

CAT Coalition

Planning Scenarios Working Group

May 6, 2020 Webinar

Notes and Summary of Discussions

Welcome

Matt Hardy welcomed everyone to the call. Matt recapped that this group is a joint group between the AASHTO Committee on Planning CAV Task Force and the CAT Coalition Planning Scenarios Working Group. Matt recapped the March webinar and previewed the agenda for today's webinar.

Justine Sydello welcomed everyone and thanked everyone for their attendance.

Working Group Chair Update

Matt updated that Sondra Rosenberg has a new position supporting other AASHTO efforts and will no longer be a co-chair of this group. Justine will remain as a co-chair of this group. Matt is in the process of identifying a new co-chair to join Justine.

5.9 GHz Spectrum Update

Matt Hardy provided an update on the 5.9 GHz spectrum. Matt reminded members that the FCC had released a NPRM in 2019 and there have been a series of periods where comments have been accepted. AASHTO, as well as many state DOTs, have submitted comments. Matt also noted that the Alliance for Automotive Innovation recently announced a pledge to deploy 5 million devices in vehicles and roadway infrastructure within the next 5 years to enable vehicle to everything (V2X) communications, dependent on the FCC leaving the full 5.9 GHz spectrum for transportation safety and allowing the use of Cellular V2X. This pledge also included a recommendation for allocation of this portion of the spectrum between DSRC and C-V2X.

USDOT Highway Automation ConOps

Ginny Crowson and John Corbin presented on the USDOT National Roadway Integration with ADS Concept of Operations (ConOps) with the goals of introducing the ConOps project and gathering some initial input from this working group. John Corbin provided an overview of the purpose and need for the ConOps. He noted that the origin of this ConOps project came from stakeholders suggesting it through various outreach activities, including the National Dialogue on Highway Automation. He noted that transportation agencies desired for FHWA to serve as a convener for engagement with industry and that the ConOps is intended to serve as a national vision for automation that could clarify goals and focus action. John described an automation ecosystem around four interacting dimensions: Communities and Travelers, Infrastructure Systems, Transportation Agencies & Institutional Systems, and Vehicle Systems and noted the interactions between these dimensions will be a focus of the ConOps.

John noted that this ConOps may not be formatted as a traditional ConOps, but rather will serve as a definitional document describing what IOOs will need to prepare for in the timeframe of approximately

2030-2035 with a partial mixed fleet of automated driving systems (Level 3 and above) and human driven vehicles.

Ginny provided additional information on the ConOps project. She noted that work began in October 2019 and will continue until September 2021 with six primary tasks:

- Task 1. Project Management
- Task 2. Background Documentation and Foundational Research
- Task 3. Stakeholder Engagement
- Task 4. ConOps Requirements Development
- Task 5. ConOps Development
- Task 6. ConOps Implementation Plan.

She noted that Task 3 (stakeholder engagement) is really a cornerstone of the project. This interaction today is part of this engagement and she noted that they will likely come back to this group later as the integration cases are further developed and needs are identified. She noted that Task 5 is the largest effort (ConOps Development) and will produce the primary document. Some more information on the ConOps:

- It will not be a standards document, but rather a context for roadway infrastructure needs and activities to support automated driving systems.
- It will be iterative and will evolve over time.
- It will be stakeholder driven.
- It will be strategic to address more than just a single system, but rather a system of systems. and
- Validated through stakeholder engagement.

The ConOps document will be divided into three parts:

- Part I – Executive Summary, focused on upper management,
- Part II – An accessible readable narrative, target audience of IOO staff
- Part II – Technical appendices for IOO specialists.

Ginny focused more on Part II, drawing attention to two sections where work is currently underway and input is desired:

- #6: ADS and Roadway Automation Context; and
- #7: ADS Integration Cases.

The context diagram builds upon the four dimensions John introduced, adding a series of interactions between those dimensions. For example, a Planning and Land Use interaction occurs between IOO Institutional Systems and Communities, Businesses and Travelers dimensions. This interaction includes the social and economic conditions within Communities, Businesses, and Travelers that influence longer term change in Institutional Systems. An example of this interaction includes a community using scenario planning to illustrate various levels of automation and identify the potential impacts on transportation that an IOO needs to factor into long range transportation planning.

Ginny introduced eight integration cases, explaining that these are expected to be prominent integration cases, but certainly not all of the integration cases by 2035. These cases, grouped into four groups include:

Freight and Packages

- Automated Long-Haul Freight
- Automated Local Freight Delivery
- Automated Home Package and Goods Delivery

Transit

- Automated Fixed Route Transit
- Automated on Demand Transit

Individual Commuting & Travel

- Automated Ride for Hire
- Automated Personal Vehicles

Agency Operations

- Automation of Fleet Vehicles

There was a question about the relationship between this project and the ADS Grants. John noted that the various CV and AV grant awards will be great resources for this project to understand what is being learned in the grant projects, but there is no other formal tie between the two.

A question was asked about whether connectivity will be included in the ConOps or if the focus will be solely on automated driving. John noted that connectivity would be a part of the ConOps as it is one portion of the Cyber Physical Interaction between Infrastructure Systems and Vehicle Systems. There are many aspects of this interaction, including connectivity. As a follow up to the question, it was suggested that this be made clearer because connectivity is another critical element IOOs will need to understand and address.

There was a question about the fact that ADS providers, automakers, and tier-1 suppliers have been developing their own roadmaps for years and would the ConOps attempt to consider these. John acknowledged this and said the project would work to incorporate it within the foundational research and engagement activities that are part of the project.

Ginny noted that she will send a two-page document with additional information about the context to the group and would appreciate any additional input the group would like to send in email follow-up.

Work Plan and Relationship to the IOO/OEM Forum

Venkat Nallamothu provided an overview of the focus areas of the CAT Coalition and noted that one of the most active groups has been the IOO/OEM Forum, noting that it is a group of IOOs and OEM representatives that have met since 2016 to serve as a sounding board for these two groups to communicate.

Dean Deeter provided additional examples for how the IOO/OEM Forum has interacted with CAT Coalition working groups, and identified two key topics that the IOO/OEM Forum will look to this working group for input, including:

- Work Zone data; and
- Connected Automation.

Dean showed a timeline that indicated there would be follow-up presentations on the IOO/OEM Forum activities with this group this fall/winter timeframe.

Member Updates and Volunteers for Future Planning Presentations

Matt opened the floor for updates from members:

- Peter Calcaterra (Connecticut DOT) noted that they are working on a CAV plan. They are a member of the Connected Vehicle Pooled Fund Study (CV PFS), working on an interesting project for how IOOs could interact with production vehicles. They continue to react to current situations and to understand the impacts of COVID-19 on transportation.
- Mark Norman noted there will be a TRB webinar next Wednesday May 13, 2020 from 2:00-3:30 on COVID 19, automated vehicles, and shared mobility. Mark provided the link to the webinar as: https://nasem.zoom.us/webinar/register/WN_mhVWeZ2LSsaZM9O3DKPIdA
- Mike Floberg (KDOT) noted that KDOT is picking up interest from local governments. KDOT will soon begin phase 2 of an action plan for CAVs in Kansas, adding to the vision project they created. They are also working on two systems, Internet of Things and a Wind Warning System that will ultimately update DMS with wind warnings.
- Cynthia Jones (Ohio DOT) noted that Ohio DOT is also involved in the CV PFS. They are also recruiting for an Automated Vehicle Pooled Fund Study. Ohio has a Smart Mobility Corridor and final installs are happening this week. Some of the connected vehicle deployments may have shorter duration and involve less participants given the COVID-19 situation. They recently received an ADS grant and are working with Federal Motor Carrier on this activity. They have a systems engineering analysis project that has been underway for several years to prepare for when there is a decision to deploy CAV systems as specific locations, approximately 70% of systems engineering would be available to help the project initiate. Also, they were planning several AV Shuttle demonstrations, but impacts of COVID have impacted these.
- Kyle Miller (WSDOT) noted that WSDOT recently had a workshop for the CAT Policy Framework they are developing. This was held as a virtual meeting. Kyle noted that the document is coming together and may be available to share soon.

Next Webinar and Close

Matt noted that there will be a presentation from the I-95 Corridor Coalition on the July webinar and invited other suggestions or offers to present. Justine opened the floor to volunteers or suggestions:

- Matt asked if Kyle could update on WSDOT's progress on the CAT Policy document. Kyle agreed that he and Ted Bailey could present whenever it works best.
- Tom Kearney suggested that there is an Early Deployers Group that gets together about once a month as a technology transfer group. He suggested approaching Michelle Noch at the USDOT Joint Program Office (JPO) to ask for a presentation on what IOOs planning groups are doing.

With no other business presented, the webinar was adjourned at 1:30 pm EST.

CAT Planning Working Group – May 6, 2020 Webinar Participants

- Matt Hardy
- Justin Sydello
- Cynthia Jones
- Tom Kearney
- Shane McKenzie
- Peter Calcaterra
- Kyle Miller
- Jeff Lindley
- Rachel Ostroff
- Charles Wade
- Matthew Swift
- Scott Belcher
- Mark Norman
- Mike Floberg
- Kara Aguilar
- Parker O'Brien
- Mark Wingate
- Melanie Alvord
- Tom Kern
- I Weiskopf
- Christos Xenophontos
- Jeremy Raw
- Venkat Nallamothu
- Ginny Crowson
- John Corbin
- Ed Seymour
- Gummada Murthy
- Linda
- Ray Derr
- Zeke Reyna
- Dean Deeter

AASHTO Committee on Planning: CAV Planning Working Group & CAT Coalition: Planning Scenarios Working Group

Webinar
May 6, 2020



1

Welcome and Agenda Review

1. Welcome
2. Working Group Chair Update
3. Update on 5.9 GHz Spectrum Activities – what it means to state DOTs and MPOs
4. USDOT Highway Automation ConOps
5. Work Plan for this Working Group – Interaction with IOO/OEM Forum
6. Member Updates
7. Next Webinar / Close



2

2

Agenda Item #1: Working Group Chair Update

Matt Hardy



3

Agenda Item #2: 5.9 GHz Update



4

Agenda Item #3: USDOT Highway Automation ConOps

John Corbin, USDOT
Ginny Crowson, Athey Creek



5

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National Roadway Integration of ADS Concept of Operations



CAT Coalition Working Group Engagement

May-June 2020

6

Agenda

- ConOps purpose and need
- Overview of ConOps
- Context and integration case development
- Feedback and discussion



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ConOps Purpose and Need



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Stakeholder Engagement: Primary National Opportunities

- Transportation agencies desire FHWA as a convener for engagement with industry
- A collaborative national vision for automation could clarify goals and focus action
- Coordination with State and local transportation agencies could accelerate education and the development of technical resources
- Synchronized communication about technology could encourage public engagement

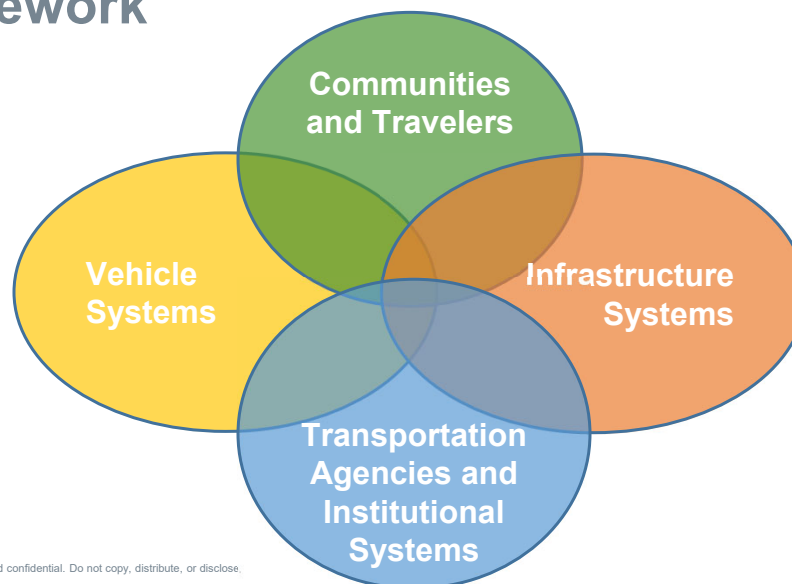


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Roadway Automation Readiness Framework



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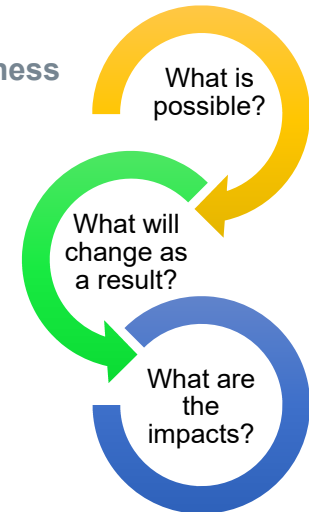
Concept of Operations Purpose and Need

▪ Delineating the “what” in preparing for automation readiness

- Mixed fleet operations
- Use cases based on operational design domains
- Changing requirements for infrastructure owner operators

▪ Definitional document

- Provide methodology for describing automation and related interactions within the vehicle-roadway system
- Enable organizations to speak the same language
- Support conversations for organizational and infrastructure planning

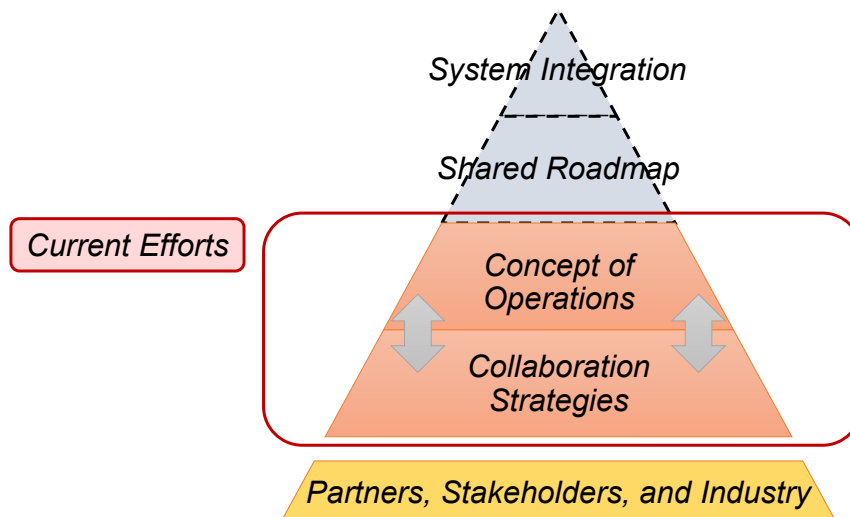


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Coordination for Automation Readiness



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Overview of ConOps



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The ConOps as a Project

- **Project duration Oct 1, 2019 – Sept 30, 2021**

- **Primary tasks**

- Task 1. Project Management
- Task 2. Background Documentation and Foundational Research
- Task 3. Stakeholder Engagement
- Task 4. ConOps Requirements Development
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- Task 6. ConOps Implementation Plan



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14

Not a Traditional ConOps

It is not...

- Standards document
- Legislative/regulatory guidance
- Technology plan

Iterative

Stakeholder-driven

It is a plan for...

- Integration
- Implementation
- Sustained coordination

Strategic

Validated

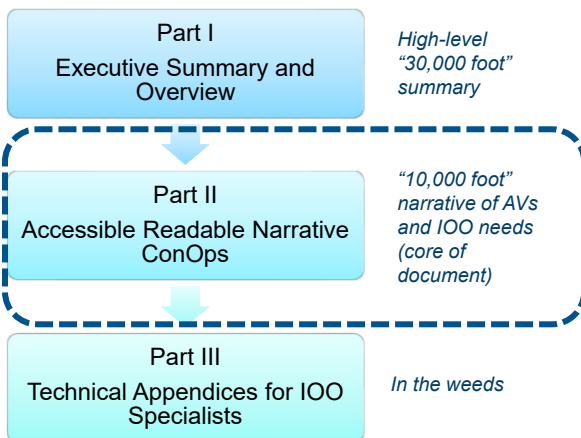


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Proposed ConOps Structure



Purpose	Audience
Info to support decision making	Upper management and decision makers
Comprehensive understanding of ADS, likely forms of deployment and major impacts on IOOs	IOO staff
Details in standalone appendices (topics and number of appendices TBD based on requirements)	IOO technical specialists



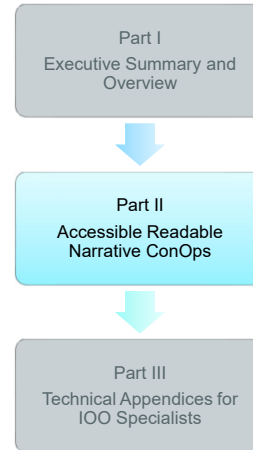
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Part II – Concept of Operations (Accessible, Readable Narrative)

1. Introduction and Overview
2. Key Terms and Concepts
3. National Initiatives and Relationships
4. Motivations for this Document
5. How IOOs Can Use This Document
6. **ADS and Roadway Automation Context**
7. **ADS Integration Cases**
8. Highway Automation System Integration Requirements
9. Sample Operational Scenarios
10. Assumptions, Constraints, Unknowns
11. Impacts



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Context and Integration Case Development

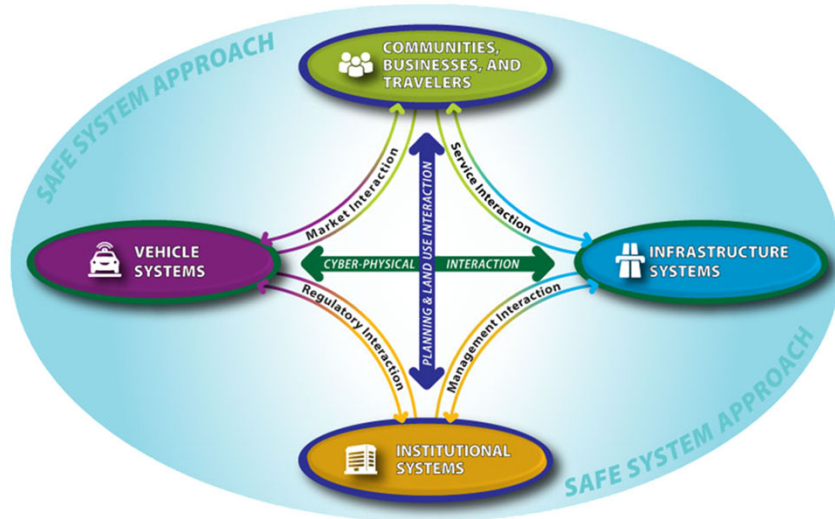


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ADS and Roadway Automation Context



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19

19

ADS Integration Cases

Freight and Packages

- Automated Long-Haul Freight
- Automated Local Freight Delivery
- Automated Home Package and Goods Delivery

Transit

- Automated Fixed Route Transit
- Automated On Demand Transit

Individual Commuting & Travel

- Automated Ride for Hire
- Automated Personal Vehicles

Agency Operations

- Automation of Fleet Vehicles

Agencies select applicable integration cases

Integration cases translate into roadway automation needs

- ADS integration cases will grow and evolve
- ConOps provides structure to add new ADS integration cases or to modify existing ones



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Feedback and Discussion



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Feedback

- **Any general feedback on...**
 - Proposed structure of the ConOps?
 - ADS and roadway automation context?
 - ADS integration cases?



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22

22

Discussion Questions

- Which integration case will most impact the roadway environment by 2035 and why?
- What aspects of fleet vehicle automation will impact safety and efficiency?

Freight and Packages

- Automated Long-Haul Freight
- Automated Local Freight Delivery
- Automated Home Package and Goods Delivery

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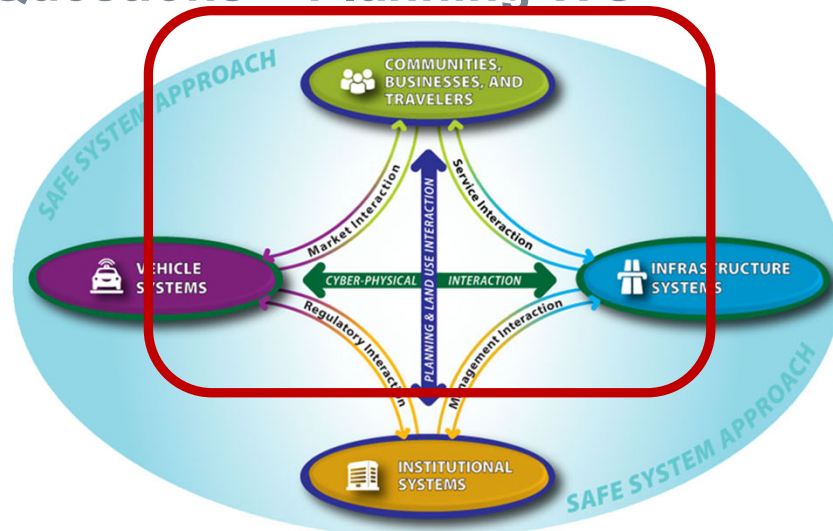
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23

Discussion Questions – Planning WG

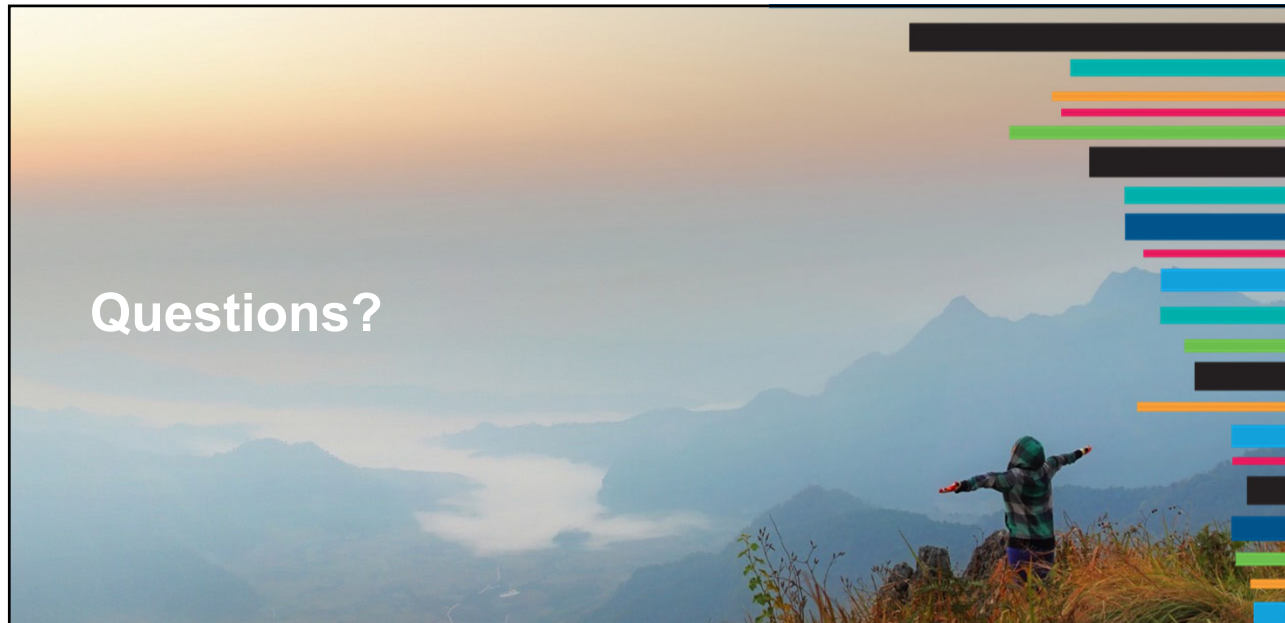
- What do we know about the impacts?
- What do we still need/want to know about the impacts?




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Questions?





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Agenda Item #4: Work Plan for This Group – Interaction with the IOO/OEM Forum

Venkat Nallamothu, AASHTO
Tom Kern, NOCoE
Dean Deeter, Athey Creek



26

IOO/OEM Forum

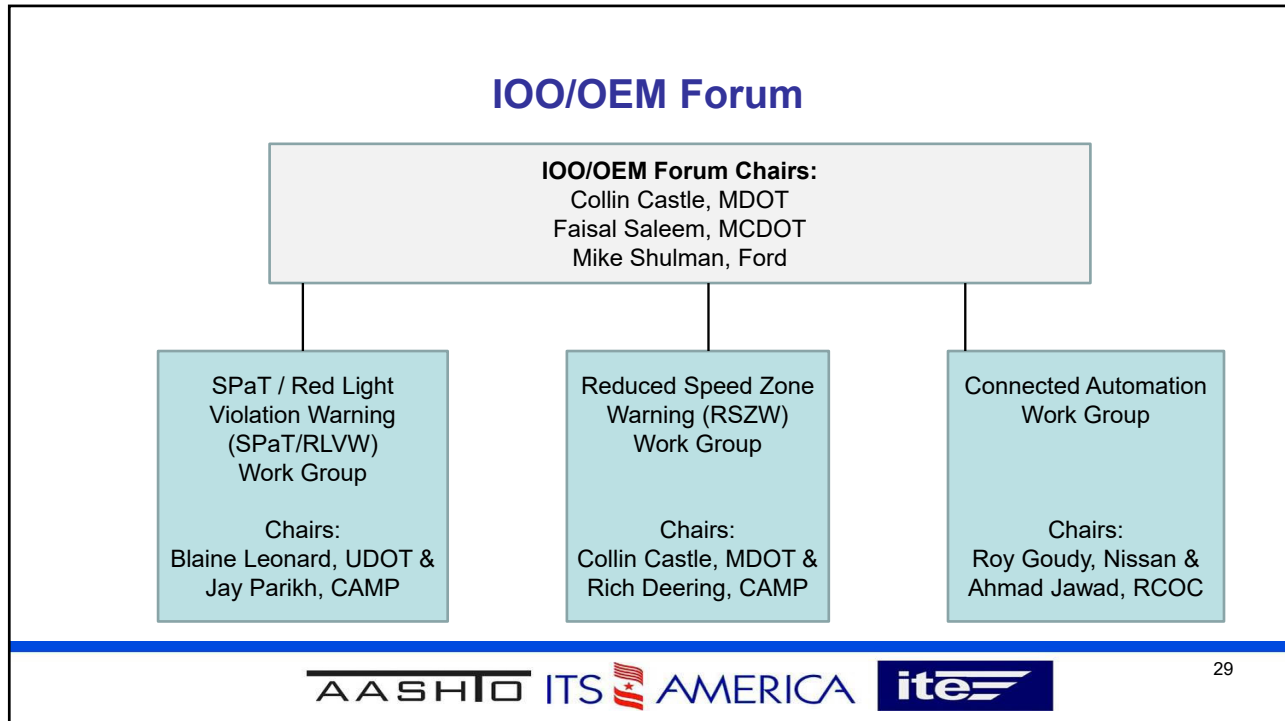
Since 2016:

- A small group of Infrastructure Owners & Operators (IOOs) have been meeting regularly with a group of automobile Original Equipment Manufacturers (OEMs)
- This has allowed detailed discussions about the data that is needed and available from both groups to support CAT applications
- The CAT Coalition Working Groups have always been a conduit into and out of the IOO/OEM Forum – engaging the broader CAT Coalition membership in activities

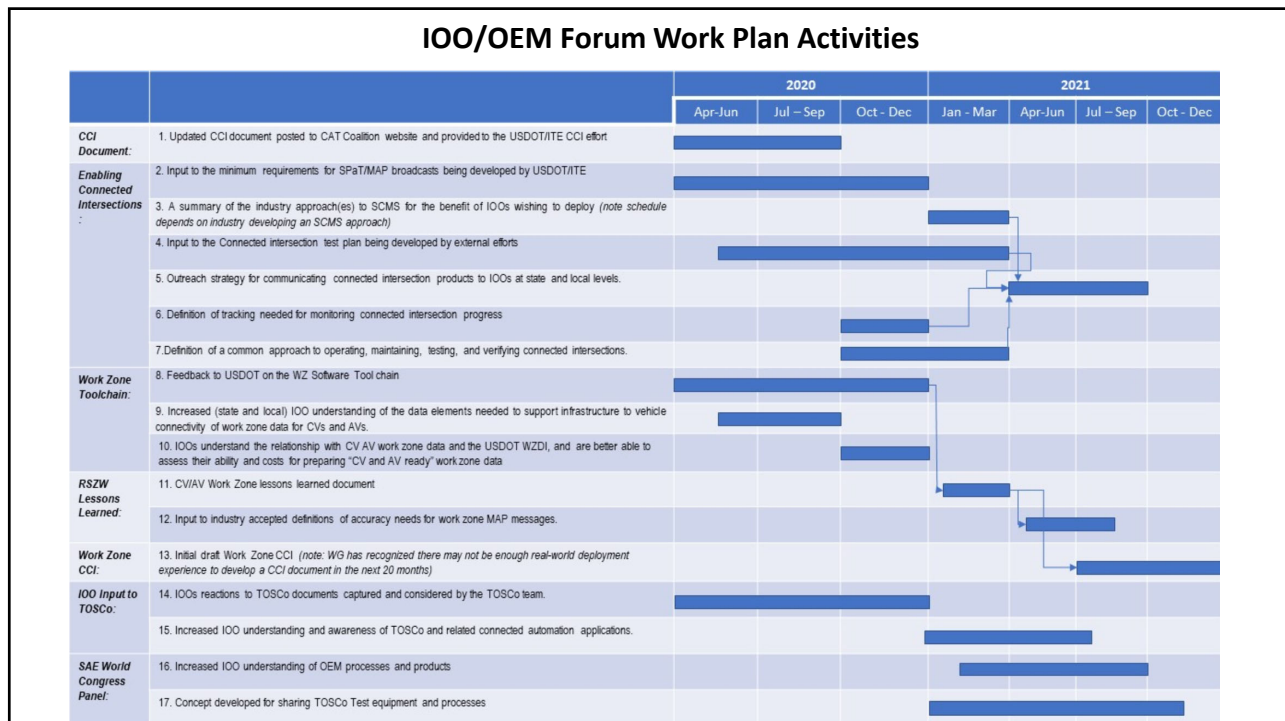
IOO/OEM Forum

Examples of Interactions:

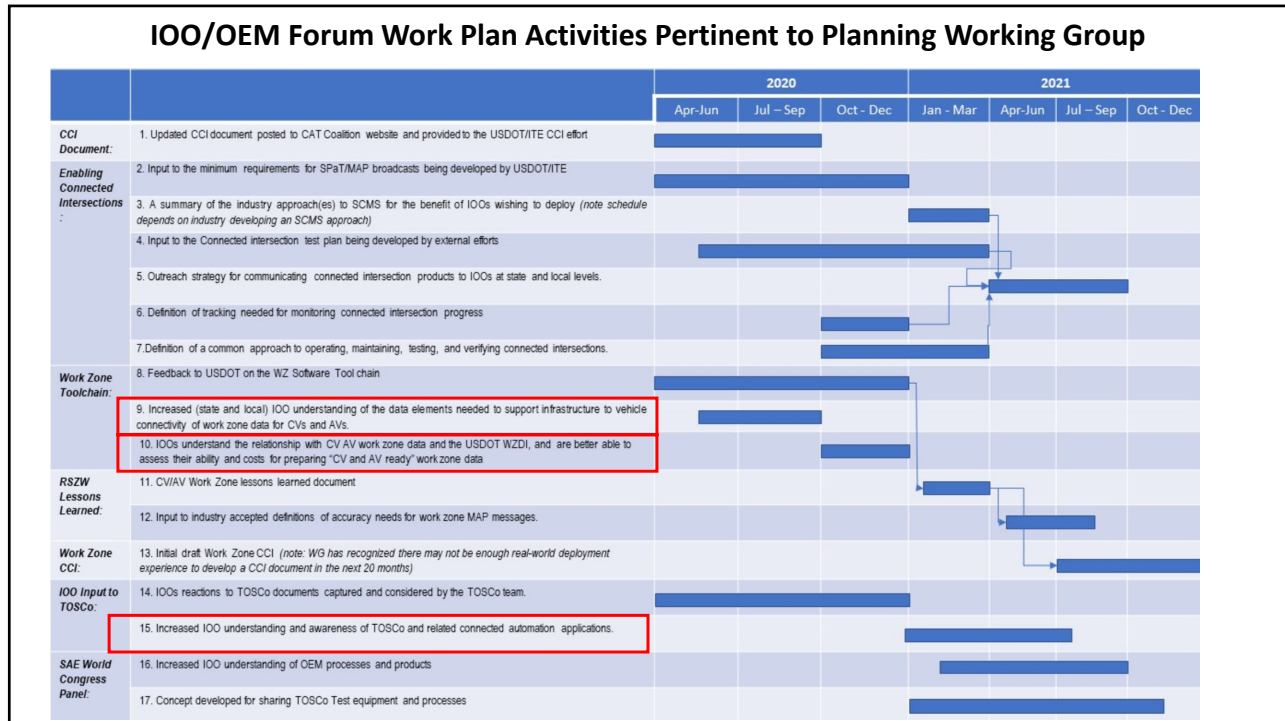
- In 2018-2019, the IOO/OEM Forum created a Concept of Operations for Work Zones
 - The CAT Coalition Technical Resources WG established a small group to provide detailed review and feedback
- In 2016-2017, the Strategic Initiatives WG was leading the SPaT Challenge:
 - The IOO/OEM Forum created a SPaT Challenge ConOps & Requirements and SPaT Verification Document to support the SPaT Challenge



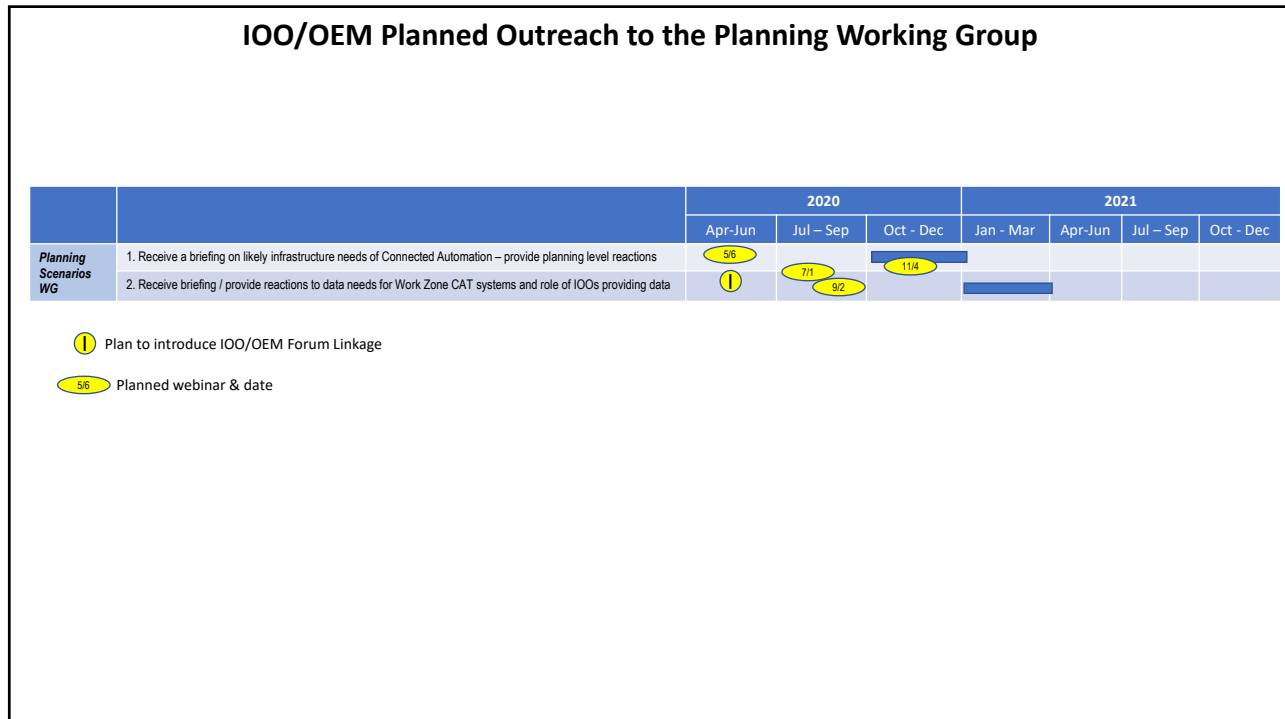
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30



31



32

Other Member Updates



33

Future Webinar Topics

- July Webinar
 - I-95 CC Scenario Planning
 - What topics would you like to cover?
 - Volunteers or suggestions for speakers?



34

34

Any Other Business / Adjourn

