2019 Connected Vehicle and Automated Vehicle (CV/AV) Survey

1. Is your agency currently deploying Connected Vehicle technology? (Select one)
   1. Yes
   2. No, but plan to deploy in the future
   3. No plans to deploy [SKIP TO Q6]
   4. Don’t know/Not sure [SKIP TO Q6]

2. [IF Q1= OPTION 2] When do you expect to deploy connected vehicle technology? (Select one)
   1. Within the next 3 years
   2. In 3 to 6 years
   3. In 7 or more years
   4. Don’t know/Not sure

3a. [IF Q1= OPTION 1] Is your agency partnering with other entities to deploy connected vehicle technology? (Select all that apply)
   Yes, public sector partner(s)
   Yes, private sector partner(s)
   Yes, college/university partner(s)
   Other partner(s) (please specify): ____________________________________________
   No, not partnering [EXCLUSIVE]
   Don’t know/Not sure [EXCLUSIVE]

3b. [IF Q1=OPTION 2] Does your agency plan to partner with other entities to deploy connected vehicle technology? (Select all that apply)
   Yes, public sector partner(s)
   Yes, private sector partner(s)
   Yes, college/university partner(s)
   Other partner(s) (please specify): ____________________________________________
   No, not partnering [EXCLUSIVE]
   Don’t know/Not sure [EXCLUSIVE]
In the next section, you are asked about whether your agency is [currently deploying or planning to deploy/planning to deploy] connected vehicle (CV) applications. You will see a selection of applications currently being tested in the field. For a complete listing of connected vehicle (CV) applications (including a brief description of each) visit the website: https://www.its.dot.gov/pilots/cv_pilot_apps.htm

4. CONNECTED VEHICLE APPLICATIONS

4a. **[IF Q1= OPTION 1 OR 2]** For each of the following Vehicle to Infrastructure (V2I) Safety Applications, please indicate your agency's deployment status. (Select one response in each row)

<table>
<thead>
<tr>
<th>Application</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Light Violation Warning (RLVW)</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
</tr>
<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
</tr>
<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
<tr>
<td>Curve Speed Warning (CSW)</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
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<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
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<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
<tr>
<td>Stop Sign Gap Assist (SSGA)</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
</tr>
<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
</tr>
<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
<tr>
<td>Reduced Speed/Work Zone Warning (RSWZ)</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
</tr>
<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
</tr>
<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
<tr>
<td>Pedestrian in Signalized Crosswalk Warning (Transit)</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
</tr>
<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
</tr>
<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
<tr>
<td>Other V2I Safety Application (please specify):</td>
<td>1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]</td>
</tr>
<tr>
<td></td>
<td>2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]</td>
</tr>
<tr>
<td></td>
<td>3. NOT planning to deploy</td>
</tr>
<tr>
<td></td>
<td>4. Don’t Know</td>
</tr>
<tr>
<td></td>
<td>5. Not Applicable</td>
</tr>
</tbody>
</table>
4b. [IF Q1= OPTION 1 OR 2] For each of the following Vehicle to Vehicle (V2V) Safety Applications, please indicate your agency's deployment status. (Select one response in each row)

**Emergency Electronic Brake Lights (EEBL)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Forward Collision Warning (FCW)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Intersection Movement Assist (IMA)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Left Turn Assist (LTA)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Blind Spot/Lane Change Warning (BSW/LCW)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Do Not Pass Warning (DNPW)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

**Vehicle Turning Right in Front of Bus Warning (Transit)**
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable
Other V2V Safety Application (please specify): ____________________________

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

4c. [IF Q1= OPTION 1 OR 2] For each of the following Environment-focused CV Applications, please indicate your agency’s deployment status. (Select one response in each row)

Eco-Approach and Departure at Signalized Intersections

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Dynamic Eco Routing (light vehicle, transit, freight)

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Other Environment-focused Application (please specify): ____________________________

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

4d. [IF Q1= OPTION 1 OR OPTION 2] For each of the following Mobility-related CV Applications, please indicate your agency’s deployment status. (Select one response in each row)

Intelligent Traffic Signal System (I-SIG)

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Transit Signal Priority

1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable
Freight Signal Priority
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Emergency Vehicle Preemption (PREEMPT)
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Dynamic Speed Harmonization (SPD-HARM)
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Queue Warning (Q-WARN)
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Cooperative Adaptive Cruise Control (CACC)
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Response, Emergency Staging, Communications, Uniform Management, and Evacuation (R.E.S.C.U.M.E.)
(e.g., Incident Scene Staging Guidance for Emergency Responders (RESP-STG), Incident Scene Work Zone Alerts (INC-ZONE), Emergency Communications and Evacuation (EVAC))
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Integrated Dynamic Transit Operations (IDTO) (e.g. Connection Protection (T-CONNECT), Dynamic Transit Operations (T-DISP), and Dynamic Ridesharing (D-RIDE))
1. Currently Deploying  [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy  [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable
Freight-Specific Dynamic Travel Planning and Performance
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Other Mobility Application (please specify): _______________________________________
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

4e. [IF Q1= OPTION 1 OR 2] For each of the following Other CV Applications, please indicate your agency’s deployment status. (Select one response in each row)

Agency Data Applications (e.g. probe data collection, CV-enabled data collection etc.)
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Road Weather Warnings (e.g., Motorist Advisories and Warnings (MAW) and Motorist Advisories and Warnings (MAW) Enhanced Maintenance Decision Support System (MDSS))
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Smart Roadside (e.g. Wireless Inspection and Smart Truck Parking)
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable

Other CV Applications (please specify): _______________________________________
1. Currently Deploying [SHOW ONLY IF Q1= OPTION1]
2. Planning to Deploy [ASK IF Q1= OPTION 1 OR 2]
3. NOT planning to deploy
4. Don’t Know
5. Not Applicable
5a. [IF Q1=OPTION 1 DEPLOY] Which of the following transportation objectives is your agency trying to achieve with the deployment of connected vehicle technology? (Select all that apply)

**Safety**
- Decrease vehicle crashes
- Decrease pedestrian crashes
- Decrease bicycle crashes

**Mobility**
- Reduce travel time
- Reduce congestion
- Improve on-time performance of transit vehicles
- Improve travel time reliability
- Increase throughput

**Environment**
- Reduce emissions
- Reduce fuel use

**Service**
- Improve customer experience
- Improve accessibility
- Improve agency operations
- Reduce costs
- Increase ridership

Other (please specify): _________________________________
Don’t know/Not sure [EXCLUSIVE]
None [EXCLUSIVE]

5b. [IF Q1=OPTION 2 PLAN] Which of the following transportation issues objectives will your agency be trying to achieve with the deployment of connected vehicle technology? (Select all that apply)

**Safety**
- Decrease vehicle crashes
- Decrease pedestrian crashes
- Decrease bicycle crashes

**Mobility**
- Reduce travel time
- Reduce congestion
- Improve on-time performance of transit vehicles
- Improve travel time reliability
- Increase throughput

**Environment**
- Reduce emissions
- Reduce fuel use
Service
- Improve customer experience
- Improve accessibility
- Improve agency operations
- Reduce costs
- Increase ridership

Other (please specify): _________________________________.
Don’t know/Not sure [EXCLUSIVE]
None [EXCLUSIVE]

6a. [IF Q1=OPTION 1 or 2] Does your agency face any of the following major challenges in planning or deploying connected vehicle technology? (Select all that apply)

Cost
- Cost of connected vehicle technology
- Cost of required updates to communications and/or physical infrastructure (e.g. communications networks, traffic signal controllers, etc.)
- Cost to operate and maintain connected vehicle technology

Technology
- Lack of information about connected vehicle technology
- Uncertainty about the information/communications technologies needed (e.g. DSRC vs. cellular)
- Too much technical risk; want to wait until technology and standards mature
- Uncertainty about the benefits of connected vehicles
- Data privacy issues (e.g. protection of Personally Identifiable Information)
- Cybersecurity issues

Institutional
- Partnership issues
- Procurement issues
- Limited funding (e.g., due to competition for funds with other transportation projects)
- Lack of support from leadership and decision-makers

Policy
- Lack of a regulatory framework
- Legal/policy/regulatory issues at the Federal level
- Legal/policy/regulatory issues at the state or local level

Operations
- Lack of public acceptance of connected vehicles
- Worker acceptance issues (e.g., apprehension, confusion, or annoyance with technology; union issues, etc.)
- Lack of staff with the right qualifications/expertise
- Lack of support for long term operations and maintenance
- Integrating new technology with current systems
6b. [IF Q1=OPTION 3 or 4] Does your agency see any of the following as major barriers to planning or deploying connected vehicle technology? (Select all that apply)

Cost
- Cost of connected vehicle technology
- Cost of required updates to communications and/or physical infrastructure (e.g. communications networks, traffic signal controllers, etc.)
- Cost to operate and maintain connected vehicle technology

Technology
- Lack of information about connected vehicle technology
- Uncertainty about the information/communications technologies needed (e.g. DSRC vs. cellular)
- Too much technical risk; want to wait until technology and standards mature
- Uncertainty about the benefits of connected vehicles
- Data privacy issues (e.g. protection of Personally Identifiable Information)
- Cybersecurity issues

Institutional
- Partnership issues
- Procurement issues
- Limited funding (e.g., due to competition for funds with other transportation projects)
- Lack of support from leadership and decision-makers

Policy
- Lack of a regulatory framework
- Legal/policy/regulatory issues at the Federal level
- Legal/policy/regulatory issues at the state or local level

Operations
- Lack of public acceptance of connected vehicles
- Worker acceptance issues (e.g., apprehension, confusion, or annoyance with technology; union issues, etc.)
- Lack of staff with the right qualifications/expertise
- Lack of support for long term operations and maintenance
- Integrating new technology with current systems

Data
- Data access issues
- Data storage issues
- Data governance concerns
7. [ASK ALL] The US Department of Transportation is trying to understand agencies’ readiness to deploy connected vehicle technology. For each of the following activities, please indicate your agency’s current status. (Select one response per row)

**Planning**

Conducted a connected vehicle planning study
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Included connected vehicle technologies and/or applications in agency planning documents (e.g., long range transportation plan, Strategic Highway Safety Plan, Transportation Improvement Program, etc.)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Instituted Memorandums of Understanding (MOUs) with potential partners regarding roles and resource commitments
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Developed Concept of Operations or initial Systems Engineering documents
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Demonstrations and Deployment

Updated your Regional ITS Architecture to include connected vehicle applications and interfaces
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Applied for a Federal grant to fund connected vehicle deployment (even if grant was not awarded)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know
Infrastructure
Secured CV test bed/testing facilities
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Engaged with USDOT’s Equipment Loan and Help Desk program
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Built or upgraded your communications network (e.g. fiber optic network, wireless communications network)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Upgraded physical infrastructure (e.g., traffic signal controllers) for connected vehicles
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Updated lane markings and infrastructure to support accurate MAP message generation
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Implemented a security credential management system (SCMS)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Applied for an FCC License to use 5.9 GHz frequency spectrum (Dedicated Short-Range Communication)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Staffing/Organizational
Procured contractor support for connected vehicles technologies
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know
Hired new staff with knowledge about connected vehicles
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Data Management
Created a data management plan for collecting, storing, analyzing, reporting and protecting privacy of CV data
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

Created a data repository for storing CV data (e.g., cloud service, new data servers, etc.)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t Know

8a. [ASK IF Q1=1 OR 2] What types of communication technologies does your agency currently use (or plan to use in the future) to support connected vehicle applications (vehicle-to-vehicle or vehicle-to-infrastructure)? (Select all that apply)

- Dedicated Short Range Communications (DSRC)
- Cellular (5G or cellular V2X (CV2X))
- Satellite
- Other (please specify): ________________________________
- Don’t know/Not sure [EXCLUSIVE]

8b. [ASK IF Q1=1 OR 2] What types of communication technologies does your agency currently use (or plan to use in the future) to provide backhaul communications in support of connected vehicle infrastructure (e.g., Roadside unit to Transportation Management Center)? (Select all that apply)

- Fiber
- Twisted Copper Pair
- Cellular
- Mobile or Fixed Satellite Services
- Data Over Cable Modem
- Digital Subscriber Line (DSL)
- Microwave
- Other (please specify): ________________________________
- Don’t know/Not sure [EXCLUSIVE]
9. **[ASK ALL]** Which of the response categories best describes your agency’s usage and familiarity with each of the following? (Select one response per row)

   **Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT), encompasses former National ITS Architecture and Connected Vehicle Reference Implementation Architecture (CVRIA)**
   1. Use
   2. Don’t use, but familiar
   3. Not familiar

   **Systems Engineering Tool for Intelligent Transportation (SET-IT)**
   1. Use
   2. Don’t use, but familiar
   3. Not familiar

   **Regional Architecture Development for Intelligent Transportation (RAD-IT), formerly TurboArchitecture**
   1. Use
   2. Don’t use, but familiar
   3. Not familiar

   **US and International Standards associated with CV and AV deployment (e.g. – SAE J2735, SAE J2945 Family, ISO 19091)**
   1. Use
   2. Don’t use, but familiar
   3. Not familiar

10. **[ASK ALL]** What types of assistance or resources does your agency need to support a connected vehicle deployment? (Select all that apply)

   **Funding/Procurement**
   - Competitive grant funds
   - Technology procurement information

   **Evaluation Resources**
   - Best practices on connected vehicle deployments
   - Evaluation methods and strategies
   - Information on the benefits/return on investment
   - Information/data on costs of connected vehicle technologies

   **Training/Technical Assistance**
   - Training
   - Education for decision-makers
   - Education for the general public
   - Technical assistance
   - Information on institutional arrangements and agreements

   **Legal/Regulatory/Policy**
   - Legal/regulatory/policy support at the Federal level
   - Legal/regulatory/policy support at the State/local level
10a. [IF YES TO ANY TRAINING/TECHNICAL ASSISTANCE] Please provide more detail on the type of training or technical assistance that would be most useful to you (be as specific as possible)

________________________________________________________________________________________

AUTOMATED VEHICLES/Automated Driving Systems
Automated Driving Systems (ADS) are a set of vehicle features that, when engaged, do not require a human to drive the vehicle. ADS refers to the Society of Automotive Engineers (SAE) International Automation Levels 3, 4, or 5, which are described as Automated Vehicles (AV) in this survey. Most of the ADS/AV testing done to date would be categorized as Level 3 or Level 4. For more information on SAE Levels of Automation, see: https://www.sae.org/news/press-room/2018/12/sae-international-releases-updated-visual-chart-for-its-%E2%80%9Clevels-of-driving-automation%E2%80%9D-standard-for-self-driving-vehicles

11. Are there any automated vehicle tests or deployments that are being conducted or have been conducted in your region/state? (Please select one)
   1. Yes (completed or in progress)
   2. No [SKIP TO 15]
   3. Don’t know/Not sure [SKIP TO 15]

12. [ASK IF Q11=OPTION 1] What is your agency’s primary role in the automated vehicle testing or deployment? (Please select one)
   1. Agency is/was leading the automated vehicle testing
   2. Agency is/was supporting the planning or execution of the automated vehicle testing
   3. Agency is not involved in the automated vehicle testing
   4. Other (please specify)

12a. [IF Q12=OPTION 1 OR 2] Please describe your agency’s activities with respect to automated vehicle testing:

________________________________________________________________________________________
13a. [Q12 = OPTION 2]: What entity(ies) are/were leading the automated vehicle testing or deployment in your region/state? (Select all that apply)

- Automakers or Original Equipment Manufacturers (OEMs)
- Automated Driving Systems (ADS) Developers
- Transportation Network Companies (TNCs) (e.g. Uber or Lyft)
- State agencies
- Metropolitan Planning Organizations (MPOs)
- Universities
- Transit agencies
- Other local agencies
- Consultants (please specify): 
- Other (please specify): 
- Don’t know/Not sure [EXCLUSIVE]

13b. [Q12 = OPTION 1] What other entity(ies) are/were you partnering with for the automated vehicle testing or deployment in your region/state? (Select all that apply)

- Automakers or Original Equipment Manufacturers (OEMs)
- Automated Driving Systems (ADS) Developers
- Transportation Network Companies (TNCs) (e.g. Uber or Lyft)
- State agencies
- Metropolitan Planning Organizations (MPOs)
- Universities
- Transit agencies
- Other local agencies
- Consultants (please specify): 
- Other (please specify): 
- Don’t know/Not sure [EXCLUSIVE]

14. [ASK if Q11=OPTION 1] Automated Vehicle Tests or Deployments

14a. Which, if any, of the following automated transit vehicle (e.g., bus, shuttle, etc.) tests or deployments are or were being conducted?

- Automated Fixed Route Shuttle
- Automated Bus Rapid Transit (BRT)
- Automated Flexible Mobility-on-Demand Shuttle Service
- Automation for Maintenance, Yard, and Parking/Storage Operations
- Automated taxi or ride-hailing testing (e.g., Uber, Lyft)
- Other automated transit vehicle test/deployment (please specify): 
- Don’t know/Not sure [EXCLUSIVE]
- None [EXCLUSIVE]
14b. Which, if any, of the following automated commercial vehicle (e.g., delivery truck, large truck) tests or deployments are or were being conducted?

- Small Delivery Robotic Vehicles
- Automated Last Mile Delivery
- Automated Regional or Long-Haul Trucking
- Truck Platooning
- Other automated commercial vehicle test/deployment (please specify): ____________
- Don’t know/Not sure [EXCLUSIVE]
- None [EXCLUSIVE]

14c. Are or were any automated light duty passenger vehicle tests or deployments being conducted (other than automated transit)? (Select all that apply)

- Automated light duty passenger vehicle test/deployment (please specify): ____________
- Don’t know/Not sure [EXCLUSIVE]
- None [EXCLUSIVE]

[FOR EACH RESPONSE CHECKED IN Q14]:

14d. Where is/was the [ENTER TEST FROM Q14] testing or deployment occurring? (Select all that apply) (See table below)

- Test bed or proving grounds
- Sidewalks
- Dedicated “slow lane”
- Urban city streets
- Highway
- Campus environment
- Private commercial or residential development
- Other (please specify):
- Don’t know/Not sure [EXCLUSIVE]

<table>
<thead>
<tr>
<th>Category</th>
<th>Automated Transit Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Automated Fixed Route Shuttle</td>
</tr>
<tr>
<td>2.</td>
<td>Automated Bus Rapid Transit (BRT)</td>
</tr>
<tr>
<td>3.</td>
<td>Automated Flexible Mobility-on-Demand Shuttle Service</td>
</tr>
<tr>
<td>5.</td>
<td>Automated taxi or ride-hailing testing (e.g., Uber, Lyft)</td>
</tr>
<tr>
<td>6.</td>
<td>Other automated transit vehicle test/deployment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Automated Commercial Vehicle Tests/Deployments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Small Delivery Robotic Vehicles</td>
</tr>
<tr>
<td>2.</td>
<td>Automated Last Mile Delivery</td>
</tr>
<tr>
<td>3.</td>
<td>Automated Regional or Long-Haul Trucking</td>
</tr>
<tr>
<td>4.</td>
<td>Truck Platooning</td>
</tr>
<tr>
<td>5.</td>
<td>Other automated commercial vehicle test/deployment</td>
</tr>
</tbody>
</table>

| Category | Automated light duty passenger vehicle test/deployment |
15. **[IF Q11 = OPTIONS 2 OR 3]** Are there plans for your agency to participate in automated vehicle testing or deployment in the future? (Select one)

1. Yes [CONTINUE]
2. No [SKIP TO Q19]
3. Don’t know/Not sure [SKIP TO Q19]

16. **[IF Q15 = OPTION 1]** When does your agency expect to participate in automated vehicle testing or deployment? (Select one)

1. Within the next 3 years
2. In 3 to 6 years
3. In 7 or more years
4. Don’t know/Not sure

17a. **[IF Q11=1 OR Q15=1]** Does your agency face any of the following challenges in planning or conducting automated vehicle testing or deployment? (Select all that apply)

**Cost**
- Cost of automated vehicle technology
- Cost of required updates to communications and/or physical infrastructure (e.g. communications networks, pavement markings, road/curb conditions, signage, etc.)
- Cost to operating and maintaining AV technology

**Technology**
- Lack of information about automated vehicle technology
- Uncertainty about the information/communications technologies needed
- Too much technical risk; want to wait until technology and standards mature
- Uncertainty about benefits of automated vehicles
- Data privacy issues (e.g. protection of Personally Identifiable Information)
- Cybersecurity issues

**Institutional**
- Partnerships issues
- Procurement issues
- Limited funding (e.g., due to competition for funds with other transportation projects)
- Lack of support from leadership and decision-makers

**Policy**
- Lack of a regulatory framework
- Legal/policy/regulatory issues at the Federal level
- Legal/policy/regulatory issues at the State or local level
Operations
Lack of public acceptance of automated vehicles
Worker acceptance issues (e.g., apprehension, confusion, or annoyance with technology; union issues, etc.)
Lack of staff with the right qualifications/expertise
Lack of support for long term operations and maintenance
Integrating new technology with current systems

Data
Data access issues
Data storage issues
Data governance concerns

Other (please specify): ____________________________
Don’t Know/Not Sure [EXCLUSIVE]
None [EXCLUSIVE]

17b. [IF Q11 = 2 OR 3 & Q15 NE 1] Does your agency see any of the following as major barriers to planning or conducting automated vehicle testing or deployment? (Select all that apply)

Cost
Cost of automated vehicle technology
Cost of required updates to communications and/or physical infrastructure (e.g. communications networks, pavement markings, road/curb conditions, signage, etc.)
Cost to operating and maintaining AV technology

Technology
Lack of information about automated vehicle technology
Uncertainty about the information/communications technologies needed
Too much technical risk; want to wait until technology and standards mature
Uncertainty about benefits of automated vehicles
Data privacy issues (e.g. protection of Personally Identifiable Information)
Cybersecurity issues

Institutional
Partnerships issues
Procurement issues
Limited funding (e.g., due to competition for funds with other transportation projects)
Lack of support from leadership and decision-makers

Policy
Lack of a regulatory framework
Legal/policy/regulatory issues at the Federal level
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Operations
Lack of public acceptance of automated vehicles
Worker acceptance issues (e.g., apprehension, confusion, or annoyance with technology; union issues, etc.)
Lack of staff with the right qualifications/expertise
Lack of support for long term operations and maintenance
Integrating new technology with current systems

Data
Data access issues
Data storage issues
Data governance concerns

Other (please specify): ___________________________
Don’t Know/Not Sure [EXCLUSIVE]
None [EXCLUSIVE]

18. [ASK ALL] Has your state or locality changed (or in the process of changing) their laws, regulations, or policies to accommodate automated vehicles? (Select one)
   1. Yes
   2. No [SKIP TO Q20]
   3. Don’t Know/Not Sure [SKIP TO Q20]

18a. [IF Q18= OPTION 1] What laws, regulations, or policies have been or are being changed? (Select all that apply)
   State laws for operation of motor vehicles (e.g., licensing, permitting)
   State laws for operation of commercial vehicles
   State laws pertaining to the insurance of automated vehicles
   State laws pertaining to the procurement of AV-equipped vehicles
   Other (please specify): __________________________
   Don’t know/Not sure [EXCLUSIVE]

19. [ASK ALL] The US Department of Transportation is trying to understand agencies’ readiness to deploy AV technology. For each of the following activities, please indicate your agency’s current status. (Select one response per row)
Planning
Conducted an automated vehicle planning study
   1. Underway or complete
   2. Not underway, but plan to
   3. No plans to
   4. Don’t know
Developed local regulations or other policies regarding automated vehicle testing and operations
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Included automated vehicle technologies and/or applications in agency planning documents (e.g., long range transportation plan, Strategic Highway Safety Plan, Transportation Improvement Program, etc.)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Partnered with other entities to test automated vehicles
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Developed Concept of Operation or initial Systems Engineering documents
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Demonstrations and Deployment
Updated your Regional ITS Architecture to include automated vehicle applications and interfaces
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Applied for a Federal grant to fund the testing of automated vehicle technology (even if grant was not awarded)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Infrastructure
Enhanced infrastructure maintenance (i.e., ensuring roadway striping is visible, removing visibility barriers from signs, etc.)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Upgraded physical infrastructure for automated vehicles
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know
Organizational

Procured contractor support for automated vehicles technologies
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Hired staff with knowledge about automated vehicles
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Data Management
Created a data management plan for collecting, storing, analyzing, reporting, and protecting privacy of AV data
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

Created a data repository for storing AV data (e.g., cloud service, new data servers, etc.)
1. Underway or complete
2. Not underway, but plan to
3. No plans to
4. Don’t know

20. [ASK ALL] What types of assistance or resources does your agency need to support automated vehicle testing or deployment? (Select all that apply)

Funding/Procurement
- Competitive grant funds
- Technology procurement information

Evaluation Resources
- Best practices on automated vehicle deployments
- Evaluation methods and strategies
- Information on the benefits/return on investment
- Information/data on costs of automated vehicle technologies

Training/Technical Assistance
- Training
- Education for decision-makers
- Education for the general public
- Technical assistance
- Information on institutional arrangements and agreements
Legal/Regulatory/Policy

- Legal/Regulatory/Policy
- Legal/regulatory/policy support at the Federal level
- Legal/regulatory/policy support at the State/local level

Other (please specify): _______________________
Don’t know/Not sure [EXCLUSIVE]
None [EXCLUSIVE]

20a. [IF YES TO TRAINING/TECHNICAL ASSISTANCE] Please provide more detail on the type of training or technical assistance that would be most useful to you (be as specific as possible).

___________________________________________________________________________________________________________________________________ [OPEN END]

21. [ASK ALL] Is there anything else you would like to share about your agency’s current or future planned activities related to connected and automated vehicles?

___________________________________________________________________________________________________________________________________ [OPEN END]