CAT Coalition Technical Resources Working Group Quarterly Meeting

November 10, 2021

11:00-12:30 (Eastern)

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Agenda

11:00-11:05	Welcome and Introductions, Outreach and Knowledge Transfer
11:05-11:10	Recap of Previous Webinar and All Working Group Activities
11:10-11:20	Plans for a CAT Coalition Compendium
11:20-12:05	Transitioning to C-V2X and FCC Licensing Process - Utah Deployment Updates and Transition Process - C-V2X Update
12:05-12:30	Partner Reports (USDOT, ITS America, ITE, Other Partners) - CARMA Update
12:30	Member Updates and Closing

Ongoing Commitment to Outreach & Knowledge Transfer

- Suggestions from WG Members on Ways to Enhance Impact:
  - Proposed new WG Members
  - Communications with/involvement in other initiatives
  - Knowledge resources to include on CAT Coalition website

Resources WG Recap

Jeremy Schroeder, Athey Creek

Resources WG Recap

- IOO/OEM Forum RSZW Working Group Update on Products
  - Summary of Connected Work Zone Needs and Standardization Activities
  - Enabling Connected Work Zones: Needed Activities and Proposed Next Steps

- Connected Intersections Update on Testing and Findings

- Resources WG Completed Work Plan Activities and Impact

Presentations and notes posted on Resources WG website:

https://transportationops.org/CATCoalition/technical_resources_WG

Work Plan Activities – Developed Products

- ✓ **White Paper on CAT Resources and Lessons Learned**
  - Developed and published in 2018
  - https://transportationops.org/sites/transops/files/Resources%20-%20White%20Paper%20v2.0%2012052018.pdf
- ✓ **Identified resource gaps**
  - Within primary CAT focus areas on signalized and unsignalized intersections, work zones, curve warnings, and end of queue, as well as general CAT issues. These were added to the list of other gaps identified during monthly webinars.
  - Included in White Paper on CAT Resources and Lessons Learned
- ✓ **CV Deployment Environment Resource**
  - Developed 2019-2020 and published in 2020
  - Updated in 2021
  - https://transportationops.org/sites/transops/files/Resources%20-%20CV%20Deployment%20Environment%20Version%201.2.pdf

Work Plan Activities – Webinars and Review

- ✓ **Hosted presentations on Cellular V2X (C-V2X)**
  - Enable discussions around technical deployments.
  - Presentations and updates by Jim Misener and Alan Clelland
- ✓ **Introduction of MaaS/MOD**
  - Discussion with invited speakers and members surrounding the increasing role of MaaS/MOD in CAT
  - Engagement and presentation by ITS America on this topic
- ✓ **Review, input, and analysis of developed CAT documentation, tools, products, and resources**
  - CAT Coalition – IOO/OEM Forum, Infrastructure-Industry WG, Strategic Initiatives WG, SPaT Resources WG
  - Other entities – USDOT, NEMA, ITE, NCHRP

Support and Interaction with Other Groups

- CAT Coalition
  - SPaT Infrastructure System ConOps & Requirements
  - RSZW Infrastructure System ConOps
  - SPaT Challenge Resources
  - Clarifications for Consistent Implementation
  - Connected Intersections Consistent Procedures for Operations
  - Preliminary Verification Resource
  - CAT Primer of Terms
- ITE
  - Connected Intersections Effort
  - RSU Standard
- USDOT
  - Roadway Automation Concept of Operations
  - Data Hub and Code Hub
  - CV Procurement State of Practice
  - V2I Benefits-Cost Assessment Tool
  - CARMA Overview
  - AV Guidance 3.0
  - CV Pilot updates
- NCHRP Project 08-120
- NEMA TS-10 Standard
- NTCIP 1218 Standard
- CAT CMM Tool

Plans for a CAT Coalition Compendium

Tom Kern, AASHTO

CAT Coalition – Activities of the Working Groups

- **Work Plans** – Define the activities and products of each Working Group
- **Webinars** – Primary meeting venues (limited in-person meetings)
- **Work Groups are advancing a series of products**:
  - 29 Completed Products to date (draft or final)
  - 6 Planned products (scheduled delivery by winter 2021)
  - **35 Total Products**

CAT Coalition Products – Types of Products

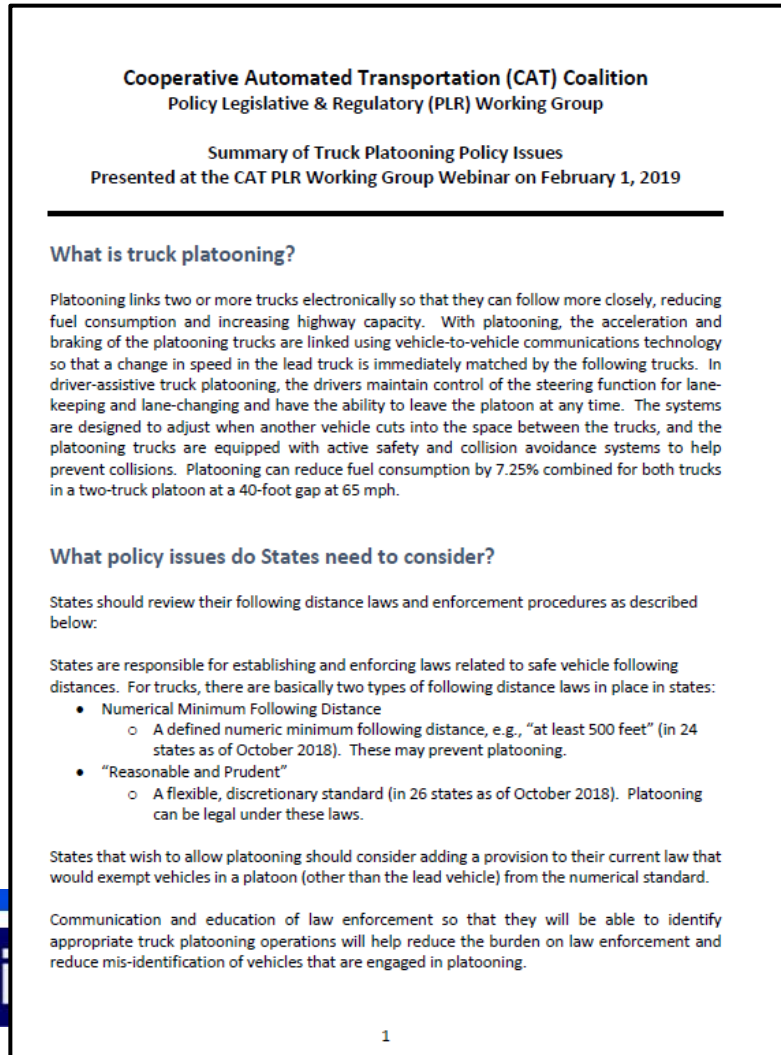
Products are not necessarily written documents – 4 types of products include:

Documents	Technical Input to Other Efforts	Engagement	Support
• White papers / Technical Memorandums / Other written products • Intended to be resources for the CAT community	• Feedback (verbal or written) to initiatives or resources being advanced by other groups • Will include a target audience, but expected to benefit other groups, as well	• Facilitating and/or conducting outreach activities to benefit CAT stakeholders • Increasing awareness or knowledge is the typical goal	• Assisting CAT stakeholders in benefitting from resources (developed by the CAT Coalition or others)

Example Product: Summary of Truck Platooning Policy Issues

Policy, Legislative, Regulatory (PLR) Working Group

Product Type	**Document (2 page)**
Target Audience	**State DOTs interested in understanding the most likely issues with platooning**
Content	• **Definition of truck platooning** • **Most common policy issue with platooning** • **Examples of approaches used to overcome issues** • **Not a guidance document**



Cooperative Automated Transportation (CAT) Coalition
Policy Legislative & Regulatory (PLR) Working Group

Summary of Truck Platooning Policy Issues
Presented at the CAT PLR Working Group Webinar on February 1, 2019

What is truck platooning?

Platooning links two or more trucks electronically so that they can follow more closely, reducing fuel consumption and increasing highway capacity. With platooning, the acceleration and braking of the platooning trucks are linked using vehicle-to-vehicle communications technology so that a change in speed in the lead truck is immediately matched by the following trucks. In driver-assistive truck platooning, the drivers maintain control of the steering function for lane-keeping and lane-changing and have the ability to leave the platoon at any time. The systems are designed to adjust when another vehicle cuts into the space between the trucks, and the platooning trucks are equipped with active safety and collision avoidance systems to help prevent collisions. Platooning can reduce fuel consumption by 7.25% combined for both trucks in a two-truck platoon at a 40-foot gap at 65 mph.

What policy issues do States need to consider?

States should review their following distance laws and enforcement procedures as described below:

States are responsible for establishing and enforcing laws related to safe vehicle following distances. For trucks, there are basically two types of following distance laws in place in states:

- Numerical Minimum Following Distance
  - A defined numeric minimum following distance, e.g., "at least 500 feet" (in 24 states as of October 2018). These may prevent platooning.
- "Reasonable and Prudent"
  - A flexible, discretionary standard (in 26 states as of October 2018). Platooning can be legal under these laws.

States that wish to allow platooning should consider adding a provision to their current law that would exempt vehicles in a platoon (other than the lead vehicle) from the numerical standard.

Communication and education of law enforcement so that they will be able to identify appropriate truck platooning operations will help reduce the burden on law enforcement and reduce mis-identification of vehicles that are engaged in platooning.

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CAT Coalition Compendium

- Will be a document that summarizes the activities and impacts of the CAT Coalition
- Will not simply be a combination of the products, but will also “weave” together a description of:
  - What was done;
  - How it was done;
  - Why it was done; and
  - How it is (and can be) used by the industry.
- Will be a ‘reflection’ document that allows the current and future working group chairs to understand what approaches have worked well (and which haven’t) to support future activities of this and other groups

CAT Coalition Compendium

- Outline has been drafted
- Formal writing of the compendium will begin this fall
- Working Groups will be invited to contribute to this in the spring of 2022
- Target is Spring of 2022 for the release of the compendium

Transitioning to C-V2X and FCC Licensing Process

- Utah Deployment Updates and Transition Process

- C-V2X Update

Blaine Leonard, Utah DOT

John Kuzin, Qualcomm

Partner Reports from USDOT, ITSA, ITE

- USDOT CARMA Update

Pavle Bujanovic, USDOT

Connected Signalized Intersection Guidance

CAT Coalition - Technical Resources Working Group Meeting

Siva R.K Narla

Senior Director, Transportation Technology

ITE

Connected Intersections (CI) Committee

- **Roy Goudy, Nissan Motors (Co-Chair)**
- **John Thai, City of Anaheim (Co-Chair)**

- Steve Bowles, 360 Network Solutions
- Justin McNew, JMCRota
- Jim Misener, Qualcomm
- Whitney Nottage, Q-Free/ Intelight
- Jay Parikh, CAMP/IOO-OEM Forum
- Raj Ponnaluri, Florida DOT
- Faisal Saleem, AZ Maricopa County DOT
- Doug Schmidt, Aptiv
- Ed Seymour, Texas A&M Transportation
- Mike Shulman, Ford Motors
- Christina Spindler, Wyoming DOT
- Steve Sprouffske, Kapsch
- Ray Starr, Minnesota DOT
- Michael Stelts, Panasonic
- Vivek Vijayakumar, General Motors
- Matt Zinn, McCain, Inc.

Connected Intersections (CI) Committee

Co-chairs shown

CI Committee
Roy Goudy, Nissan Motors
John Thai, City of Anaheim

SDO Support
AASHTO
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NEMA
SAE International

Sponsor
USDOT

Positioning Task Force
Jim Misener, Qualcomm
Justin McNew, JMCRota
28 members

Testing/Conformity Task Force
Jay Parikh, CAMP
Christina Spindler, Wyoming DOT
49 members

Security Task Force
Jimmy Upton, ISS
William Whyte, Qualcomm
38 members

SPaT/MAP Task Force
Michael Maile
Ray Starr, Minnesota DOT
66 members

Traffic Controller Issues Task Force
Kevin Balke, TTI
Roy Goudy, Nissan Motors
57 members

Traffic Controller Vendors Subcommittee
Eric Raamot, Econolite (Chair)
Intsignia
Oriux
Pillar Consulting
Rapid Flow Technologies
Q-Free/Intelight
Siemens/Yunex
TTI

Over 200 participants
(Infrastructure, Automotive OEMs, Mobile User Community)

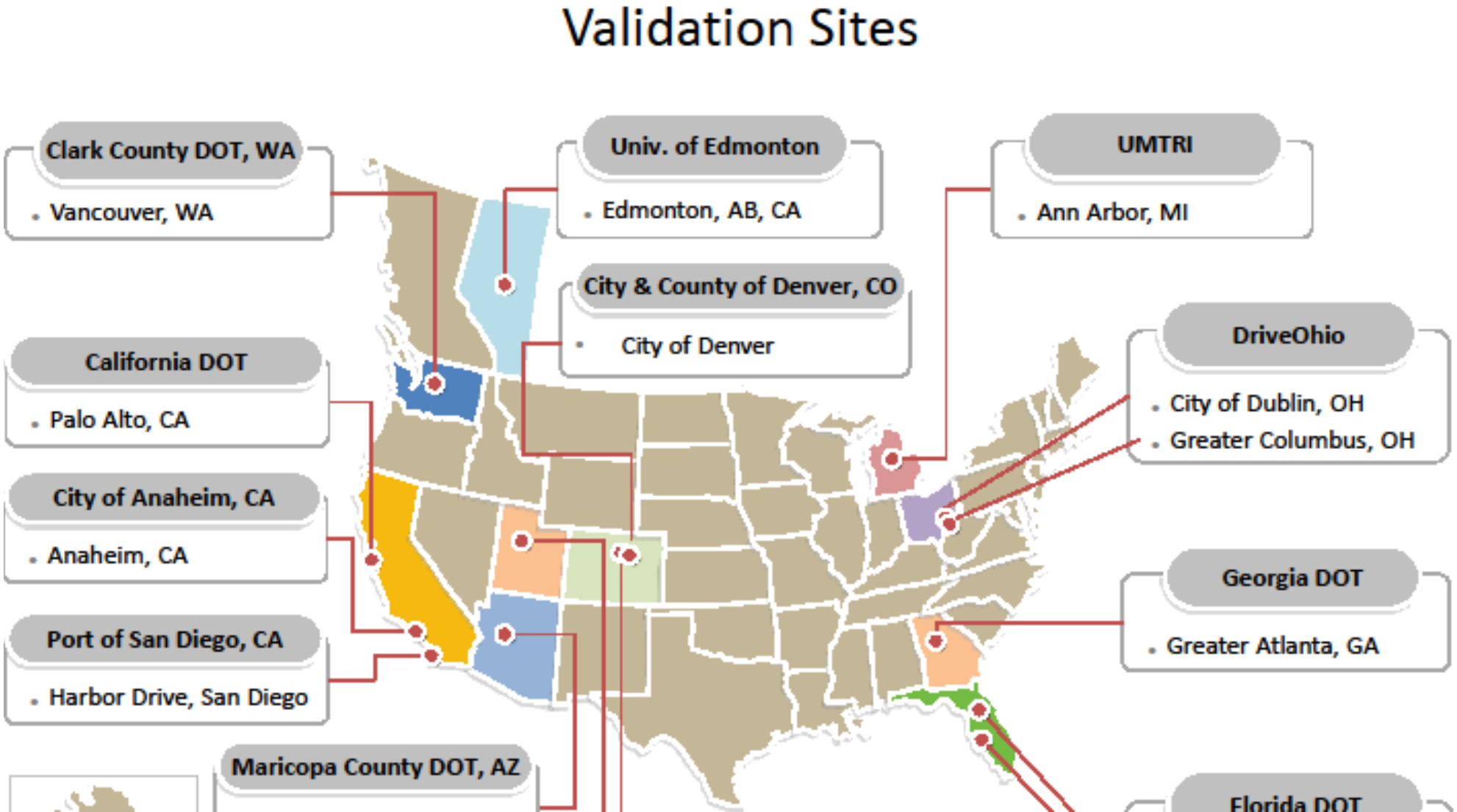
Significance of Project

- An important first step to establish an open dialogue between IOOs, OEMs, and the traffic signal controller industry to "provide an explanation on what data and connected vehicle messages are being broadcast from an interoperable connected intersection so safety applications can be deployed for production vehicles, with an initial focus on the Red-Light Violation Warning (RLVW) application.“
- Outcomes:
  - Held over 200 meetings during a span of less than one year, each with an average of 15-20 attendees, to discuss the contents of the CI Implementation Guide.
  - The publication of the ***CI Implementation Guide***, which defines requirements for the key capabilities and interfaces for interoperable connected signalized intersections that IOOs, production vehicles and application developers can build to.
  - A ***validation phase*** where SPaT and MAP messages broadcasted from validation sites were captured and analyzed by an impartial third party. The analysis of the messages led to many insights, some of which led to changes to the deployment, changes to the guidance in the CI Implementation Guide, or identifying areas where future research may be needed.
    - The ***validation phase*** also provided insights into what future testing may look like to assure the proper performance of a connected intersection.

Validation Phase

- Goal: Validate and verify the products developed as part of the CI Implementation Guide
- Solicited for qualified validation sites in January 2021.
  - 15 validation sites from 13 agencies/organizations across North America volunteered staff, time and resources
- From April to July 2021, agencies collected field data (SPaT and MAP Messages) and provided to the CI project team for analysis for conformance to the CI Implementation Guide. Agencies also provided feedback (gaps and ambiguities) on CI Implementation Guide
- Held weekly status meetings to share experiences and observations from the analysis of the field data
- Output: Validation phase led to many insights – some leading to changes in the agency's deployment, changes in the final CI Implementation Guide, and identifying areas where future research / testing methodology may be needed
- Agencies appreciated the feedback from an impartial third party and insights on what future testing may look like
- ***Validation report*** **is** expected to be available end of 2021

Validation Sites



Closing Remarks

Any deployment updates or lessons learned to share with the group?

Any other closing comments or questions?

This is the final Resources WG Meeting

Thank you for all of your contributions!