Connected and Automated Vehicle Initiative

The Connected and Automated Vehicle (CAV) Initiative is focused on implementing and streamlining connected and automated vehicles and emerging technologies for improving safety and enhancing mobility for motorists. The TSM&O Strategic Plan outlines CAV as one of the key focus areas. These technologies include but are not limited to wireless communications, vehicle sensors, and transit signal priority.

Equipment within the Connected Vehicle (CV) is employed to continually transmit a vehicle's position, direction, and speed (e.g., whether turning or braking), as well as other information, to vehicles sharing the road with it, at rates of up to 10 times per second. CVs are capable of "talking" to equipment installed along the road itself and other infrastructure, such as traffic signals, stop signs, toll booths, work or school zones, and railroad crossings. The information shared enables applications to send alerts and warnings to drivers about potential crashes, queues forming ahead, ahead, upcoming work zones, and much more.

Autonomous Vehicles (AV) are vehicles that have advanced sensors (radar, LiDAR, cameras, etc.) and computing abilities to provide steering, braking, and acceleration without the driver's input.

There are three major approaches to CAV communication, generally referred to as V2X (meaning vehicle to everything):

- Vehicle to Vehicle (V2V)
- Vehicle to Infrastructure (V2I)
- Vehicle to Pedestrian (V2P)

The CAV office manages research and pilot projects in order to provide direction and considerations as CV and AV technologies become mainstream.

Vehicle to Vehicle (V2V) Communications:

Connected vehicles are vehicles that can communicate. This allows vehicles to share data on their position and use this data collected to warn drivers of potential dangers. These technologies can warn drivers of cautions that are not seen or visible to sensors.

Vehicle to Infrastructure (V2I) Communications:

Vehicle to Infrastructure connected vehicles will allow the vehicle to communicate with traffic management centers. This communication can be used to update drivers on weather, traffic, and work zones.

Vehicle to Pedestrian (V2P) Communications:

Vehicle to Pedestrian connected vehicles will allow the vehicle to communicate directly with the pedestrian or multiple pedestrians within close proximity. In addition, communication can be to other vulnerable road users, such as cyclists.

CAV Business Plan

A CAV Business Plan has been developed by the Department for deploying technologies statewide. This plan was initiated by the FDOT Statewide Traffic Engineering and Operations Office and adopted in January 2019. The CAV Business Plan provides the framework to create a comprehensive, statewide approach; particularly important in a decentralized organization like FDOT, and intended for use by all stakeholders. The approach addresses planning, research, design implementation, maintenance, and operations, and is geared toward the Systems Engineering process.

CAV Projects and Initiatives

Initial pilot projects have been deployed across the state as examples of how CAV could be incorporated into infrastructure. The CAV website provides the planning, design, and operational stages of these individual projects and initiatives. Project managers should review the website to familiarize themselves with available technologies and training resources.

CAV initiatives may be included into larger Construction or Maintenance projects. Some aspects of managing a CAV efforts may differ from other project types. For example:

- CAV devices may not always be on the FDOT Approved Products List (APL). In these cases, the project manager will need to coordinate with the respective Districts' TSM&O Engineers within the Traffic Engineering and Operations Office to go through an approval process with FDOT's Traffic Engineering Research Laboratory.
- There may be extra emphasis placed on acceptance testing as some devices may not be on the APL.
- Additional coordination with the Central Office may be needed - for example, FCC cellular vehicle-to-everything (C-V2X) licensing, onboarding on to the statewide Vehicle-to-everything Data Exchange Platform (V2X DEP) etc. The project managers are suggested to work with the District TSM&O engineers to get the requirements that should be incorporated into the project procurement packages as requirements for the contractors and device manufacturers to meet.
- Close coordination is needed with the Traffic Operations Office.

CAV Training Resources

Training and additional resources continue to be developed and refined. Please continue to check the CAV Website for updates. Trainings and resources include:

- Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use Vehicles