MARYLAND
CONNECTED & AUTOMATED VEHICLES

Regional and Local Agency Outreach

June 15 & 16, 2021

MEETING LOGISTICS

- Meeting is being recorded
- Slides are already available in this meeting platform and will also be shared after the meeting
- **Please mute your microphone when not speaking**
- Meeting will include live polling
- Use the chat to ask a question or provide comments
- In the meantime, please enter your name and the jurisdiction you represent in the chat box to introduce yourself!

TODAY'S AGENDA

- Opening Remarks
- Introductions
- What are CAVs?
- Emerging Technologies Survey Results
- Overview of Maryland's CAV Strategic Framework
- Impact to Local Jurisdictions
- How to Stay Involved

OPENING REMARKS

Administrator, Christine Nizer

Maryland Department of Transportation

Motor Vehicle Administration

Executive Director, James F. Ports, Jr.
Maryland Transportation Authority

MARYLAND DEPARTMENT OF TRANSPORTATION

Introductions

TODAY'S SPEAKERS

Facilitator

Sam Van Hecke

Cambridge Systematics

SVanHecke@camsys.com

Nanette Schieke
CAV Program Manager

Maryland Department of Transportation
Motor Vehicle Administration

Nschieke@mdot.Maryland.gov

Carole Delion
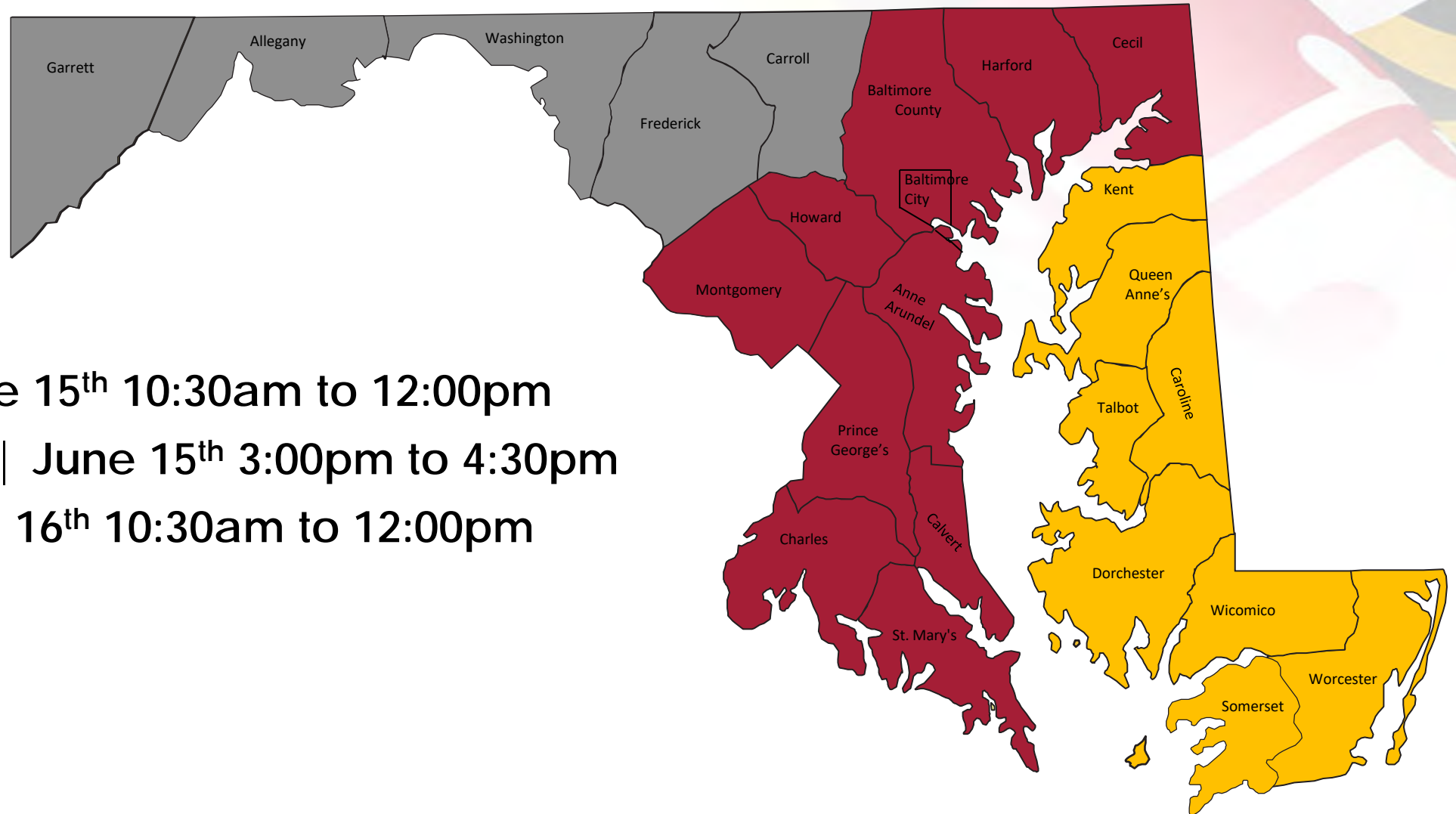*Division Chief*

Maryland Department of Transportation
State Highway Administration

cdelion@mdot.maryland.gov

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SERIES OF WEBINARS

- Western | June 15th 10:30am to 12:00pm
- North & South | June 15th 3:00pm to 4:30pm
- Eastern | June 16th 10:30am to 12:00pm

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GOALS FOR TODAY

1. Share knowledge about Connected & Automated Vehicles (CAV)

2. Create an avenue for local jurisdictions to coordinate with the Maryland CAV Working Group & its stakeholders

3. Generate interest and participation in CAV initiatives

4. Empower local jurisdictions to investigate and adopt CAV technologies

What Are CAVs?

CENTRAL REGION

What words come to mind when you think of Connected and Automated Vehicles?

What words come to mind when you think of Connected and Automated Vehicles?

smart
vehicle
data options time real safety
connects accurate

KEY DEFINITIONS

- **Connected Vehicles** "talk and listen" to infrastructure, other vehicles, and mobile devices. This communication enables applications that can warn a human driver of an impending hazard, enable a vehicle to operate more efficiently, or guide a vehicle to take appropriate action given the surroundings.

- **Automated Vehicles** use sensors and other technologies to understand the environment to assist drivers, and eventually perform driving tasks in place of a human driver.

- **Connected and Automated Vehicles** leverage connected capabilities with automated features to bring the best of both worlds into one vehicle.

Source: Maryland CAV Strategic Framework

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SAE **J3016**™ LEVELS OF DRIVING AUTOMATION™

Learn more here: sae.org/standards/content/j3016_202104

|	SAE LEVEL 0™	SAE LEVEL 1™	SAE LEVEL 2™	SAE LEVEL 3™	SAE LEVEL 4™	SAE LEVEL 5™
What does the human in the driver's seat have to do?	You **are** driving whenever these driver support features are engaged – even if your feet are off the pedals and you are not steering			You **are not** driving when these automated driving features are engaged – even if you are seated in "the driver's seat"		
	You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety			When the feature requests, **you must drive**	These automated driving features will not require you to take over driving	

	These are driver support features			**These are automated driving features**		
What do these features do?	These features are limited to providing warnings and momentary assistance	These features provide steering **OR** brake/ acceleration support to the driver	These features provide steering **AND** brake/ acceleration support to the driver	These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met		This feature can drive the vehicle under all conditions
Example Features	• automatic emergency braking • blind spot warning • lane departure warning	• lane centering **OR** • adaptive cruise control	• lane centering **AND** • adaptive cruise control at the same time	• traffic jam chauffeur	• local driverless taxi • pedals/ steering wheel may or may not be installed	• same as level 4, but feature can drive everywhere in all conditions

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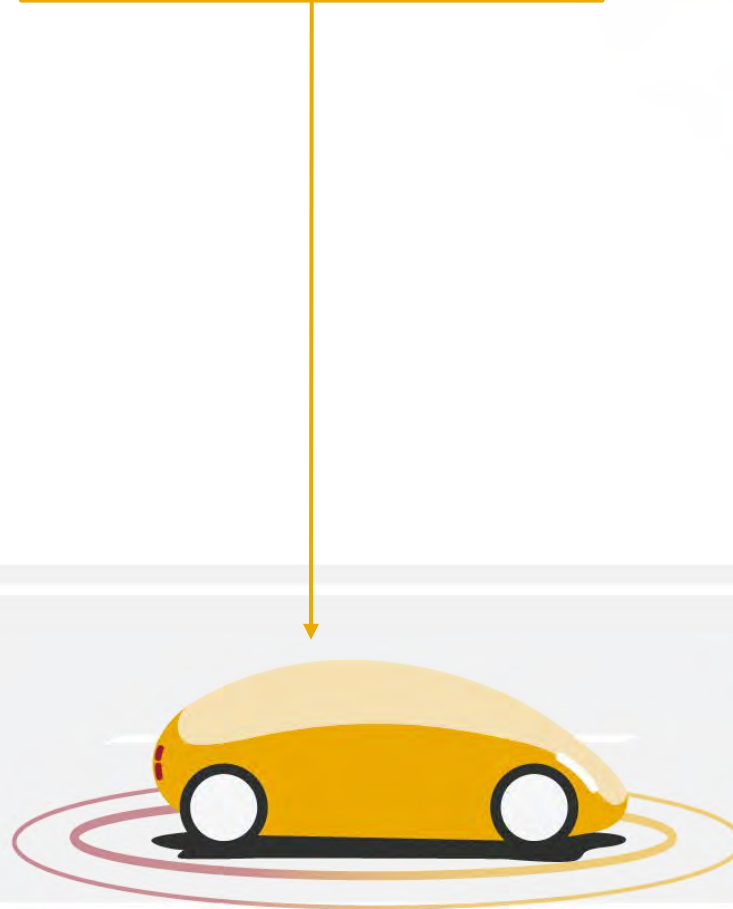**CONNECTED VEHICLE**
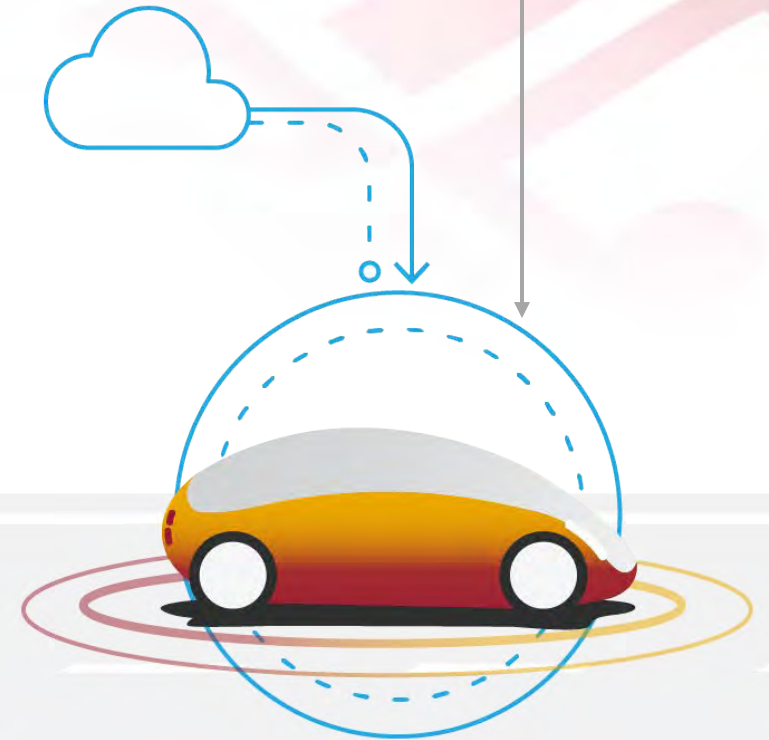Communicates with nearby vehicles and infrastructure.
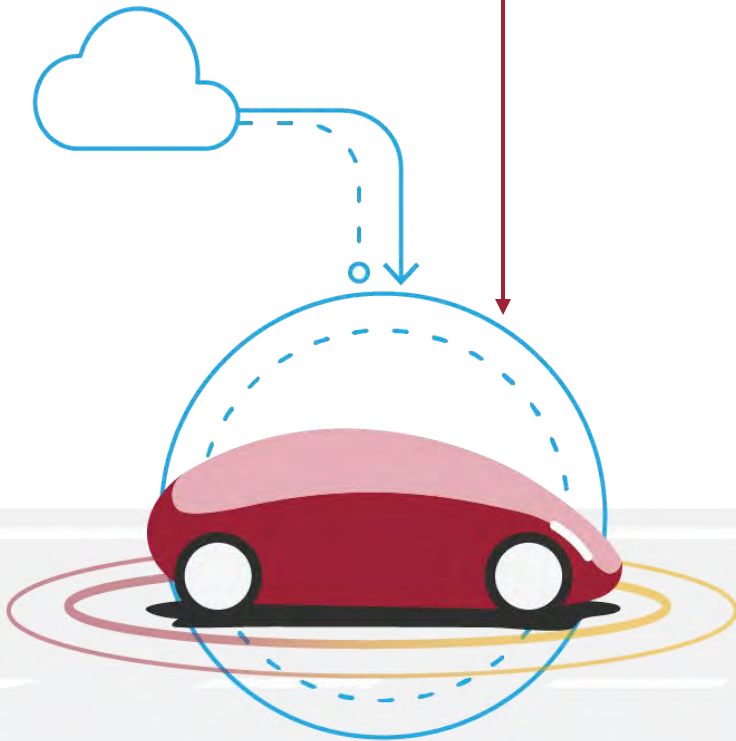
AUTOMATED VEHICLE
Uses onboard sensors to "see" nearby vehicles and infrastructure.

CONNECTED AUTOMATED VEHICLE
Leverages both automated and connected technologies.

POSSIBLE IMPACTS

Reduce Crashes

Reduce Traffic Congestion

Reduced CO_2 Emissions

Reduced Travel Time and Value of Time

Increase VMT (or not?)

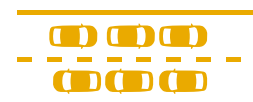🧳 ▸ CAV ▸ 🏠 Last Mile Services -> Increase in Transit Use!

Increased Mobility Options & Quality of Life

Increased Lane Capacity (but more Zero Occupancy Vehicles?)

More Effective/Affordable Ride-Sharing

More Efficient Parking

Note that these possible impacts are theoretical and depend on several factors

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Emerging Technology Survey

EMERGING TECHNOLOGY SURVEY (**2020**)

68 Respondents (~15% response rate)

➢ **Top priority:** Having a better understanding of how your jurisdictions fits within an automated, connected, electric and shared statewide ecosystem.

➢ Having established planning tools, strategies, and state policy to help start the planning process.

➢ Participating in ongoing statewide conversations on the potential implications of Emerging Technologies on the transportation system & the economy.

➢ **Lowest priority:** Providing public education on the introduction of Emerging Technologies in a jurisdiction or region.

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EMERGING TECHNOLOGY SURVEY (**2021**)

47 Respondents (~10% response rate)

➢ **Top priority:** Having established planning tools, strategies, and state policy to help start the planning process.

➢ Having a better understanding of how your jurisdictions fits within an automated, connected, electric and shared statewide ecosystem.

➢ Participating in ongoing statewide conversations on the potential implications of Emerging Technologies on the transportation system & the economy.

➢ **Lowest priority:** Providing public education on the introduction of Emerging Technologies in a jurisdiction or region.

Overview of Maryland's CAV Strategic Framework

MARYLAND'S CAV VISION

Uphold & enhance a **Safe, Efficient, and Equitable** transportation future by delivering collaborative and leading-edge CAV solutions. Maryland is open for business and eager to realize the life-saving and economic benefits of CAV technology, while ensuring safety for all. We are embracing CAV technology and innovation through **continuing collaboration** with partners interested in **researching testing, and implementing** CAVs in MD.

MARYLAND

safe | efficient | equitable
and open for business.

MARYLAND'S CAV MILESTONES

2015
Foundations

- Statewide CAV Working Group Formed

2016
Early Efforts

- Stakeholder engagement across Maryland and at federal level begins

2017
Permits & Pilots

- Permit process established

- 1st company pilots CAV technology

- CAV strategic plans start forming within MDOT business units

2018
Expansion

- Maryland CAV Vision finalized

- CV technology pilots underway

- 2nd company pilots CAV technology

2019
Stronger

- MDOT receives two grants to advance CAV pilot programs

- Agencies consider workforce impacts

2020
Full Steam Ahead

- BWI Thurgood Marshall Airport considers CAV parking technology as a service for customers

- CAV Strategic Framework

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FRAMEWORK DEVELOPMENT

September 2020

- Public Survey (600+ responses)

- 1:1 Interviews with various agencies (10+)

October 2020

- 2-week public comment period on Draft Framework (150+ comments)

November 2020

- Governor's Office Review

December 2020

- Release of the Maryland CAV Strategic Framework

> " Maryland has the expertise, infrastructure and leadership to be a national leader in CAV technology and implementation."

> " Maryland should be a leader in the deployment of CAV technologies."

> " I believe this is the future and I would love to see Maryland get out in front of this technology."

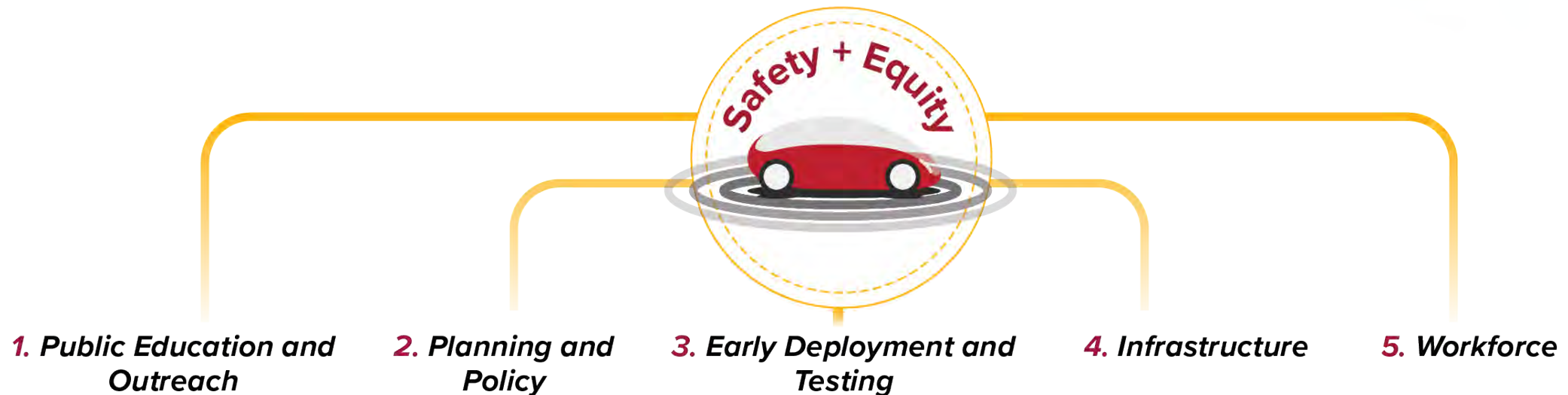MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

FRAMEWORK PUBLIC RESPONSE

FRAMEWORK PURPOSE

- Call to action for Maryland stakeholders to be involved in CAV
- Intended to provide guidance through core values and key focus areas
- Increase awareness and engagement in CAV

Safety + Equity

1. Public Education and Outreach

2. Planning and Policy

3. Early Deployment and Testing

4. Infrastructure

5. Workforce

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PUBLIC EDUCATION AND OUTREACH

- Increase transparency of educational CAV material and ongoing efforts.

- Ensure diverse audience when communicating initiatives.

- Leverage existing outreach avenues.

PLANNING AND POLICY

- Facilitate opportunities through the Maryland CAV Working Group.

- Establish clear goals and metrics for CAV in Maryland.

- Identify and address barriers to CAV.

- Incorporate CAV into planning and policy documents.

- Establish policies on cross-collaboration and open data sharing.

- Anonymize CAV data and safeguard from mishandling.

EARLY DEPLOYMENT AND TESTING

- Broaden use cases for early deployment and pilot projects.

- Gather public perception and adjust pilots.

- Grow the list of locations for CAV testing.

- Prioritize freight-focused CAV strategies in the short term.

- Leverage deep bench of academic excellence.

- Embrace new partnerships for non-traditional research.

INFRASTRUCTURE

- Establish baseline operation of technology infrastructure.

- Establish acceptable equipment downtimes.

- Remain engaged with national guidelines and integrate or create State-specific specifications.

- Dedicate resources and create partnerships to build out the communications infrastructure.

- Asset-management and software configuration management.

WORKFORCE

- Promote and enhance existing workforce.

- Address recruitment & retention gaps at the local level.

- Establish expectations for future staffing.

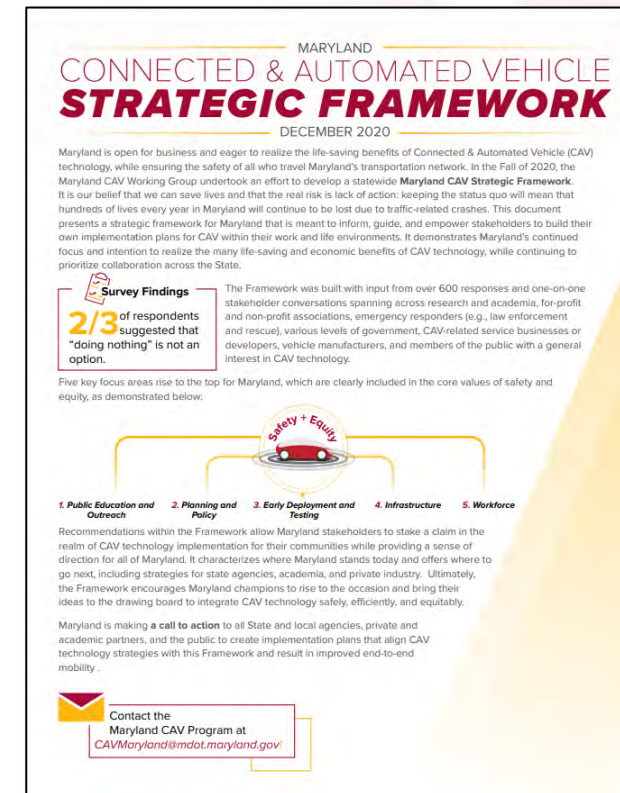- Field training and traditional trade jobs should be encouraged.

FRAMEWORK LOCATION

Full report, plus 1-Page Executive Summary available at:

mdot.maryland.gov/MarylandCAV

Question: How might you help advance Maryland's call-to-action outlined in the CAV Strategic Framework?

Legend: Western, Central, Eastern, Statewide

Categories:
- Develop a CAV plan for my agency/company based on Framework
- Ensure ohers in my organization are aware of the Framework and suggested focus areas.
- Work with partners to advance one or more of the initiatives.
- I don't see a clear way to advance within my organization
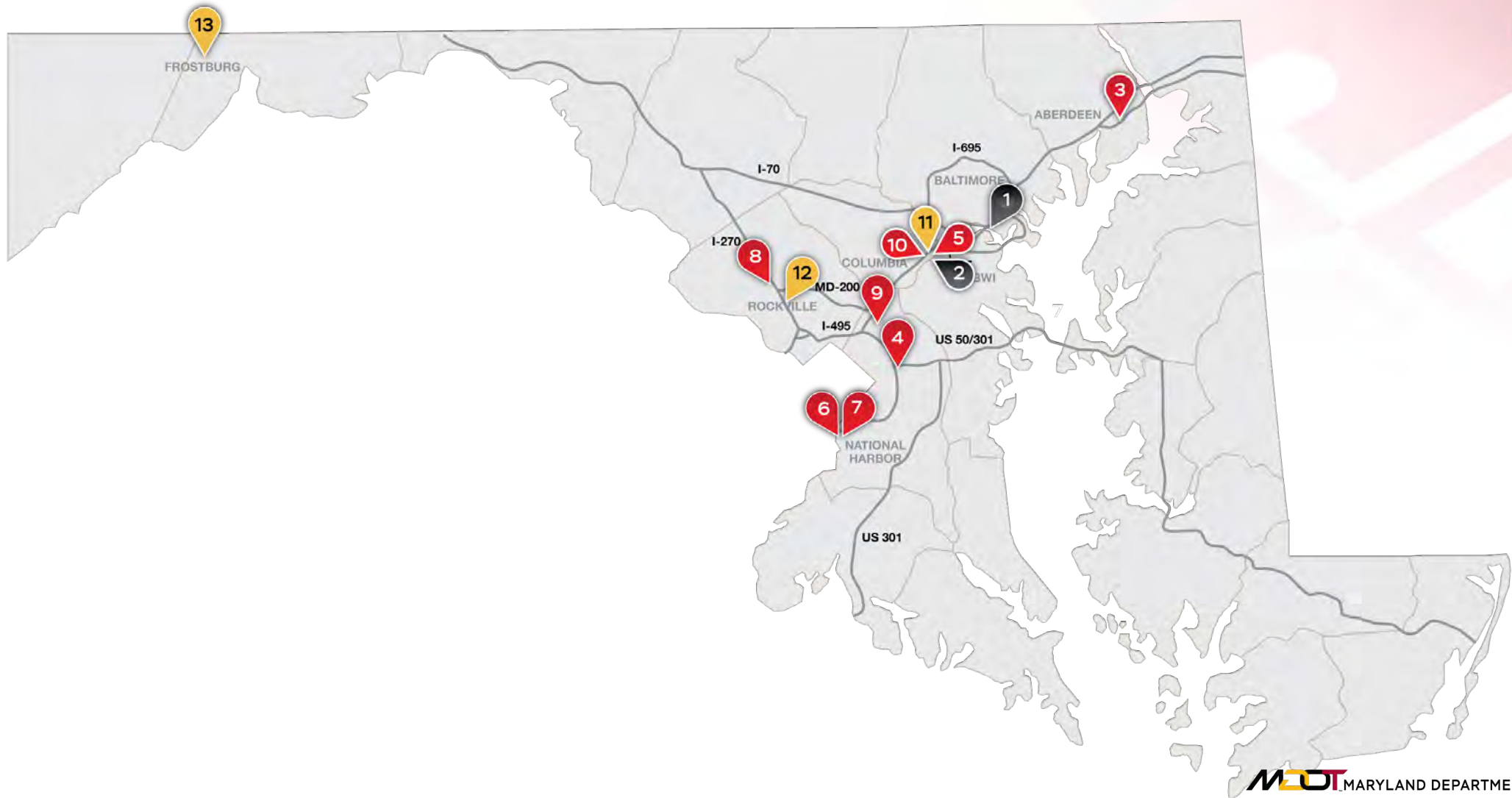- We shouldn't act until Federal guidance is set for CAVs.
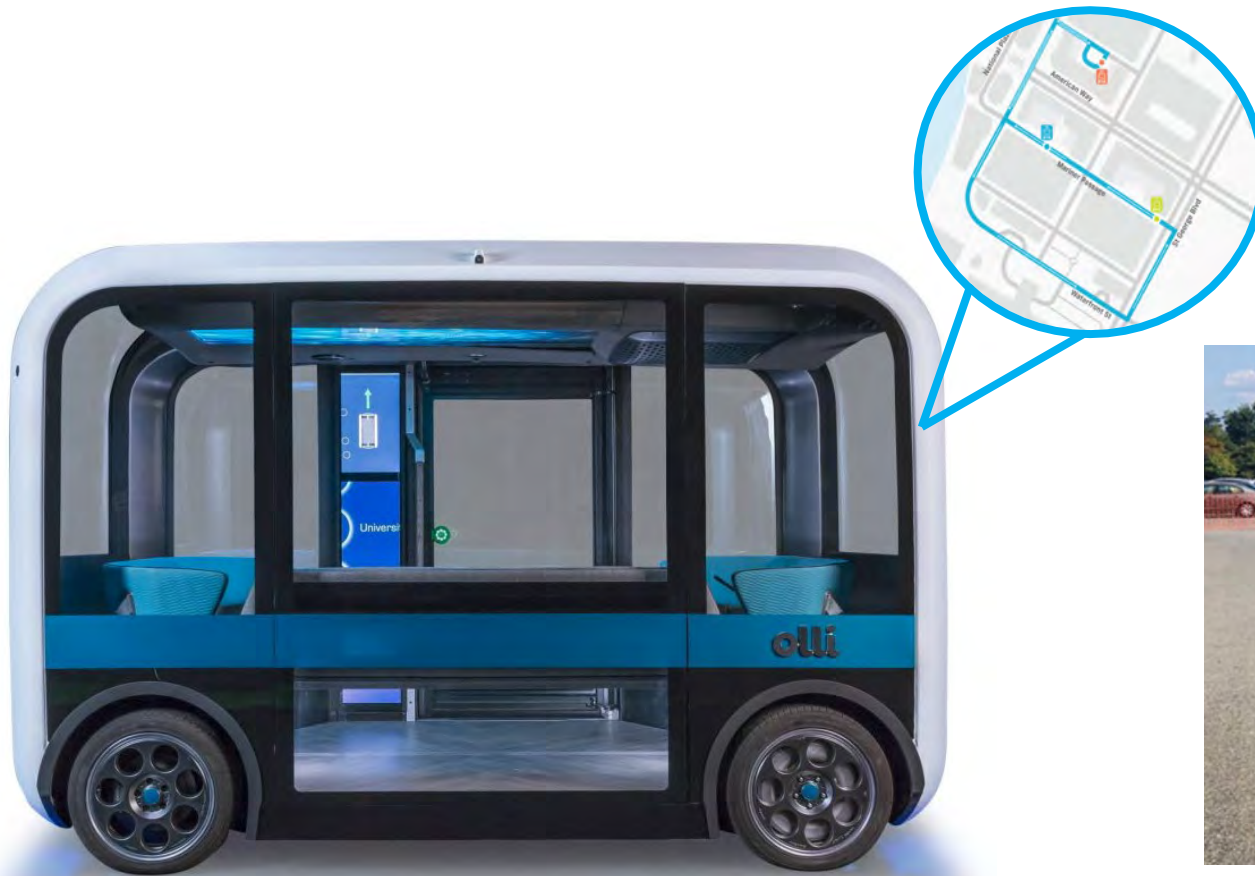
Impact to Local Jurisdictions

A MAP VIEW OF STATEWIDE INITIATIVES

LOCAL AND REGIONAL PROJECT EXAMPLES

OLLI @ NATIONAL HARBOR & GAITHERSBURG

STEER – ACROSS STATE
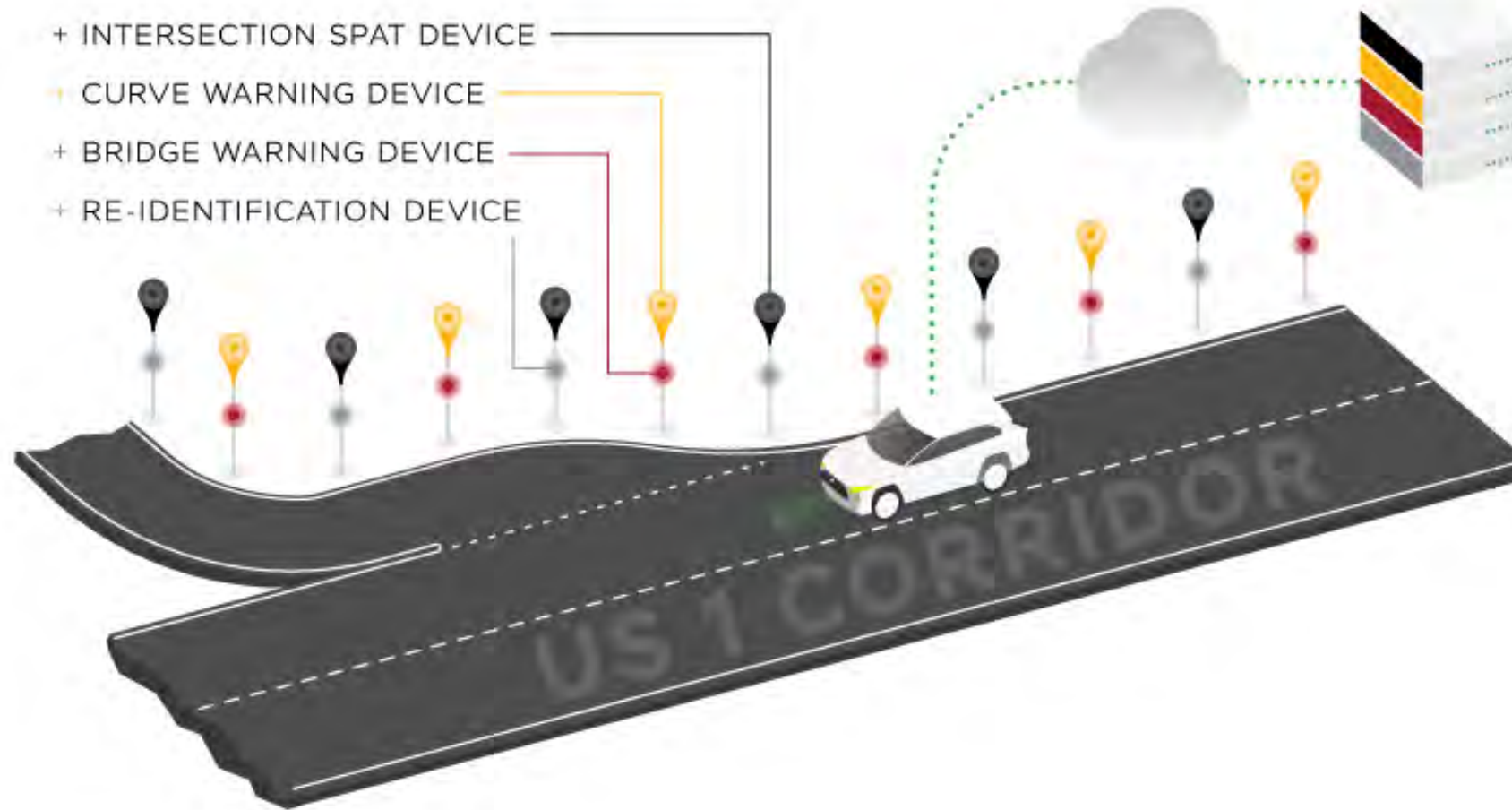
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POSSIBLE AV PROJECTS

POSSIBLE CV PROJECTS

- Road Side Units deployments for warning notifications
- Traffic Management System upgrades
- Fiber / telecommunications infrastructure upgrades

+ INTERSECTION SPAT DEVICE
+ CURVE WARNING DEVICE
+ BRIDGE WARNING DEVICE
+ RE-IDENTIFICATION DEVICE

US 1 CORRIDOR

ROLE & OPPORTUNITIES FOR LOCAL AND REGIONAL AGENCIES

- Identify community vision of local transportation ecosystem needs
- Tie needs to known CAV solutions
- Include CAV in plans and policies
- Educate local, regional, and statewide legislators on CAV
- Engage with CAV companies early to learn limitations and opportunities
- Pursue and implement CAV pilot deployment projects
- Support data collection and sharing, while balancing privacy
- Build staff skill in CAV and related technology

LOCAL JURISDICTION PLANNING FOR CAV RESOURCE DOCUMENT

- Developed in coordination with the Maryland Dept. of Planning

- Short (~13 pages) document on how to get started with CAV

- Includes menu of action items at different investment levels

- Supports future long term planning documents

- Meant as guidance – not a requirement and not comprehensive of all possible CAV actions a jurisdiction could take

Question: How has CAV impacted your community?
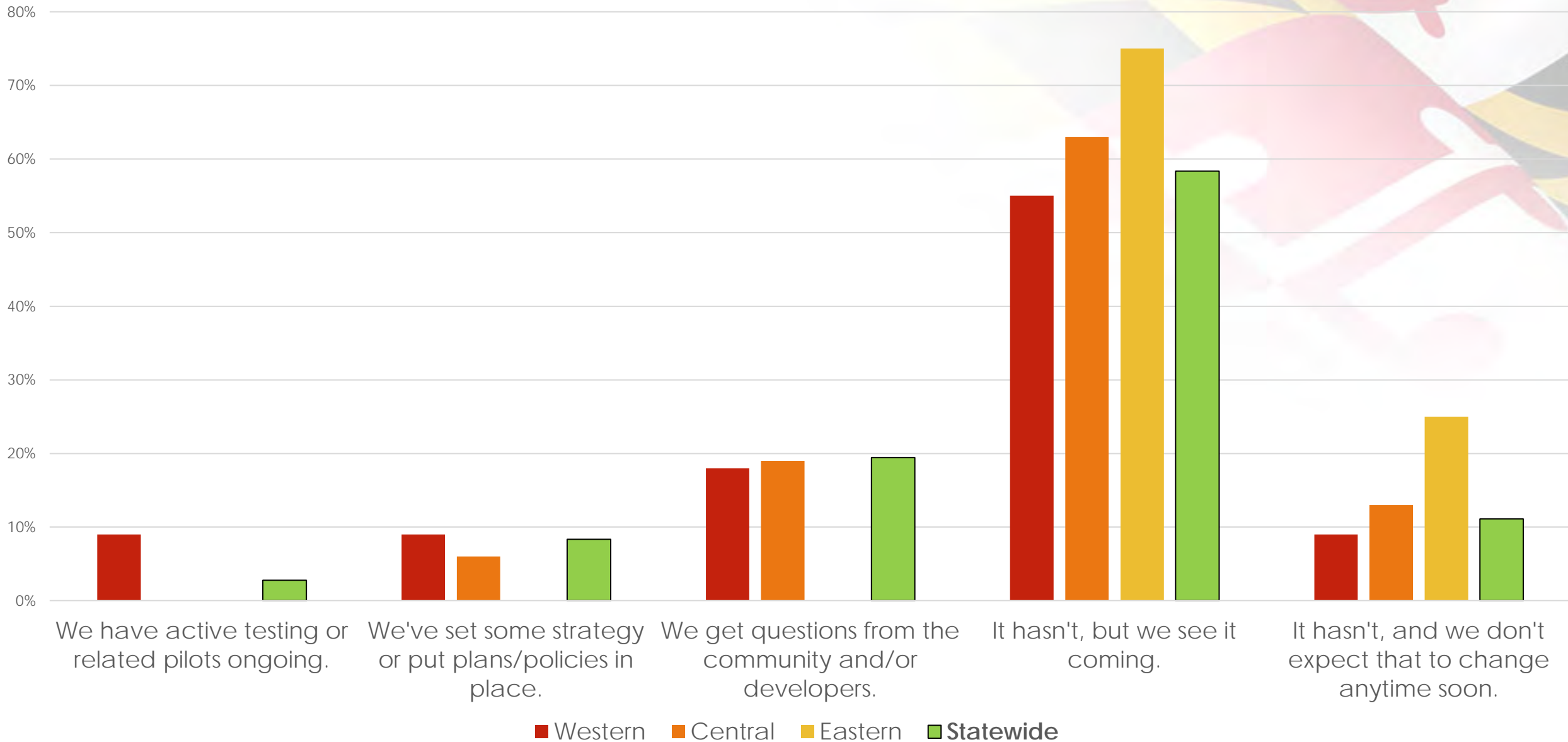
How to Stay Involved

# PARTICIPATE IN COORDINATION GROUPS

- **Coordination Team**
  - Nanette Schieke
    nschieke@mdot.maryland.gov
- **SubGroups**
  - Freight: Parto Mazdeyasni
    pmazdeyasni@marylandports.com
  - Policy: Michele Gross
    mgross10@mdot.maryland.gov
  - Technical: Carole Delion
    cdelion@mdot.Maryland.gov
  - Emergency Responder: Roxane Mukai
    rmukai@mdta.state.md.us
- **Next Meeting of CAV Working Group**
  - August 10, 2021

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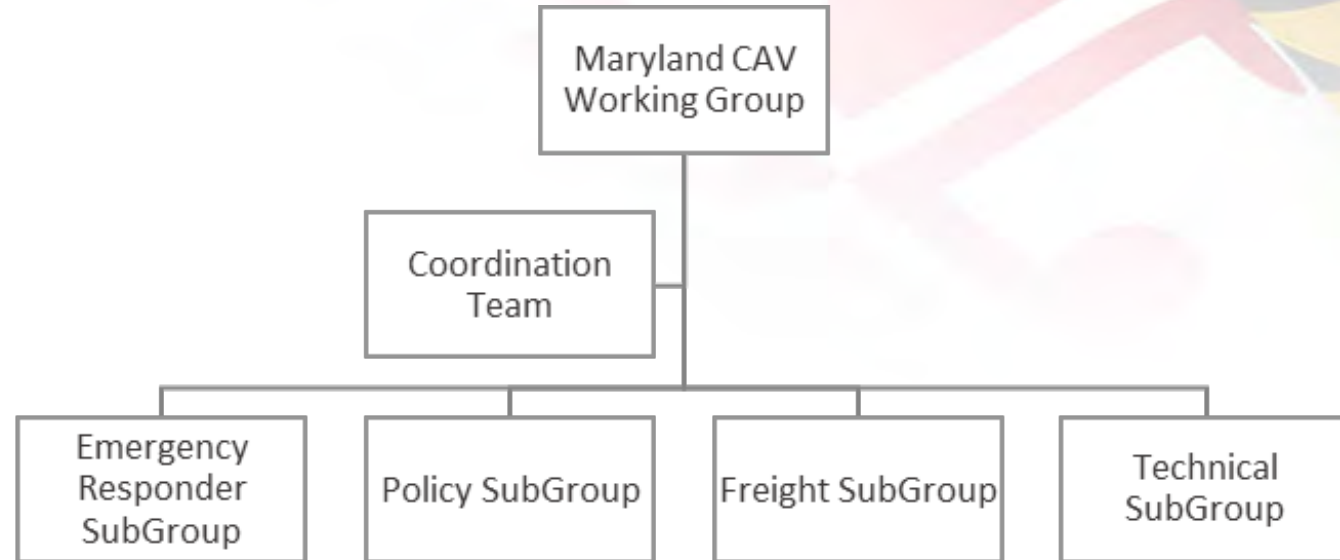
GIVE US FEEDBACK ON THE FRAMEWORK AND HOW YOU'RE USING IT

- **Questions/Ideas** always welcome
  CAVMaryland@mdot.maryland.gov

- Share your projects with the email above or any one of the coordination groups

Open Discussion