CAT Coalition Planning Scenarios Working Group

January 8, 2020 Webinar Notes and Summary of Discussions

Summary of Action Items

- 1. Matt will circulate the comments/questions submitted in the chat box during the webinar to encourage email dialog and discussion.
- 2. Members of this group are encouraged to email Matt Hardy if they would like to volunteer to present on a future webinar or if they have suggestions for other speakers.

Welcome

Matt Hardy welcomed members and noted this is a combination of the Cooperative Automated Transportation (CAT) Coalition working group on planning and CAV group within the AASHTO Committee on Planning (COP) as both efforts are looking to plan for the eventual deployment of CAV/CAT. The merging of these groups is helping to increase CAT Coalition engagement with local MPOs.

Matt noted that Justine Sydello is a co-chair but is not able to attend today. Matt then turned it over to Sondra Rosenberg (Nevada DOT and co-chair of this group).

Sondra welcomed the attendees and thanked them for their involvement in the webinar. Sondra recapped that this is the second webinar of this group. During the first webinar in November, the group reviewed the activities of AASHTO and the CAT Coalition. Minnesota DOT presented on their CAV Scenario Planning. The MnDOT CAV Scenario Planning Final Report is now available on-line at: http://www.dot.state.mn.us/automated/docs/cav-scenario-planning-report.pdf

Update on AASHTO and the CAT Coalition

Matt Hardy, Tom Kern, and John Corbin gave an overview of AASHTO and the CAT Coalition activities. Matt noted that CAV is one area that AASHTO wants to support more coordination among the state and local agencies. The CAT Coalition brings together the public sector Infrastructure Owners and Operators (i.e. state and local DOTs) as well as private sector and researchers. A goal of the CAT Coalition is to involve everyone under one tent, and this working group is helping to involve more MPOs in the coalition.

Matt asked Tom Kern to give an overview of the CAT Coalition. Tom reviewed the working groups of the CAT Coalition that are arranged into three focus areas:

- Programmatic and Strategic Activities;
- Planning, Scenarios, and Resources; and

Infrastructure & Industry.

Tom noted that the two co-chairs of the coalition are Roger Millar (Secretary of Transportation for WSDOT) and Jennifer Cohen (Secretary of Transportation for Delaware DOT). Tom showed a screen shot of the CAT Coalition website (http://transportationops.org/catcoalition). The website houses a variety of resources that were either developed by the CAT Coalition or developed outside the CAT Coalition. Each working group has a page with details on the working groups.

John Corbin (FHWA) offered his perspective that the planning aspects of CAT are becoming increasing important and parallel the activities needed to identify and define policy advances to support CAT. John noted a current FHWA project that is designed from the ground up to be stakeholder led is the development of the Concept of Operations for Highway Automation, and a parallel effort led by AASHTO is to develop the National Strategy for Highway Automation. Both activities are in the very early stages, and John anticipates these efforts will benefit greatly from information shared by this group.

AMPO Overview

Bill Keyrouze presented a high-level summary of the Association of Metropolitan Planning Organizations (AMPO) and the AMPO technical working groups, including the working group on Vehicle Connectivity and Automation. After sharing background on this working group, Bill described the effort to create the National Framework for Regional Vehicle Connectivity and Automation Planning. This effort was completed in 2019 and the report is available on-line. Bill noted that the purpose of the project was to develop a framework and tool as MPOs:

- Incorporate vehicle connectivity and automation into metropolitan transportation planning processes and work to guide its deployment to help meet regional transportation needs and goals; and
- Explore the potential impacts of vehicle connectivity and automation and their implications for the transportation system, its users, and the concept of mobility.

The framework identifies 15 impact areas (defined in more detail in the document), including:

- Safety and security
- Operations
- Mobility and mode choice
- Freight
- Transportation demand
- Infrastructure design and capacity
- Funding and financing
- New transportation service markets

- Equity
- Data collection and analysis, housing, availability, and affordability
- Public acceptance
- Land use
- Air quality conformity
- Policy Engagement and Coordination
- Employment

The framework is broken into four sections of recommendation:

- 1. Engagement, coordination, collaboration
- 2. Policies and investment decisions:
- 3. Other planning products and processes;
- 4. Institutional readiness.

As next steps, Bill shared that the AMPO Connectivity and Automation Working Group will continue to meet quarterly by webinar to continue the conversation. For the Framework, AMPO is in discussions with FHWA to hopefully identify funds to update the framework. AMPO is looking forward to continuing strong engagement with partners such as AASHTO, APTAA, FHWA and others.

Finally, Bill noted that there is an AMPO Data Working Group that will convene soon.

MPO Case Studies

The CAV planning activities of three metropolitan planning organizations (MPOs) were presented during the information sharing portion of the webinar.

Orlando MetroPlan CAV Readiness Plan

Eric Hill from the Orlando MetroPlan MPO presented the CAV Readiness Plan that is underway. Eric noted that MetroPlan is the MPO for the Orlando area, representing about 2 million residents, but with the tourist nature, on any given day the population increases to 5 million people.

The purpose of the CAV Readiness Study is to assess the region's readiness for the arrival and integration of CAVs. Eric noted that community acceptance was an emphasis of the project. He noted that the outcomes of this project will feed into the long-range transportation plan.

Currently, the project is in Task 4 - preparing recommendations for CAV readiness.

Eric describe a workshop they conducted as part of the project. During the workshop, there was a survey of attendees. The outcomes of the survey in the workshop included the following:

- Attendees were generally knowledgeable about CAV terminology;
- Favorable attitude towards CAVs;
- Attendees see benefits as reducing crashes and improved mobility for elderly and disabled;
- Attendees has concerns with safety and trust in the technology; and
- Attendees felt funding should include training and workforce development, as well as educating the public on CAVs.

Eric concluded by noting that they will soon have the draft recommendations from the consultant team for CAV preparedness. They will present the reccommendations to the Metro Board for review. Early deliverables of the project are already on-line if participants would like to view them.

Eric's slides were made available for download during the webinar and are being circulated with the summary.

Dallas / Ft. Worth - Planning for CAVs in Era of Wireless Uncertainty

Tom Bamonte from the North Central Texas Council of Governments (NCTCOG) presented their efforts to plan for CAVs.

Tom noted that in this era of uncertainty about communications, the NCTCOG policy board approved a three-part program to include:

- AV Planning A comprehensive AV Planning process (funding of about \$1.5 million)
- AV Demonstrations In order to put all metro agencies on same playing field, NCTCOG will make some resources available to cover costs of public entity hosting AV deployments (funding of about \$10 million); and
- Use Cases NCTCOG will fund AV deployments for use cases not served by AV developers (funding of about \$20 million).

Tom's slides were made available for download during the webinar and are being circulated with the summary.

Kofi Wakhisi - Atlanta Regional Commission (ARC)

Kofi presented a quick overview of implementations that ARC and Georgia DOT have pursued in recent years. He noted that recent FCC activities are likely to impact the original concept for communications The original concept was a vision for TSMO with technology aspects as well as event management, geometric changes, and other TSMO approaches. ARC Board identified \$8 million dollars with \$2 million local match to deploy a combined DSRC and CV2X dual-mode technologies to implement connected vehicle technologies throughout Atlanta operating in the 5.9 GHz spectrum at traffic signal systems to send a message to the industry about their commitment to connectivity.

Kofi noted that GDOT had already participated in the SPaT Challenge to deploy 50 intersections with roadside units. Kofi identified speed harmonization for safety benefits and overall mobility benefits as one use case they envision with the connected infrastructure. Kofi noted that they are anticipating another paradigm shift as 5G becomes widespread in operations.

When asked if they considered a 4G/5G combined approach. Kofi responded that they have considered LTE point-to-point communications, but it is unknown if that is compliant with 5G. Tom Bamonte noted that TxDOT is conducting the Connected Freight Corridor project and that they are considering both 4G and 5G communications.

Other questions were entered in the chat box, but in the interest of time Matt indicated that he will include in the notes going out and encourage some email exchanges.

Next Webinar / Close

Matt recapped that the plan with this group is to conduct webinars every other month. There was a suggestion to focus the next webinar in March on city level planning as well as state level planning. Matt invited members to email him directly if they would like to volunteer to present at an upcoming webinar or suggest another speaker. Matt may also reach out to help identify speakers.

The next webinar is scheduled for Wednesday, March 11, 2020 from 12:00-1:30 ET.

CAT Planning Working Group – January 8, 2019 Webinar Participants

- Adam Argo
- Ted Bailey
- Lara Bouck
- Daniela Bremmer
- Tom Bruff
- Richard Cippoletti
- John Corbin
- Ray Derr
- **Daniel Doenges**
- Marsha Fiol
- Tony Fischer
- Mavrick Fitzgerald
- Mike Floberg
- Amanda Graor
- Sarah Hicks
- Amanda Horner
- Ryan Huff
- Kyung-Hwa Kim
- Harlan Miller

- Peter Koeppel
- Jeff Lindley
- **Emily Lindsey**
- Marwan Madi
- Ali Makarachi
- Shane McKenzie
- Dave Miller
- Kyle Miller
- Carol Morton
- Nikki Navio
- Mark Norman
- Chris O'Neill
- Sooraz Patro
- Jeremy Raw
- Leslie Reardon
- Sondra Rosenberg
- Ed Seymour
- **Eileen Singleton**
 - Matthew Swift

- Linda Sitz
- Hari Sripathi
- Pragati Srivastava
- **Daniel Studdard**
- **Charles Wade**
- Lynn Weiskopf
- James Weston
- Marc Williams
- Mark Wingate
- Christos Xenophontos
- levon Boyagian
- Eric Hill
- **Thomas Bamonte**
- Dean Deeter
- DeLania Hardy

AASHTO Committee on Planning: CAV Planning Working Group &

CAT Coalition: Planning Scenarios Working Group

Webinar January 8, 2019





Welcome and Agenda Review

- Welcome
- MnDOT CAV Scenario Planning presented on November webinar available at: http://www.dot.state.mn.us/automated/docs/cav-scenario-planning-report.pdf
- Overview of AASHTO Activities
- AMPO Sharing
 - Bill Keyrouze, AMPO
- **MPO Case Studies**
 - MetroPlan Orlando (Eric Hill)
 - Dallas/Ft. Worth (Tom Bamonte)
 - Atlanta Regional Commission partnership with GDOT (Kofi Wakhisi)
- Next Webinar / Close







CAT Coalition – Organization (Current) USDOT / FHWA Roger Millar, WSDOT & Jennifer Cohan, Del DOT Focus Area: Focus Area: Infrastructure & Programmatic & Strategic Planning, Scenarios, Industry Activities & Resources Focus is on documenting needs and best Supports the CAT industry in Supports the CAT industry in defining the digital & physical CAT infrastructure, and establishing secure, verified practices for programmatic, strategic, and technical activities to encourage CAT deployment & operation through understanding Automated Transportation planning & scenario development, initiatives such as the SPaT Challenge & Connected Fleet Challenge. available resources, and connections between vehicles 8 documenting resource needs IOO/OEM Technical Planning / Policy, Legislative Strategic Industry Resources Working Scenarios Initiatives Working and Regulatory Working C. Castle F. Saleem Group T. Larkin-Working Group **Working Group** Group B. Leonard J. Toth Sondra F. Saleem M. Shulmar P. Ajegba J. Averkamp N. Katta S. Gehring J. Svdello esearch Testing and Demonstration (e.g. NCHRP 20-102, CV Pilot Sites, ATCMTD Sites, and other Federally & State led activities) AASHIO ITS AMERICA ite=



CAT Coalition Recent Activities / Accomplishments

Programmatic & Strategic Accomplishments (examples)

- CAT Funding and Staffing Survey Results & Summary
- Connected Fleet Challenge Resources & Website
- · SPaT/Fleet Challenge Webinar Series Concludes January 2020
- Initiation of efforts for common (plain language) Automated Driving Terms Lexicon as used in AV Policy documents

Planning Scenarios & Resources Accomplishments (examples)

- · Facilitated multi-agency presentation for a Cellular V2X Overview
- · Initiated and progressed towards a new resource titled "CV Deployment Environment" -that broadly highlights communications and back end systems needs.
- Merging of CAT Coalition Planning Activities with AASHTO COP CAV Task Force:
 - Expanded emphasis to State DOT and local MPO CAV planning

Infrastructure & Industry Accomplishments (examples)

- Initiated activities for a "Communications 101" resource and developed the outline and preliminary content.
- Initiated efforts to survey AV shuttle pilot deployments to summarize as a resource
- Completed an outreach webinar to explain the Software tool chain for work zone MAP creation
- Completed Draft Clarifications for Consistent Implementations (CCI) for Signalized Intersections
- Responding to industry indications of 2022 production vehicles with V2I safety applications





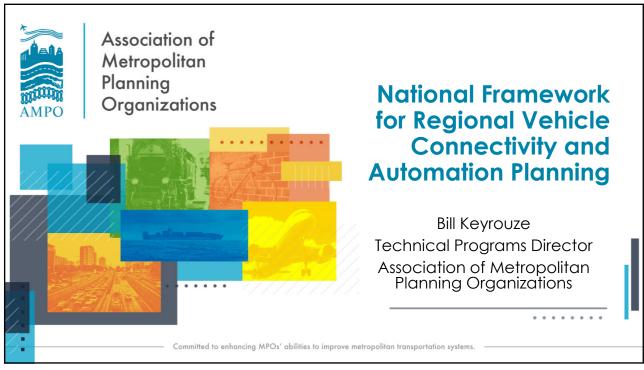
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Agenda Item #2: **Overview of AMPO CAV Planning Activities**

Bill Keyrouze, AMPO







AMPO's Technical Working Groups

AMPO is a nonprofit, membership organization established in 1994 to serve the needs and interests of Metropolitan Planning Organizations (MPOs). We offer our member MPOs technical assistance and training, conferences and workshops, legislative and rulemaking updates, newsletters and communications, research, a forum for transportation policy development and coalition building, and a variety of other services.

AMPO facilitates several long-standing technical working groups focused on transportation planning topic areas that are required or of interest to MPOs.

- · Air Quality
- Vehicle Connectivity and Automation
- Performance-based Planning & Programming
- · Travel Modeling
- GIS
- · Public Involvement



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Vehicle Connectivity and Automation Working Group Background

Working Group Composition

• 15-20 core members from diverse backgrounds, MPO-size, and geography

Working Group Objectives

- Build technical, institutional, and policy capacity
- · Leverage the benefits of deployment
- · Address knowledge gaps
- Support the U.S. DOT's efforts

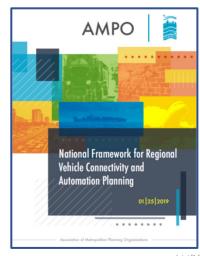
Working Group Activities and Products

- Four meetings between 2017 2018 each documented by a whitepaper
- National Framework for Regional Vehicle Connectivity and Automation Planning (Framework)
- Symposium in Denver, CO on November 14-15, 2018
 - Refine the Framework and identify next steps/items for potential further exploration

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Purpose: Provide a framework and tool as MPOs:

- Incorporate vehicle connectivity and automation into their metropolitan transportation planning process and work to guide its deployment to help meet regional transportation needs and goals
- Explore the potential impacts of vehicle connectivity and automation and their implications for the transportation system, its users, and the concept of mobility



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National Framework for Regional Vehicle Connectivity and Automation Planning

Importance of the MPO:

- 80.7% of the U.S. population is urban and ~90% of the U.S. GDP is generated within metropolitan areas
- Shape the transportation system, maintain safety and equity, and move people and goods regardless of mode choice
- Through policy boards, technical committees, community outreach, and the development of core MPO products, build relationships with transportation agencies and decision makers, community organizations, and the public
- Through policy development and investment decisions, guide how vehicle connectivity and automation can help meet regional transportation needs and goals



United States Census Bureau Urbanized Areas and Urban Clusters 2019

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Vehicle Connectivity and Automation Impact Areas:

- Safety and security
- Operations
- Mobility and mode choice
- Freight
- Transportation demand
- Infrastructure design and capacity
- · Funding and financing
- New transportation service markets

- Equity
- Data collection and analysis, housing, availability, and affordability
- Public acceptance
- · Land use
- · Air quality conformity
- Policy Engagement and Coordination
- Employment

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National Framework for Regional Vehicle Connectivity and Automation Planning

Recommendations:

- Engagement, Coordination, and Collaboration
- Policies and Investment Decisions
- Other Planning Products and Processes
- Institutional Readiness
 - Resources and Best Practice Examples

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Recommendations and Resources: Engagement, Coordination, and Collaboration

- Advise policy and decision makers
- Build partnerships to reduce redundancy and move forward in a unified direction
- Inform and share information regarding the current reality of vehicle connectivity and automation deployment
- Develop a vision and goals for the desired future of transportation with vehicle connectivity and automation to help understand how it can help meet regional transportation needs and goals
- Include equity in communications
 - Fact Sheet, Resource Packet, Impact Areas Table

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National Framework for Regional Vehicle Connectivity and Automation Planning

Recommendations and Resources: Policies and Investment Decisions

- Support deployment scenarios that help meet the vision/goals and transportation system needs, maintain equity, and do not decrease safety, security, operations, reliability, or mobility
- Support an environment that fosters innovation
- Incorporate discussions of vehicle connectivity and automation in the metropolitan transportation plan
- Ensure investment decisions support the **current** and **future** transportation system
- Encourage shared use/other strategies that will minimize or mitigate potential increases in VMT
- Support data sharing and explore opportunities for using vehicle connectivity and automation as an additional data source
- Build partnerships and collaborate with transportation partners and engage stakeholders for discussions on policy and investment decisions related to vehicle connectivity and automation
 - Shared Use Mobility, Transportation Technology, and Intercity Transit Services, FTA 6/2018, and Impact
 Ampo.org

Recommendations and Resources: Other Planning Products and Processes

- Use **modeling** and **scenario planning** to explore future unknowns
- Be aware of the different dimensions of readiness: vehicle systems technology, supportive infrastructure, responsive institutions, and community acceptance
- Identify drivers, levers, triggers, and tipping points of scenarios to help identify key milestones
- Be aware of the potential for vehicle connectivity and automation to support performance measures, target setting, and national goals
- Explore the potential for vehicle connectivity and automation to impact air quality and transportation conformity
- Identify new **data sets** that are critical to **inform decisions** in the transportation planning process
 - Transportation Scenario Planning for Connected and Automated Vehicles (FHWA) – coming soon

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National Framework for Regional Vehicle Connectivity and Automation Planning

Recommendations and Resources: Institutional Readiness

- Identify needs for expanding staff skills sets or restructuring program areas
- When possible, provide training or participation in regional, state, or national dialogues
- Encourage staff to monitor the status
- Ensure staff are aware of how vehicle connectivity and automation technology impacts their program areas
 - Resource Packet, Impact Areas Table, and Sample AV Statewide Procurement Language

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Next Steps

- AMPO Vehicle Connectivity and Automation Working Group
 - Quarterly webinars and continued conversation
- AMPO National Framework for Regional Vehicle Connectivity and Automation Planning
 - In conversations with FHWA to update the Framework and develop additional materials
- Member and Stakeholder Engagement
 - AASHTO, APTA, FHWA, FTA, ITE, ITS America, NARC, TRB, and others
- AMPO Data Working Group
 - Coming soon

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Thank You

The working group meetings are documented in whitepapers. Whitepapers and other meeting materials may be found at: http://www.ampo.org/resources-publications/ampo-work-groups/connected-and-autonomous-vehicles-working-group/

For more information, contact:
Bill Keyrouze, Technical Program Director

bkeyrouze@ampo.org | 202.624.3683

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MPO	Case	Studies	S



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MetroPlan Orlando

Eric Hill



Connected and Automated Vehicle (CAV) Readiness Study

Eric T. Hill

Director, Transportation System Management & Operations

AMPO Webinar - AASHTO CAV Working Group and CAT Coalition
January 8, 2020



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CAV Readiness Study



Commissioned Study

Purpose

Assess the region's readiness for arrival and integration of connected and automated vehicles (CAVs)



Tasks

- Task 1 CAV Industry Best Practices Review
- Task 2 Evaluation of Existing Local Capabilities
- Task 3 Host 3 Public Involvement Workshops
- Task 4 Recommendations for CAV Preparedness
- Task 5 Final Report

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Connected Vehicle (CV)



Onboard wireless communications share information and alerts to

- Improve safety
- Increase mobility
- Reduce congestion

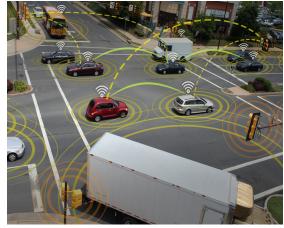


IMAGE SOURCE: USDOT

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CV Examples



- Collision Warning
- Reduce Speed
- Pedestrian Ahead
- Blind Spot Warning
- Wrong Way Vehicle
- Curve Speed Warning
- Work Zone Ahead



IMAGE SOURCE: THEA CONNECTED VEHICLE PILOT

Automated Vehicle (AV)



Has one or more aspects of a safetycritical driving functions controlled by something other than direct input by a human driver



IMAGE SOURCE: USDO

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CAV Readiness Study



Connected Automated Vehicle (CAV)

The fully-automated, self-driving vehicle of the future that may not have a steering wheel or pedals for braking and accelerating – it will combine CV and AV capabilities



IMAGE SOURCE: USDOT

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Technical Memorandum 1



CAV Best Practices

- Analysis of current CAV planning nationwide
- Paradigm shift in technologies
- Policy and regulation changes



IMAGE SOURCE: GLOBAL-5

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CAV Industry Practices



- CAV projects: feasible; innovative; local need; and regional equity
- Consider CAV technologies to inform the decision-making process
- Match local needs and capabilities with emerging industry trends

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Technical Memorandum 2



Evaluation of Local Existing Capabilities

- 23 jurisdictions interviewed in Osceola, Seminole and Orange counties
- AV and CV practices and infrastructure



IMAGE SOURCE: GLOBAL-5

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Potential Opportunities



- Establish CAV consortium
- Advance CAV deployments
- Install enhanced communication networks
- Expand workforce CAV knowledge
- Develop region-wide training
- Solve or mitigate equity challenges

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CAV Existing Capabilities



Pilot Deployments

- Lake Nona AV shuttle launched Sept 18
- UCF AV shuttle, CV and PedSafe programs funded by FDOT to launch in 2020 and 2021



IMAGE SOURCES: LAKE NONA, COAST AUTONOMOUS

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CAV Deployments



Orange County

- GreenWay connected vehicle (CV) infrastructure
- PedSafe CV pedestrian and bicycle collision avoidance system

Seminole County

- State Road 434 CV pilot
- Bluetooth/DSRC CV RSUs on Lake Mary Boulevard

Osceola County

- Dedicated Short Range Communications
- Neptune Road Corridor; NeoCity

CAV Challenges



- Safety
- Security
- Impact on the network/mobility

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Task 3 – CAV Public Engagement



Public Involvement Workshops

• Osceola County, Kissimmee Civic Center Tuesday, October 29, 5 - 6:30 p.m.



• Seminole County, Lake Mary Events Center Tuesday, November 12, 5 - 6:30 p.m.



• Orange County, First United Methodist Church Tuesday, November 19, 5 - 6:30 p.m.



CAV Workshop Format



- Open house
- PPT presentation
 - Technology overview
 - Local CAV deployments
- Live polling & eSurvey
- Open Discussion



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Survey Findings



- Attendees were generally knowledgeable about CAV terminology
- Favorable attitudes towards self-driving CAVs
- Anticipated CAV Benefits
 - Fewer crashes
 - Improved mobility for elderly & disabled
- CAV Concerns
 - Safety concerns
 - Do not trust the technology / do not want to give up control
- Prioritize funding for:
 - Training/workforce development
 - Educating the public about CAVs

Workshop Discussions



- Safety bicycle/pedestrian, general
- Data Security
- Impact on the network/mobility
- · When and if CAV technologies will be standardized
- · Insurance industry issues and considerations
- Whether and how roadway maintenance needs (striping) will intensify
- · Lack of training for local staff and elected officials
- Whether and how a jurisdiction could "opt out" of supporting CAVs
- Growing pains during the transition from legacy vehicles to CAVs
- Ensuring equal access to CAV deployments and testing
- And more!

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Study Next Steps



- Prepare recommendations for CAV Preparedness
- Present to MetroPlan Board and committees
- Final Report
- CAV Study website:

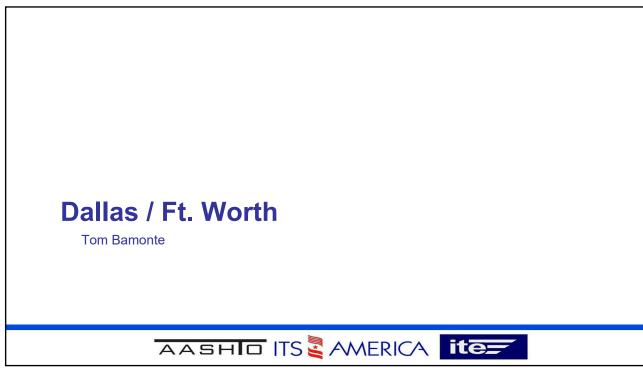
https://metroplanorlando.org/programsresources/transportation-system-managementoperations/cav-readiness-study/





Comments?





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Atlanta Regional Commission Kofi Wakhisi, ARC

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Future Webinar Topics

- March Webinar
 - Emphasis on State DOTs Readiness Planning
 - Volunteers or suggestions for speakers?

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Other Member Updates

(If time allows)





