

# AASHTO Connected & Automated Vehicle Focus Area

April 18, 2017 Webinar



# Agenda

1. Role Call
2. SPaT Challenge Overview and Update
3. Autonomous Vehicle Policy Updates
4. Feedback/Input/Questions
5. Research Topics

# SPaT Challenge Overview & Update

Blaine Leonard, Utah DOT

# Origin of the SPaT Challenge

## **“Chicken and Egg” problem:**

How do we encourage / initiate broad V2I deployment?

How do we demonstrate commitment to the OEM and private industry?

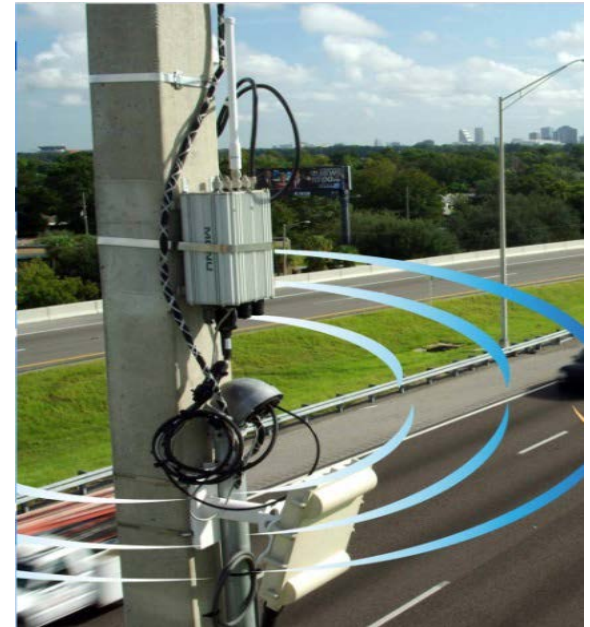
What is a reasonable, early expectation?



## **Signalized Intersections (low-hanging fruit)**

# SPaT Challenge

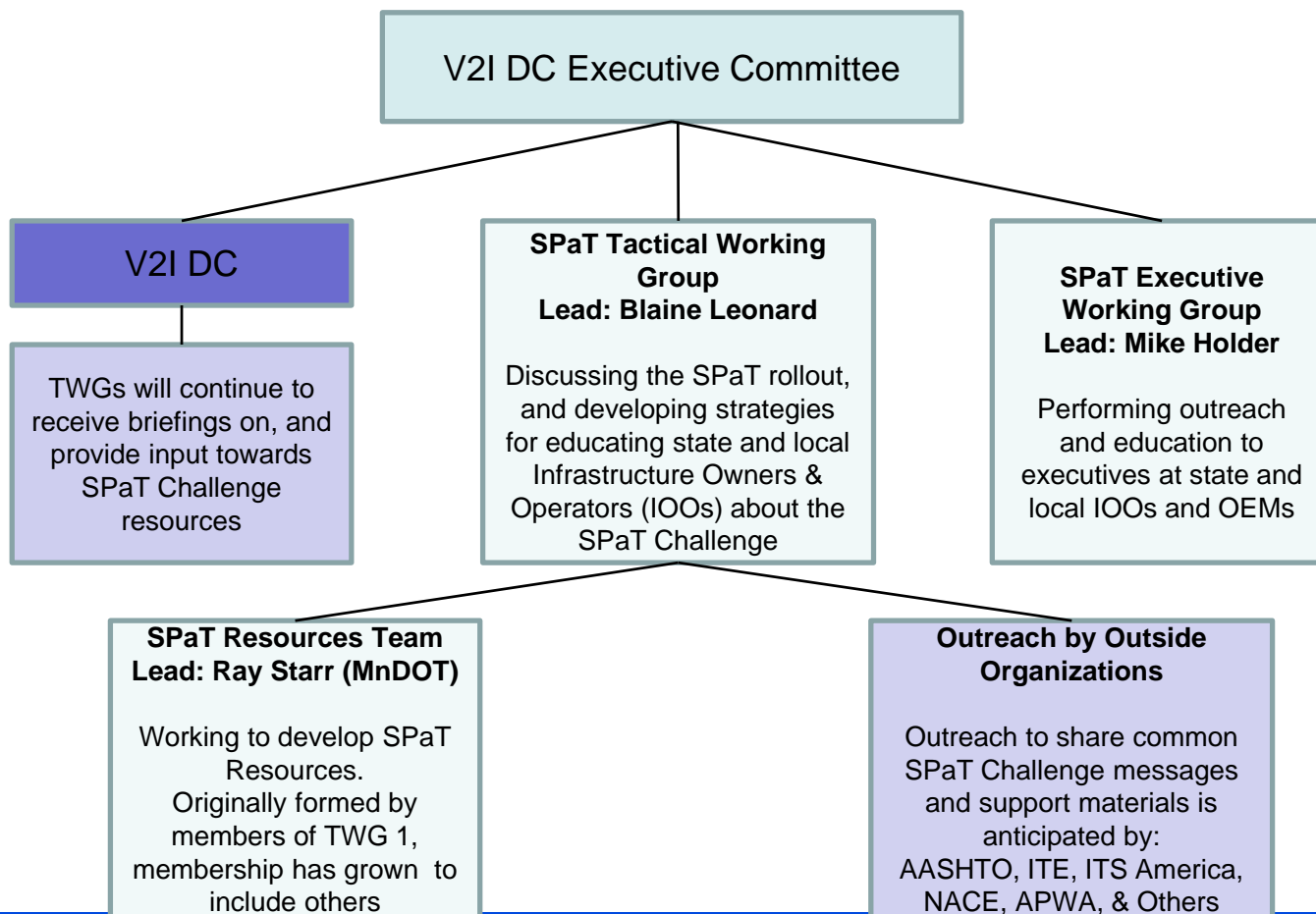
Challenge state and local public sector transportation Infrastructure Owners & Operators (IOOs) to **deploy DSRC infrastructure with SPaT (and MAP) broadcasts** in at least one coordinated corridor or network (approximately 20 signalized intersections) in each state by January 2020.



Additional V2I Applications that build on SPaT are also encouraged!


**20 Intersections in 50 states by 2020!**

# V2I DC Organization of SPaT Challenge






# SPaT Challenge Website

[www.transportationops.org/spatchallenge](http://www.transportationops.org/spatchallenge)

**NCoE** National Operations Center of Excellence  
Your Transportation Operations Resource

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TSM&O RESOURCESWHY TSM&O?NEWSBLOG

Home


## SPAT CHALLENGE OVERVIEW

**The SPaT Challenge**

A challenge to state and local public sector transportation infrastructure owners and operators to cooperate together to achieve deployment of DSRC infrastructure with SPaT broadcasts in at least one corridor or network (approximately 20 signalized intersections) in each of the 50 states by January 2020. SPaT broadcasts are expected to be accompanied by MAP and RTCM broadcasts.

**SPaT Challenge Progress**

The map display below illustrates those agencies actively participating in the SPaT Challenge, and those that have completed the Challenge. Additional resources are available at this site. Please let us know if you accept the SPaT Challenge.



[SPaT Home](#)[Resources](#)[Contact Us](#)

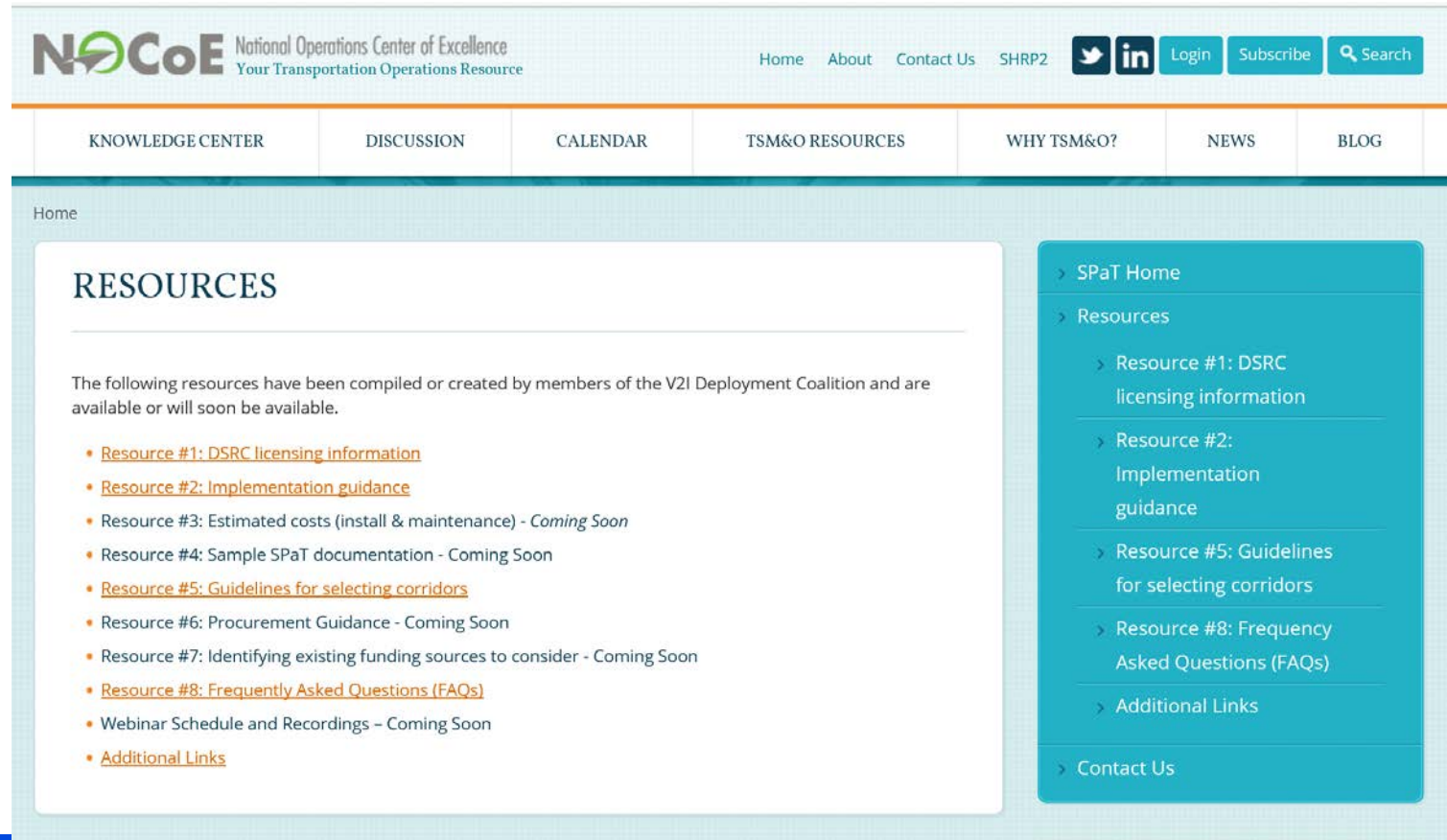
# Who is Pursuing SPaT Challenge?

SPaT Involvement	#
Agencies with active DSRC SPaT Broadcasts	4
Agencies that have identified they are pursuing the SPaT Challenge <ul style="list-style-type: none"><li>- Either on the SPaT Challenge website map or in the process of being added</li></ul>	9
Agencies we have informally heard are starting the process of organizing for the SPaT Challenge <ul style="list-style-type: none"><li>- Yet to be verified and added to the SPaT Challenge map</li></ul>	4
<b>Total</b>	<b>17</b>





# SPaT Challenge Website

Resources are being posted as they are finished



The screenshot shows the homepage of the SPaT Challenge Website. The header features the NOCoE logo (National Operations Center of Excellence) and the tagline 'Your Transportation Operations Resource'. Navigation links include Home, About, Contact Us, SHRP2, and social media icons for Twitter and LinkedIn. There are also buttons for Login, Subscribe, and a Search bar. Below the header is a horizontal menu with categories: KNOWLEDGE CENTER, DISCUSSION, CALENDAR, TSM&O RESOURCES, WHY TSM&O?, NEWS, and BLOG. The main content area is titled 'RESOURCES' and includes a paragraph stating that the following resources have been compiled or created by members of the V2I Deployment Coalition and are available or will soon be available. A list of resources follows, including links to DSRC licensing information, implementation guidance, estimated costs, sample SPaT documentation, guidelines for selecting corridors, procurement guidance, identifying existing funding sources, frequently asked questions (FAQs), and a webinar schedule. A right-hand sidebar contains a list of links: SPaT Home, Resources (with sub-links for Resource #1: DSRC licensing information, Resource #2: Implementation guidance, Resource #5: Guidelines for selecting corridors, Resource #8: Frequency Asked Questions (FAQs), and Additional Links), and Contact Us.

NOCoE National Operations Center of Excellence  
Your Transportation Operations Resource

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Home

## RESOURCES

The following resources have been compiled or created by members of the V2I Deployment Coalition and are available or will soon be available.

- [Resource #1: DSRC licensing information](#)
- [Resource #2: Implementation guidance](#)
- Resource #3: Estimated costs (install & maintenance) - *Coming Soon*
- Resource #4: Sample SPaT documentation - *Coming Soon*
- [Resource #5: Guidelines for selecting corridors](#)
- Resource #6: Procurement Guidance - *Coming Soon*
- Resource #7: Identifying existing funding sources to consider - *Coming Soon*
- [Resource #8: Frequently Asked Questions \(FAQs\)](#)
- Webinar Schedule and Recordings - *Coming Soon*
- [Additional Links](#)

> SPaT Home

> Resources

- > Resource #1: DSRC licensing information
- > Resource #2: Implementation guidance
- > Resource #5: Guidelines for selecting corridors
- > Resource #8: Frequency Asked Questions (FAQs)
- > Additional Links

> Contact Us

# SPaT Challenge Resources

SPaT Challenge Resource	Status
DSRC Licensing Information	On-line / Available
Guidelines for Selecting Corridors	On-line / Available
Implementation Guidance	On-line / Available
SPaT Challenge Folio	On-line / Available
SPaT Challenge FAQs	On-line / Available
SPaT Challenge Estimated Costs	Draft Being Reviewed
SCMS & The SPaT Challenge	Draft Being Reviewed
Standards Versioning Management	Draft Being Reviewed
Simple Steps to Deployment – Resource Guide	Draft Being Reviewed
Specifications & Requirements	In Development
Procurement Guidance	In Development

# SPaT Challenge Tactical Working Group

- SPaT Challenge Communications Plan
  - In draft form, finalize in coming months
- “Announcement” documents
  - Technical & Executive versions drafted
- Planning Coordinated Outreach through:
  - AASHTO
  - ITE
  - ITS America

# The SPaT Challenge – Getting Started

- Select a Corridor / Area
  - Infrastructure Compatibility
    - ❖ Signal Controllers
    - ❖ Backhaul
  - Future V2I Applications
    - ❖ Red Light Violation Warning
    - ❖ Intelligent Signal Systems
    - ❖ Eco-Driver
  - Get on the NOCOE SPaT Challenge Map

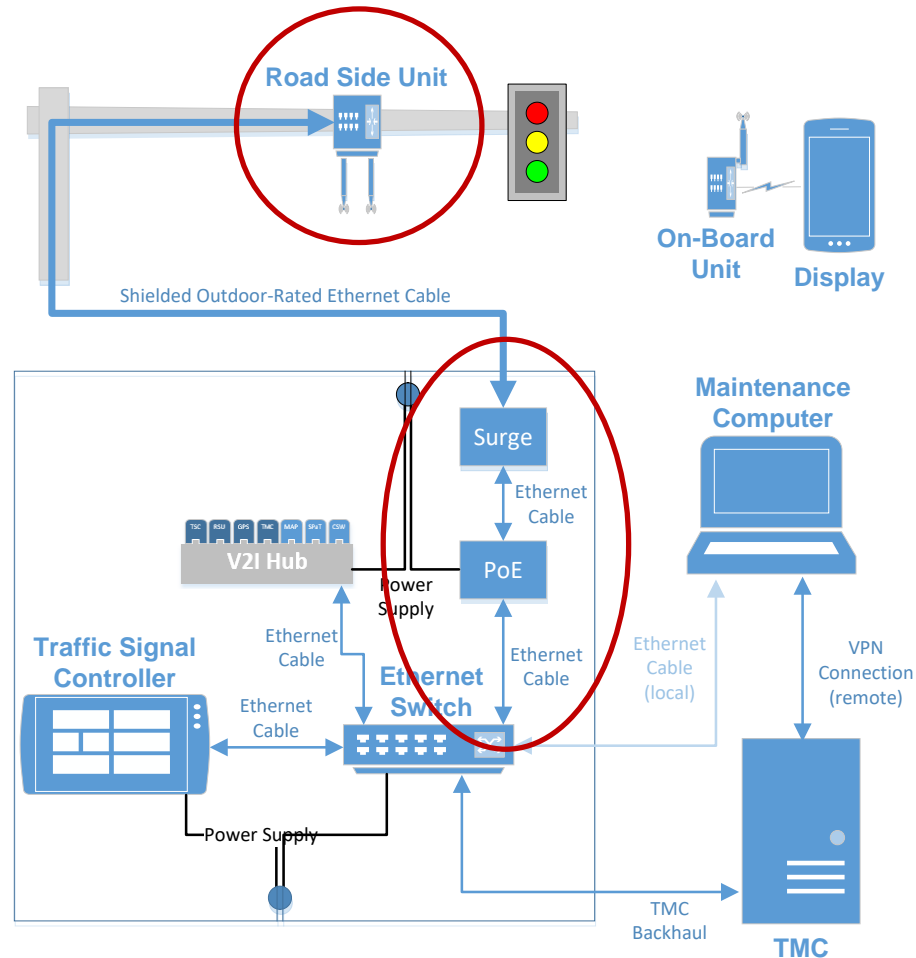
Guidelines for Selecting Corridors

# The SPaT Challenge – Getting Started

- Define Operations / Requirements
  - Identify Partners and Stakeholders
    - ❖ Other Jurisdictions
    - ❖ Deployment Partners
  - Understand Hardware and Architecture
    - ❖ DSRC Roadside Units (RSU)
    - ❖ Messages Being Sent – SPaT and MAP
    - ❖ Performance Requirements

Implementation Guide

# The SPaT Challenge – Getting Started



# The SPaT Challenge – Getting Started

- Design / Procure
  - Identify Hardware Needed
    - ❖ DSRC / Cabling / Mounting
    - ❖ Budgeting
  - Procurement
  - DSRC Licensing
  - Create MAP Data

Pending . . .

Hardware Specifications  
Message Specifications  
Procurement Guidance  
Estimated Costs  
Licensing Process

# The SPaT Challenge – Getting Started

- Installation / Integration
- Testing and Verification
- Operate and Maintain
- Consider Next Steps ...

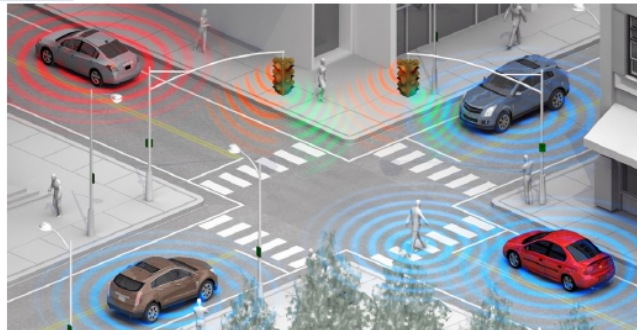




# The SPaT Challenge – Questions?

## The National Connected Vehicle Deployment Challenge

20 SPaT Intersections in 50 States by 2020



### The Challenge:

To challenge state and local public sector transportation infrastructure owners and operators to cooperate together to achieve deployment of DSRC infrastructure with SPaT broadcasts in at least one corridor or network (approximately 20 signalized intersections) in each of the 50 states by January 2020

# Autonomous Vehicle Policy Updates

# AV Legislative / Policy

- Resources:
  - National Conference of State Legislatures (NCSL) – tracking of legislation
    - ❖ In 2017, 32 states have introduced legislation
    - ❖ In 2016, 20 states introduced legislation
    - ❖ In 2015, 16 states introduced legislation
    - ❖ 12 states have passed legislation related to autonomous vehicles
    - ❖ Governors in Arizona and Massachusetts issued executive orders related to autonomous vehicles

# NCSL Website

national conference of sta... X GoogleResults X Autonomous Vehicles | Se... X

www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx Search

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**NCSL**  
NATIONAL CONFERENCE of STATE LEGISLATURES


Strong States, Strong Nation

ABOUT US | LEGISLATORS & STAFF | RESEARCH | MEETINGS & TRAINING | NCSL IN D.C. | MAGAZINE | BLOG

## AUTONOMOUS VEHICLES | SELF-DRIVING VEHICLES ENACTED LEGISLATION

4/12/2017

### Autonomous Vehicles



Many people consider autonomous vehicles to be a significant part of the future of the automotive industry.

As the technology for autonomous vehicles continues to develop, it may be necessary for state and municipal governments to address the potential impacts of these vehicles on the road.

Each year, the number of states considering legislation related to autonomous vehicles has gradually increased.

#### TABLE OF CONTENTS

- Enacted Autonomous Vehicle Legislation Map
- Enacted Autonomous Vehicles Legislation
- Additional Resources

#### RESOURCES

- Introduced 2016 Autonomous Vehicles Legislation

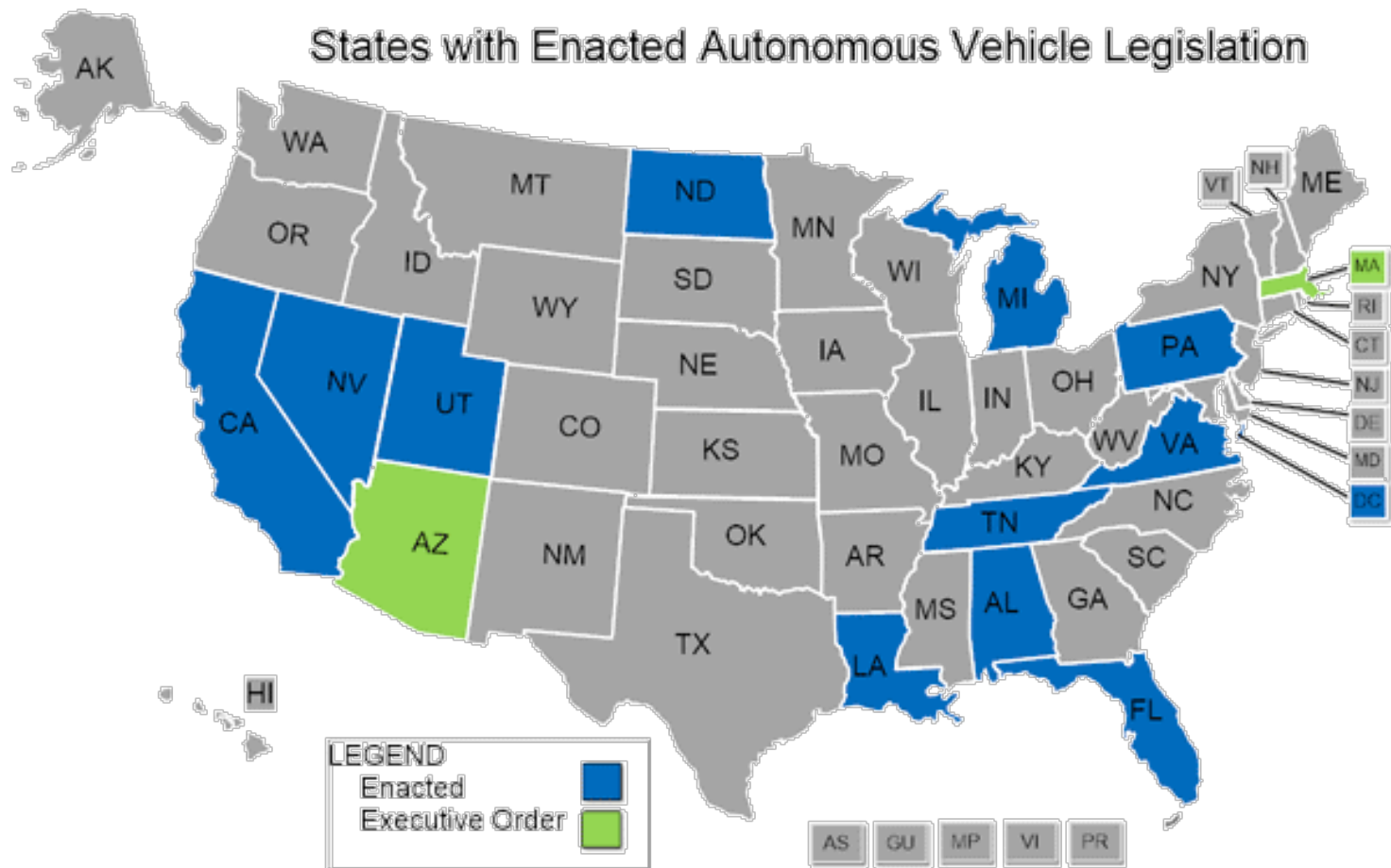
#### NAVIGATION

- Home
- About State Legislatures
- Agriculture and Rural Development
- Civil and Criminal Justice
- Education
- Elections and Campaigns
- Environment
- Ethics
- Finance
- Fiscal
- Health
- Human Services

Map tracking AV legislation

Links to enacted AV legislation

# NCSL Map (4/2017)



# AV Legislative / Policy

- Other Resources:
  - NHTSA “Federal Automated Vehicle Policy: Accelerating the Next Generation in Roadway Safety” (September 2016)
  - NHTSA “Preliminary Statement of Policy Concerning Automated Vehicles” (2013)
  - Bryant Walker Smith, “Automated Vehicles Are Probably Legal in the United States”, Tex. A&M Law Rev. 411 (2014)

# California AV Policy Update

Greg Larson, Caltrans





# Automated Vehicle Regulations in California

April 18, 2017





# California Legislation - Senate Bill 1298 (2012)

As soon as practicable, but no later than January 1, 2015, DMV must adopt regulations setting forth requirements for:

- Manufacturers' testing of automated vehicles on public roadways
- Operation (deployment) of automated vehicles on public roadways

# California's Definition of an Automated Vehicle

A vehicle, equipped with automated technology, that has the capability to drive **without the active physical control or monitoring by a human operator** (not driver assistance!)





# Responsible Agencies

- Statewide Steering Committee:





# Regulations Package 1 – Testing

- Two pre-notice workshops
- 45-day public comment period
- Formal public hearing
- 15-day public comment period
- Regulations approved and adopted in May 2014
- Became effective on September 16, 2014



# Testing on California Public Roadways

- \$5 million in insurance, bond, or self-insurance
- Manufacturer has tested vehicle under controlled conditions and reasonably determined it is safe to operate the vehicles on public roads under those conditions
- Test driver must be seated in driver seat during testing, ready to regain control
- Test driver requirements:
  - No DUI, not an at-fault driver, and no more than 1 point on license
  - Successful completion of test driver training program
  - Must be an employee, contractor, or designee of manufacturer
- Report any accident within 10 days
- **Report unanticipated disengagements of automated technology annually**
- Testing permit valid for one year
- Vehicles > 10,000 lbs GVW and motorcycles excluded from testing



# Current Testing Permit Holders (30)



Mercedes-Benz



**BOSCH**

Invented for life



**HONDA**



TESLA MOTORS



**drive.ai**



Faraday Future



- Valeo North America
- Next EV
- Wheego Electric Cars
- Telenav, Inc
- NVIDIA Corporation
- AutoX Technologies Inc
- Subaru
- Udacity, Inc.
- Navya, Inc.
- Renovo Motors, Inc
- UATC, LLC (Uber)
- PlusAI, Inc.
- Nuro, Inc.
- CarOne, LLC
- Apple, Inc.



# Regulations Package 2 - Deployment

- Theme: “Necessary to ensure the safe operation” on public roads
- Pre-notice workshops conducted in March 2014 and January 2015
- “Request for Interest” for any third-party entities with an interest/capability in conducting functional safety reviews of autonomous vehicles
- Draft deployment regulations released in December 2015
- Two more public workshops
  - January 28, 2016 in Sacramento
  - February 2, 2016 in Los Angeles
- Put on hold pending release of NHTSA Policy Statement



# AV Deployment Regulations (continued)

- Revised draft released on September 30, 2016
  - References “Safety Assessment Letter” from NHTSA Policy
- Public Workshop in Sacramento on October 19, 2016
- Formal proposed rules published on March 10, 2017
  - “Driverless” Testing and Operation will now be allowed
- Initial comments will be solicited until April 24, 2017
- Public Hearing in Sacramento on April 25, 2017
- Revisions, as necessary
- AV Deployment Regulations expected to be finalized by September; effective by December 2017





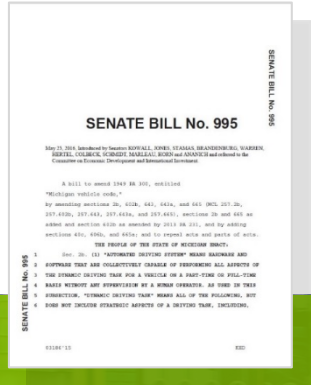
# Questions?

<https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/bkgd>

# Michigan AV Policy Update

Matt Smith, MDOT





**Mike Kowall (R-White Lake), Primary Sponsor**

Allows driverless operation on public roads at any time





## SENATE BILL No. 995

Bill to amend Sections 247-249, 249A, 249B, 249C, 249D, 249E, 249F, 249G, 249H, 249I, 249J, 249K, 249L, 249M, 249N, 249O, 249P, 249Q, 249R, 249S, 249T, 249U, 249V, 249W, 249X, 249Y, 249Z, 249AA, 249AB, 249AC, 249AD, 249AE, 249AF, 249AG, 249AH, 249AI, 249AJ, 249AK, 249AL, 249AM, 249AN, 249AO, 249AP, 249AQ, 249AR, 249AS, 249AT, 249AU, 249AV, 249AW, 249AX, 249AY, 249AZ, 249BA, 249BB, 249BC, 249BD, 249BE, 249BF, 249BG, 249BH, 249BI, 249BJ, 249BK, 249BL, 249BM, 249BN, 249BO, 249BP, 249BQ, 249BR, 249BS, 249BT, 249BU, 249BV, 249BW, 249BX, 249BY, 249BZ, 249CA, 249CB, 249CC, 249CD, 249CE, 249CF, 249CG, 249CH, 249CI, 249CJ, 249CK, 249CL, 249CM, 249CN, 249CO, 249CP, 249CQ, 249CR, 249CS, 249CT, 249CU, 249CV, 249CW, 249CX, 249CY, 249CZ, 249DA, 249DB, 249DC, 249DD, 249DE, 249DF, 249DG, 249DH, 249DI, 249DJ, 249DK, 249DL, 249DM, 249DN, 249DO, 249DP, 249DQ, 249DR, 249DS, 249DT, 249DU, 249DV, 249DW, 249DX, 249DY, 249DZ, 249EA, 249EB, 249EC, 249ED, 249EE, 249EF, 249EG, 249EH, 249EI, 249EJ, 249EK, 249EL, 249EM, 249EN, 249EO, 249EP, 249EQ, 249ER, 249ES, 249ET, 249EU, 249EV, 249EW, 249EX, 249EY, 249EZ, 249FA, 249FB, 249FC, 249FD, 249FE, 249FF, 249FG, 249FH, 249FI, 249FJ, 249FK, 249FL, 249FM, 249FN, 249FO, 249FP, 249FQ, 249FR, 249FS, 249FT, 249FU, 249FV, 249FW, 249FX, 249FY, 249FZ, 249GA, 249GB, 249GC, 249GD, 249GE, 249GF, 249GG, 249GH, 249GI, 249GJ, 249GK, 249GL, 249GM, 249GN, 249GO, 249GP, 249GQ, 249GR, 249GS, 249GT, 249GU, 249GV, 249GW, 249GX, 249GY, 249GZ, 249HA, 249HB, 249HC, 249HD, 249HE, 249HF, 249HG, 249HH, 249HI, 249HJ, 249HK, 249HL, 249HM, 249HN, 249HO, 249HP, 249HQ, 249HR, 249HS, 249HT, 249HU, 249HV, 249HW, 249HX, 249HY, 249HZ, 249IA, 249IB, 249IC, 249ID, 249IE, 249IF, 249IG, 249IH, 249II, 249IJ, 249IK, 249IL, 249IM, 249IN, 249IO, 249IP, 249IQ, 249IR, 249IS, 249IT, 249IU, 249IV, 249IW, 249IX, 249IY, 249IZ, 249JA, 249JB, 249JC, 249JD, 249JE, 249JF, 249JG, 249JH, 249JI, 249JJ, 249JK, 249JL, 249JM, 249JN, 249JO, 249JP, 249JQ, 249JR, 249JS, 249JT, 249JU, 249JV, 249JW, 249JX, 249JY, 249JZ, 249KA, 249KB, 249KC, 249KD, 249KE, 249KF, 249KG, 249KH, 249KI, 249KJ, 249KK, 249KL, 249KM, 249KN, 249KO, 249KP, 249KQ, 249KR, 249KS, 249KT, 249KU, 249KV, 249KW, 249KX, 249KY, 249KZ, 249LA, 249LB, 249LC, 249LD, 249LE, 249LF, 249LG, 249LH, 249LI, 249LJ, 249LK, 249LL, 249LM, 249LN, 249LO, 249LP, 249LQ, 249LR, 249LS, 249LT, 249LU, 249LV, 249LW, 249LX, 249LY, 249LZ, 249MA, 249MB, 249MC, 249MD, 249ME, 249MF, 249MG, 249MH, 249MI, 249MJ, 249MK, 249ML, 249MM, 249MN, 249MO, 249MP, 249MQ, 249MR, 249MS, 249MT, 249MU, 249MV, 249MW, 249MX, 249MY, 249MZ, 249NA, 249NB, 249NC, 249ND, 249NE, 249NF, 249NG, 249NH, 249NI, 249NJ, 249NK, 249NL, 249NM, 249NN, 249NO, 249NP, 249NQ, 249NR, 249NS, 249NT, 249NU, 249NV, 249NW, 249NX, 249NY, 249NZ, 249OA, 249OB, 249OC, 249OD, 249OE, 249OF, 249OG, 249OH, 249OI, 249OJ, 249OK, 249OL, 249OM, 249ON, 249OO, 249OP, 249OQ, 249OR, 249OS, 249OT, 249OU, 249OV, 249OW, 249OX, 249OY, 249OZ, 249PA, 249PB, 249PC, 249PD, 249PE, 249PF, 249PG, 249PH, 249PI, 249PJ, 249PK, 249PL, 249PM, 249PN, 249PO, 249PP, 249PQ, 249PR, 249PS, 249PT, 249PU, 249PV, 249PW, 249PX, 249PY, 249PZ, 249QA, 249QB, 249QC, 249QD, 249QE, 249QF, 249QG, 249QH, 249QI, 249QJ, 249QK, 249QL, 249QM, 249QN, 249QO, 249QP, 249QQ, 249QR, 249QS, 249QT, 249QU, 249QV, 249QW, 249QX, 249QY, 249QZ, 249RA, 249RB, 249RC, 249RD, 249RE, 249RF, 249RG, 249RH, 249RI, 249RJ, 249RK, 249RL, 249RM, 249RN, 249RO, 249RP, 249RQ, 249RR, 249RS, 249RT, 249RU, 249RV, 249RW, 249RX, 249RY, 249RZ, 249SA, 249SB, 249SC, 249SD, 249SE, 249SF, 249SG, 249SH, 249SI, 249SJ, 249SK, 249SL, 249SM, 249SN, 249SO, 249SP, 249SQ, 249SR, 249SS, 249ST, 249SU, 249SV, 249SW, 249SX, 249SY, 249SZ, 249TA, 249TB, 249TC, 249TD, 249TE, 249TF, 249TG, 249TH, 249TI, 249TJ, 249TK, 249TL, 249TM, 249TN, 249TO, 249TP, 249TQ, 249TR, 249TS, 249TT, 249TU, 249TV, 249TW, 249TX, 249TY, 249TZ, 249UA, 249UB, 249UC, 249UD, 249UE, 249UF, 249UG, 249UH, 249UI, 249UJ, 249UK, 249UL, 249UM, 249UN, 249UO, 249UP, 249UQ, 249UR, 249US, 249UT, 249UU, 249UV, 249UW, 249UX, 249UY, 249UZ, 249VA, 249VB, 249VC, 249VD, 249VE, 249VF, 249VG, 249VH, 249VI, 249VJ, 249VK, 249VL, 249VM, 249VN, 249VO, 249VP, 249VQ, 249VR, 249VS, 249VT, 249VU, 249VV, 249VW, 249VX, 249VY, 249VZ, 249WA, 249WB, 249WC, 249WD, 249WE, 249WF, 249WG, 249WH, 249WI, 249WJ, 249WK, 249WL, 249WM, 249WN, 249WO, 249WP, 249WQ, 249WR, 249WS, 249WT, 249WU, 249WV, 249WW, 249WX, 249WY, 249WZ, 249XA, 249XB, 249XC, 249XD, 249XE, 249XF, 249XG, 249XH, 249XI, 249XJ, 249XK, 249XL, 249XM, 249XN, 249XO, 249XP, 249XQ, 249XR, 249XS, 249XT, 249XU, 249XV, 249XW, 249XX, 249XY, 249XZ, 249YA, 249YB, 249YC, 249YD, 249YE, 249YF, 249YG, 249YH, 249YI, 249YJ, 249YK, 249YL, 249YM, 249YN, 249YO, 249YP, 249YQ, 249YR, 249YS, 249YT, 249YU, 249YV, 249YW, 249YX, 249YY, 249YZ, 249ZA, 249ZB, 249ZC, 249ZD, 249ZE, 249ZF, 249ZG, 249ZH, 249ZI, 249ZJ, 249ZK, 249ZL, 249ZM, 249ZN, 249ZO, 249ZP, 249ZQ, 249ZR, 249ZS, 249ZT, 249ZU, 249ZV, 249ZW, 249ZX, 249ZY, 249ZZ

# Public Act No. 332

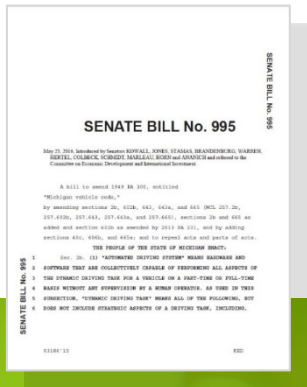
Mike Kowall (R-White Lake), Primary Sponsor

## Open for Transport

Platooning of commercial vehicles

Supporting the military, large shipping or logistics companies





# Public Act No. 332

Mike Kowall (R-White Lake), Primary Sponsor



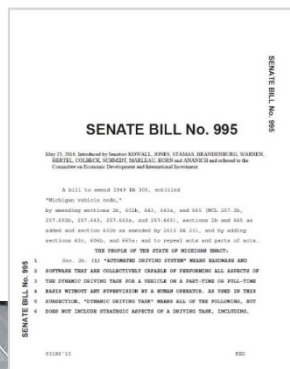
## A New Way to Ride

Automated vehicle networks  
connected to consumers

Creates array of travel options  
for consumers



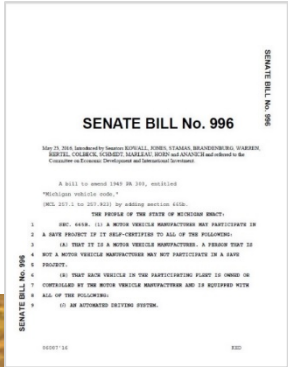




**Mike Kowall (R-White Lake), Primary Sponsor**

Council on Future Mobility reports to the legislature annually on new laws or regulations

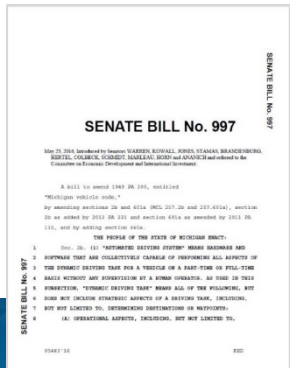
What new policies would help enhance safety, mobility and the state's economy through this technology?



**Mike Kowall (R-White Lake), Primary Sponsor**

Provides specific standards for SAVE projects

## Vehicle networks started and controlled by vehicle manufacturers



# Public Act No. 334

Rebekah Warren (D-Ann Arbor), Primary Sponsor

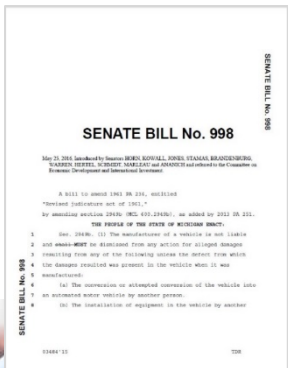
## World Class Destination

Creates the American Center for Mobility (ACM)

The mission of the ACM is still evolving and will include vehicle testing in real world conditions







## Ken Horn (R-Frankenmuth), Primary Sponsor

Ensures that a mechanic, acting in compliance, will not be exposed to liability when working on autonomous technology.

**Feedback or Questions?**

# CAV Related Research Discussions

Galen McGill or Scott Marler