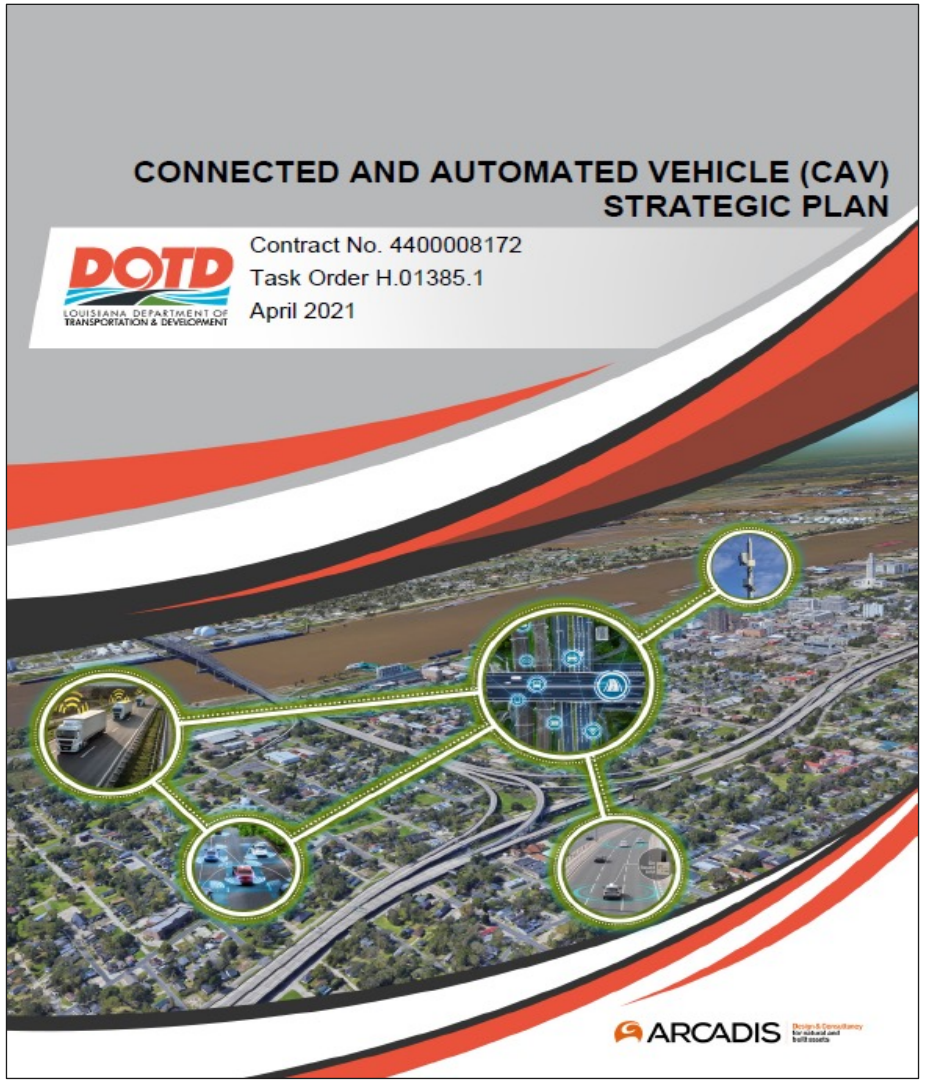
Preparing for Louisiana's CAV Future

2021 ITS Texas/TexITE Joint Meeting

11/5/2021

Outline

- Background
- CAV Strategic Plan
  - Development Process
  - CAV Technology Review
  - Strategic Visioning and Project Planning Workshop
  - Action Plan
  - Follow-up Workshop and Final Document
- Lessons Learned



DOTD CAV Technology Team

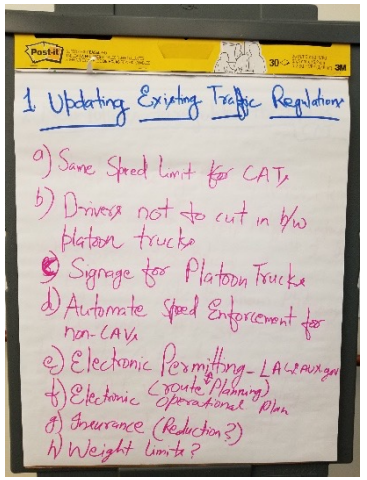
- 33 Members from 25 Sections and Districts

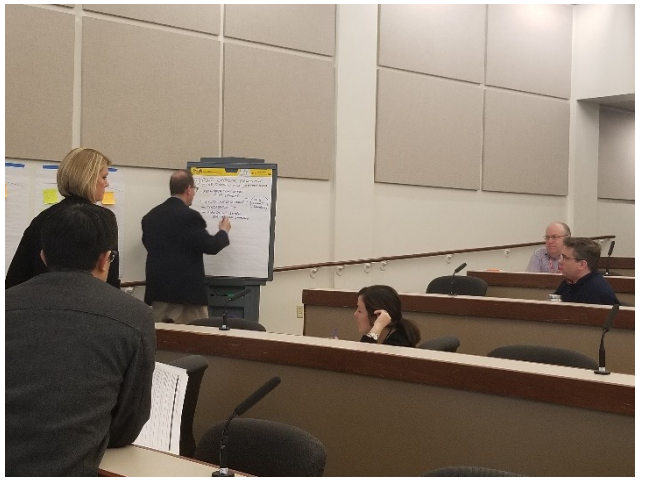
Working Group	Members
Highway Technology & Infrastructure	8
Multimodal Transportation Technology & Infrastructure	8
Agency Role Definition & Policy Formulation	7
Departmental Applications	7

CAV Technology Team Activities

Workshops

1. CAV Primer - 6/17
2. Strategic Planning 1 - 9/17
3. Strategic Planning 2 - 2/18
4. Policy and Planning - 9/18
5. Digital Infrastructure and Data - 3/19
6. CAV Freight - 9/19
7. CAV Operations - 9/20
8. Infrastructure Design and Safety - 3/21

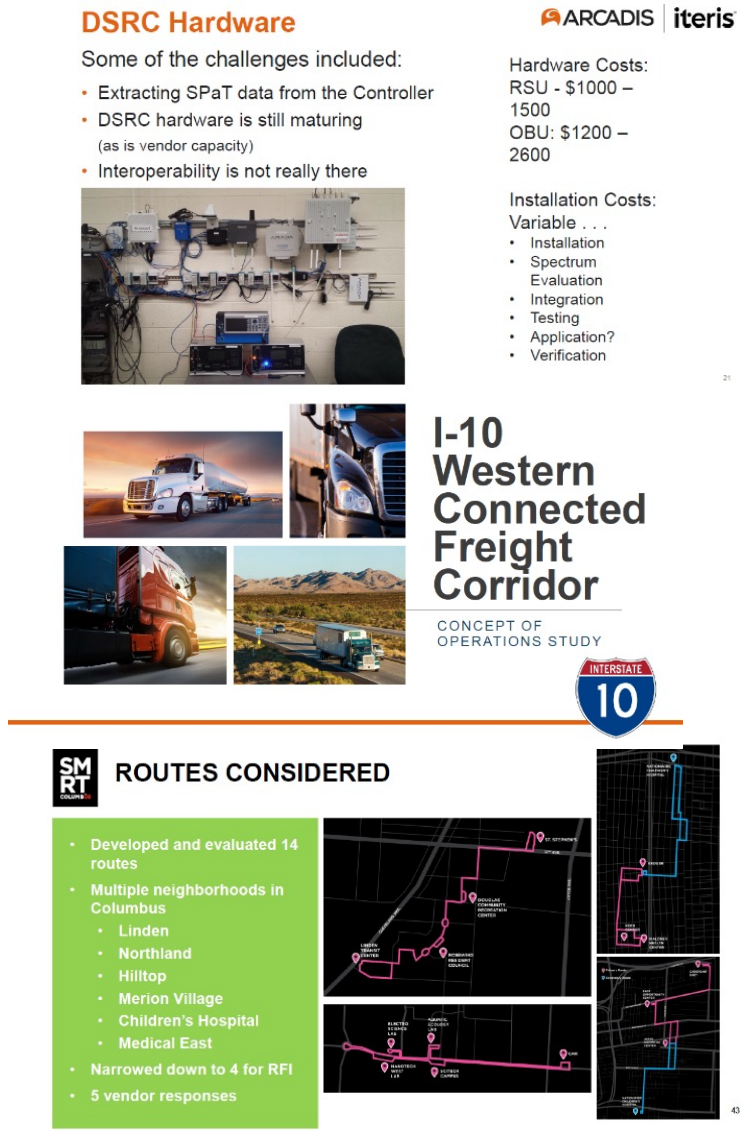




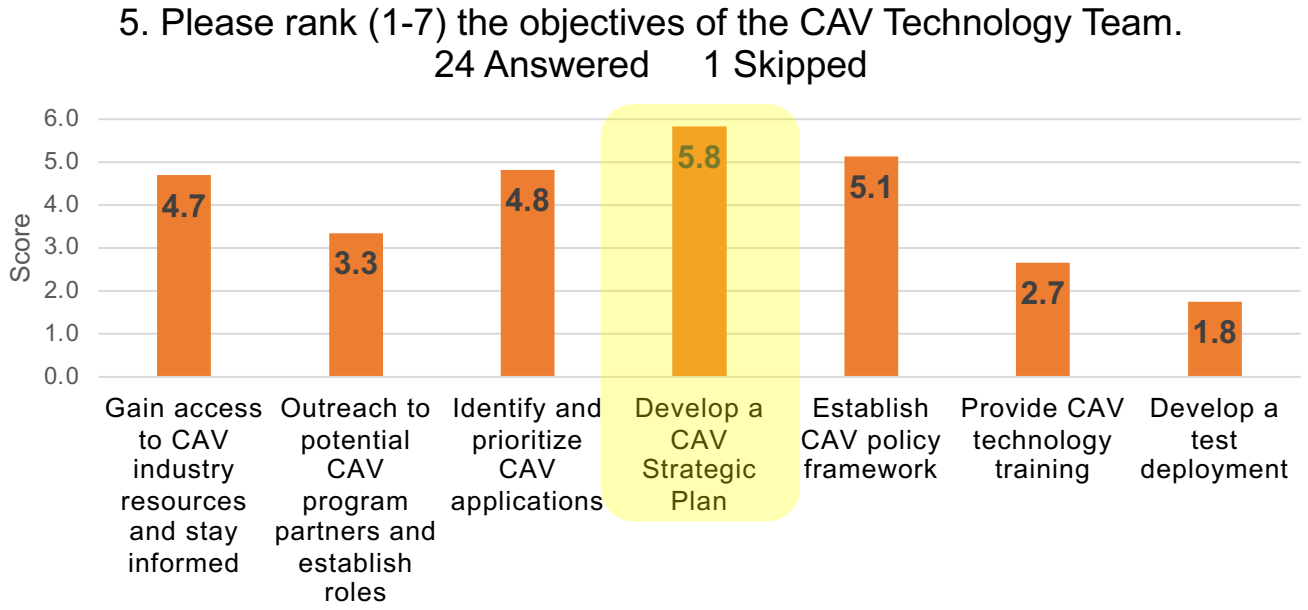
CAV Technology Team Activities

Web Meetings

1. CAV Legislation and Policy - 8/17
2. Machine Vision: Pavement Markings - 10/17
3. SPaT Challenge Update - 6/18
4. I-10 Connected Freight - 12/18
5. Security in CV Deployments - 6/19
6. Smart City: Columbus - 12/19
7. Connected Roadway Classification – 6/20
8. CAV and Edge Compute for Roadways – 12/20



Why develop a CAV Strategic Plan?



	Most Urgent					Least Urgent		Score
Gain access to CAV industry resources and stay informed	6	3	4	4	2	2	2	4.7
Outreach to potential CAV program partners and establish roles	0	1	3	6	7	5	1	3.3
Identify and prioritize CAV applications	2	4	9	4	4	0	0	4.8
Develop a CAV Strategic Plan	9	8	3	1	1	0	1	5.8
Establish CAV policy framework	5	6	4	4	3	1	0	5.1
Provide CAV technology training	1	0	0	4	5	10	3	2.7
Develop a test deployment	1	1	0	0	1	5	16	1.8

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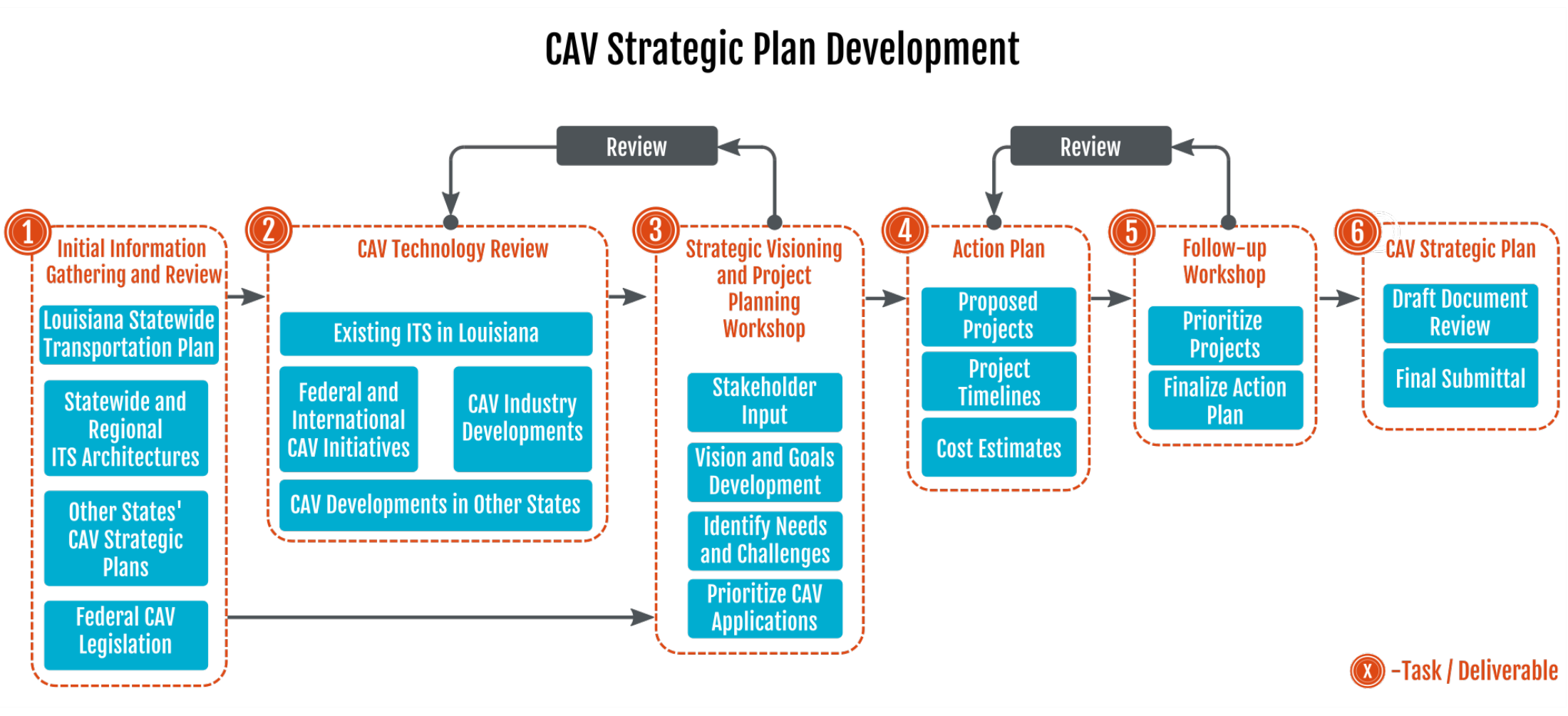
Development Process



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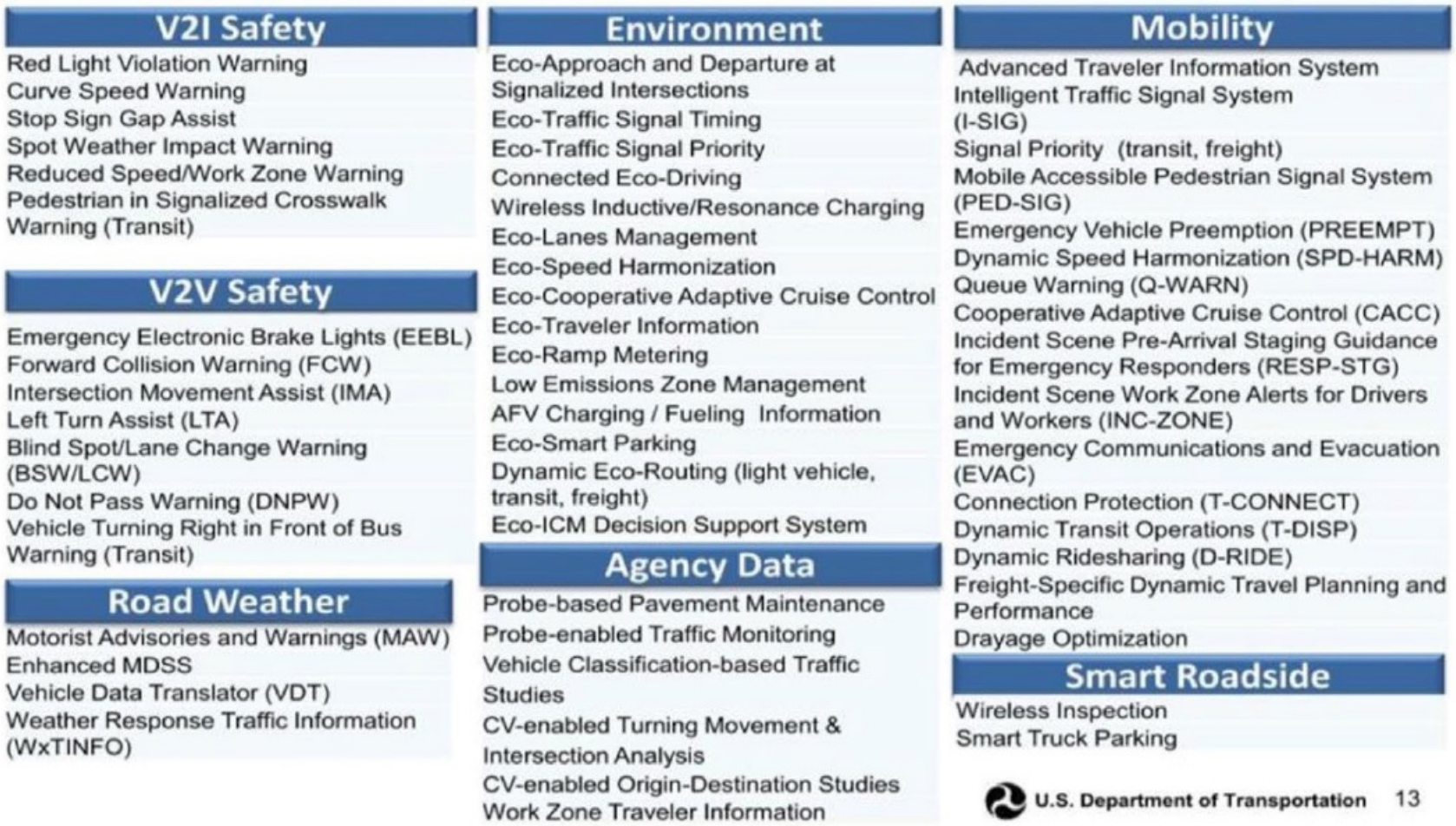
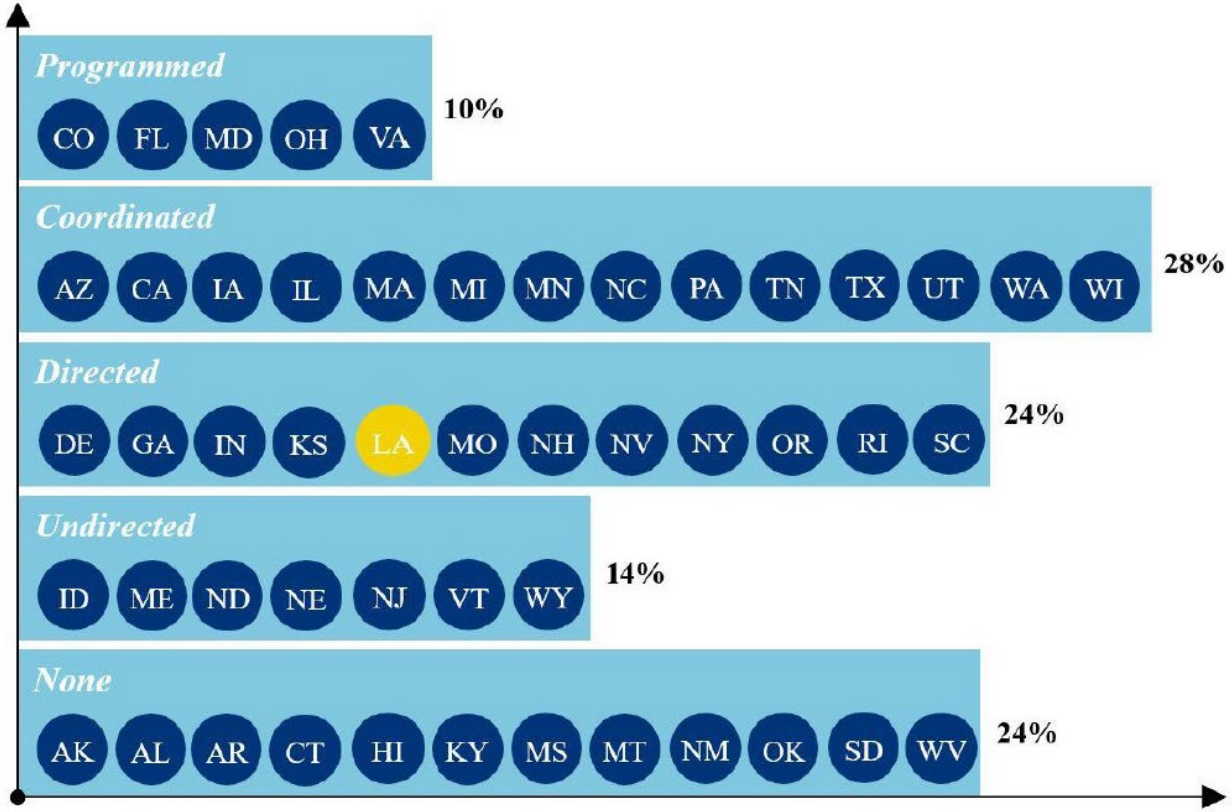
CV Applications



Relevant Planned ITS Projects

Project Name	Description	CAV Relevance	
		ARC-IT 8.3 Service Package	USDOT CV Application*
Statewide MAP	Project to deploy MAP vehicles and the following services: • Traffic Management Center (TMC) support • Traffic Incident Management (TIM) services • Motorist services (tire changes, fuel, first aid, etc.) • Emergency vehicle fleet • Tow service on bridges • General contract management	• PS04: Mayday Notification • PS06: RESP-STG • PS07: Incident Scene Safety Monitoring • PS08: Roadway Service Patrols	• Advanced Traveler Information System (ATIS) • RESP-STG • MAW
Statewide Incident Management Program	Program to provide ITS applications to enhance incident management along targeted corridors.	• PS04: Mayday Notification • PS06: RESP-STG • PS07: Incident Scene Safety Monitoring • PS08: Roadway Service Patrols	• ATIS • RESP-STG • MAW
Travel Time for Emergency Evacuation	Portable travel-time devices will be deployed in corridors critical to hurricane evacuation to determine route performance and alternate routes to support maximum throughput.	• PS14: Disaster Traveler Information • TI01: Broadcast Traveler Information • TI07: In-Vehicle Signage • TM06: Traffic Information Dissemination	• Road Weather Applications • Emergency Communications and Evacuation (EVAC)
Communication (Fiber Optics)	Fiber optic installation and integration into TMC at: • I-49 from I-10 to Alexandria • US-61 from Sorrento to I-310 • US-90 from Morgan City to Houma • US-90 from Houma to New Orleans	• SU01: Connected Vehicle System Monitoring and Management • SU03: Data Distribution	• V2I Applications
Work Zone ITS	This project will deploy portable Dynamic Message Signs, closed circuit television cameras, variable speed limits, queue detection, Highway Advisory Radios, intrusion alarms, etc., for work zone surveillance and traveler information in critical corridors. Connected variations include short-range communications and cloud-based connections to traveler information services.	• MC07: Work Zone Safety Monitoring • SU03: Data Distribution • TI01: Broadcast Traveler Information • TI07: In-Vehicle Signage	• RSWZ • Work Zone Traveler Information (in conjunction with USDOT's Work Zone Data Exchange)

CAV Efforts in Different States



Source: Melson, C. and J. Ma. 2021. "Broad Stakeholder Engagement in Connected and Automated Vehicle (CAV) Planning: Survey and Case Study of Louisiana". 2021 TRB Annual Meeting, January 2021, Washington, D.C.

Programmed: Efforts directed and coordinated by the DOT that provide a mechanism for long-term, large-scale CAV deployment.

Coordinated: Efforts directed and coordinated by the DOT with an intent to develop a mechanism for deployment

Directed: Efforts directed by the DOT but not conducted in a coordinated fashion

Undirected: Efforts not specifically directed by the DOT and where the DOT is not necessarily the main beneficiary

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Vision and Goals

- Develop CAV **strategic vision** and **goals**
- Identify current **needs** and **challenges** in:
  - Safety
  - Congestion
  - Multi-modal and infrastructure issues

Vision and Goals

CAV Vision

LADOTD will provide a policy, program, and legal framework to encourage the safe and secure deployment of CAV technologies that focus on sustainable improvements in safety, efficiency, and reliability of Louisiana's transportation system.

Goal 1: Leveraging the benefits of CAV technologies to improve safety, mobility, and reliability.

LADOTD will be focused on using CAV technologies to improve the safety, mobility, and reliability of the Statewide transportation system.

Goal 3: Developing a clear and measurable framework to evaluate the performance of CAV technology deployments.

LADOTD will develop a framework and performance measures to help incorporate the impacts of CAV into operations and long-range planning.

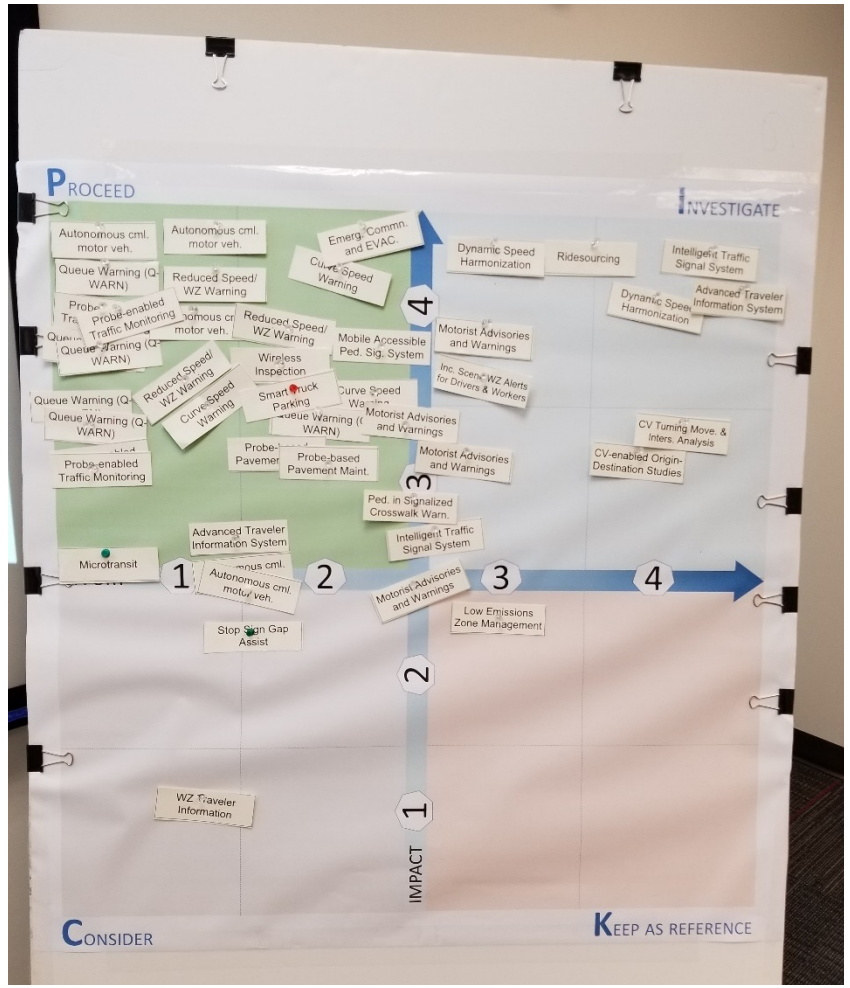
Goal 2: Developing CAV technology readiness for LADOTD workforce to support CAV deployments.

LADOTD will develop the necessary skills and CAV readiness for the workforce involved in CAV deployments. Enhanced training and professional development will encourage successfully integrating CAV into current operations and planning.

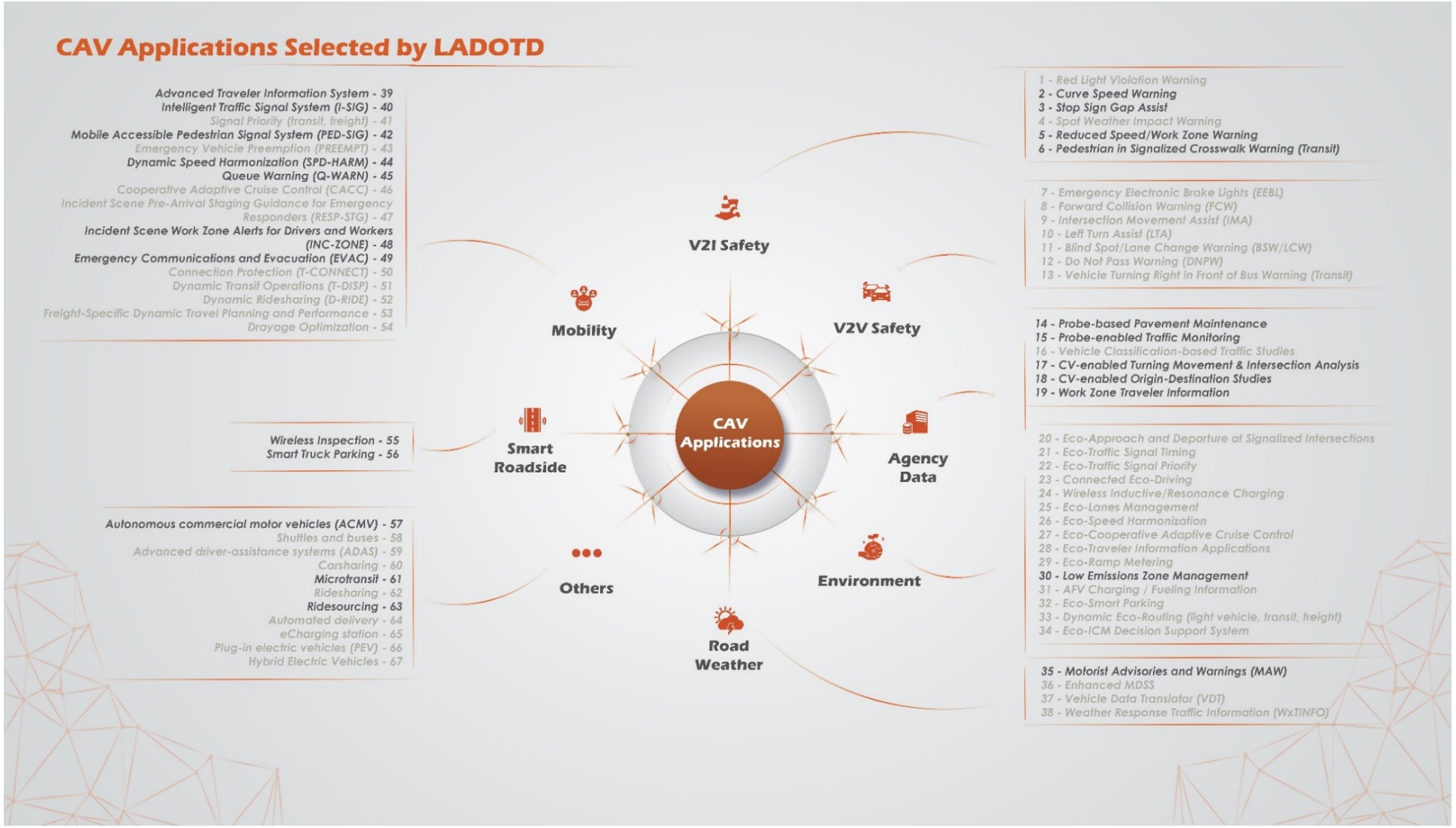
Goal 4: Exploring opportunities to leverage CAV technologies that support LADOTD processes and operations.

LADOTD will explore opportunities to leverage the benefits provided by CAV technology and data to support internal business processes and operations.

CAV Applications Prioritization



CAV Applications Prioritization



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Action Plan (Goals Traceability)

	Leveraging the benefits of CAV technologies to improve safety, mobility, and reliability	Developing CAV technology readiness for the LADOTD workforce to support CAV deployments	Developing a clear and measurable framework to evaluate the performance of CAV technology deployments	Exploring opportunities to leverage CAV technologies that support LADOTD processes and operations
	Goal 1	**Goal 2**	**Goal 3**	**Goal 4**
CAV Technology Support Team Development		X	X	X
Pursue Federal Funding Opportunities	X	X		X
Establish Dedicated CAV Funding	X			X
St. Tammany Parish I-12 Queue Warning System	X		X	
Jefferson Parish I-10 Queue Warning System	X		X	
West Baton Rouge Parish Queue Warning System	X		X	
East Baton Rouge Parish Queue Warning System	X		X	
Curve Speed Warning at Various Statewide Locations	X		X	
I-10 in Metairie Dynamic Speed Harmonization System	X			
Baton Rouge Dynamic Speed Harmonization System	X			
Statewide Data Management System	X	X	X	
Autonomous Commercial Motor Vehicle Policy	X	X		
Smart Truck Parking on Major Interstates	X			
Statewide Deployment of CAV Work Zone Technologies	X		X	X
Waycare Pilot Project	X		X	X

Action Plan (Timeline)

Project	Initial Start Year[1]				
	1	2	3	4	5
CAV Technology Support Team Development*	→				
Pursue Federal Funding Opportunities*	→				
Establish Dedicated CAV Funding*			→		
St. Tammany Parish I-12 Queue Warning System[2]		–	–	–	–
Jefferson Parish I-10 Queue Warning System[2]		–	–	–	–
West Baton Rouge Parish Queue Warning System	→				
East Baton Rouge Parish Queue Warning System[2]		–	–	–	–
Curve Speed Warning at Various Statewide Locations[3]			→		
I-10 in Metairie Dynamic Speed Harmonization System			→		
Baton Rouge Dynamic Speed Harmonization System[4]				–	–
Statewide Data Management System		→			
ACMV Policy*	→				
Smart Truck Parking on Major Interstates			→		
Statewide Deployment of CAV Work Zone Technologies		→			
Waycare Pilot Project	→				

[1]Initial start year of 5-year CAV planning cycle indicates beginning of project planning process and is not intended to show duration or completion of each project. Project completion will vary depending on planning, design, and implementation requirements of each project.
[2]Start year pending outcome of West Baton Rouge Parish Queue Warning System deployment evaluation.
[3]Assumes five deployments, one deployment in each metro area.
[4]Start year pending outcome of I-10 Metairie Dynamic Speed Harmonization System deployment evaluation.
*Program-level projects are not physical deployments and thus are implemented on ongoing basis.

Action Plan (Details)

Project/Action Title as identified during the Strategic Visioning and Project Planning Workshop.

St. Tammany Parish I-12 Queue Warning System

Goals

1	Ensuring and maximizing the benefits of CAV technologies to improve safety and mobility.
2	Improving DOTD's workforce readiness to deploy CAV technologies and infrastructure.
3	Developing a framework to clearly measure and evaluate the performance of CAV deployments.
4	Exploring opportunities to leverage CAV technologies that support DOTD processes and objectives.

Goals the project addresses are highlighted in a darker shade. The goals were identified as part of the Strategic Visioning and Project Planning Workshop.

Deploying a queue warning system on I-12 in St. Tammany Parish which utilizes V2I and V2V to provide vehicle operators with sufficient warning of an impending queue backup in order to brake safely, change lanes, or modify the route such that secondary collisions can be minimized or even eliminated would greatly improve traffic safety. The V2V component would automatically broadcast queue status information (e.g., rapid deceleration, disabled status, and lane location) to nearby upstream vehicles, and the V2I component to the local traffic management center (TMC). Following the USDOT CV applications guidelines, the system should perform two essential tasks: queue determination (detection and/or prediction) and queue information dissemination.

Project Team
Lead Group: LADOTD ITS Section
Stakeholders: LADOTD Hammond District (62) Office, Statewide TMC, FHWA
Project Support: LADOTD CAV Technology Support Team

Lead Group is the Section in charge of executing actionable steps.

Stakeholders are team members that should be involved at each actionable step.

Project Support are team members that provide critical input to ensure the success of the project.

Key Performance Indicators (KPIs)

- Number of rear-end crashes
- Crash severity
- Incident detection time
- Incident response time

Key Performance Indicators are metrics that should be used to measure project development and success.

Focus Areas

- Enhance traffic monitoring and management capabilities within project limits.
- Enhance traffic incident management capabilities within project limits.

Focus Areas are targeted activities to maximize the benefits of the project.

Recommended Steps

	Approximate Timeframe	Project Implementation
0 – 5 Years	2021 - 2022	Systems Engineering analysis (high level design)
	2022 – 2023	Detailed project Plans, Specifications, & Estimates (PS&E)
	2023 - 2024	Project bidding and construction letting process.
	2024 - 2025	Deployment and System Integration

Recommended Steps are the actionable steps that should be taken within the next 5 years. Steps that have already been taken are highlighted in gray.

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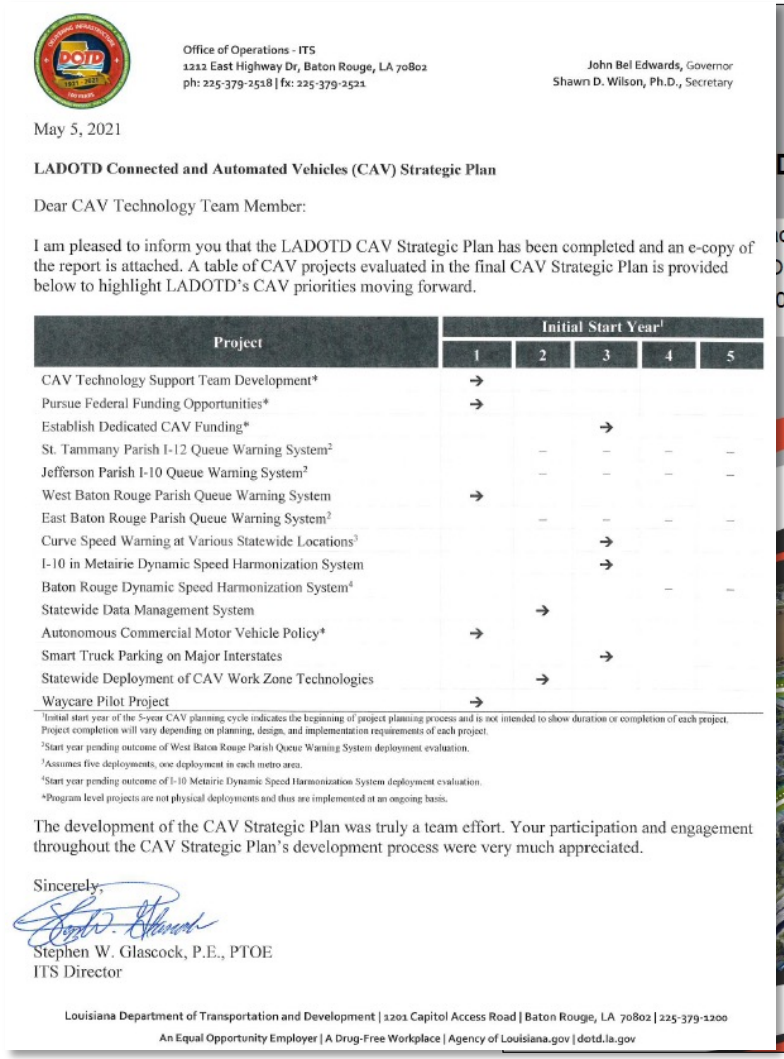
Final Document

- Submitted 5/11/21
- Accompanied by transmittal letter from ITS director
- Plan – 44 pages
- Plan w/ appendices – 135 pages



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John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

May 5, 2021

LADOTD Connected and Automated Vehicles (CAV) Strategic Plan

Dear CAV Technology Team Member:

I am pleased to inform you that the LADOTD CAV Strategic Plan has been completed and an e-copy of the report is attached. A table of CAV projects evaluated in the final CAV Strategic Plan is provided below to highlight LADOTD's CAV priorities moving forward.

Project	Initial Start Year[1]				
	1	2	3	4	5
CAV Technology Support Team Development*	→				
Pursue Federal Funding Opportunities*	→				
Establish Dedicated CAV Funding*			→		
St. Tammany Parish I-12 Queue Warning System[2]		–	–	–	–
Jefferson Parish I-10 Queue Warning System[2]		–	–	–	–
West Baton Rouge Parish Queue Warning System	→				
East Baton Rouge Parish Queue Warning System[2]		–	–	–	–
Curve Speed Warning at Various Statewide Locations[3]			→		
I-10 in Metairie Dynamic Speed Harmonization System			→		
Baton Rouge Dynamic Speed Harmonization System[4]				–	–
Statewide Data Management System		→			
Autonomous Commercial Motor Vehicle Policy*	→				
Smart Truck Parking on Major Interstates			→		
Statewide Deployment of CAV Work Zone Technologies		→			
Waycare Pilot Project	→				

[1]Initial start year of the 5-year CAV planning cycle indicates the beginning of project planning process and is not intended to show duration or completion of each project. Project completion will vary depending on planning, design, and implementation requirements of each project.
[2]Start year pending outcome of West Baton Rouge Parish Queue Warning System deployment evaluation.
[3]Assumes five deployments, one deployment in each metro area.
[4]Start year pending outcome of I-10 Metairie Dynamic Speed Harmonization System deployment evaluation.
*Program level projects are not physical deployments and thus are implemented on an ongoing basis.

The development of the CAV Strategic Plan was truly a team effort. Your participation and engagement throughout the CAV Strategic Plan's development process were very much appreciated.

Sincerely,

Stephen W. Glascock, P.E., PTOE
ITS Director

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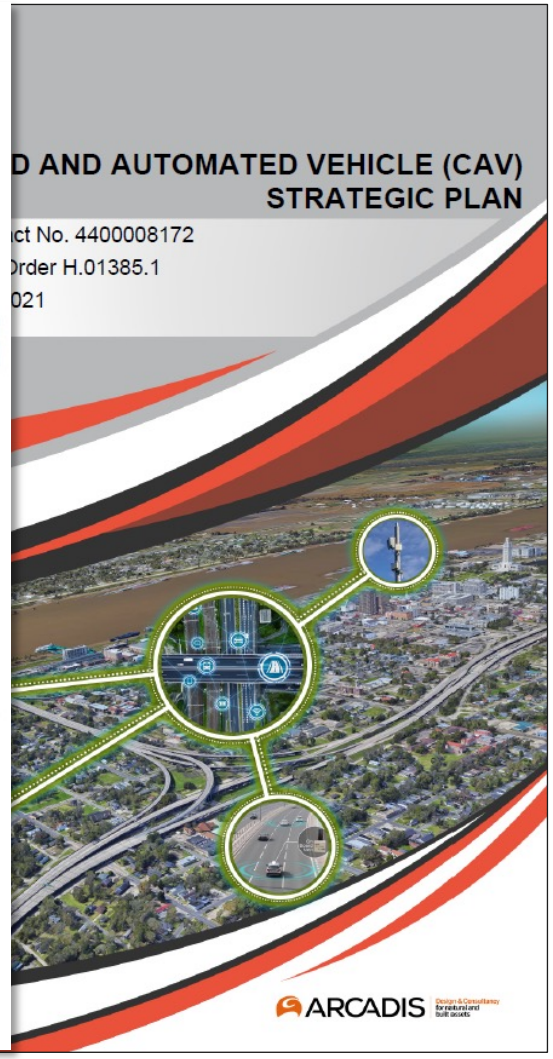

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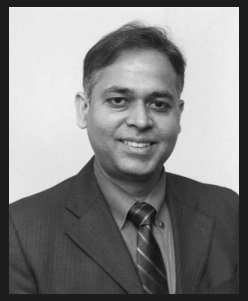
Lessons Learned

- CAV Technology Team was crucial for starting Strategic Plan
- Identify key roles, they will be critical points of contact:
  - Technical (internal)
  - Policy/High-Level (internal)
  - External Stakeholders
- Allow for stakeholder input throughout the project, be ready to iterate
- Focus on actionable and applicable projects
- CAV technology changes quickly, be prepared to update documents during development
- Plan for 1.5 yr timeline for a small/medium size agency

Questions/Comments



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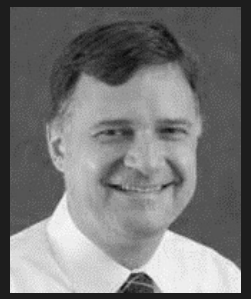

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