Virtual Meeting of the Intelligent Transportation Systems Committee
Thursday, July 9, 2020, 1:30 p.m.

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I. Call to Order
II. Public Comment - 3 minutes per speaker, please
III. Approval of Minutes
   A. April 9, 2020
   B. January 9, 2020
IV. Status Reports
   A. Performance Evaluation of E-Scooter Sharing in the City of Tampa (YuYu Zhang, CUTR)
   B. Smart Cities Mobility Plan Scope Review (Lee Woodcock, Atkins)
   C. Cêvê Pilot: Lessons Learned About Data Management (David Aylesworth, Cêvê)
   D. Tampa Bay Next Update: Westshore SafeTRIP (FDOT Representative)
V. Old Business & New Business
   A. Next meeting, October 8th
   B. Smart Cities Alliance Workshop on Smart Work Zones, August 6th @2p
   C. ITS 101 Course Update
VI. Adjournment
VII. Addendum
A. Technology Application Partnerships with Local Agencies for Deploying CAV Technologies

B. Florida’s CAV Business Plan

The full agenda packet is available on the MPO’s website, www.planhillsborough.org, or by calling (813) 272-5940.

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I. CALL TO ORDER:

Chairman, Mr. Brandon Campbell called the meeting to order at 1:31 p.m. and a quorum was present. The meeting was held via Go To Webinar.

MEMBERS PRESENT:

- Brian Gentry ................... Hillsborough County Public Works
- Brandon Campbell .......... City of Tampa
- Jason Dudjak…………….City of Plant City
- Jeff Sims..................... Environmental Protection Commission of Hillsborough County
- Margaret Kubilins............. FDOT Non-Voting Advisor
- Achilleas Kourtellis.........CUTR

OTHERS PRESENT:

Johnny Wong, Cheryl Wilkening, Allison Yeh and Gena Torres, Hillsborough MPO; Eric Hill, MetroPlan Orlando; Paula Flores, GPI; David Aylesworth and Kris Milster, Ceve

II. PUBLIC COMMENTS:

There were no public comments.

III. APPROVAL OF MINUTES:

There were no comments or changes to the minutes January 9, 2020 minutes. The approval of minutes will be carried to the next meeting.

IV. ACTION ITEMS

A. FY21 & 22 Unified Planning Work Program

Allison Yeh, MPO Staff, presented the Hillsborough MPO Unified Planning Work Program FY 2021 & FY 2022. This update is required Biennial and is effective July 1, 2020 to June 30, 2022. It outlines major planning tasks, documents federal and state funding, coordinates federally funded planning tasks performed by the MPO, HART and FDO and complies with federal and state rules. A few of the major projects completed in FY19 and FY20 were 2045 Long Range Transportation Plan, Environmentally Friendly Noise Walls and Countywide Speed Management Study. A list of projects underway are the Data Platform Performance, Data Portal, Equity Score Card, Plant City Transit Feasibility Plan, Vision Zero Corridor Study and the Regional LRTP. Ms. Yeh reviewed a snapshot of the FY 2021 and 2022 funding. There are six major tasks that our funding is going towards. Task 1 is transportation planning management which includes UPWP development and amendments, grants management along with state and federal certification. Task 2 is system and corridor planning and Task 3 is the Long Range Transportation Plan and Data Collection. Task 4 involves the transportation improvement plan which is the TIP project prioritization, Tip development and amendments and State Tip Coordination. The MPO and MPO Committees are involved in Task 5 along with other outreach. Lastly, Task 6 is local and regional coordination and planning. In February and March the MPO went to Committees and asked them for project ideas. They came back with Motions for projects that they would like to see in the work program. Ms. Yeh summarized the
committee’s Motions which included Best Practices for Street Sweeping and Maintenance for Bike lanes, Right Size Parking Calculator, Best Practices in Electric Vehicle Charging, Continue Audits in School Safety Study, Safety Park Speed Zone Study, Study of Uniform Buffered Bicycle Lane Standards countywide and vulnerability and resiliency assessments. Ms. Yeh reviewed the Jurisdiction and Agency Project Requests and discussed the critical path projects and analyses and explained this is a way to monitor compliance activities for federal funding. She went over potential studies an preliminary cost estimates. The I-275 Boulevard Conversion Study is at the top of the list. The MPO Committees review the UPWP draft in April then adopts final UPWP in May. The new UPWP will be effective July 1, 2022 to June 30, 2022. Ms. Yeh is taking comments on the FY21 & FY22 UPWP and will forward those comments to the MPO Committee.

Brandon Campbell inquired about the potential studies and wondered if they anticipated any changes or additional needs due to our emergency management situation now. The study of Supply-Chain and and Resilience Pilot Project would apply so are the studies adjustable. Achilleas Kourtellis supported Brandon Campbell’s statement. There were no other comments.

V. STATUS REPORTS

A. Capability Maturity Model Assessment

Eric Hill, MetroPlan Orlando, presented the Transportation Systems Management and Operations (TSMO). The definition of TSMO is an integrated set of strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety and reliability of the transportation system. The reason we do TSMO is to limit funding, advances in technology, greater expectations from customers and better understanding of congestion. There are several sources of congestion such as incidents, bottlenecks, work zones, inclement weather, poor signal timing and special events. There is a difference between urban and rural congestion perspectives. TSMO Strategies consist of active transportation, congestion pricing, freight management, integrated corridors, incident management, managed lanes, parking management and road weather are a few. MetroPlan Orlando started 15 years ago. They looked at the 10 worst and first behaviors and locations and at that time they created the TSMO department, committee and addressed funding and noted champions on their board. They have been working on the I-4 corridor between Orlando and Tampa. He presented graphs of the crash severity and explained why they need to use TSMO. MetroPlan has been working with the Polk TPO, Hillsborough MPO, Forward Pinellas, Sarasota/Manatee MPO and Pasco MPO. Mr. Hill identified their six tasks and they have been able to complete the first three which are the Regional TSMO Opportunity, Policy Board Support and Development of TSMO. The Capability Maturity Model (CMM) is a tool they use to see where everyone stands with TSMO. There has been some agreement and some hesitation on Task 4 Formalize Interagency Agreement. Task 5 is management and that is working with staff at the MPOs and Task 6 is evaluation. The CMM was promoted by the Federal Highway Administration and came through the SHRP 2 program. It is an evaluation of the key process and institutional capabilities to advance TSMO. It was adapted from IT industry. In the model there are six dimensions of Capability Maturity Model. They are Business Processes, Systems and Technology, Performance Management, Culture, Organization and Staffing and lastly Collaboration. The objective is to help agencies to determine where they are and to get better. Mr. Hill provided data from FDOT District 5 that shows CMM works. The Transportation System Management and Operations Implementation Plan came out of District 5. Hillsborough MPO measured their capability level and the CMM explains how to get to the next level through business process,
system and technology and lastly performance measures. The challenges and opportunities with TSMO have been staff turnover, LRTP update, change, parochialism, resources and timing. Mr. Hill provided a list of resources for TSMO. The next steps is to develop case studies, evaluation, pool funded study and National Institute for Congestion Reduction (NICR).

Brandon Campbell noted MetroPlan Orlando has a TSMO committee and questioned if they have an ITS committee as well. Kris Milster inquired about the National Operation of Excellence and the ITS Committee and if there will be a peer exchange. Brandon Campbell questioned how frequently does the National Operations Center of Excellence meet.

There were no other questions.

B. Hillsborough County Air Quality Update

Jeff Sims, EPC, presented the Air Quality Update for Hillsborough County. The Air Management Division is made up of various sections. The focus today is Air Monitoring. The reason air pollution should be controlled is the well documented connection between air quality and human health. Common Air Pollutants effects our respiratory and cardiovascular systems. There is also potential to damage agriculture and vegetation therefore reducing crops. Our Nation’s air report shows a comparison of growth areas and declining emissions along with declining National Air Pollutant Concentration Averages. The EPA monitors six air pollutants which are Nitrogen Dioxide, Ozone, Particulate Matter, Carbon Monoxide, Sulfur Dioxide and Lead. They are all in attainment status in Hillsborough County. The biggest concern is Ozone. There are 11 air monitoring stations for public health protection and research. There is continuous monitors for Ozone, NO2, CO, SO2 and particulate matter. There is a near-road monitoring station near I-275 to enhance understanding of mobile source impacts. A graph of the data collected from 3 days at the near-road site during hourly peaks and all concentrations were well below health-based standards. Mr. Sims discussed the Ozone precursor pollutant concerns. Ozone is a secondary pollutant and is a combination of VOC and NOX. Sunlight plays a significant factor in this pollutant. The sources of NOX are utilities, boilers, fuel combustion and mobile/non-road mobile sources. Mr. Sims briefly reviewed the impacts of Ozone Nonattainment. Hillsborough County’s Ozone design value is 70 ppb. This is based on a 3 year average of 4th highest recording per year. MPO considerations regarding air quality are to reduce congestion, and vehicle/truck idling, promote alternative transportation options, encourage public transit, promote alternative/cleaner fuel options and support electric vehicle charging infrastructure. The EPC Transportation related initiatives are alternative vehicle fleet, two public charging stations on-site, public outreach, Tampa Bay Clean Cities Coalition, Staff Route Optimization, sustainability office and Air Quality Advisories. The overall message is that our air quality is good.

Beth Alden commented on the air quality monitoring stations around the county and how do you use to monitor ozone precursors. Brandon Campbell inquired about the opportunities for the ITS arena to supplement the information the EPC has using the ITS traffic network.

C. Vision Zero Speed Management Study

Paula Flores, MPO Consultant, presented an update on the Speed Management Study. The first goal is to update policies, standard and procedures to foster a culture of safety in planning and design of the transportation system. The second goal is to create a safe multimodal
transportation system through good design, lighting and connected facilities. This is important because Florida is the most dangerous state for pedestrians and bicyclists in recent history. The data tells us that 75 percent of fatal crashes occur on roads with posted speeds of 40mph, 75 percent of fatal and serious injury crashes occur on one-third of our roads, 33 percent of fatal crashes involve aggressive driving and one-third of pedestrian crashes result in death or incapacitation. Speeding kills more than 10,000 a year. The goal of this study is to improve public health and safety by reducing road fatalities and serious injuries. The desired outcomes are to improve safety experience, increase awareness, institutionalize good practices, identify supportive policies, programs and infrastructure improvements to meet safety goal and to obtain cooperation and support of stakeholders. The speed management action plan is stakeholder involvement, speed management practices, corridor prioritization, next 30 high injury corridors and speed management action plan. Ms. Flores reviewed the crash statistics and communities of concern. They started with the top 20 crash corridors and prioritized according to the performance level. They were able to identify the next 30 and prioritize the next 30 high injury corridors and priority matrix. The next step will be to establish a speed management action plan.

Brandon Campbell inquired about the National Best Practices and wondered were we fall in comparison to other agencies and how do we rank. Pete Costello asked if the study has been shared with other Vision Zero Cities. Margaret Kubilins noted that FDOT D7 will work with them on these techniques.

VI. OLD & NEW BUSINESS

A. Next ITS Meeting July 9th

B. Johnny Wong stated the Super Bowl Mot Evaluation Study will give us a good opportunity to evaluate Smart Cities. They will put together a proposal identifying performance measures to determine how well our strategies are working in hopes to make us available to Hillsborough County for a resource.

VII. ADJOURNMENT

There was no further business, the meeting adjourned at 3:46 p.m.
I. CALL TO ORDER:

Chairman, Mr. Brandon Campbell called the meeting to order at 1:35 p.m. and a quorum was present. The meeting was held in the 15th Floor Conference Room.

MEMBERS PRESENT:

- Brian Gentry.................... Hillsborough County Public Works
- Brandon Campbell .......... City of Tampa
- Vinny Corazza…………….City of Temple Terrace
- Anna Quiñones...........Tampa/Hillsborough Co. Expressway Authority
- Justin Willits.................. HART
- Fred Baxter………………City of Plant City
- Jeff Sims ...................... Environmental Protection Commission of Hillsborough County
- Margaret Kubilins........FDOT Non-Voting Advisor
- Achilleas Kourtellis........CUTR

OTHERS PRESENT:

Johnny Wong and Cheryl Wilkening, Hillsborough MPO.

II. PUBLIC COMMENTS: There were no public comments.

III. APPROVAL OF MINUTES:

Brian Gentry made a motion to approve the ITS meeting minutes and the October 10, 2019 Minutes. The motion was seconded by Vinny Corazza and carried unanimously.

Vinny Corazza requested that acronyms on future minutes to be defined when first introduced.

IV. ACTION ITEMS

A. 2019 Attendance Review & Declaration of Vacant Seats

Johnny Wong, MPO Staff, reviewed the attendance policy and stated that the MPO Bylaws require that “at a minimum, committee member attendance will be reviewed annually.” The MPO may review and consider rescinding, the appointment of any member of any committee who fails to attend three consecutive meetings. Plant City had three consecutive absences in 2019 but they were excused.

There was no action on attendance.

B. 2020 Election of Officers

Johnny Wong, MPO Staff, reviewed the current officers for 2019 which are Vik Bhide for Chair, Brian Gentry for Vice Chair and Vinny Corazza for Officer at Large and then requested nominations for the officers. The MPO Bylaws require that officers are to be elected at the first meeting of each year. There are no term limits for officers, therefore, they can be re-elected and serve indefinitely. Jeff Sims inquired if Vik Bhide was still interested in being Chair. Brandon Campbell explained that due to Vik Bhide’s
schedule he will not be able to attend most meetings. Brian Gentry then nominated Brandon Campbell for Chair. Voted unanimously. Brandon Campbell nominated Brian Gentry for Vice Chair. Voted unanimously. Vinny Corazza nominated Jeff Sims as Officer at Large. Voted unanimously. 2020 Officers will be Brandon Campbell for Chair, Brian Gentry for Vice Chair and Jeff Sims for Officer at Large.

V. STATUS REPORTS

Training Session for ClearGuide Data & Analytics Platform

Anita Vandervalk-Ostrander with Iteris introduced the staff involved in ClearGuide. Johnny Wong reviewed the background behind the idea for data platform was introduced in 2016. Hillsborough MPO was selected to participate in a pilot project lead by federal highway administration. The idea was to create a data business plan creating a road map on how to govern, manage and implement a data portal. After working with Anita Vandervalk-Ostrander and staff on this plan they have successful transitioned into the implementation of that plan. Our goals for the data analytics and platform are to have a shared data source for all the transportation agencies across the county. We wanted the platform to be rapidly deployed and available to the ITS members and then to the public. We have been under contract with ClearGuide for about 10 weeks. The ITS members will be delegates for their respective agency.

Anita Vandervalk-Ostrander reviewed the Phases of ClearGuide. In November, Phase 1A was implemented and this was basically turning on the ClearGuide Data Platform. This phase involves getting it up to speed with respect to the capability. It is powered by third party data service development. We are in Phase 1B which is data discovery for augmenting the data platform. Phase 1C is requirements for definition for Phases 2, 3 and 4 which will occur January – April 2020. Phase 2 will be integration of incident, crash, volume and milepost data. Phase 3 will add additional data features and Phase 4 will be the integration of predictive data.

Masoud Hamedi from Iteris gave a high-level view of what ClearGuide does and how to use it.

VI. OLD & NEW BUSINESS

A. ITS Master Plan Update

There is a tentative date for kickoff which is the end of February or beginning of March. We have decided to expand the scope it from an ITS Master Plan to a Smart Cities Update. We’ve asked consultants to adjust the scope. We will be in touch with ITS Committee members individually for ideas.

B. Next ITS Meeting April 9th

VII. ADJOURNMENT

There was no further business, the meeting adjourned at 3:32 p.m.

VIII. ADDENDUM

A. MPO 2020 Calendar
B. CCC Regional Priorities
Board & Committee Agenda Item

**Agenda Item**
Performance Evaluation of E-Scooter Sharing in the City of Tampa

**Presenter**
Y. (YuYu) Zhang, Ph.D, University of South Florida

**Summary**
The City of Tampa sponsored an e-scooter pilot program with four service providers in May 2019. A University of South Florida team, led by Dr. Zhang, performed a research study looking into this real-world testing of e-scooter sharing. The study evaluates the performance of this new type of shared mobility and proposes recommendations for effective regulation if the City determines to move forward with this mobility service. Dr. Zhang will share the research process, major findings, and regulation recommendations from the research.

A draft final report was submitted to the City of Tampa in late April 2020.

**Recommended Action**
None. For information only.

**Prepared By**
Lisa K. Silva, AICP, PLA., MPO staff

**Attachments**
None.
Board & Committee Agenda Item

**Agenda Item**
Smart Cities Mobility Plan Scope Review

**Presenter**
Lee Woodcock, Atkins

**Summary**

The proposed scope of the Smart Cities Mobility Plan covers the development of a clear 5-year program vision and supporting road map to guide technology deployment. The project will be a collaborative effort among key staff from across the region, community leaders, and local officials for the identification and application of technology to provide benefits for the region and its stakeholders.

The Smart Cities Mobility Plan will be delivered in two phases:

Phase 1 focuses on setting a baseline understanding of technology solutions that are currently deployed, solutions that could be deployed, and emergent & developing technology. These solutions will be mapped against the program categories and identify potential benefits. Following the technology review, a workshop will be held with staff from the MPO and partner agencies to consider and ultimately identify potential Smart Cities projects across Hillsborough County. Phase 1 will culminate in a Summit with staff, community leaders, and local officials to recap the work and provide an engagement opportunity.

Phase 2 will develop a roadmap based on the work from Phase 1. It will also be important to gain feedback from the Summit attendees at the start of Phase 2 and thus, 1-on-1 interviews will be held with key personnel to capture detailed feedback.

**Recommended Action**
None. For information only.

**Prepared By**
Johnny Wong, PhD, MPO Staff

**Attachments**
Draft Scope.
Smart Cities Mobility Plan for Hillsborough MPO

Introduction

The Hillsborough MPO is aggressively working to advance the use of existing and emerging technologies across its planning area. Both existing and emergent technologies may help improve mobility both within the county and across the region. The 2045 Long Range Transportation Plan establishes investment criteria and details transportation priorities and associated funding over the next 25 years. The plan identifies five investment programs corresponding to critical transportation needs:

Each of the five investment program categories is supported by a goal statement, current levels of performance and targets to be achieved.

Smart Cities Mobility plan

Development of a clear 5-year Smart Cities vision and supporting road map is important to thoughtfully guide deployment of the technologies described in the Smart Cities section of the 2045 Long Range Transportation Plan.

The Smart Cities Mobility Plan will clarify the Hillsborough MPO’s role in identifying & applying technologies to provide benefits for the region and its stakeholders. The Smart Cities Mobility Plan will be delivered in two phases: Phase One is outlined below and the scoping of Phase Two will be developed at the end of phase one. This staggered scoping approach will ensure that feedback from local partners, particularly regarding the role of the MPO, will be considered appropriately.

Phase One

A) Discovery

The discovery process includes two parts:

I. First, a horizon scanning & industry literature review to identify current Smart Cities practices and technologies will establish an understanding of where the greatest deployment opportunities can be found. These will be mapped against the five investment
programs and supported by case studies that demonstrate benefits, special considerations, lessons learned from case studies, privacy issues, etc.

II. Second, a baseline of current technology deployments will be developed by engaging local stakeholders and producing a State of the Practice document covering the Hillsborough planning area.

Completion of the Discovery process will yield a toolkit of technologies to be considered for future deployments. Each technology will be mapped using a numerical scale ranging from 1 (low) to 10 (high) to indicate the magnitude of potential benefits, as well as color-coded to indicate which of the five investment programs will be impacted by the technology. Technologies will then be classified as follows: 1. technology solutions that are currently utilized in the county; 2. existing technology solutions that are not currently utilized; and, 3. new & emergent technology solutions that may be beneficial. In addition to the classification schema, approximate costs of deployment will be identified for each. Below is a sample for illustration purposes only:

<table>
<thead>
<tr>
<th>Existing technology solutions we have</th>
<th>Existing technology solutions we do not have</th>
<th>New &amp; emergent technology solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• active traffic management, 8; $$</td>
<td>• flood detection sensors, 4; $$</td>
<td>• predictive analytics</td>
</tr>
<tr>
<td>• integrated Corridor management, 7; $$$</td>
<td>• micro-mobility, 5; $</td>
<td>• blockchain</td>
</tr>
<tr>
<td>• signal retiming &amp; coordination, 6; $</td>
<td>• connected vehicles</td>
<td>• 5G communications</td>
</tr>
<tr>
<td>• vehicle detection and tracking</td>
<td>• autonomous vehicles</td>
<td></td>
</tr>
<tr>
<td>• incident management</td>
<td>• virtual curb-side management</td>
<td></td>
</tr>
<tr>
<td>• journey planning</td>
<td>• mobility as a service</td>
<td></td>
</tr>
<tr>
<td>• performance management</td>
<td></td>
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<tr>
<td>• big data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• traffic signal prioritization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• fiber communications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• parking technologies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The deliverable from A) Discovery will be a Technical Memorandum that summarizes the two parts of the process. The Technical Memorandum will be approximately 10 pages.

B) Analysis

The Analysis process will utilize the outputs from the Discovery process as follows:

I. The current & planned technology deployments will be mapped in the MPO’s geographic information system; and,

II. A planning meeting will be held for a stakeholder workshop. The planning meeting will finalize the agenda, confirm invited attendees and also identify the critical inputs and outputs that are required from the workshop itself (such as, will this solve the problem of
interest? are there legal challenges to consider? is there public support for this particular technology? and others); and,

III. A workshop will be held with MPO staff and key staff from partner agencies to identify transportation facilities performing poorly in one or more of the five program categories and to confirm which existing technology solutions are currently utilized, existing technology solutions that are not currently utilized, and new & emergent technology solutions that may be considered to improve performance. The output of this workshop will be a list of potential projects to consider;

IV. The potential projects identified above will then be assigned a score using the prioritization matrix from the Discovery process. The matrix will include performance criteria aligning to the five program categories, potential benefits to the defined measures for each directive, and planning-level cost estimates. Where no existing performance measure exist, appropriate performance measures will be identified.

The deliverables from B) Analysis will be the Workshop agenda, prioritization score and, if necessary, supplemental performance measures.

C) Workshop

The final part of Phase One will be a workshop with key staff of the MPO and partner agencies hosted at the quarterly Tampa Bay Smart Cities Alliance meeting. The workshop will have four main objectives:

1. Present the results of the Discovery process to stakeholders;
2. Share the overview of current technology deployments and potential prioritized projects;
3. Strategize potentials deployment strategies (e.g. corridor focused, etc). Brainstorm a roadmap to guide phasing of future technology deployments; and
4. Using the ITS committee as a think tank, identify the most appropriate role of the Hillsborough MPO.

The deliverable from C) Workshop will be a 2-3pg summary report of the workshop session.

D) Engagement Materials – Optional

An optional task is to develop graphical engagement materials explaining the benefits of potential technology solutions. This could be produced prior to the workshop or created after the workshop.

E) Next Steps

On conclusion of the workshop, a separate meeting will be held with the MPO team to consider the outputs from Phase One. Conclusions from the workshop will be used as an input to the meeting. Also, a short summary report (2-3 pgs) of the workshop session will be produced.

The output from the meeting with the MPO team will be a high-level scope of Phase Two of the Smart Cities Mobility Plan. The primary aim of Phase Two will be the development of the overarching roadmap. In addition, it will also be important to gain feedback from workshop attendees at the start of Phase Two and one-on-one meetings will be held with key personnel so that feedback can be considered prior to scope finalization.

The deliverable from E) Next Steps will be a Phase Two Scope.
Board & Committee Agenda Item

Agenda Item
CēVē Pilot: Lessons Learned About Data Management

Presenter
David Aylesworth, CēVē

Summary
Tampa-based transportation software startup, CēVē, will present lessons learned while developing a mobile app that provides traffic signal timing, speed limits, and special event information to Tampa drivers.

Their experience includes getting public road, school, and event data from Florida, Georgia, and Virginia, and creating cloud services for use by mobile devices. Other ongoing efforts include support for 511 information, smart work zones, and bicycle/pedestrian mobility.

Founder David Aylesworth will provide feedback to local transportation professionals on digital infrastructure requirements for smart city applications that will spur innovation and improve mobility, and share ideas for using mobility data to help local transportation planners.

Recommended Action
None. For information only.

Prepared By
Johnny Wong, PhD, MPO Staff

Attachments
None.
Board & Committee Agenda Item

**Agenda Item**
Tampa Bay Next Update: Westshore SafeTRIP

**Presenter**
Margaret Kubilins, FDOT District 7

**Summary**
To prepare for the reconstruction of Tampa's Westshore Interchange, FDOT has developed SafeTRIP which is a comprehensive Transportation Management Plan that will address Traffic Management, Regional Demand, Innovation and Smart Work Zones, and Public Engagement (TRIP).

The vision for SafeTRIP is a well-planned and innovative construction zone that maintains safety and reliability for the local community, the traveling public, and construction workers by providing quality transportation choices, strategic innovation, and proactive communication.

The presenter will discuss the details of SafeTRIP plan and its ITS elements.

**Recommended Action**
None. For information only.

**Prepared By**
Johnny Wong, PhD, MPO Staff

**Attachments**
None.
Technology Application Partnerships with Local Agencies for Deploying Connected and Automated Vehicle Technologies

Request for Partnership Proposals

6/10/2020
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1 FDOT Technology Applications Partnerships with Local Agencies

The Florida Department of Transportation (FDOT), through the Connected and Automated Vehicle (CAV) Program, requests applications from local agencies to deploy projects using CAV technologies on roadways within the state of Florida. The Technology Application Partnerships with Local Agencies for Deploying Connected and Automated Vehicle Technologies (TAPs-LA) was created to foster transportation innovation with local agencies.

2 Program Description

2.1 Vision, Goals, and Objectives of the CAV Program

The vision of using CAV technologies is to achieve a fatality-free roadway network and a congestion-free transportation system in Florida. The goal is to reduce highway crashes that result in fatalities. The objective is to use CAV technologies to increase mobility for all people, improve travel time reliability, enhance multimodal operations, and positively affect the economy of Florida. The CAV Business Plan, adopted in January 2019, includes additional details. It is recognized that CAV technologies and benefits do not stop at jurisdictional boundaries. Similar to FDOT’s approach for many years regarding interconnected signal systems, the FDOT encourages seamless CAV operations leveraging public investment.

2.2 TAPs-LA Focus Areas

The purpose of TAPs-LA is to partner with Florida’s local agencies to incorporate and deploy CAV technologies. TAPs-LA is funded under the FDOT’s CAV Program initiative to deploy advanced transportation and congestion management technologies, which may include:

1. Advanced traveler information systems
2. Advanced transportation management technologies
3. Roadway infrastructure maintenance, monitoring, and condition assessment
4. Advanced public transportation systems
5. Transportation system performance data collection, analysis, and dissemination systems
6. Advanced safety systems, including vehicle-to-vehicle and vehicle-to-infrastructure communications, technologies associated with autonomous vehicles, and other collision avoidance technologies
7. Advanced mobility and access technologies, such as dynamic ridesharing and information systems to support human services for elderly and disabled individuals
8. Advanced work zone management systems deployment

The definitions of these advanced transportation and congestion management technologies can be found in the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative notice of funding opportunity.

For project ideas, please visit the CAV website for operational and planned deployments. For clarification on eligibility, please contact the District Traffic Operations Engineer (DTOE).
3 Partnership Information

3.1 Eligible Applicants

The applicants must meet the following eligibility criteria to be considered for project selection. The applicants that do not meet the criteria should not submit applications. Eligible applicants must be one of the following types of organizations in the state of Florida:

1. County governments
2. City governments
3. Public transit agencies
4. Port authorities
5. Airport authorities

The FDOT encourages applicants to partner with the private sector or public agencies, including multimodal and multijurisdictional entities, research institutions, and organizations representing transportation and technology leaders or other stakeholders. For applications consisting of multiple local agencies, the lead agency should be listed first and the other agencies after. Applications that consist of multiple local agencies must have a cooperative agreement, memorandum of understanding, or other organizational mechanism in place and shown in the project proposal.

3.2 Eligible Roads

The roads must be existing and publicly maintained. The CAV Program, through the Districts, will fund the projects on state roads. Local agencies submitting applications accept that the local entity must own, operate, and maintain local roads within its jurisdiction before, during, and after deployment. This includes obtaining required permits for the local roads.

The project roads spanning more than one jurisdiction must be contiguous. Local agencies should work with their metropolitan planning organizations and transportation planning organizations to determine which state and local roads may be project candidates.

3.3 Procurement Approach

TAPS-LA includes a combination of state funds (from the FDOT) and local funds. State funding will be expended on the state highway system while local funding will be applied to local roads. If the local agency uses federal funds, a Local Agency Program (LAP) agreement and the associated LAP certification is required. If the FDOT performs the local project on the behalf of the local agency, the Locally Funded Agreement (LFA) process should be followed.

The Districts will evaluate participation on a case-by-case basis. The higher the participation, the more favorably the application will be considered. The FDOT will consider participation with local forces which may include construction, equipment, and personnel.

The FDOT will be responsible for funding, contracting, and managing the project on the state highway system. The local agency will be responsible for funding, contracting, and managing the project on the local roads. The procurement process for state and local roads should occur concurrently or as close in time as possible to minimize delays in the project schedule (although there is no guarantee that the project schedules will align). In addition, the FDOT District and local agency shall closely coordinate the two project scopes and schedules to ensure technology interoperability.
3.4 Roles and Responsibilities

The FDOT involvement will include the following:

1. Districts, specifically the DTOEs, will receive project partnership proposals.
2. Districts will identify, screen, and select a maximum of two project proposals per year and send recommendations to Central Office for further consideration.
3. Central Office CAV Program staff will shortlist a maximum of five projects per year for TSM&O leadership and assistant secretaries, if needed.
4. Central Office, including TSM&O leadership and assistant secretaries, will choose a minimum of two to a maximum of four projects for each fiscal year.
5. Districts will choose a contracting method to administer the project; the local agency may be a technical committee member or reviewer depending on the contracting method and project.
6. The District Traffic Operations Office will coordinate with the District Program Management Office, who in turn will facilitate funding for the contracting method in coordination with the District Traffic Operations Office and the Central Work Program and Budget Office. The District Traffic Operations Office will also coordinate with the Central Office CAV Program and the local agency.
7. Districts will monitor performance including but not limited to budget, project completion, and reporting annually and provide Central Office a status report in collaboration with the local agency before June 1 of each year.
8. Districts and local agencies will conduct a kick-off meeting. The Districts and local agencies may discuss the high-level concept of operations, systems engineering management plan, and Regional ITS Architecture update requirements at the kick-off meeting.
9. Districts and local agencies will participate in status meetings.
10. Districts will perform technical and budget reviews on funds for the projects.
11. Districts will provide technical guidance.
12. Districts and local agencies will coordinate on data management and sharing.
13. Districts and local agencies will develop the detailed scope for the before-and-after analysis.
14. The local agency will be responsible for the operations and maintenance (O&M) of all equipment installed on the local roads.
15. The Districts will cover the O&M costs on the state roads.

In the above notes, “District” refers to the FDOT District leadership including traffic operations and/or other offices at the discretion of the FDOT District leadership.

As a part of this program:

- The FDOT will offer the local agency access to the FDOT’s Vehicle-to-Everything (V2X) Data Exchange Platform.
- The FDOT will offer the local agency access to the FDOT’s Security Credential Management System (SCMS) Platform.
- The FDOT will lead the before-and-after analysis/study; the report is due within six months of project completion.
• The FDOT may provide other CAV platforms for interoperability and other elements for promoting safety and mobility, i.e., signal system modules, SunGuide®.

4 Project Selection Information

4.1 Funding and Number of Selected Projects
Central Office will select two to four projects totaling $2,000,000 per fiscal year. Funding will be available from fiscal year 2021 through 2025. District Offices may consider additional funding to supplement this TAPs-LA initiative.

4.2 Project Selection Contribution
Central Office, through the Districts, will contribute up to $500,000 toward each project, which can only be applied to a state road. The selected proposals will be determined on a case-by-case basis, based on engineering data and criteria discussed in Section 6, Application Review Information.

4.3 Period of Performance
The anticipated period of performance is between one and two years for a project. The applicants must propose a period of performance specific to their project.

4.4 Project Selection Process
The Districts will invite the local agencies within their jurisdiction to submit project proposals following the guidelines described in Section 5, Application and Submission Information. Selections will be made using the application review information described in Section 6. There will be two separate screenings: one at the District and one at Central Office.

The Districts will send their recommended projects to Central Office for consideration. If a District chooses multiple candidate projects, then the candidate projects should be ranked numerically with the highest priority project identified as number one. The District should send Central Office no more than two projects.

Central Office will evaluate the Districts’ recommended proposals and shortlist the applications to no more than five out of the total received applications from the Districts. The project list will be considered by the FDOT Transportation System Management and Operations (TSM&O) leadership and the FDOT assistant secretaries, if needed. After receiving input from the FDOT TSM&O leadership, Central Office will select two to four projects based on funding.

4.5 Program Requirements
Applicants can submit only one application per eligible entity (or lead agency – if there is more than one local agency on the project).

A report demonstrating a before-and-after analysis will be required following project completion. The objectives of the before-and-after analysis are as follows:

• To determine the effectiveness of the improvement in addressing safety and mobility goals
• To document the challenges encountered in furnishing, installing, integrating, and testing the equipment; as well as training maintenance and operational staff on using the equipment and system

Technology Application Partnerships with Local Agencies for Deploying Connected and Automated Vehicle Technologies
To assess the local agency performance of the system

The District and the local agency must work together to develop a detailed scope for the before-and-after analysis. If the application is selected, the District and the local agency must complete the before-and-after analysis. The report is due within six months of project completion.

The District and local agency must develop a high-level concept of operations (ConOps) on the system approach no later than three months after the agreement has been executed. If the local agency develops the ConOps, the cost will be considered a local force. Information on the FDOT systems engineering process including the ConOps can be found at this [website](#).

FDOT views TAPs-LA projects as long-term investments in CAV technology. Prior to the commencement of the project partnership, the Department and local agency concerned will enter into an agreement on the funding break-down, implementation/deployment schedule, roles, responsibilities and any other commitments to successfully complete the project. As part of the partnership agreement, the local agency will be responsible for O&M of all equipment installed on the local roads. The Districts will cover the O&M costs on the state roads. The FDOT District Office should enter into an agreement with the local agency that all CAV equipment on the local roads will be maintained by the local agency at their own cost.

5 Application and Submission Information

5.1 Submitting Application Package

Applicants must submit their applications electronically in Adobe Acrobat PDF format either on a non-returnable flash drive or via file transfer appliance to their DTOE.

5.2 Content and Form of Application Submission

The applicant must submit the application consisting of the following application volumes and sections (see Table 1).

<table>
<thead>
<tr>
<th>Volume</th>
<th>Section</th>
<th>Page Limitations/Formatting</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Technical Proposal</td>
<td>1. Cover Page and Work Program Supplemental Information</td>
<td>One file in PDF format; 10-page limit</td>
</tr>
<tr>
<td></td>
<td>2. Project Narrative</td>
<td>Arial/Calibri font, text size – 12 or above, 1-inch margin on all sides</td>
</tr>
<tr>
<td></td>
<td>3. Management Structure</td>
<td></td>
</tr>
<tr>
<td>II. Budget Detail</td>
<td>4. Budget Detail</td>
<td>One file in PDF format; 5-page limit</td>
</tr>
<tr>
<td>III. Schedule</td>
<td>5. Schedule</td>
<td>PDF of MS Project Gantt Chart (No more than 2 years)</td>
</tr>
</tbody>
</table>

5.2.1 Section 1 – Cover Page and Work Program Supplemental Information

The cover page must include the following information in table format (see Table 2). If the state road is associated with a project in the FDOT Five-Year Work Program, please provide the information listed in Table 3. Tables 2 and 3 do not count against the page limit.
Table 2: TAPs-LA Cover Page

| Project Name | Eligible Entity in Florida | Total Project Cost (from all sources) | $ | CAV Program Request (state roads only) | $ | Are local funds restricted to a specific project component? If so, which one? | | Is this project currently programmed in the below mentioned plan/program? | Yes | No |
| MPO or TPO Long Range Transportation Plan | | | | | | | |
| FDOT Five-Year Work Program | | Complete the Work Program Supplemental Information Form Complete the Work Program Supplemental Information Form | | | | | |
| City or County Capital Improvement Plan | | | | | | | |
| Technologies Proposed to Be Deployed | | | | | | | |
| Is the project within the existing architecture? | Yes | No | | | | | |

Table 3: TAPs-LA Work Program Supplemental Information Form
(To be completed by the District Office)

| Managing District | Geographical District | County | Project Manager | Trans System | Work Mix | Description | FPID | Phase | Contract Class |
| | | | | | | | | |
| SIS | Strategic Growth Corridor | Strategic Growth Hub | | | | | | |
| SIS Corridor | SIS Connector | SIS Hub | | | | | | |

5.2.2 Section 2 – Project Narrative

The project narrative should include the following information:

1. Vision, goals, and objectives of the applicant for the technology deployment, including any future related deployments, and the vision of the organization and goals, objectives, and activities to be pursued in addressing the identified issues and challenges
2. An introduction that provides a clear, concise description of the project and the proposed technology deployment(s)
3. A description of the geographic area or jurisdiction the deployment will service
4. A description of the real-world issues and challenges to be addressed by the proposed technology deployments; applicants should discuss how the proposed technology deployments address the goals of the CAV Program
5. A description of transportation systems and services to be included in the project
6. A deployment plan that includes providing long-term operation and maintenance of advanced transportation and congestion management technologies to improve safety, efficiency, system performance, and return on investment, and a meaningful description of the local agency’s commitment to operate and maintain the CAV devices
7. A description of any challenges in the regulatory, legislative, or institutional environments or other obstacles to deployment. This includes but is not limited to right-of-way constraints, environmental (species, wetlands, contamination, archeology, etc.)
8. Quantifiable system performance improvements, such as:
   a. Reducing traffic-related crashes, congestion, and costs
   b. Optimizing system efficiency
   c. Improving access to transportation services
9. Quantifiable safety and mobility benefit projections such as data-driven estimates of how the project will improve the study area’s transportation system efficiency and reduce traffic congestion
10. A plan to leverage and optimize existing local and regional advanced transportation technology investments
11. A schedule for conducting the technology deployment and for completion of all proposed activities

5.2.3 Section 3 – Management Structure
The applicant must describe the proposed management structure that will oversee the implementation of the project and provide administration of the agreement. The applicant shall include the following information in the application to describe their proposed management structure:

1. A description of the applicant’s organization that will be designated as the local agency entering the agreement:
   a) Membership of any partnership or entity proposed to carry out the deployment. Applicants that consist of multiple local agencies should show evidence that a cooperative agreement, memorandum of understanding, or other organizational mechanism must be in place and shown in the project proposal. This agreement must be in place contractually before the FDOT commits to the project implementation through the execution of the agreement.
   b) A description of how the entity will manage the program, including the management of project funding
2. A plan for partnering with the private sector or public agencies, including multimodal and multijurisdictional entities, research institutions, organizations representing transportation and technology leaders, or other transportation stakeholders
3. A diagram or flow chart depicting the organizational structure of the project team
4. Applications that include more than one local agency or consortia of research or academic institutions must show evidence that a cooperative agreement, memorandum of understanding, or other organizational mechanism is already executed in the project proposal. This agreement must be in place contractually before the FDOT commits to the project implementation through the execution of the agreement.

If the local road portion of the project is using federal funding, additional management requirements must be met in accordance with the LAP certification process. If the FDOT performs the local project on the behalf of the local agency, the Locally Funded Agreement (LFA) process should be followed.

The management structure should be represented in an organizational chart. The staffing for the application will be viewed for its program/project management structure or the organizational structure that will oversee the proposed technology deployment and its administration. The following staffing criteria will be considered as part of the application selection process:

- The degree that the application includes a program/project management structure or organization that will successfully oversee the proposed technology deployment
- Expertise and qualifications of key personnel for managing or conducting appropriate aspects of the proposed technology deployment through the period of performance

5.2.4 Section 4 – Budget Detail
The applicant shall provide a summary budget narrative. Please indicate the source of funds (federal, state, local or other) and resource commitments including from local forces. The applicant shall also provide a summary table providing the estimated costs across project components or tasks and type of road (state or local). The summary budget should represent the total cost of the project, inclusive of both the FDOT participation and the required local participation.

5.2.5 Section 5 – Project Schedule
The applicant shall provide a high-level Gantt chart of the proposed project.

6 Application Review Information
The FDOT will evaluate the projects based on technical merit, staffing, cost considerations, fiscal and managerial capacity, and operations and maintenance.

6.1 Technical Merit
The CAV Business Plan contains project selection criteria that will be used to evaluate the proposals. The project narrative should cover these categories. The Districts will evaluate the project proposals according to the project selection criteria and scoring matrix in Table 4.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Criteria</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerate the CAV Program</td>
<td>Does this project accelerate the deployment and implementation of CAV technologies in Florida?</td>
<td>6</td>
</tr>
</tbody>
</table>
### Categories

<table>
<thead>
<tr>
<th>Categories</th>
<th>Criteria</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Does this project directly reduce or have the potential to reduce fatal, serious injury, and/or secondary crashes?</td>
<td>20</td>
</tr>
<tr>
<td>Mobility</td>
<td>From a mobility perspective, does this project directly benefit at least one mode, i.e., vehicles, pedestrians, bicyclists, disabled, economically disadvantaged, and aging road users?</td>
<td>15</td>
</tr>
<tr>
<td>Efficiency and Reliability</td>
<td>Does this project directly benefit (or have the potential to impact) efficiency and/or reliability for travelers, freight, transit riders, aging road users, pedestrians, and/or bicyclists?</td>
<td>5</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Do proposed technologies comply with or have the potential to comply with relevant state and federal safety laws?</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Is the proposed project interoperable and/or does it have the potential to become interoperable with the existing or programmed CAV Projects?</td>
<td></td>
</tr>
<tr>
<td>Funds</td>
<td>Does this project leverage local funds if the project will involve industry partners, in addition to FDOT and the local agency, will there be a structured memorandum of understanding (MOU) spelling out the roles and responsibilities of all partners?</td>
<td>10</td>
</tr>
<tr>
<td>Benefit/Cost</td>
<td>Does this project offer benefits with a high B/C ratio and a good return on investment?</td>
<td>6</td>
</tr>
<tr>
<td>Data and Security</td>
<td>Explain how the project will safeguard data privacy and deploy a cybersecurity platform.</td>
<td>10</td>
</tr>
<tr>
<td>Operations and Maintenance</td>
<td>Does this project address staffing, funding, and procedures for operations, maintenance, and replacement of CAV infrastructure, technologies, and applications?</td>
<td>8</td>
</tr>
<tr>
<td>Project Evaluation</td>
<td>Does this project have pre-defined performance measures? What are the expected outcomes and how are these outcomes measured?</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Is there a systems validation and verification process in place? Explain how this will be performed.</td>
<td></td>
</tr>
<tr>
<td>Management Structure</td>
<td>Does the project offer a management structure to deliver the outputs with safety and mobility goals?</td>
<td>5</td>
</tr>
</tbody>
</table>

**Maximum Total Points** 100

---

### 6.2 Cost Considerations

The following cost considerations will be reviewed as part of the application selection process:

- The cost will be considered in the project selection decision; the cost information will be analyzed to assess cost reasonableness, eligibility, and conformance to applicable cost principles for FDOT Procedure 350-020-301; the applicants should provide local funds, and supporting detail for these funds, including the applicant’s activities to maximize the non-FDOT share of the project funding.
- Local agency funding availability, or the lead agency if there is more than one local agency, will be considered in the project selection decision.
This partnership agreement includes a combination of state funds (from FDOT) and local funds. State funding will be expended on the state highway system while local funding will be applied to local roads.

7 TAPs-LA Implementation and Project Selection Schedule

Table 5 shows the TAPs-LA implementation and project selection schedule. This is tentative and subject to change based on a District’s plans.

Table 5: TAPs-LA Implementation and Project Selection Schedule

<table>
<thead>
<tr>
<th>Item</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Districts receive TAPs-LA document</td>
<td>June 12, 2020</td>
</tr>
<tr>
<td>Districts begin TAPs-LA local agency engagement</td>
<td>June 19, 2020</td>
</tr>
<tr>
<td>DTOEs receive proposals</td>
<td>August 21, 2020</td>
</tr>
<tr>
<td>DTOEs send recommended proposals to Central Office</td>
<td>September 7, 2020</td>
</tr>
<tr>
<td>Central Office selects project proposals</td>
<td>September 28, 2020</td>
</tr>
<tr>
<td>Districts and Central Office work on getting the funds into the Work Program for state roads; local agency secures funding for local roads</td>
<td>September 29 through December 31, 2020</td>
</tr>
<tr>
<td>Districts and local agencies implement projects - TBD</td>
<td>Tentative ~ January 4, 2021</td>
</tr>
</tbody>
</table>
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Executive Summary

The Connected and Automated Vehicles (CAV) Program at the Florida Department of Transportation (FDOT) is gaining significant momentum. FDOT’s Central and District Offices, planning and implementation stakeholders, industry entities, and university partners are aggressively supporting the deployment of the CAV Program to achieve near-term and sustainable safety, mobility, and economic development (SME) benefits. FDOT has started planning, designing, and deploying several CAV pilot projects. FDOT has also started to engage with private-sector companies that are developing, testing, and implementing CAV technologies and applications. FDOT’s Transportation Systems Management and Operations (TSM&O) Program and the Statewide Arterial Management Program (STAMP) are key to the Department’s CAV Program.

This CAV Business Plan identifies and captures the results of FDOT’s coordination through internal and external meetings and workshops. These meetings and workshops assist in acknowledging the unknowns and help in developing an institutionalized framework and timeframes to aggressively move the CAV Program from research and pilot projects into statewide deployment using expedited planning and outcome-centric SME goals. This CAV Business Plan also outlines preparation efforts for Florida’s infrastructure while drawing upon lessons learned from prior FDOT projects. This document is not intended to be a strategic plan, but builds on similar FDOT programs and plans, including but not limited to the: Florida Transportation Plan (FTP), TSM&O Strategic Plan, STAMP Action Plan, Transportation Technology Strategic Plan, Strategic Highway Safety Plan (SHSP), Strategic Intermodal System (SIS) Policy Plan, Florida’s Aging Road Users Strategic Safety Plan (Safe Mobility for Life Coalition), and Traffic Incident Management (TIM) Plan.

Drawing on the vision and goals from the strategic plans listed above, this CAV Business Plan identifies specific CAV short-term to long-term action items. This CAV Business Plan will remain active with periodic updates as opportunities and needs arise. This Plan identifies the following categories of CAV activities as key elements for fulfilling the SME goals in Florida.

- Identify **policies and governance** with a goal to develop and communicate an institutionalized framework for planning, designing, and deploying CAV in Florida to maximize the SME benefits.
- Leverage **program funding** and identify other funding opportunities for implementation, operations, and maintenance.
- Identify **education and outreach** program objectives with a goal to create awareness of CAV Program deployments and develop the current and future CAV workforce in Florida.
- Develop **industry outreach** to implement SME outcome-based CAV technologies **through active partnerships** with the industry, universities, and stakeholders.
- Identify and develop **technical standards and specifications** to create a framework for CAV infrastructure preparedness including general facilities design, software updates, and hardware upgrades.
- Establish a platform for **CAV implementation readiness** in terms of technology implementation, infrastructure improvements, and needs identification.
- Move towards full-scale **CAV deployment and implementation** using the most relevant CAV applications that have the potential to achieve the SME benefits.
### Legend Key: CAV Business Plan Action Items, Symbols, and Acronyms

<table>
<thead>
<tr>
<th>Status Symbols</th>
<th>Relative Cost Symbols</th>
<th>Role Acronyms</th>
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<td>Symbol</td>
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<td>Symbol</td>
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<td>FAU</td>
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<td>FIU</td>
<td>MPO/TPO</td>
<td>Metropolitan and Transportation Planning Organizations</td>
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<td>UF</td>
<td>FP</td>
<td>Freight Logistics and Passenger Operations</td>
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<tr>
<td>UNF</td>
<td>WP</td>
<td>Work Program and Budget</td>
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<td>USF/CUTR</td>
<td>WP</td>
<td>Work Program and Budget</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal Impact Acronyms/Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>ED</td>
</tr>
</tbody>
</table>

### Responsibility Acronyms

<table>
<thead>
<tr>
<th>Term Acronyms</th>
<th>TEO</th>
<th>Traffic Engineering and Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>Policy Planning</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Systems Planning</td>
<td></td>
</tr>
<tr>
<td>SIS</td>
<td>Strategic Intermodal System</td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>Forecasting and Trends</td>
<td></td>
</tr>
<tr>
<td>TDA</td>
<td>Transportation Data Analytics</td>
<td></td>
</tr>
<tr>
<td>EM</td>
<td>Environmental Management</td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>Transportation Technology</td>
<td></td>
</tr>
<tr>
<td>PIO</td>
<td>Public Information Office</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Mobility</td>
<td></td>
</tr>
<tr>
<td>ED</td>
<td>Economic Development</td>
<td></td>
</tr>
</tbody>
</table>

| Policy, Guidance, Standard, Specification, Report, etc. |
1. Introduction and Background

The Connected and Automated Vehicles (CAV) Program at the Florida Department of Transportation (FDOT) is gaining significant momentum. FDOT’s Central and District Offices, planning and implementation stakeholders, industry entities, and university partners are aggressively pursuing the deployment of the CAV Program to achieve sustainable safety, mobility, and economic development (SME) benefits. FDOT has started planning, designing, and deploying several CAV pilot projects, and is engaging with private companies that are developing, testing, and implementing CAV technologies. FDOT’s Transportation Systems Management and Operations (TSM&O) Program and the Statewide Arterial Management Program (STAMP) are key to the Department’s CAV Program.

FDOT and its partners are committed to continuing the deployment of the CAV projects to support the SME needs in the state. FDOT’s CAV Program partners include the United States Department of Transportation (USDOT), local agencies (city and county), Metropolitan Planning Organizations (MPOs), Transportation Planning Organizations (TPOs), toll authorities, local transit agencies, private-sector technology and application developers, auto manufacturers (original equipment manufacturers (OEMs) and Tier 1 and Tier 2 suppliers), Florida and national modal, professional, and standards development organizations, and universities. This CAV Business Plan links the CAV Program with the various project activities and the CAV efforts to create a comprehensive statewide approach which includes planning, research, implementation, maintenance, and operations. This CAV Business Plan follows other FDOT programs and plans, including the Florida Transportation Plan (FTP), TSM&O Strategic Plan, STAMP Action Plan, Transportation Technology Strategic Plan, Strategic Highway Safety Plan (SHSP), Strategic Intermodal System (SIS) Policy Plan, Florida’s Aging Road Users Strategic Safety Plan (Safe Mobility for Life Coalition), and Traffic Incident Management (TIM) Plan.

At the national level, FDOT is actively involved in committees and initiatives, including the multi-state Connected Vehicle (CV) Pooled Fund Study, the American Association of State Highway and Transportation Officials’ (AASHTO) Committee on Transportation System Operations (CTSO), the AASHTO Committee on Traffic Engineering (CTE), the AASHTO Vehicle-to-Infrastructure (V2I) Deployment Coalition, the I-95 Corridor Coalition, the Institute of Transportation Engineers (ITE), and the Intelligent Transportation Society of America (ITSA). For example, FDOT responded to the AASHTO Signal Phase and Timing (SPaT) challenge with a project in Tallahassee. Such activities have allowed FDOT to sustain and expand its national leadership while developing a strong CAV Program.

The CAV Business Plan was initiated within FDOT’s Statewide Traffic Engineering and Operations Office (STEOO). As the CAV Program is expanding, the coordination and collaboration efforts with FDOT Central and District Offices are also increasing. To better understand the perspectives of various offices on CAV opportunities and challenges, and their planned roles, the STEOO interacts and collaborates with internal partners and external stakeholders. This Plan supports safety, mobility, and infrastructure advancements achievable by deploying CAV technologies.

1.1. Vision, Goals, and Objectives

The CAV Program goals and objectives support the FDOT TSM&O 2017 Strategic Plan. The CAV technologies have the potential to significantly reduce highway crashes that result in traffic fatalities. This is consistent with FDOT’s vision and that of Vision Zero. The CAV technologies also have the potential to improve travel time, increase vehicle and person mobility, enhance multimodal operations, and positively affect the economy in Florida.
1.1.1. CAV Vision
This CAV Business Plan drives, towards Vision Zero with a fatality-free roadway network and a congestion-free transportation system in Florida using CAV technologies.

1.1.2. Safety Objectives
The objective of the CAV Program is to improve safety for all transportation modes and road users, including pedestrians and bicyclists. This safety objective aligns with the FDOT’s SHSP, FTP, SIS Policy Plan, and other state and national programs funded by the Federal Highway Administration (FHWA), the Federal Motor Carrier Safety Administration (FMCSA), and the National Highway Traffic Safety Administration (NHTSA). NHTSA observed that 94% of highway crashes are caused by human error\(^1\). Recognizing the potential to mitigate human error, while noting that this expectation needs to be tested and validated, implementation of CAV technology is anticipated to improve safety in the long-term.

1.1.3. Operations/Mobility Objectives
Traffic congestion (Figure 1) in Florida is increasing due to several factors, including population and tourism growth. According to the USDOT, CAV signal-control applications reduced travel time by 27\%, while the cooperative adaptive cruise control and speed harmonization reduced travel time by 42\%. While continuing to implement conventional operational improvements, the objective of the CAV Program is to leverage CAV technologies to significantly improve traffic operations, and increase vehicle, person, and multimodal throughput.

1.1.4. Economic Development Objectives
The objective of the CAV Program is to interact with the private sector to promote economic development in Florida. As of September 2018, FDOT has already entered into statewide data user agreements with Waze, Traffic Technology Services (TTS), Connected Signals (CS), Live Traffic Data (LTD), and is exploring other industry partners, such as freight, transit, etc. Collaboration with transportation industry partners is essential for accomplishing this objective.

1.2. Focus Areas
The following are the seven priority focus areas of this Business Plan:
1. Policies and Governance
2. Program Funding
3. Education and Outreach
4. Industry Outreach and Partnerships
5. Technical Standards and Specifications Development
6. Implementation Readiness
7. Deployment and Implementation

1.3. CAV Implementation Roadmap Overview
Of the three phases (Figure 2) to implement this Plan, the Initialization Phase has been in progress since FY 2017 with various research and pilot projects, along with involvement in national committees and

\(^1\) https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812506
organizations that focus on CAV standards and implementation efforts. Table 1 shows the relationship between the roadmap and the specific priority focus areas.

**Figure 2. CAV Implementation Roadmap Overview**

![Roadmap Overview Diagram]

**Table 1. CAV Focus Areas Roadmap**

<table>
<thead>
<tr>
<th>CAV Focus Area</th>
<th>Initialization</th>
<th>Early Implementation</th>
<th>Full-Scale Implementation and Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies and Governance</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Program Funding</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Education and Outreach</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Industry Outreach and Partnerships</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Technical Standards and Specification Development</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Implementation Readiness</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Deployment and Implementation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

NOTE: Please refer to the Legend Key, preceding Page 1.

The **2017-2018 Initialization Phase** focus elements include a wide range of activities, including:

- Participate in national organizations such as AASHTO and ITE.
- Develop and build relationships with CAV technology manufacturers and application developers.
- Provide opportunities for both internal and external developers to develop and test technologies and applications.
- Build industry partnerships and update the relevant FDOT policies and approaches.
- Participate in CAV initiatives and use available tools such as those from USDOT.
- Develop, implement, and evaluate CAV pilot projects.
- Develop a data management plan, an operations and maintenance (O&M) framework, education and outreach activities, and understand the existing conditions.
- Coordinate internally on CAV activities, while aligning with other plans and FDOT’s vision.

The **2019-2020 Early Implementation Phase** focuses on small- to medium-scale implementation and pilot projects, using O&M funds, phasing in CAV, upgrading SunGuide® software, utilizing the Data Integration and Video Aggregation System (DIVAS), updating architecture documents, developing performance measures, and collaborating with private and public industry partners.

The **2020+ Full-Scale Implementation and Operations Phase** focuses on completing infrastructure upgrades, implementing large CAV projects, conducting performance and outcome assessments, performing O&M activities, advancing outreach with stakeholders, and analyzing the impacts of agency and industry partnerships.
2. CAV Focus Areas and Action Items

2.1. Policies and Governance

This CAV Business Plan identifies the policies and governance elements with a goal to develop and communicate an institutionalized framework for planning, designing, and deploying the CAV Program in Florida. Table 2 shows the specific action items.

Table 2. Policies and Governance Action Items

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform Coordination for Technology, Data Governance, and Policies.</td>
<td>1</td>
<td>☮</td>
<td>S</td>
<td>E</td>
<td></td>
<td>TEO, TT, PP, LP</td>
<td>$</td>
</tr>
<tr>
<td>Implement and Maintain the CAV Business Plan.</td>
<td>2</td>
<td>☮</td>
<td>NM</td>
<td></td>
<td></td>
<td>TEO</td>
<td>$</td>
</tr>
<tr>
<td>Oversee CAV Program Delivery and Messaging.</td>
<td>3</td>
<td>☮</td>
<td>M</td>
<td>E</td>
<td>S, M, ED</td>
<td>LT, TEO</td>
<td>$</td>
</tr>
<tr>
<td>Collaborate with the Office of Transportation Technology to develop an enterprise operation change management framework, if required.</td>
<td>4</td>
<td>➡</td>
<td>M</td>
<td>E</td>
<td></td>
<td>TEO, TT, FP, EM</td>
<td>$</td>
</tr>
</tbody>
</table>

NOTE: Please refer to the Legend Key, preceding Page 1.
*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.

The key initial steps for the policies and governance action items include:
- Identify opportunities to prioritize and coordinate CAV Program activities within Florida.
- Develop statewide CAV Program messaging.
- Incorporate other state agencies into the CAV project implementation process.
- Incorporate local agencies into the CAV project implementation process, leveraging the existing Local Agency Program (LAP) certifications to the extent possible.
- Evaluate federal and state policies related to CAV.
- Develop CAV Program workforce-related items such as training, skill development, resource needs, etc.
- Develop economic impacts through the CAV Program to follow FTP goals.
- Summarize current state and national legislation supporting CAV.
- Leverage and discuss SIS Policy Plan to support CAV Program.
- Identify roles and responsibilities for states, governing/regulatory agencies, local agencies, etc.
- Discuss and understand the CAV regulation elements.

2.2. Program Funding

Developing a program funding strategy can assist FDOT to prioritize work and make the best use of available funds. A sound funding strategy can assist with identifying grants or funding opportunities in advance to avoid last-minute proposals and make the best use of available resources. Table 3 shows the specific action items.

Table 3. Program Funding Action Items

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish Sustainable CAV Implementation, O&amp;M Funding using State/SIS/District/Local Funds.</td>
<td>5</td>
<td>☮</td>
<td>S</td>
<td>NM</td>
<td>S, M, ED</td>
<td>LT, TEO, WP, FP, PP</td>
<td>$$$</td>
</tr>
</tbody>
</table>

NOTE: Please refer to the Legend Key, preceding Page 1.
*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.
Florida’s CAV Business Plan

### Functional Areas and Action Items

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track the role of CAV in the TSM&amp;O Cost Feasible Plan.</td>
<td>6</td>
<td>☀</td>
<td>S</td>
<td>E</td>
<td>📜</td>
<td>TEO, D1-7, FTE</td>
<td>$</td>
</tr>
<tr>
<td>Study CAV Implementation and O&amp;M Best Practices, and Staffing Needs.</td>
<td>7</td>
<td>☀</td>
<td>M</td>
<td>E</td>
<td>📜</td>
<td>TEO</td>
<td>$</td>
</tr>
</tbody>
</table>

**NOTE:** Please refer to the Legend Key, preceding Page 1.

*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.

The key initial steps for the *program funding* action items include:

- Identify funds to foster CAV deployments including O&M funding.
- Determine types and priority of projects that FDOT wants to support with startup funding.
- Actively coordinate with and involve Policy and System Planning, District Planning, and TPOs and MPOs early in the project planning process.
- Determine funding sources that FDOT intends to use.
- Develop funding applications for grant opportunities such as Advanced Transportation and Congestion Management Technology Deployment (ATCMTD), Accelerated Innovation Deployment (AID) Demonstration, and Better Utilizing Investments to Leverage Development (BUILD).
- Address staffing needs for implementation, maintenance, and development.
- Discuss SIS routes and potential of including CV technology earlier in the planning process.

The CAV equipment will require periodic and responsive maintenance such as inspections, preventive maintenance, repairs, and monitoring. Required on-call staff will handle critical emergency repairs as well as scheduled upgrades and replacements. Just as with ITS devices, CAV equipment will eventually start to age, and bring a considerable increase to its annual maintenance costs. Therefore, there is a need for dedicated O&M and replacement funds for the CAV deployment projects.

#### 2.3. Education and Outreach

The *education and outreach* program is aimed at organizational change management, while creating a unified message, and increasing awareness about CAV opportunities. *Education and outreach* are meant to provide the current and future transportation workforce with increased CAV Program knowledge and skills including, but not limited to, technology, deployment, integration, and software development. FDOT will explore the need for developing the educational outreach program to inform transportation planners, managers, engineers, local agencies, and users (travelling public, motor carriers, other road users) about the CAV Program. Outreach will assist in providing a better understanding of how CAV infrastructure will be deployed and operated, while also addressing the infrastructure requirements, standards, implications, and challenges with CAV deployments. Table 4 shows the *Education and Outreach* action items.

**Table 4. Education and Outreach Action Items**

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop CAV information.</td>
<td>8</td>
<td>☀</td>
<td>M</td>
<td>E</td>
<td>📜</td>
<td>TEO, P, TDA</td>
<td>$</td>
</tr>
<tr>
<td>Implement CAV awareness outreach.</td>
<td>9</td>
<td>☀</td>
<td>M</td>
<td>E</td>
<td>📜</td>
<td>TEO, P, TDA, D1-7, FTE</td>
<td>$</td>
</tr>
<tr>
<td>Support Florida Automated Vehicles (FAV) Summit and other CAV events.</td>
<td>10</td>
<td>☀</td>
<td>L</td>
<td>E</td>
<td>ED</td>
<td>TDA, TEO, LP, FP</td>
<td>$</td>
</tr>
</tbody>
</table>
Educational outreach programs may:

- Highlight CAV benefits and trends.
- Identify elements and functions pertaining to the CAV Program.
- Develop CAV case studies and lessons learned.
- Provide an understanding and explanation of CAV architecture and infrastructure needs.
- Communicate CAV opportunities, challenges, benefits, and perceptions.
- Partner with Florida universities including FAU, FIU, FPU, FSU-FAMU, UCF, UF, UNF, USF/CUTR.
- Research the impacts of ride-hailing, shared mobility etc. on vehicle-miles traveled and CAV.

2.4. Industry Outreach and Partnerships

The goal of industry outreach and partnerships is to foster economic development and to leverage private sector efforts to improve safety and mobility, and to implement outcome-based CAV solutions through strategic partnerships with the industry, universities, and others. Collaborating with industry leaders, researchers, and the private sector can assist FDOT to better prepare for leveraging opportunities and addressing challenges of CAVs. Table 5 shows the Industry Outreach and Partnerships action items.

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage, Establish Favorable Environment for, and Create Public-Private Partnerships.</td>
<td>12</td>
<td>S, M</td>
<td>NM</td>
<td>S, M, ED</td>
<td>TEO, TDA, LT, LP</td>
<td>$$$</td>
<td></td>
</tr>
<tr>
<td>Provide Opportunities for Industry Partners to Test Hardware and Software.</td>
<td>13</td>
<td>O</td>
<td>S</td>
<td>NM</td>
<td>S, M, ED</td>
<td>TEO, TT</td>
<td>$$$</td>
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</tbody>
</table>

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*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.

While obtaining industry input and feedback on CAV policy formulation and the development and implementation of this Plan, the Department will discuss its internal role versus what will be expected of the industry. Partnerships with different segments of the CAV industry can keep FDOT informed and better aligned with their short- and long-term decisions. Benefits to the industry and other partnerships in Florida include:

- Opportunities to fast-track CAV deployments
- Improved understanding of standards development process including O&M practices
- Increased ability to access innovation and test advanced technologies
- Better-aligned research and development investments with CAV industry needs
- Well-defined roles and responsibilities of public versus private entities
- Managed CAV agreements and deliverables
- Properly formulated policy on CAV with private industry engagement

2.5. Technical Standards and Specifications Development

Standards play a vital role by providing interoperability between new and existing infrastructure, functions, and processes. These standards form the basis of how products and processes interact with
each other. The goal of CAV technical standards and specifications development is to create a framework for consistent infrastructure preparedness, including general facility design, software updates, and hardware upgrades. The CAV standards are currently under development through a cooperative partnership between the industry and USDOT. Advancing and adopting these standards will assist in expediting the deployment of CAV applications in Florida. Table 6 shows the specific action items.

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop Systems Engineering Process for CAV.</td>
<td>14</td>
<td>O</td>
<td>M</td>
<td>E</td>
<td></td>
<td>TEO</td>
<td>$$</td>
</tr>
<tr>
<td>Implement Security Credential Management System (SCMS), and Cybersecurity and Physical Security of CAV Equipment.</td>
<td>15</td>
<td>O</td>
<td>M</td>
<td>NM</td>
<td></td>
<td>TEO, TT</td>
<td>$$$</td>
</tr>
<tr>
<td>Mainstream CAV into FDOT Standards and Specifications, Guides, and Manuals.</td>
<td>16</td>
<td>O</td>
<td>M</td>
<td>E</td>
<td></td>
<td>TEO, PM, D</td>
<td>$$</td>
</tr>
</tbody>
</table>

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Several professional associations are currently developing, maintaining, and updating CAV-related standards. The USDOT also offers an array of useful online tools and requirements for collecting and distributing CAV data in real-time based on these standards. The following are the key implementation steps:

- Following the FDOT Transportation Technology Plan Enterprise Architecture
- Follow national/international standard associations/agencies, such as:
  - Society of Automotive Engineers (SAE) – J2735, J2945, etc.
  - Institute of Electrical and Electronics Engineers (IEEE) – P802.11p-2010, 802.3, 1609.0
  - 3rd Generation Partnership Project (3GPP)
  - National Transportation Commissions for ITS Protocol (NTCIP) – 1202, 1206, etc.
  - National/International Agencies such as Dan law, OmniAir Consortium, 7layers, etc.
  - International Organization for Standardization (ISO)
- Follow USDOT initiatives, such as:
  - Roadside Unit (RSU) Specifications
  - USDOT Proof of Concepts – SCMS, etc.
  - Information Data Exchange (IDE) Proof of Concept
  - USDOT (SpAt) MAP Data Development Tool
  - USDOT Pilot Projects – CAV Pilots, Smart City, Test Beds
  - Crash Avoidance Metrics Partnership (CAMP) Initiatives
  - Strategic Transit Automation Research Plan
  - Central Florida Connected Vehicles (CV) Proving Ground
  - Federal Transit Administration (FTA) Transit Automation Initiative Guidance
- Leverage lessons learned from various CAV pilot projects in Florida
- Participate in professional associations, such as Association of Unmanned Vehicle Systems International (AUVSI), IEEE, NTCIP, 3GPP, etc.
- Coordinate with FDOT Design Office for specifications and design standard updates
- Address security elements pertaining to SCMS usage and applications, physical security, and network and data security; refer to 14-2 F.A.C. cybersecurity standards, as applicable
2.6. Implementation Readiness

The goal of **CAV implementation readiness** is to create a statewide CAV-ready environment for deployment of infrastructure and meeting any identified needs. For example, FDOT is implementing projects such as the SPaT Challenge and I-75 FRAME, while partnering with the University of Florida’s (UF) I-STREET and Florida Turnpike Enterprise’s SunTrax. As FDOT accelerates CAV deployment around the state, each project will have unique requirements that entail specific approaches to implementation and deployment; however, there is a large set of commonalities among the deployments. Table 7 provides the **Implementation Readiness** action items.

**Table 7. Implementation Readiness Action Items**

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use and Apply USDOT Implementation Tools.</td>
<td>17</td>
<td>Ø</td>
<td>M</td>
<td>E</td>
<td>S, M, ED</td>
<td>TEO, D1-7, FTE</td>
<td>$$$</td>
</tr>
<tr>
<td>Develop CAV-related Items for Traffic Engineering Research Laboratory (TERL) Processes.</td>
<td>18</td>
<td>Ø</td>
<td>M</td>
<td>NM</td>
<td></td>
<td>TEO</td>
<td>$$$</td>
</tr>
<tr>
<td>Develop CAV Infrastructure Deployment Plan.</td>
<td>19</td>
<td>Ø</td>
<td>L</td>
<td>E</td>
<td>, ED</td>
<td>TEO</td>
<td>$</td>
</tr>
<tr>
<td>Address RTMC Needs for Data Usage/Storage.</td>
<td>20</td>
<td>Ø</td>
<td>M</td>
<td>E</td>
<td></td>
<td>TEO, D1-D7, FTE, TT</td>
<td>$</td>
</tr>
<tr>
<td>Analyze CAV Safety Elements/SHSP Focus Areas.</td>
<td>21</td>
<td>Ø</td>
<td>M</td>
<td>E</td>
<td>, S</td>
<td>TEO</td>
<td>$</td>
</tr>
<tr>
<td>Prepare for Communication Options.</td>
<td>22</td>
<td>Ø</td>
<td>M</td>
<td>NM</td>
<td></td>
<td>TEO, TT</td>
<td>$</td>
</tr>
<tr>
<td>Develop Decision Support Systems.</td>
<td>23</td>
<td>Ø</td>
<td>M</td>
<td>NM</td>
<td>S, M</td>
<td>TEO, D1-7, FTE, ED, EM</td>
<td>$$$</td>
</tr>
</tbody>
</table>

**NOTE:** Please refer to the Legend Key, preceding Page 1.

*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.*

The following are the key implementation steps:

- Leverage the Open Source Application Development Portal.
- Make resources and investments available based on alternative evaluations.
- Prepare readiness plans for freeways and expressways, signalized intersections, non-signalized intersections, and integrated corridors.
- Perform analysis of infrastructure, and capabilities of network, data centers, local agencies, etc.
- Prepare for continuous and real-time collection of data, data archival, data retrieval and analysis of data from the pilot projects.
- Develop CAV Infrastructure Deployment Plan - establish a method to identify, track, communicate, and meet miscellaneous CAV infrastructure needs through the **CAV technical standards and specifications development** process.
- Address risk management by:
  - increasing the knowledge and understanding of risk amongst all stakeholders,
  - improving internal risk culture and aligning the CAV Program goals with risks,
  - identifying economic impacts and assessing risks of the CAV Program, and
  - identifying risks such as those related to interoperability, obtaining the Federal Communications Commission (FCC) approvals in a timely manner, and data storage.
- Analyze Regional Transportation Management Center (RTMC) requirements for:
  - data retrieval, storage, archival, sharing, etc.,
  - integration with ROADS,
  - establishing data governance, and
2.7. Deployment and Implementation

The FDOT’s **CAV deployment and implementation** effort focuses on *phasing in* the CAV applications. The goal is to move from planning to full-scale CAV deployment and implementation using various applications to achieve the SME goals in Florida. Based on the type of deployment planned, the FDOT Central Office (CO) will assist the District Offices and local agencies in identifying the infrastructure required for the deployment. FDOT has traditionally identified deployment projects that are funded through various sources including those with federal match or through state and research programs; these projects (I-75 FRAME, US 90 SPaT, Gainesville SPaT Trapezium, etc.) are being planned or deployed. This approach should continue at a fast pace since the industry is rapidly evolving and technologies are changing. **CAV Deployment and Implementation** generally work together with applicable recurring tasks in prior Sections 2.1 through 2.6. Table 8 shows the **Deployment and Implementation** action items.

### Table 8. Deployment and Implementation Action Items

<table>
<thead>
<tr>
<th>Functional Areas and Action Items</th>
<th>Activity</th>
<th>Status</th>
<th>Term</th>
<th>Main Role</th>
<th>Outcome</th>
<th>Responsibility*</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement Statewide CAV Deployment Plan.</td>
<td>24</td>
<td>O</td>
<td>M</td>
<td>NM</td>
<td>S, M, ED</td>
<td>TEO, FP</td>
<td>$$$</td>
</tr>
<tr>
<td>Incorporate CAV into RTMC Operations.</td>
<td>25</td>
<td>O</td>
<td>M</td>
<td>NM</td>
<td>S, M</td>
<td>TEO, D1-7, FTE</td>
<td>$$$</td>
</tr>
<tr>
<td>Develop Standard Operating Procedures.</td>
<td>25.01</td>
<td>O</td>
<td>M</td>
<td>NM</td>
<td>📖</td>
<td>TEO, D1-7, FTE</td>
<td>$ $</td>
</tr>
<tr>
<td>Develop and Implement Updates to SunGuide®.</td>
<td>25.02</td>
<td>O</td>
<td>M</td>
<td>NM</td>
<td>📖</td>
<td>TEO, D1-7, FTE</td>
<td>$$$</td>
</tr>
<tr>
<td>Develop Benefit-Cost (B/C) Ratios (In-Field or Proxy) for CAV Applications.</td>
<td>26</td>
<td>O</td>
<td>S</td>
<td>E</td>
<td>📖</td>
<td>D1-7, FTE</td>
<td>$$$</td>
</tr>
</tbody>
</table>

**NOTE:** Please refer to the Legend Key, preceding Page 1.

*Several Offices (TEO, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, WP, FP, PIO and TT) may have a role.

The following are the key steps to deployment and implementation:

- Perform a District survey, and advise, on regional long-range transportation plan and project needs in coordination and consultation with the District and Central Planning Offices.
- Focus on the MPOs and TPOs, in consultation with FDOT Central and District Offices.
- Leverage existing regional partnerships with cities, counties, and universities.
- Advance projects based on Districts’ needs following the guidance from the TSM&O Leadership Team.
- Potential near-term CAV Deployment Plan project categories include:
  - Provide network connectivity and types of connections from field locations to the RTMCs and Traffic Management Centers.
  - Upgrade traffic signal controllers and evaluate upgrade options so that signal controllers can interface with an RSU for extraction of SPaT basic safety messages.
  - Develop MAP data for pilot locations.
  - Conduct pilot projects with applications in Smart Work Zones (SWZ), Autonomous Truck Mounted Attenuators (ATMA), Truck Platooning, pedestrian safety applications, multimodal applications including transit and freight, and aging driver mobility applications.
  - Implement CAV projects in all FDOT Districts to achieve the SME goals. This shall be accomplished with input from the Districts and the TSM&O Leadership Team.
3. Project Selection Criteria and Performance Measures

3.1. Selection Criteria

All projects to be funded for deployment should follow the systems engineering (SE) process. A high-level operational concept should be developed to define user needs and perform stakeholder coordination. The following project selection criteria provide general guidance to develop CAV deployment projects. A score on a scale of 1-10 (10 being the most beneficial rank) may be assigned to the identified project for each criterion (see Table 9). These criteria may be used for various purposes, including project prioritization at the Districts and by the Central Office.

Table 9. Project Selection Criteria and Scoring Matrix

<table>
<thead>
<tr>
<th>Categories</th>
<th>Criteria</th>
<th>Self-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerate the CAV Program</td>
<td>Does this project accelerate the deployment and implementation of CAV technologies in Florida?</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>Does this project directly reduce or have the potential to reduce fatal, serious injury and/or secondary crashes?</td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td>From a mobility perspective, does this project directly benefit all modes including pedestrians, bicyclists, disabled, economically disadvantaged, and aging road users?</td>
<td></td>
</tr>
<tr>
<td>Efficiency and Reliability</td>
<td>Does this project directly benefit (or have potential to impact) efficiency and/or reliability for all travelers, freight, transit riders, aging road users, pedestrians, and bicyclists?</td>
<td></td>
</tr>
<tr>
<td>Feasibility</td>
<td>Is this project implementable (technology-ready), scalable, and portable for statewide deployment?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do proposed technologies comply with or have the potential to comply with relevant state and federal safety law?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the proposed project interoperable and/or does it have the potential to become interoperable with the existing or programmed CAV Projects?</td>
<td></td>
</tr>
<tr>
<td>Funds</td>
<td>Does this project leverage federal, local, and/or private funds? Are there any private organization and/or local agency partners? If yes, what are their match types and roles? Is there an agreement or Memorandum of Understanding (MOU) in place?</td>
<td></td>
</tr>
<tr>
<td>Benefit/Cost</td>
<td>Does this project offer benefits with a high B/C and a good return on investment?</td>
<td></td>
</tr>
<tr>
<td>Data and Security</td>
<td>Does this project collect, disseminate, and use real-time traffic, transit, parking, and other transportation information to improve safety and mobility, and reduce congestion? Explain how the project will safeguard data privacy and deploy a cybersecurity platform.</td>
<td></td>
</tr>
<tr>
<td>Operations and Maintenance</td>
<td>Does this project address staffing, funding, and procedures for operations, maintenance, and replacement of CAV infrastructure, technologies, and applications?</td>
<td></td>
</tr>
<tr>
<td>Project Evaluation</td>
<td>Does this project have pre-defined performance measures? What and how are these outcomes measured?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Will there be a before and after analysis performed, and lessons learned documented? If yes, how will this be documented and shared?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a systems validation and verification process in place? Explain how this will be performed.</td>
<td></td>
</tr>
</tbody>
</table>

Total Score
3.2. Evaluation and Performance Measures

Project evaluation is an integral part of pilot implementation. Evaluation should be performed at two stages of the project life cycle:

- Pre-project evaluation for the selection of projects based on strategies listed in Section 3.1 to meet the overall statewide CAV Program's SME goals
- Post-project evaluation to assess the impact of the project meeting the overall project objectives and goals

These evaluations are identified to document and share lessons learned and to develop future guidance. All projects should have verification, validation, and testing, and should answer the following questions:

- Was the system built as envisioned and designed? Is the project doing what it is intended to do? For example, are the SPaT and MAP messages being broadcasted, are they accurate, etc.?
- Did the project achieve the benefits expected when the project was selected for implementation? For example, are intersection-related crashes and delays at SPaT-equipped intersections reduced?

The project-specific performance measures may be discussed and developed by the stakeholder team. The SME benefit-cost analysis should also be conducted during the pre-project evaluation phase with the benefit-cost and return on investments analyses evaluated and tracked after implementing the projects.

4. Summary

This CAV Business Plan identified the following categories of CAV Program activities as key elements for fulfilling the SME goals in Florida:

- Identify **policies and governance** with a goal to develop and communicate an institutionalized framework for planning, designing, and deploying CAV in Florida.
- Leverage **program funding** and identify additional funding opportunities for implementation, operations, and maintenance.
- Identify **education and outreach** program objectives with a goal to create awareness and usage of CAV Program deployments and develop workforce on CAV Program practice in Florida.
- Develop **industry outreach and partnerships** to implement SME outcome-based CAV technologies through active partnerships with the industry, universities, and stakeholders.
- Identify and develop **technical standards and specifications** to create the framework for consistent CAV infrastructure preparedness, including general facilities design, software updates, and hardware upgrades.
- Establish a platform for **CAV implementation readiness** in terms of technology implementation, infrastructure improvements, and gaps identification.
- Move to full-scale **CAV deployment and implementation** using the most relevant CAV applications that have the potential to achieve the SME benefits, and track the benefits realized from CAV deployments.