



WisDOT Connected and Automated Vehicle Strategic Work Plan

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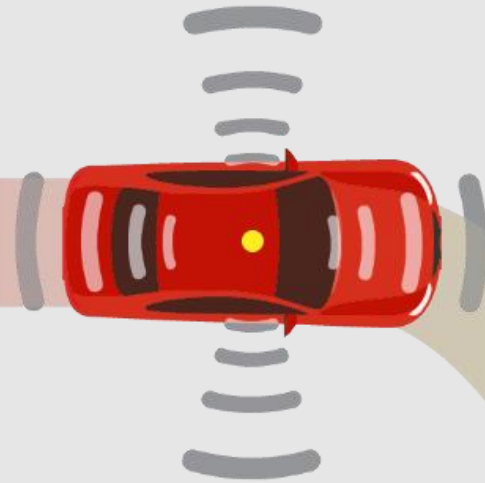
2022 Southeast Wisconsin Transportation Symposium
University of Wisconsin Milwaukee, Milwaukee, WI

October 14, 2022

General CAV info

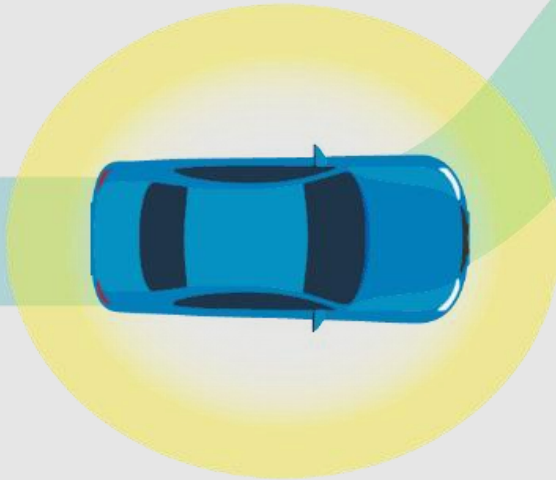
Automated Vehicle (AV)

Manage all or most driving tasks in varying degrees in certain areas.



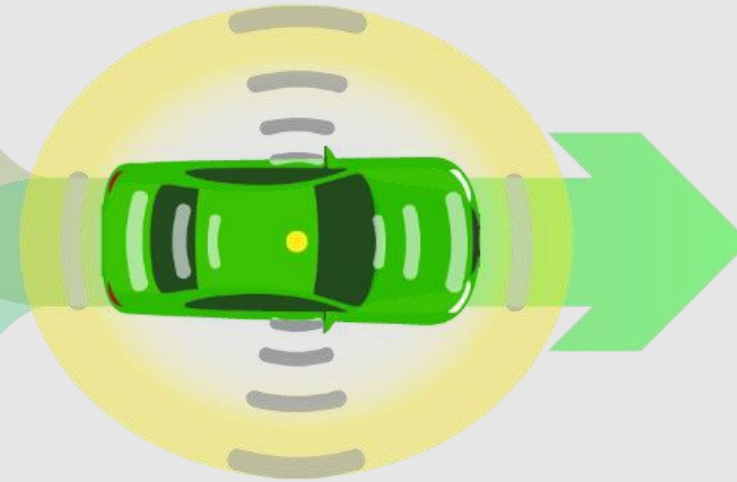
Connected Vehicle (CV)

Communicates with nearby vehicles and infrastructure



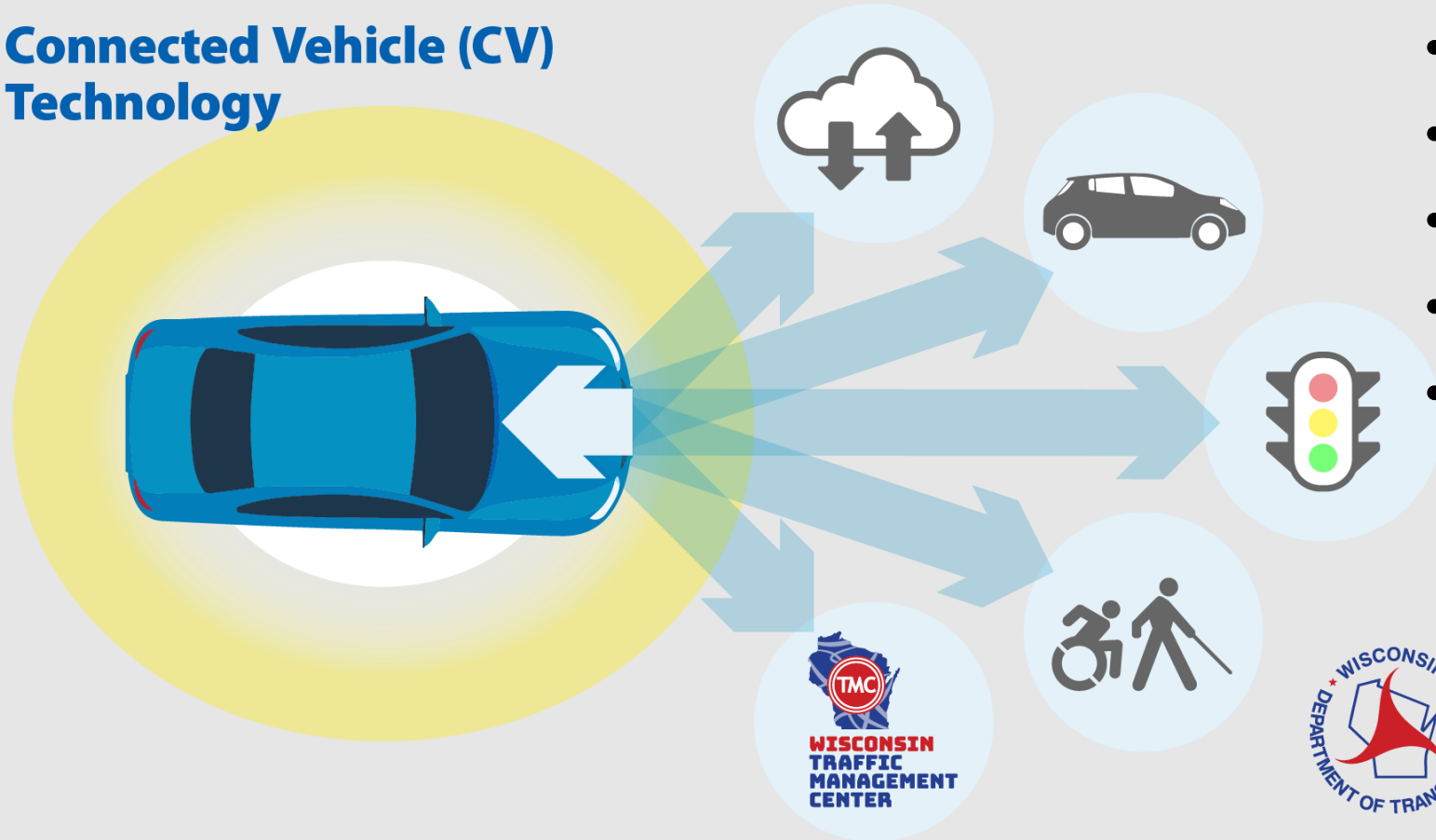
Connected Automated Vehicle (CAV)

Leverages automated and connected vehicle capabilities



General CAV info

Connected Vehicle (CV) Technology

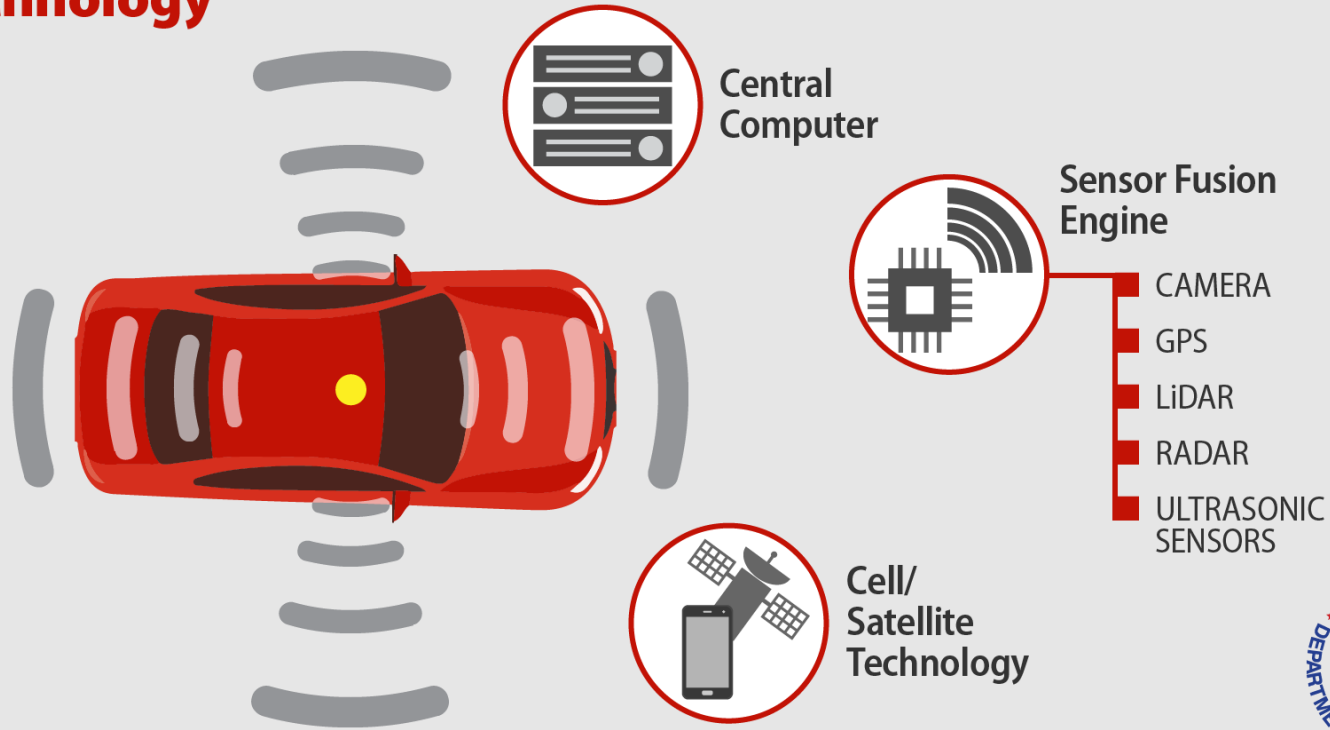


Connected Vehicle

- Over-the-air updates
- Vehicle to Vehicle (V2V)
- Vehicle to Infrastructure (V2I)
- Vehicle to Pedestrian (V2P)
- Vehicle to Everything (V2X)

General CAV info

Automated Vehicle (AV) Technology



Automated technology

- “Sees” with its sensors
- Is in many cars on the road today.
- Can perform some or all of the driving tasks.
- Includes driverless cars and cars with drivers



Safety benefits

- 94% of crashes are a result of human error*
- Connected and Automated Vehicles could eliminate many of these risks
 - Education about safety features is key
 - Many safety features are in cars right now..

Automated technology available now

- Lane keep
- Emergency braking
- Blind spot detection
- Adaptive cruise control

Connected technology under development

- New data can help inform new road designs
- Vehicle data can improve real time traffic management
- Road condition information and obstructions can be relayed to drivers



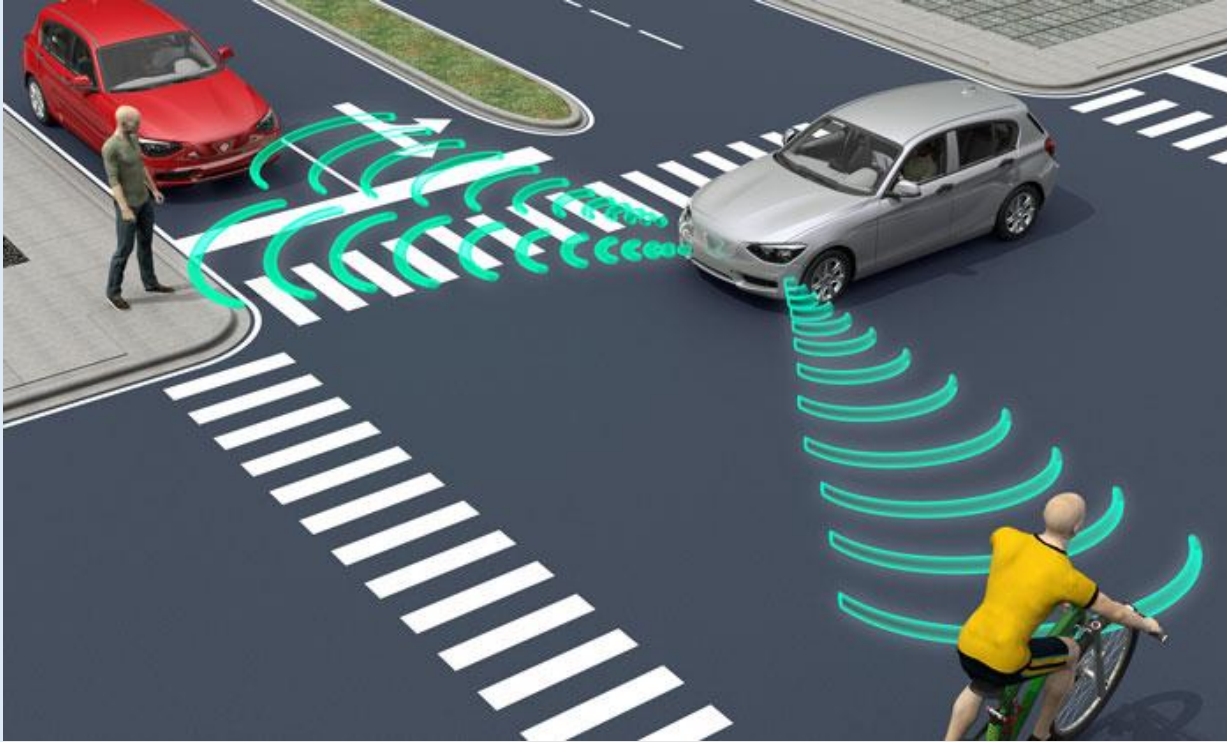
Simple resource explaining new car technology and benefits -

MyCarDoesWhat.org
<https://mycardoeswhat.org/>



*NHTSA <https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812115>

Affects on local transportation



Connected Vehicles

- ITS – Intelligent Transportation System upgrades
- Fiber optic expansion in the Right-of-Way
- Improved road condition information and dispatch for incidents

Automated Vehicles

- CAV training is needed for local *Law Enforcement and First Responders* – with the *Traffic Incident Management Enhancement (TIME coalition)*
- Pavement design for extra lane wear, bridge strength analysis may be needed
- Transit options: Elderly, medical visits, job connections for non-drivers

Impacts of Automated Vehicles on Highway Infrastructure, FHWA

- Publication no. **FHWA-HRT-21-015**, March 2021
- <https://www.fhwa.dot.gov/publications/research/operations/21015/index.cfm>



Transit



*Racine Badger
with UW-TOPS
lab and
Gateway
Technical
College*

Testing and pilot of AV transit, self-driving taxis, potential benefits

- More flexibility in routes and 24 hour on call service
- Lower costs
- Expanded transit options in rural and other low volume transit areas for medical visits, jobs, non-drivers
- Driverless food and medical supply vehicles



*Waymo and GM Cruise have
logged 100,000 driverless miles
in CA and AZ*



*Nuro is an operational driverless
delivery vehicle.*



Technologies



Work zones and pavement

- 6-inch-high contrast pavement lane markings improve functionality of automated sensors
- ConnectedTech iPin or iCones can transmit the location of work zones to approaching traffic
- Smart arrow boards can be updated in real-time

Technologies

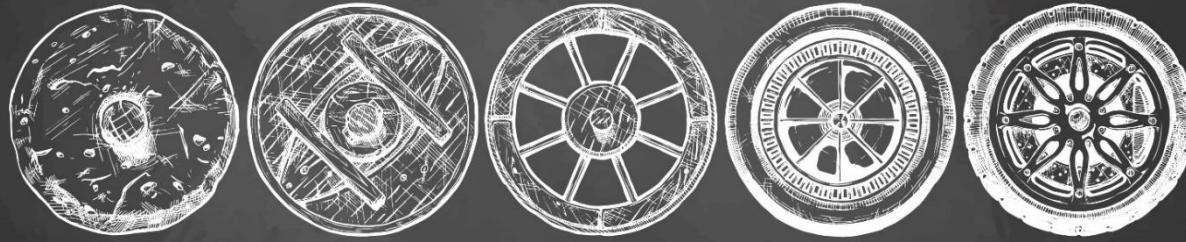


Work zones

- Autonomous truck mounted crash attenuator (AMTA) follows behind highway maintenance vehicles and absorbs impact of crash if vehicle accidentally enters work zone
- ATMA removes the driver from a hazardous situation



Automated Vehicles



Current Legal Status of Automated, Autonomous, or Self-Driving Vehicles

Wisconsin state law currently requires an operator to be behind the wheel and in physical control of a vehicle at all times while driving on Wisconsin roadways.

As with any other vehicle that is operated on the roadway, the operator or owner is responsible for the appropriate and safe operation of the vehicle while driving it. This includes the use of any technology the vehicle is equipped with, any malfunctions of the vehicle, and adherence with [current state law](#) and the [Rules-of-the-Road](#).



WisDOT CAV Strategic Plan 2021-2023



Objective areas of focus

1. Statute, Policy and Regulation
2. Communications and Outreach
3. Partnerships
4. Organizational Alignment, Coordination, and Readiness
5. Develop Transportation System Infrastructure and Operations Readiness
6. Research, Testing, and Pilot Projects
7. Data Governance and Security
8. Law Enforcement and First Responder Services



1. Statutes, Policy, and Regulation



Statutes

- Developing recommendations to update and clarify state statutes for autonomous vehicles

Platooning

- 2017 Wisconsin Act 294 eliminated the required following distance for electronically controlled vehicles.
- How does platooning affect HAZMAT, school buses, liquid loads, logging, etc.?
- Provided guidance for truck platooning , included guidance for *Law Enforcement and pilot training and AV demo.*



2. Communications and Outreach

- **CAV Communications and Outreach Strategy** - published on the WisDOT website

Audiences

Analysis of key audiences, their communication needs, and potential communications channels

Messaging

High-level messaging for each of the major audience categories

- General public
- Local transportation officials
- State and Federal policy makers
- Law enforcement/first responders
- Industry and research partners

Tactical Plan

Description of the tactical plan built from the message strategy.

- **CAV Attitudes and Perceptions** survey RFP in process



3. Partnerships

- Education is a priority
- The most valuable **partnership** to pursue at this stage would promote education, *communications and outreach*.
- How to do that?
 - Subcommittee is reviewing needs, strategies and models for a CAV education partnership.
 - Beginning a *CAV Attitudes and Perceptions* survey and analysis that will help guide the Communication and Outreach tactics.



4. Organizational Alignment, Coordination, and Readiness

Objective and key Actions:

- Department scan of potential impacts on business operations, processes and affected partners or programs.

4 ▾ DBM DBSI DMV DSP DTIM DTSD EO + Search (Ctrl+E)

• Membership in external organizations

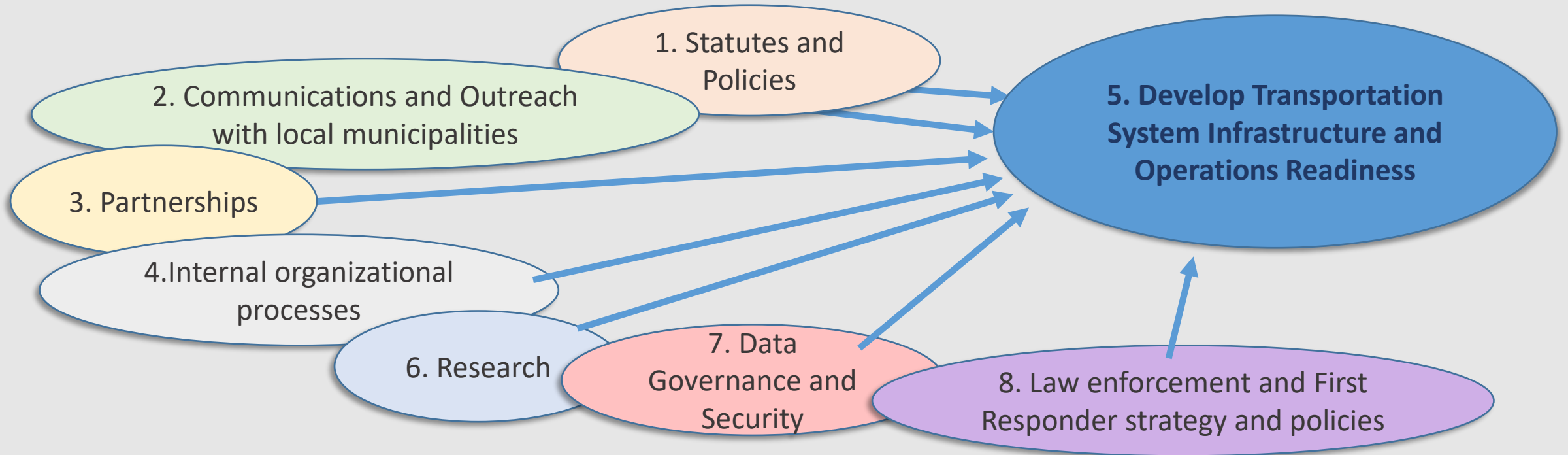
Process	Why Impacted	-CV -AV W/driver -AV W/o a driver	Upstream or downstream division or process affected	Constraining state or federal statutes	General Plans to Address	Timeline / Urgency 1 yr 2 yr 5+ yrs	Priority 1-10 1=highest	-Actionable -Emerging -Positioning	Potential Cost / new resources	Created by / edit by initials
Process for AV crash scene	Special CV or AV considerations may be needed. Contacting the remote owner, towing, enforcement, safety.	AV W/o a driver		WI Chapter 346	SOP development; Training	5+	10	Positional		BJB LM
Understanding vehicle feature tech for crash scene investigation	MMUCC - Capturing CV operating feature during crash.	AV w/driver and w/o driver	Need new data fields in MV4000, new safety analysis			1yr			New cabling, software.	BJB
Process for	If an alt route is established	AV W/o		WI	SOP	5+	10	Positional		LM

MLD



5. Develop Transportation System Infrastructure and Operations Readiness

- Implementation of projects, policies, operations, etc. will be guided by the results of the prerequisite work done by other committees



6. Research, Pilots and Testing

Testing infrastructure technologies

- Ryan Road and Oak Creek

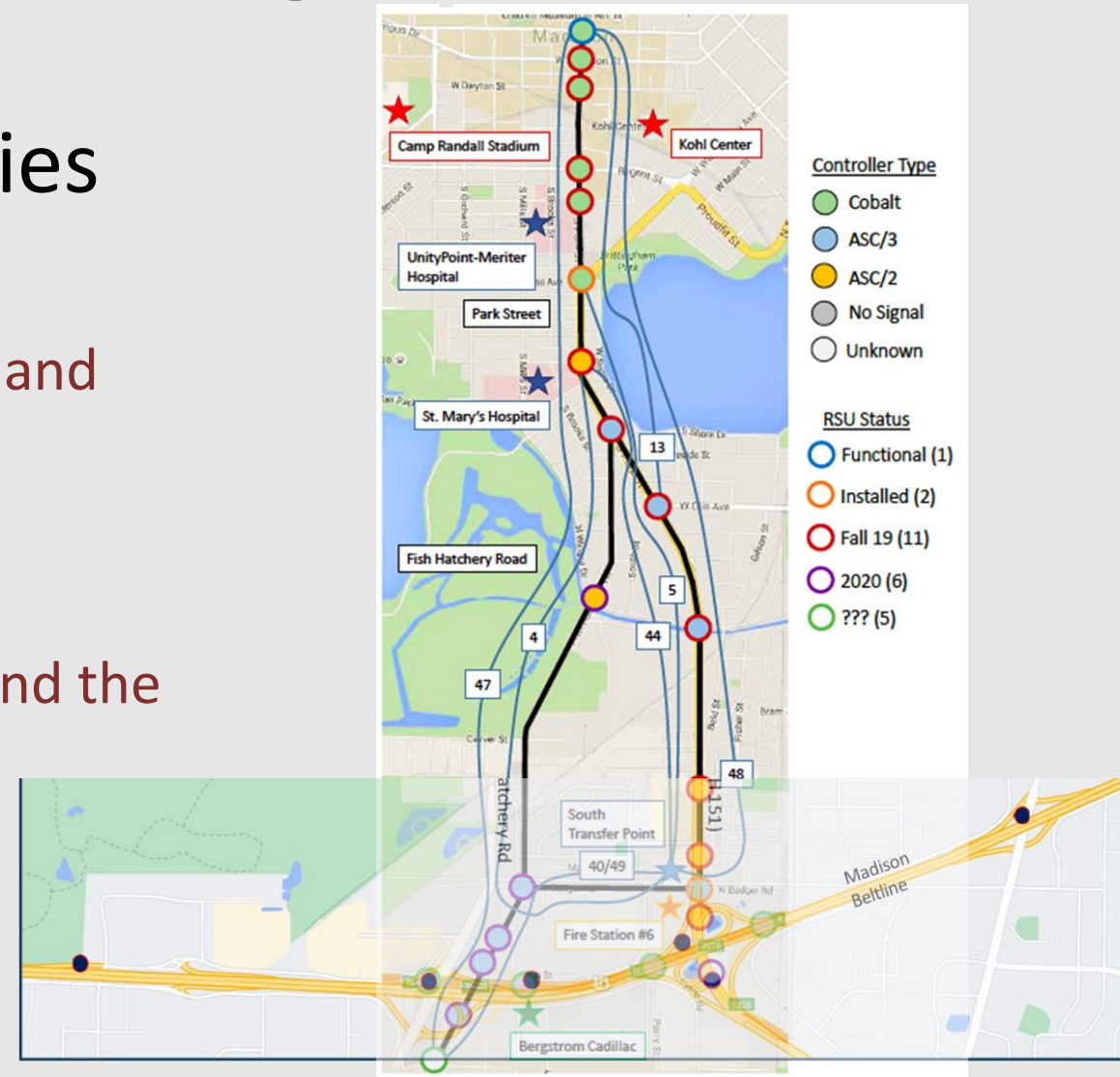
CV research project is testing onsite radios and real-time data collection

- CV Pilot projects

MMITSS* Park St. corridor, UW-TOPS Lab and the City of Madison

Phase 3 integration with Hwy 12/18

*MMITSS – Multi-Modal Intelligent Traffic Signal System



6. Research, Pilots and Testing

Participating in CAV research initiatives

- **Work Zone Data Exchange (WZDx)** – USDOT funded projects in 13 states
- Funding sources, grants and applications for IIJA/BIL, SMART, ATTAIN federal grants.
- Grant preparation: identifying potential projects and preparing grant applications ahead of funding windows



7. Data Governance and Security

- IPIT, the UW Milwaukee **Institute for Physical Infrastructure and Transportation** is creating a data governance framework, oversight and management structure for CV and AV data.

- Data Governance structure would manage data collection justification, privacy and security issues, storage, records retention, capital expenditures, total life cycle costs and planning, new data uses for operations or road design

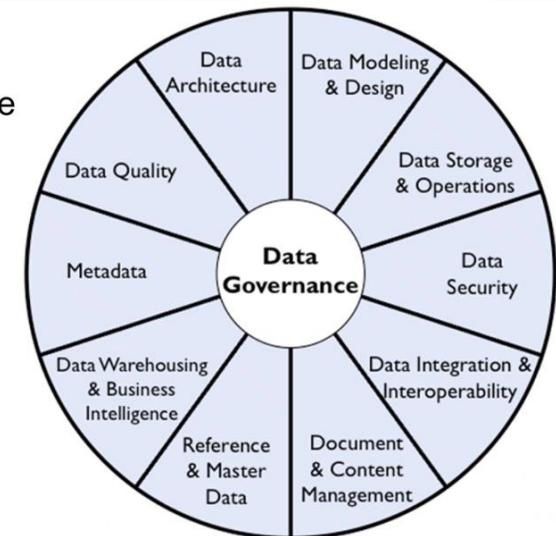
- **Management structure options**

- Data policy and planning oversight committee (enterprise coordination)
- Steering committee (standards and enforcement)
- Data stewards (execution and recommendations)

Steps for WisDOT Data Governance

- Identify best practices at other DOTs
- Socialize the concept of Data Governance
- Identify key stakeholders at WisDOT
- Draft Data Governance structure
- Draft Policies and Procedures

Questions and how to plug in



8. Law Enforcement and First Responder Services

- Traffic Incident Management Enhancement (TIME) member survey completed – helped inform content for TIME training
 1. Department of Justice law enforcement CAV training video (40 mins)
 - Delivered July 2022
 2. TIME Law Enforcement First Responder training and AV demo with Racine Badger
 - Pilot training delivered September 2022.
 - Interested Parties
 - State and local law enforcement
 - First Responders
 - State and Local Officials
 - Other interested parties



Wisconsin Automated Vehicle External (WAVE) Advisory Committee

A forum of representatives from...

- State Legislature representatives
- State agencies
- Federal agencies
- Local government
- Academia
- Interest groups / stakeholders
- Industry

Actions

- Reviews CAV issues and provides input and advice to WisDOT on CAV planning priorities, implementation policies, and impacts to a safe and efficient transportation system
- Meets twice a year



Complete roster on webpage wisconsindot.gov/cav



WAVE Meetings

- September 2020
 - Education theme
 - Covered by Wisconsin media and mentioned in national transportation press
- March 2021
 - Local and Tribal Government theme
- September 2021
 - CAVs and Transportation Equity theme
- March 2022
 - CAV Safety and Vulnerable Road Users (VRU)
 - CAV Safety and Law Enforcement and First Responders
- October 2022
 - Review of WAVE recommendations and progress



WisDOT OUTREACH and PRESENTATIONS

Strategy and messaging used for:

- LE&FR pilot training and demo
- Governor's Conference on Highway Safety
- TIME newsletters and TIME Regional meetings
- Wisconsin Towns Association
- Joint WI / MN joint MPO / RPC conference
- MAASTO CAV e-Summit
- Wisconsin Non-Driver Advisory Cmte. (WiNDAC)
- WAVE coordination, feedback and updates
- ITS/ITE – Intelligent Transportation System / Institute of Transportation Engineers
- Guidance to develop **CAV Attitudes and Perceptions survey RFP.**



MAASTO CAV subcommittee workgroup

- Continue to coordinate with the MAASTO subcommittee on best practices, state projects, up-to-date CAV information.



- MAASTO - Mid America Association of State Transportation Officials

MAASTO CAV subcommittee workgroup

	MAASTO Priorities	WisDOT CAV Strategic Work Plan Objective Areas
MAASTO Ongoing	<ul style="list-style-type: none"> Equity, Access & Engagement Regular Convening and Annual CAV Summit 	<p>Note: Equity message should be incorporated in all areas</p> <ul style="list-style-type: none"> Partnerships Communication and Outreach
	<ul style="list-style-type: none"> Coordination on Federal Grants 	<ul style="list-style-type: none"> Research, Testing, and Pilot Projects Develop Transportation System Infrastructure and Operations Readiness
MAASTO Short-Term Completion Targets; 1-4 years	<ul style="list-style-type: none"> DOT Organizational Readiness 	<ul style="list-style-type: none"> Organizational Alignment, Coordination, and Readiness
	<ul style="list-style-type: none"> Data Sharing 	<ul style="list-style-type: none"> Data Governance and Security
	<ul style="list-style-type: none"> AV Legislation and Engaging Policy Makers 	<ul style="list-style-type: none"> Statute, Policy, and Regulation
	<ul style="list-style-type: none"> AV Legislation and Engaging Policy Makers 	<ul style="list-style-type: none"> Law Enforcement and First Responder Services
MAASTO Medium-Term Completion Targets; 5-9 years	<ul style="list-style-type: none"> Research 	<ul style="list-style-type: none"> Research, Testing, and Pilot Projects
MAASTO Long-Term Completion Targets; 10+ years	<ul style="list-style-type: none"> Planning and Forecasting 	<ul style="list-style-type: none"> Develop Transportation System Infrastructure and Operations Readiness Organizational Alignment, Coordination, and Readiness
	<ul style="list-style-type: none"> Local and Tribal Coordination 	<ul style="list-style-type: none"> Communications and Outreach

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