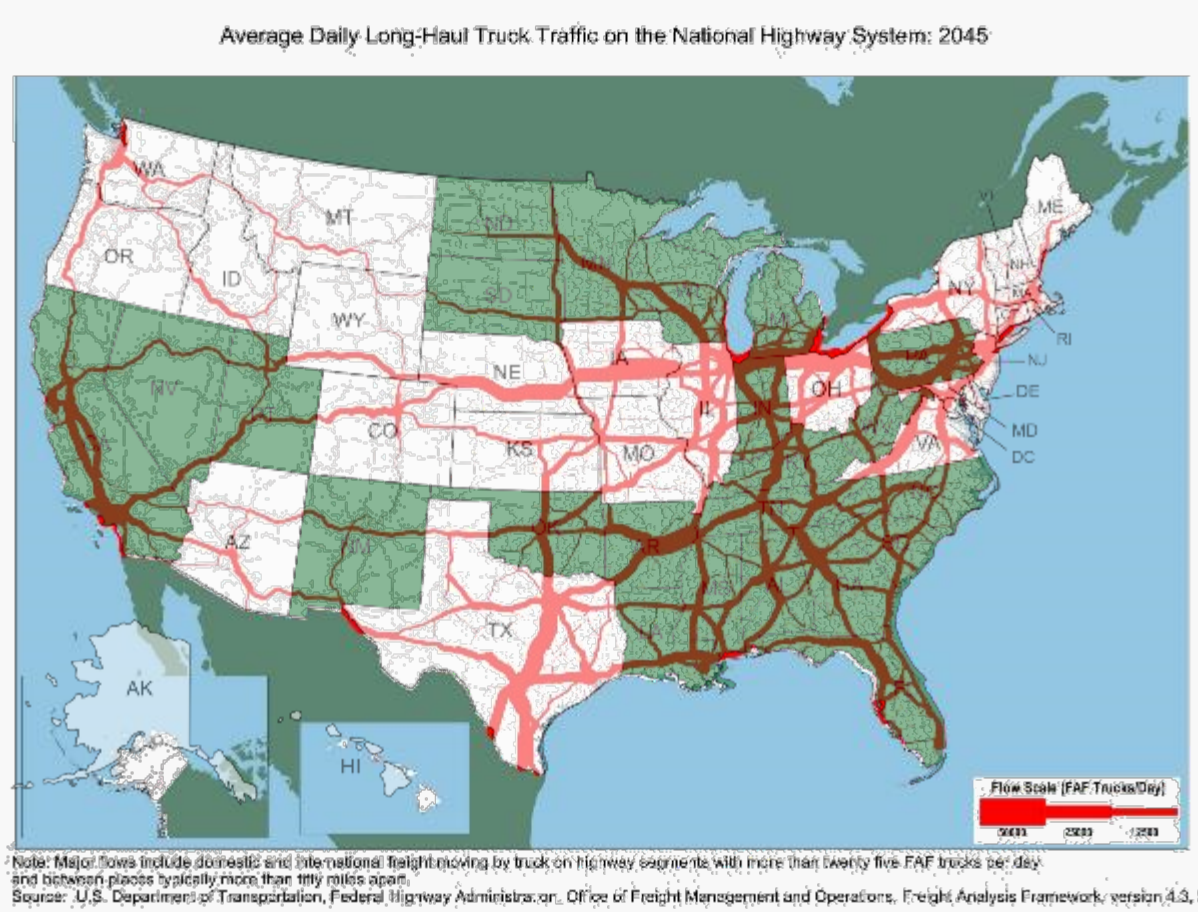


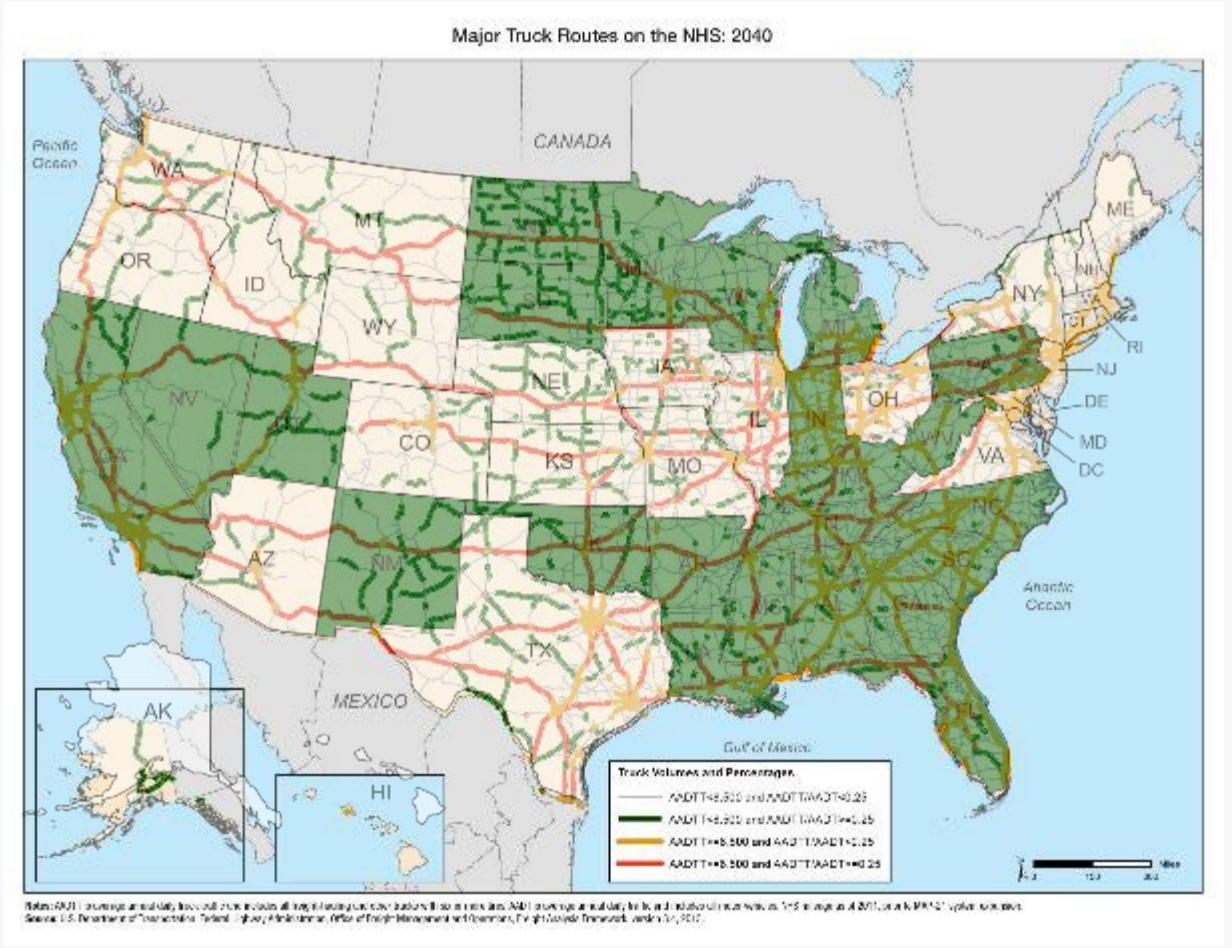


23 States with Bills including specific details on platooning

Task 1: Legislations and Regulations

Long-Haul Truck Traffic and Major Truck Routes in the USA





Overview of Tasks

Task2: Impact and Needs (Infrastructure, Road Design, and TCD)

2.1. Analyze the compatibility of current road designs with the operational requirements of truck platooning.

2.2. Assess the effectiveness and adaptability of existing TCDs in managing traffic flow involving truck platoons.

2.3. Identify infrastructure upgrades or modifications needed to accommodate safe and efficient truck platooning operations in Montana.

Task 2: Impact and Needs

Initiatives and Lessons Learned

North Dakota to Deploy Autonomous Attenuator Trucks

BY ASPHALTPRO STAFF

Transportation Consortium of South-Central States (Tran-SET)

Investigating the Impacts of Truck Platooning on Transportation Infrastructure in the South Central Region

Investigating mobility, environmental, safety, and pavement impacts of truck platooning through a series of modeling case studies

Providing an efficient movement of freight is a critical component to the economy of the U.S.– especially to states in Region 6 (AR, LA, NM, OK, and TX). Truck platooning is a connected and automated vehicle (CAV) application of interest to the freight industry due to its potential energy savings, safety benefits, and ability to reduce highway congestion. However, the short following distances maintained between trucks and more precise lane-keeping lead to a higher

is unclear how these greater weight concentrations and new load configurations will impact the deterioration or damage to pavements. Also, it is unclear what will be the impacts of truck platooing on traffic safety at different traffic conditions. Addressing this uncertainty is critical, especially considering the current state of severe financial constraints in which not all state-owned infrastructure can be maintained.

KRATOS

Developed for Defense, Adapted for Business Continuity

THE RIGHT REGULATORY FRAMEWORK

In order to bring truck platooning to Europe's roads in the near future, we will need to build on the political momentum of the Declaration of Amsterdam and implement what we have learnt from the European Truck Platooning Challenge in 2016.

Above all, we need to create an enabling regulatory framework at both the EU and international levels. To that end, these changes will need to be made to existing rules and legislation:

UN legislation · EU legislation · National legislation

REQUIRED COMMUNICATION PROTOCOLS FOR PLATOONS OF TRUCKS

- Brake signal transmission – R13
- Steering signal transmission – R79
- Light signal transmission – R48, R121
- Multi-brand data standardisation – new regulation
- Electromagnetic compatibility (EMC) – R10
- Platoon V2V and V2X communication

AUTOMATED COMMANDED STEERING FUNCTION (ACSF), BRAKING FUNCTIONS AND AEBS

- ACSF – R79 or new regulation
- Braking – R13

TRAFFIC RULES

- Safety distance – Vienna Convention
- Revision of all national road traffic regulations

DRIVER MONITORING

- Somnolence / driver sentinel – new regulation
- Event data recorder

DRIVER TRAINING

- Driving licences – Directive 2006/126 EC

SIGNALLING AND ROAD MARKINGS FOR PLATOONS

- Road signs – Regulation (EC) No 1071/2009
- Vehicle signs (HUD/HMI) – R121 GRSG
- Direct/indirect visibility – R46
- Other users signalling – R48 or new regulation

ADDITIONAL REQUIREMENTS FOR PERIODIC TECHNICAL INSPECTIONS

- Technical roadside inspection of roadworthiness commercial vehicles
- R13, R48, R79, R89, R116, R121, R130, R131
- Directive 2000/30/EC
- 1997 Agreement

TYPE APPROVAL

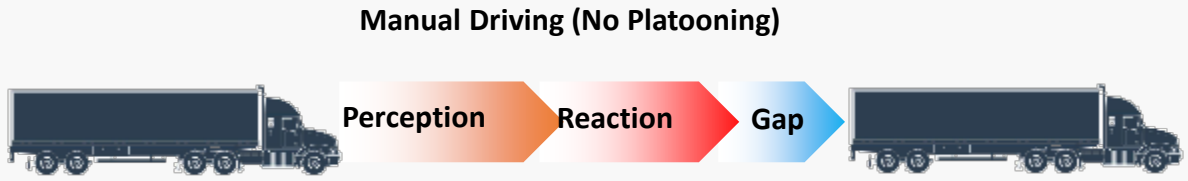
- Targets to be defined for type approval
- Platooning engagement/disengagement rules (split and merge)
- New regulation for platooning components/ systems on trucks

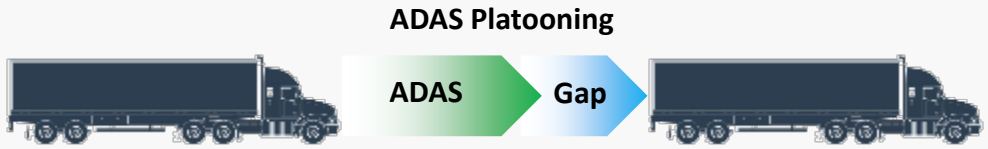
Overview of Tasks

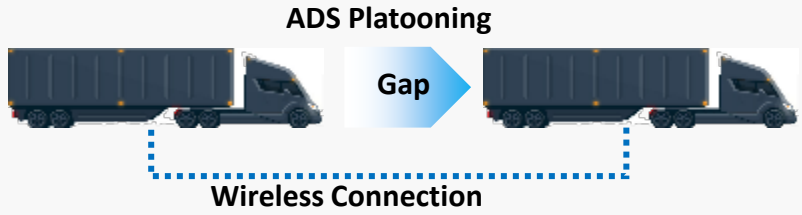
Task3: Expert Review of Findings and Recommendations

3.1. Design and administer surveys or interviews to transportation experts

3.2. Identify expert opinions on the benefits, challenges, and implications of truck platooning for Montana's highways.





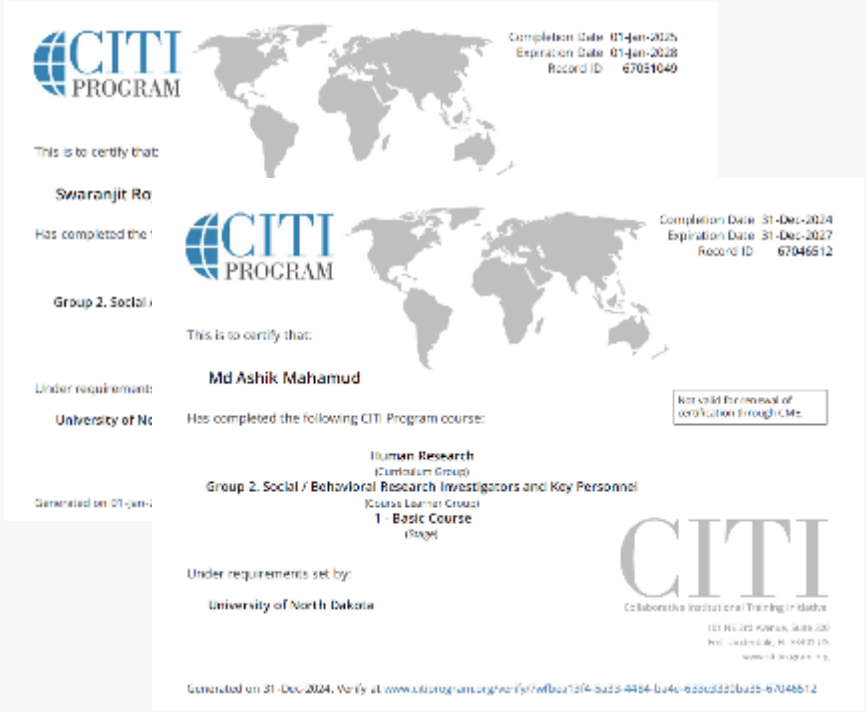


Overview of Tasks

Task 4: Collecting Institutional Review Board (IRB) Approvals

4.1. Submit the IRB protocol, outlining (research plan, such as study objectives, methodology, data collection procedures, risk assessment, and plans for informed consent and data protection)

4.2. To assess ethical acceptability of the research and will evaluate potential risks to participants, the adequacy of informed consent procedures, and the overall protection of participant rights and privacy.



Overview of Tasks

Task 5: Collect Expert Perception of Deploying Truck Platoons

5.1. Develop survey instruments to gather expert opinion on truck platooning.

5.2 Collect perception of experts in rural great plains states that share similar weather conditions.

5.3. Compile and analyze expert feedback to assess benefits of truck platoons, challenges, implications, risk associated infrastructure needs, safety and mobility concerns of truck platoons.

Overview of Tasks

Task 6: Collect Public Acceptability of Truck Platoons

6.1. Develop survey instruments to gather public opinion on truck platooning.

6.2. Gather data on the acceptability of truck platoon testing and deployment among Montana residents.

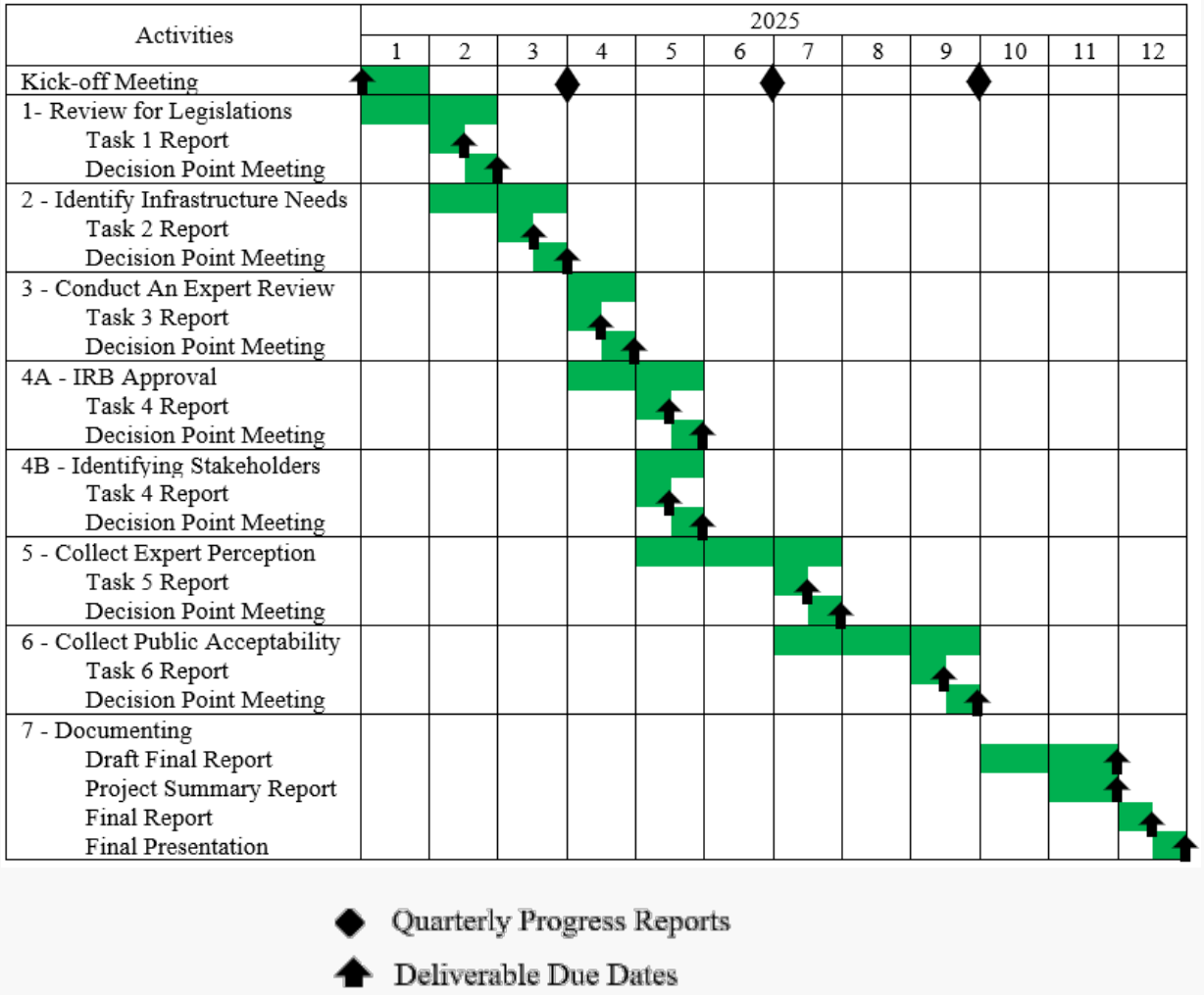
6.3. Compile and analyze public feedback using latent factor analysis to identify public perception of associated risks, safety concerns, security concerns, and liability implications

Overview of Tasks

Task 7: Develop Final Deliverables and Products

- Comprehensive final report.
- Detailed final PowerPoint presentation summarizing the research findings
- A project summary report.
- Expert and public online survey instrument using Qualtrics software.
- Participants' responses in the form of spreadsheets (coded).
- Two research manuscript to support understanding of the conducted research (presented and/or published)
- Quarter progress reports to report the research progress (MDT template)

Timeline and Budget



Labor Expenses

Person	Role	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Total Hours
Sherif Gaweesh	PI	35	35	39	40	40	40	40	269
TBD	GRA (1/2 Time)	150	150	150	140	150	150	150	1040
								Total:	1309

Person	Role	Total Hours	Hourly Wage	Total Wages	Hourly Benefit Rate	Total Benefits	Total Cost
Sherif Gaweesh	PI	269	56.67	$15,243	29.0%	$4,417	$19,660
TBD	GRA (1/2 Time)	1040	28.85	$30,000	0.50%	$150	$30,150
Total:		1309		$45,243		$4,567	$49,810

Indirect Cost @ 41%:	$22,154
Total Labor Cost:	$49,810
Tuition:	$9,813
Direct Expenses	
In State Travel	
Out of State Travel	$1,141
Expendable Supplies	
Total Project Cost:	$81,654

UNIVERSITY OF NORTH DAKOTA

THANK YOU!