CAT Coalition
Strategic Initiatives Technical Working Group
April 23, 2020 Webinar
Notes and Summary of Discussions

Welcome

Blaine Leonard welcomed everyone to the webinar. Approximately 77 members and guests joined the webinar. A list of those in attendance is provided at the end of these notes.

Ongoing Commitment to Outreach and Knowledge Transfer

Blaine provided a brief recap of the Work Zone Software tool chain that was developed to assist agencies in creating the information needed to describe lane configurations of work zones and other areas with reduced speed or lane drops. Users of the software tool chain can use the software on a tablet or computer in the vehicle, together a high-resolution GPS receiver, to map the path of a vehicle as it traverses the work zone. Once through the work zone, the tool chain builds a map file based on that data and configuration input from the user. This information can then be used to populate infrastructure-to-vehicle (I2V) messages broadcast by the roadside to support in-vehicle warning systems. The tool chain is available for download and use at the following web address: https://www.campllc.org/software-tools/

Also, a 90-minute webinar was conducted and recorded in November 2019, explaining how to download and use the tool chain. Individuals from Arizona and Texas describe their experiences using the tool chain. The link to the webinar can be found on the CAT Coalition website at: http://transportationops.org/catcoalition/IOO_OEM_Forum .

New Topic #1 – Work Zone Data Exchange – Gathering Industry Perspective

Derald Dudley and Amy Nelson presented progress on the USDOT effort to create a Work Zone Data Exchange (WZDX) as a standard for exchanging work zone data. Currently, version 2 of the WZDX is available and version 3 is under development. Some major changes in Version 2.0 include:

- Required GeoJSON formatting of WZDX feed;
- Converted “common core” data dictionary into relational data model with road event tables;
- Added a new data table to accommodate mobility impacts and lane level restriction; and
- Added new “type of work” table to provide specifics.

While version 2 had significant changes, there are only minor changes expected in the transition to version 3, with backward compatibility, and agencies should not wait for version 3 to implement.

Faisal Saleem shared a summary of Maricopa County's use of the WZDX for Smarter Work Zones and Connected Vehicles. Faisal shared examples of the application protocol interface (API) and in-vehicle truck displays that utilize the data communicated.

Kristin Virshbo offered an update for the Worker Presence subgroup within the WZDX initiative. The Worker Presence data element in the Work Zone Data Exchange is intended to indicate when humans are on-scene at the work zone. Kristin reviewed various options for how worker presence could be detected or reported and noted that even the definition of when workers are present can be complicated. Finally, there are privacy, ethical, and competitive considerations that must be examined as part of reporting worker presence. A survey to collect information from a variety of users and stakeholders is being prepared and will be active next month. Please contact Kristin at Kristin.virshbo@crc-corp.com if you are interested in participating and offering input from your experience.

Amy Nelson updated the group on the activity from the Technical Assistance subgroup that educates data producers and consumers about how to access data. They assist with validation tools and lessons learned. Please contact Amy at amy.nelson@dot.gov if you want to be involved. There is a virtual webinar event planned for May 19, 2020 from 1:00-2:30 EDT titled: Virtual Event on Increasing Worker and Driver Safety through Access to Work Zone Data. Registration for this event is available at: **Register** . After the event, a recording will be available on the Work Zone Data Exchange (WZDx) website.

New Topic #2 – Enabling Connected Intersections Initiative

Blaine Leonard introduced the fact that many of the connected intersections that are broadcasting SPaT and MAP messages today are interacting with agency fleet vehicles (e.g. transit buses, snowplows, etc.). The ultimate vision is for the data that is broadcast to be successfully received and interpreted by on-board applications of production vehicles or third-party applications in vehicles. Over the last few years, it has become apparent that accomplishing this compatibility will require additional testing and clarifications on data structure and accuracy. Therefore, several "data related activities" have been identified that are independent of the communications medium used for communications. Therefore, these data activities can be addressed even with uncertainty about the 5.9 GHz spectrum allocation. Blaine went on to describe an activity of the IOO/OEM Forum that is called the Enabling Connected Intersections initiative, which is attempting to bridge this gap in communications capability. This initiative is just beginning and will have seven primary activities to address the data needs, summarized as follows:

- Action #1: Create and reach consensus on minimum requirements for intersection broadcasts of SPaT & MAP.
- Action #2: Summarize Industry Approach(es) to SCMS and develop IOO Guidelines
- Action #3: Test Plan
- Action #4. Reference Implementation and Functional Safety Assessment
- Action #5: Develop and Execute the Enabling Connected Intersections Outreach and Expansion Strategy
- Activity #6: Deployment Tracking
- Activity #7: O&M Approach

Blaine described that there are also several parallel activities led by groups outside the CAT Coalition that will accomplish portions of the activities and the IOO/OEM Forum will collaborate with these activities to avoid duplication. As time was running short, Blaine briefly covered the role of this working group in supporting and engaging with the Enabled Connected Intersections initiative. Blaine indicated that time will be spent at the July Strategic Initiatives WG webinar defining the role for this group in supporting this initiative.

New Topic #3 – Role of SCMS in Deployment Initiatives

Blaine introduced that the use of security credentials will be critical to both IOOs and OEMs trusting the messages received. Blaine introduced two speakers for today to speak about their deployment activities regarding security credential management systems (SCMS).

Jonathan Parent and Matt Krech presented background on Canadian CV and AV activities.

Matt Krech described Canada's SCMS objectives for working across borders in North America, particularly between Canada and the U.S., including:

1) Developing a recommended operating model for nationally-coordinated pilot systems.
2) Developing an operational model for nationally-coordinated, production-ready SCMS.
3) Developing a recommended governance model to coordinate SCMS in Canada.

Matt noted that It is important to think about SCMS interoperability across states and internationally, to develop SCMS transparency with input from IOOs, and to consider multi-provider systems for fundamental security and privacy.

Next, Rob Zimmer from Panasonic discussed V2X over the air security as provided in Panasonic activities. Rob highlighted four threats addressed by SCMS:

1) Message Authenticity
2) Message Authorization
3) Message Integrity
4) Message Confidentiality

Panasonic is working with ISS to provide a multi-stage level for security. Rob introduced Panasonic's role as helping vendors meet standards, enroll devices, and get priority with security keys. Online registration allows users to have access to Panasonic's system. Rob shared the CMS Connectivity Lifecycle from RSU and OBU enrollment to production to top off.

PLR Working Group Update

Faisal Saleem provided an update from the Policy, Legislative, Regulatory (PLR) Working Group. At the most recent webinar in February, the PLR Working Group had a presentation from the University of

Washington School of Law on their research into CAV policies across the U.S. Faisal noted that the research focused on many aspects of CAV policies, including:

- Graphical displays of which states have comprehensive definitions legislation.
- Descriptions of the Uniform Law Commission (ULC) Model Legislation, with commentary on what the research team likes and does not like about the model language.
- Information about what Automated driving vehicles are being tested and the levels of requirements for testing illustrated by state.
- Insight into likely impacts of automated vehicles on vehicle liability and insurance.

The next PLR webinar is scheduled for June 16, 2020 where UC-Davis will present information on a roadmap for state AV legislation. Webinar summaries and documents created by the PLR Working Group can be found at: https://transportationops.org/CATCoalition/policy_legislative_regulatory_WG.

Partner Reports: US DOT ITS America, ITE, Other

Deb Curtis discussed the V2I Hub MAP creation tool and noted that USDOT has requested modifications to refine the tool to include an interface between the Work Zone Software tool chain and the V2I Hub MAP creation tool. Deb also noted that the V2I Hub MAP creation tool will be hosted by NOCoE starting in May 2020.

Deb also described an initiative that recently started as a partnership between USDOT and ITE to develop documents describing consistent and interoperable use of standards for connected intersections. This will be a collaboration of both IOOs and OEMs. Siva Narla from ITE is leading this effort. To be included as an interested party and receive updates, contact Siva Narla at snarla@ite.org .

Carlos Alban from ITS America reported that they are continuing to work with ITS America's V2X task force to finish comments on the Federal Communications Commission (FCC) Notice of Proposed Rulemaking (NPRM).

Blaine added to what Deb had reported, and noted that ITE has two ongoing efforts related to standardization:

1) RSU Standardization
2) Connected Intersection Standardization

Open Discussion on Emerging Topics

Venkat Nallamothu shared that the Alliance for Automotive Innovation recently announced a pledge to deploy 5 million devices in vehicles and roadway infrastructure within the next 5 years to enable vehicle to everything (V2X) communications, dependent on the FCC leaving the full 5.9 GHz spectrum for transportation safety and allowing the use of Cellular V2X. AASHTO and ITS America are preparing statements of support. It is very early in the process and the Alliance is expected to share additional details.

Close

T**he next webinar is scheduled for Thursday, July 23, 2020, at 2 pm Eastern.**

TWG 1 April 23, 2020 Webinar Participants

- Blaine Leonard (Chair)
- Ahmad Jawad
- Alan Clelland
- Amy Nelson
- Animesh Balse
- Barry Einsig
- Blaine Van Dyke
- Bob Murphy
- Brian Kelley
- Carlos Alban
- Carole Delion
- Cathy Huebsch
- Christian Kulus
- Cliff Heise
- Cory Johnson
- Curtis Thompson
- Dave Miller
- Dean Deeter
- Deborah Curtis
- Debra Bezzina
- Derald Dudley
- Eddie Fidler
- Faisal Saleem
- Frank Provenzano
- Gummada Murthy
- Gurprit Hansra
- Hideki Hada
- Jack Hall
- Jacob Folkeringa
- James Chang
- Jason Ellis
- Jeff Stewart
- Jeremy Schroeder
- Jesus Ruiz
- Jianming Ma
- Joe Averkamp (Co-Chair)
- J Lower
- John Roman
- Jonathan Parent
- Jon Riehl
- Justin Chan
- Katherine Blizzard
- Ken Moshi
- Ken Yang
- Kent Kacir
- Kristin Virshbo
- Kyle Garrett
- Liana Mortazavi
- Marcella Kaplan
- Mark Kopko
- Mark Peters
- Matt Krech
- Matt Smith
- Mauricio Guerra
- Mike Schagrin
- Mike Stelts
- Mohammed Gallaa
- Mohammed Hadi
- Nu Rosenbohm
- Patrick Son
- Patrick Zelinski
- Pierre Rasoldier
- Rob Zimmer
- Robert Dingess
- Roxane Mukai
- Shah Imran
- Shane McKenzie
- Stan Caldwell
- Steve Sawyer
- Stephen Mensah
- Steve Misgen
- Susan Catlett
- Tom Kern
- Tom Sohrweide
- Tom Timcho
- Venkat Nallamouthu
- Weimin Huang

CAT Coalition Strategic Initiatives TWG – April 23, 2020
Webinar Agenda

1. Outreach and Knowledge Transfer
2. New Topic #1: Work Zone Data Exchange – Gathering Industry Perspective
3. New Topic #2: Enabling Connected Intersections Initiative
4. New Topic #3: Role of SCMS in Deployment Initiatives
5. PLR Working Group Update
6. Partner Reports
7. Open Discussion on Emerging Topics

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Outreach and Knowledge Transfer

- Suggestions for additional resources to be shared
- Suggestions for additional members of this working group
- Brief Recap of the Work Zone Software Toolchain

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Work Zone Software Toolchain

Background:

The software toolchain for the Connected Work Zone (CWZ) Safety Application was developed under the V2I Safety Applications Project by Crash Avoidance Metrics Partners LLC (CAMP).

Toolchain purpose:

This toolchain is intended to be a resource to assist state and local DOTs in creating the information needed to describe lane configurations of work zones and other areas with reduced speed or lane drops. The vehicle path is mapped by a vehicle with a high-resolution GPS receiver as it traverses the work zone, and the tool builds a map file based on that data and configuration input from the user. This information is used to populate infrastructure-to-vehicle (I2V) messages broadcast by the roadside to support in-vehicle warning systems.

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Work Zone Software Toolchain

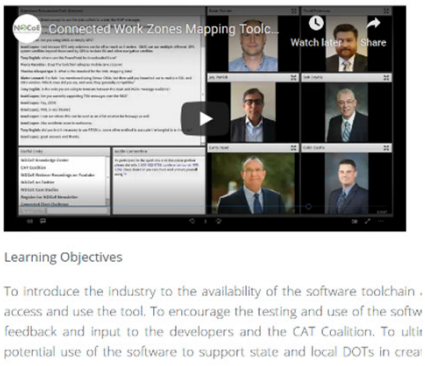
How to download the toolchain:

This toolchain is now available for agencies to download and use through a 'click-through' license at the following address: https://www.campllc.org/ - under the software/tools tab.

How to get more information:

NOCoE Webinar: November 2019

90-minute webinar overviewing the Toolchain, with information shared by Toolchain users in Texas and Arizona



Webinar can be viewed at: http://transportationops.org/catcoalition/IOO_OEM_Forum

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Work Zone Data Exchange – Gathering Industry Perspective

FHWA/Volpe Team

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The Work Zone Data Exchange and CAV Data Needs

April 23,2020

Derald Dudley & Amy Nelson
U.S. Department of Transportation

Kristin Virshbo
Castle Rock Associates

Faisal Saleem
Maricopa County Department of Transportation

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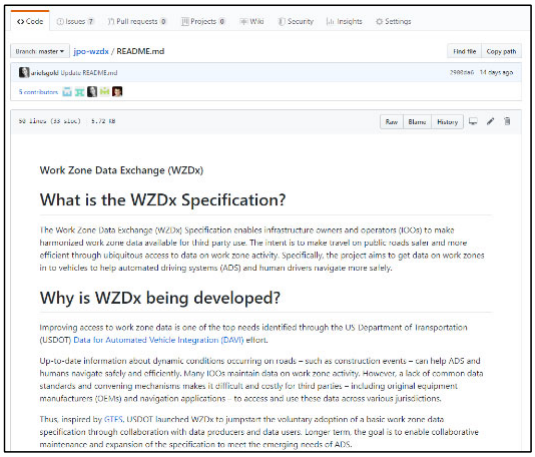
The Work Zone Data Exchange (WZDx)



https://github.com/usdot-jpo-ode/jpo-wzdx

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https://www.transportation.gov/av/data/wzdx 7

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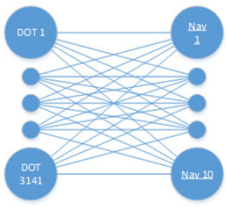
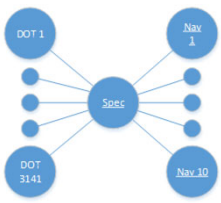
The Power of Data Standardization





- Presumption
  - 3,141 US Counties / County Equivalents (Producer)
  - 10 Navigation Platforms (Consumer)
  - Exchange WZD between counties and navigation platforms one time
- No Standardization
  - Needed Translations: 10 * 3,141 = 31,410
- Adopted Standard
  - Needed Translations: 1 * 3,141 = 3,141

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https://www.transportation.gov/av/data/wzdx 8

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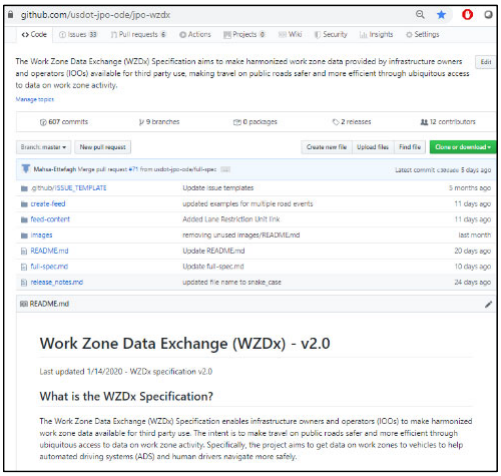
WZDx Specification v2

- Version 2 of the Work Zone Data Exchange (WZDx) Specification was released on GitHub on **January 15, 2020.**
- Major changes in v2:
  - Required GeoJSON formatting of a WZDx feed
  - Converted the "common core" data dictionary into a relational data model with road event tables featuring new geometry-specific data elements
  - Added new data tables to accommodate mobility impact and lane level impacts/restrictions (i.e., closures and restrictions)
  - Added a new 'Types of Work' table to provide specific information on the types of work being performed at a work zone



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https://www.transportation.gov/av/data/wzdx

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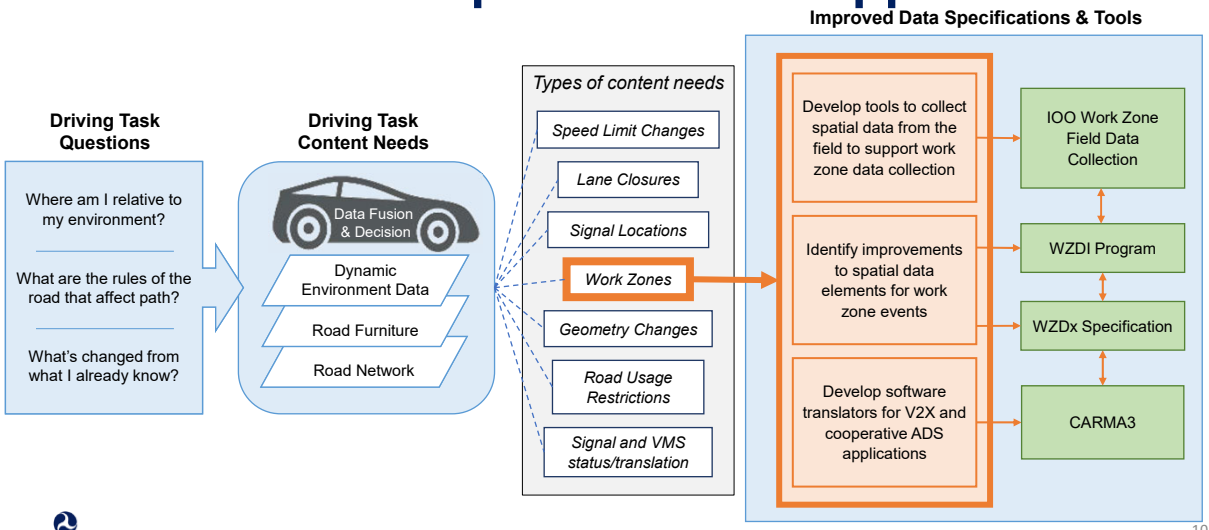
Utilizing Common Work Zone Event Data for V2x and Cooperative ADS Applications



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https://www.transportation.gov/av/data/wzdx

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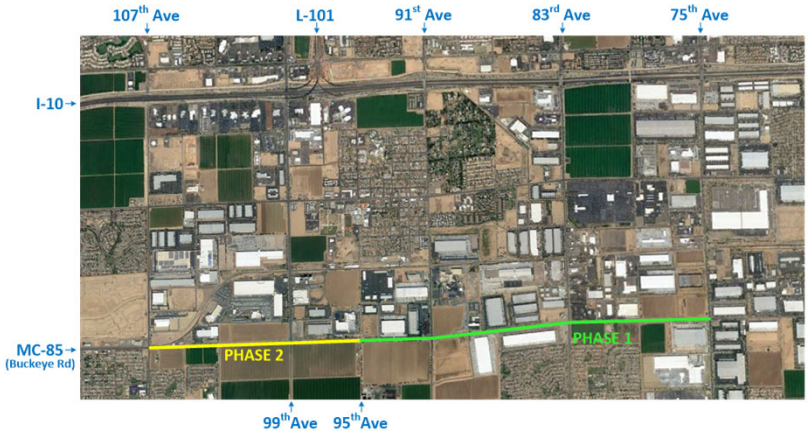
MC-85 SWZ Project (SWZ, CV & WZD)



- Major Freight Corridor
- Long Project Duration
- Available Alternate Routes
- Challenging Industrial Area

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https://www.transportation.gov/av/data/wzdx

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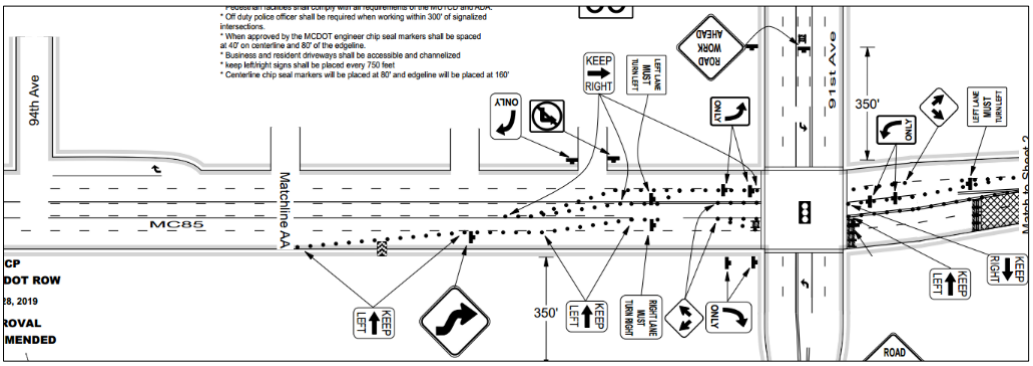
Traffic Control Plans



- January 2019 to June 2020, to widen MC-85 to a total of 5 lanes; storm drains, sidewalk, lighting, irrigation.
- Minimum of 1 lane in each direction open, shifting all traffic to opposite side of road, first south half, then north half.
- 24 x 7 restrictions, workers on-site M-F 8 AM to 5 PM.

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Sample WZDx Data Frame

Traffic Control Plan #12 Eastbound

Tag	Value	Notes/Comments
identifier	Maricopa.gov.2019012001	
subidentifier	TT0345;TCP_12;eastbound	Use Project # and TCP #. A single TCP could generate two restrictions, one in each direction.
StartDateTime	startDateTime-ver: 2019-01-20T06:35:00-07:00	By convention, we will include timezone value (-07:00) since AZ does not recognize DST; could also use UTC (Z). Suggest this be a convention for all.
EndDateTime	endDateTime-est: 2019-08-20T23:59:59-07:00	How would day-time construction (8 AM to 5 PM, M-F) be represented? Make five entries?
BeginLocation	roadName: MC-85 (Buckeye Rd) roadDirection: eastbound latitude-est: 33.435795 longitude-est: -112.259716 crossStreet: 91st Ave	
EndLocation	latitude-est: 33.437151 longitude-est: -112.224501 crossStreet: 79th Ave	
wz_status	active	Could this field include a separate Date/Time field if Work Zone will only be set up during off-peak hours during an extend time period?
totalLanes	2	

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ion.gov/av/data/wzdx

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Sample WZDx Data Frame

Traffic Control Plan #12 Eastbound (Continued)

Tag	Value	Notes/Comments
openLanes	shift-left (yes) left-lane(also good?) alternating-flow-lane (no)	Trying to describe the case where all lanes are actually blocked and one lane of traffic is shifted over into the opposing traffic lane. Used shift-left since it means "all open lanes shift to the left". Could also use left-lane? Note, discrepancy in WZDx_final01.xsd, line 185: "shift-left", vs "left-shift-lanes" in reference document.
closedLanes	right-lane	Shared two-way left turn center lane not available or closed; no left turn allowed. Other: How would one represent a center two-way left turn lane on an arterial? See next slide.
closedShoulders	Both	
workersPresent	True	This could require a Date/Time field separate from the Project Start/End Date/Time fields if the closure is always present but workers are only present during certain work hours/days
Description	Eastbound lanes reduced to one lane and shifted to opposing side of roadway on MC-85 (W. Buckeye Rd) from near 91st Ave to near 75th Ave. for approx. 7 months. Westbound traffic also reduced to 1 lane.	Where would real-time ITS information such as travel times / speeds, and DMS message text be represented? Consider embedding within this field, or provide a URL link in this field to another data page, other?
issuingOrganization	Maricopa County DOT	
timestampCreation	2019-01-20T06:35:00-07:00	
timeStampUpdate	2019-03-29T14:42:00-07:00	

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sportation.gov/av/data/wzdx

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MCDOT WZDx JSON API
(https://api.mcdot-its.com/WZDx/Activity/Get)


```
WorkZoneActivity:
  0:
    identifier:                "maricopa.gov.2019012001"
    subidentifier:             "TT0345;TCP_12;eastbound"
    startDateTime:
      startDateTime-ver:       "2019-01-20T06:35:00-07:00"
    endDateTime:
      endDateTime-est:         "2019-08-20T23:59:59-07:00"
    beginLocation:
      roadName:                "MC-85 (Buckeye Rd)"
      roadNum:                 "MC-85"
      roadDirection:           "eastbound"
      latitude-est:            33.435795
      longitude-est:           -112.259716
      crossStreet:             "91st Ave"
    endLocation:
      latitude-est:            33.437151
      longitude-est:           -112.224501
      crossStreet:             "75th Ave"
    wz_status:                 "active"
    totalLanes:                2
    openLanes:                 "shift-left"
    closedLanes:               "right-lane"
    closedShoulders:           "both"
    workersPresent:            "true"
    description:               "Eastbound lanes reduced to one lane and shifted to opposing side
                                of roadway on MC-85 (W. Buckeye Rd) from near 91st Ave to near 75th
                                Ave. for approx. 7 months.  Westbound traffic also reduced to 1
                                lane."
    issuingOrganization:       "Maricopa County DOT"
    timestampEventCreation:    "2019-01-20T06:35:00-07:00"
    timestampEventUpdate:      "2019-03-29T14:42:00-07:00"
```


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https://www.transportation.gov/av/data/wzdx

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In-Truck Demonstration (Swift – Drivewyz)

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https://www.transportation.gov/av/data/wzdx

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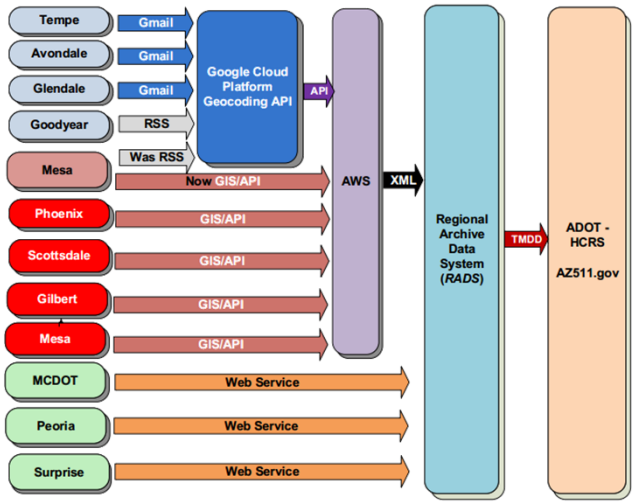
Next Steps: Regional WZDx (Multiple Sources)



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https://www.transportation.gov/av/data/wzdx

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Worker Presence Subgroup & Survey

- Purpose
  - Survey of stakeholders – IOOs and the ITS community – to collect input from a representative sample of stakeholders beyond the WZDWG
- Actively seeking sponsorship and outreach support to encourage wide-spread participation
- Proposed Survey Topics
  - Current definitions of worker presence in state and local regulations
  - Current methods of collecting worker presence data, and their respective strengths and weaknesses
  - Privacy, ethical, and competitive concerns about sharing worker presence information

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https://www.transportation.gov/av/data/wzdx

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Technical Assistance Subgroup

- Purpose
  - Educate data producers and consumers on how to access the WZDx's most recent specification and achieve data conformity
  - Lead steward in developing and reviewing business rules and best practices for setting up WZDx feeds or updating current feeds as new versions of the specification are released
- Subgroup members will review and propose validation tools for setting up feeds and provide technical guidance to adopters
- Will provide step-by-step details on how early adopters implemented the v2 specification
- Will create a form through which WZD members can share questions and answers

For More Information

To learn more and access available resources, please visit:

- DAVI Website
- WZDx Website
- Automated Vehicles 4.0
- AV Data Roundtable Summary Report
- General Transit Feed Specification
- WZDx Version 2 Specification
- WZDx GitHub Site
- Work Zone Data Initiative

For more information on the WZDx project, WZDx Demonstration Grants, or the Work Zone Data Working Group, contact *avdx@dot.gov*

Enabling Connected Intersections Initiative

Blaine Leonard

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Enabling Connected Intersections

IOO/OEM Forum SPaT/RLVW Group – leading the initiative

- Majority of SPaT/MAP broadcasts are received by fleet vehicles (e.g. transit, snowplows) or after-market On-board units
- At least one OEM has formally announced that production vehicles will have on-board, V2I safety applications starting in 2022
- Outside of the communications uncertainties that exist, there are data related actions and verifications needed to "enable" this connectivity to production vehicles

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Enabling Connected Intersections
Seven (7) Primary Actions

Action #1: Create and reach consensus on minimum requirements for intersection broadcasts of SPaT & MAP.

Action #2: Summarize Industry Approach(es) to SCMS and develop IOO Guidelines

Action #3: Test Plan for verification of messages

Action #4: Reference Implementation and Functional Safety Assessment

Action #5: Develop and Execute the Enabling Connected Intersections Outreach and Expansion Strategy

Action #6: Deployment Tracking

Action #7: O&M Approach

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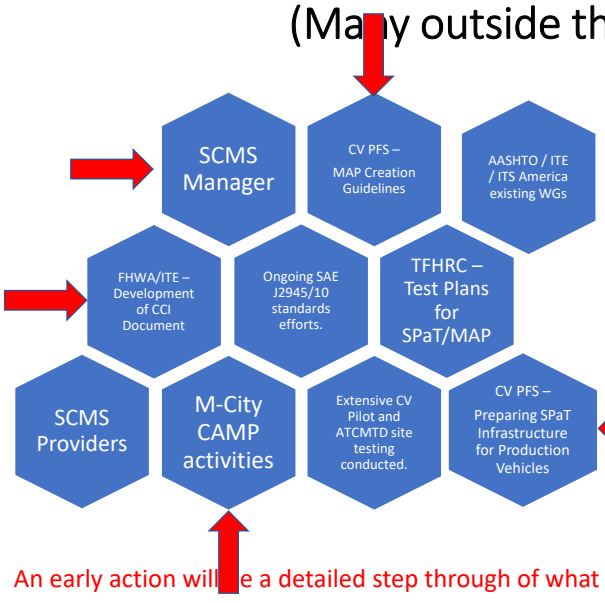
Leveraging Other Parallel Activities
(Many outside the CAT Coalition)



- A large part of this effort will be coordinating with and leveraging these activities
- Enabling Connected Intersections will create new content to supplement other activities

An early action will be a detailed step through of what portions of the Actions will be done by outside efforts

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Role of the Strategic Initiatives WG in this Effort

We'll use the Strategic Initiatives WG webinars in 2020-2021 to request your input on several Actions, including, but not limited to the following:

- ***Action #3: Test Plan*** – As the Test Plan is developed, Strategic Initiatives WG members will be encouraged to conduct testing on your SPaT systems and provide feedback through this group.
- ***Action #5: Outreach Strategy*** – Early draft will be shared with this group for feedback & reaction. Once finalized, this group will be asked to support outreach efforts.
- ***Action #7: O&M Approach*** – Will define a common approach to operating, maintaining, testing, and verifying connected intersections (e.g. how to handle temporary intersection outage). Early drafts will be vetted with this group, and members will be asked to provide input and perspective based on your deployments

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Role of SCMS in Deployment Initiatives

Matt Krech, Transport Canada

Rob Zimmer, Panasonic

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CENTRE D'INNOVATION CENTRE

Overview of Transport Canada's SCMS Work Plan

CAT Coalition – Strategic Initiatives Working Group
April 23rd, 2020

Matt Krech, P. Eng
Jonathan Parent, EIT

Transport Canada Transports Canada

Canada

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CENTRE D'INNOVATION CENTRE

Program to Advance Connectivity and Automation in the Transportation System (ACATS)

Program Goal

- Help Canadian infrastructure owner/operators prepare for the array of technical, regulatory and policy issues that will emerge as a result of the introduction of Connected Vehicles (CV) and Automated Vehicles (AV).

Key activities

- Supporting CV/AV capacity building and knowledge sharing amongst stakeholders
- Supporting the development of highly qualified personnel
- Leading or funding: research, studies, and analysis (incl. cybersecurity); the development of codes, standards, certifications and guidelines necessary to deploy CV/AV technologies in Canada

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V2X Pilots in Canada

- **ACTIVE** (Edmonton)
  - Largest deployment in Canada
  - Experimenting with C-V2X
- **AURORA** (UBC)
  - Heavy focus on communication technologies and cross-border/jurisdiction issues
  - Unique research into spectrum misbehaviour
- **City of Stratford**
  - Canadian smart city
  - Candidate for first "full city" deployment, potential for SCMS hosting
- **Transport Canada's Motor Vehicle Test Centre** (Blainville)
  - V2V testing, V2I intersection
- **Ottawa**: L5 Testing Facilities
  - Canada's V2X "Living Lab"
- **City of Calgary, City of Montreal, MTO / 400 series highways**, and more…

Image credit: ESCRYPT

SCMS Work Plan Objectives

1) Develop a recommended **operating model for a nationally coordinated pilot SCMS** to support current and future CV testing in Canada

2) Develop a recommended **operating model for a nationally coordinated production-ready SCMS** that support pan-Canadian and US interoperability

3) Develop a recommended **governance model** to coordinate SCMS activities in Canada

Image credit: ESCRYPT

Work plan status

Phase		Objective	Timeframe
1A	Requirement Analysis	Review literature; Canadian privacy legislation; assess Canadian stakeholder needs/considerations.	Feb. 2019 – Nov. 2019
1B	Option Analysis	Identify options to operate and govern a nationally coordinated SCMS; gather stakeholder feedback.	Nov. 2019 – March 2020 Workshop: Dec. 2019
1C	Recommended Operational Model	Elaborate selected models; develop proposed high level architecture for pilot and large scale systems (number of each certificate management entity (CME), location).	April 2020 – July 2020 Workshop: June 2020
2A	Specification and Costing	Estimate costs of publically funded components.	2020-2021
2B	Recommended Certificate Policy	Develop recommended Certificate Policy (CP) for a national system.	2020-2021

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Requirements Analysis – Findings

- Some CV data may need to be kept in-province or in-country; specific notification/consent on privacy requirements may be triggered
- Strong interest in harmonized enrollment requirements across regions
- Existing pilots and early investments should be able to be transitioned to a production environment
- Trust Anchor Management needs to enable interoperability between SCMS providers and OEM root CAs
  - Single EU-like Trust List Manager vs. Diverse set of SCMS Electors
- Prior work done by the European Commission on a Certificate Policy may be leveraged for North America
- Report available here

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Options Analysis – Findings

- Government-industry P3 identified as preferred governance model
- Stakeholders should be able to operate a single set of technical components in NA; Canada may have unique policies, but should not require operation of a separate system or root CA
- Certificate update parameters may be adapted for supporting rural deployment with infrequent connectivity
- Integrated Canada-US elector system is preferable for trust anchor management
- Report will be available on Transport Canada's Ingenium Portal shortly

Final thoughts

- Important for CV deployment community to proactively consider SCMS interoperability across domestic and international borders
- SCMS Certificate Policy should be developed transparently with input from IOOs
- A multi-provider system should be considered to meet fundamental security and privacy outcomes

CENTRE D'INNOVATION CENTRE

VATION CENTRE

Thank You

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Transport Canada Transports Canada

Canada

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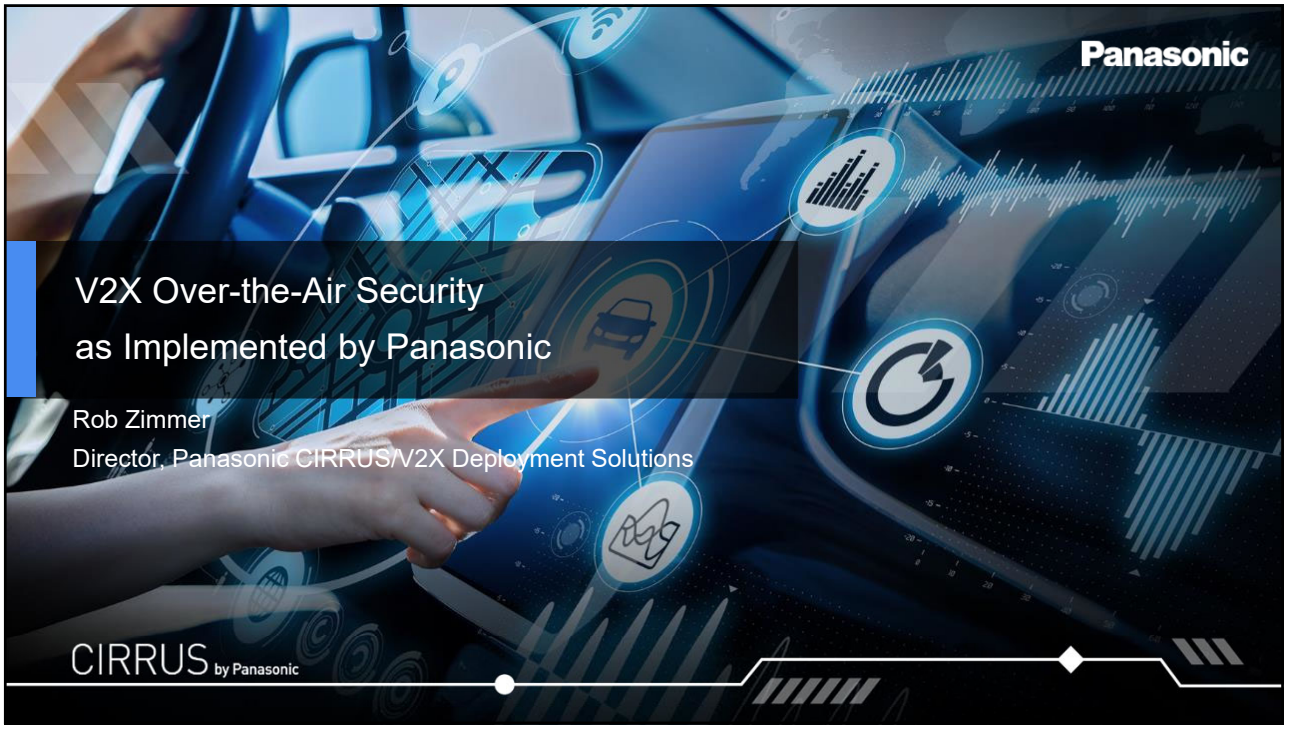

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Topics for today

Panasonic

- What is security, and what is Over-the-Air (OTA) security?
- How has Panasonic teamed with ISS to implement OTA security?
- How does an OBU or RSU implement security for OTA Messages?

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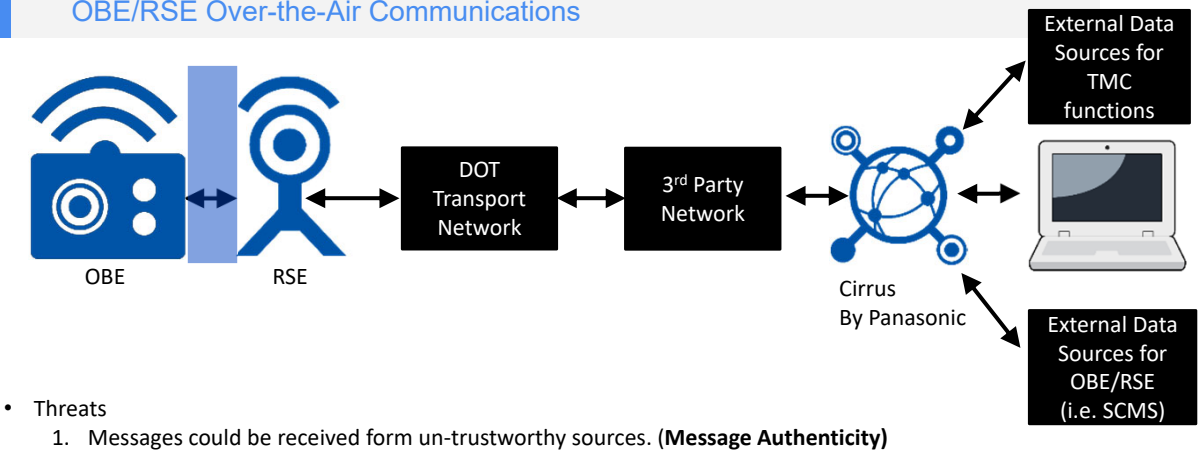
Key System Components and Interfaces: OBE/RSE Over-the-Air Communications

Panasonic



- Threats
  1. Messages could be received form un-trustworthy sources. (**Message Authenticity)**
  2. Messages could be received from sources that don't have the privileges asserted. (**Message Authorization**)
  3. Messages could be modified en-route. (**Message Integrity**)
  4. Messages could be read by unintended recipients (**Message Confidentiality)**

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OBE ←→RSE Message Authenticity Threat

Panasonic

- Threat
  1. **Message Authenticity** - Messages could be received form un-trustworthy sources.
  2. **Message Authorization** - Messages could be received from sources that don't have the privileges asserted
  3. **Message Integrity** - Messages could be modified en-route
- Mitigation Strategy
  - IEEE 1609.2 specifies Public Key Infrastructure (PKI) security techniques for signing messages using security certificates issued by a Certificate Authority
  - BSM and TIM messages sent over the air by OBE or RSE are signed and the signature may be verified by the receiving entity
  - If a signature verifies as valid it ensures:
    - The source of the message is trusted – source is trusted by a certificate authority that trusts the receiver
    - The message asserts privileges that match the attached signed certificate
    - The message was not modified in route – a hash of the message is verified as matching the message contents

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OBE ←→RSE Message Authenticity Threat

Panasonic

- Threat
  4. **Message Confidentiality** - Messages could be read by unintended recipients
- Mitigation Strategy
  - IEEE 1609.2 specifies security techniques for encrypting messages using security certificates issued by a Certificate Authority
  - Message encryption is used on a case-by-case basis
  - Encrypted messages must be decrypted by the receiver.
  - Encrypted messages may also have content that is signed.

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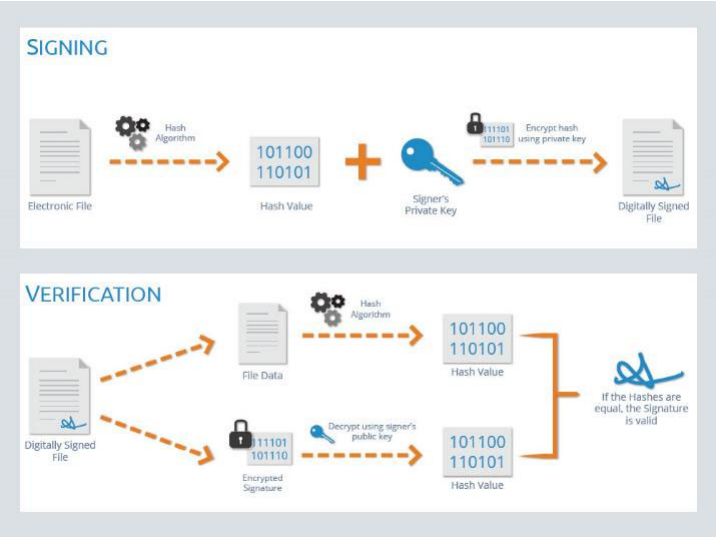
Panasonic

How does Over-the-Air Message signing work



Borrowed from:
https://www.revasolutions.com/expertise/process-management/digital-signatures/attachment/digital-signatures-methodology/

CIRRUS by Panasonic

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35 Years of Embedded Security

- **INTEGRITY Security Services (ISS)**
  - Founded in 2010
  - Subsidiary of Green Hills Software
  - Hardware and platform agnostic security solutions
  - End-to-End Security Experts – device infrastructure
  - Design and management team have 250+ years experience
  - Over 1 billion devices secured with ISS solutions

INTEGRITY SECURITY SERVICES

- **Green Hills Software (Incorporated 1982)**
  - Largest embedded security company in the world
  - 1500+ existing embedded customers
  - 37 offices worldwide
  - Only RTOS to achieve Common Criteria EAL6+ certification

Green Hills SOFTWARE

 Slide 2 Green Hills SOFTWARE

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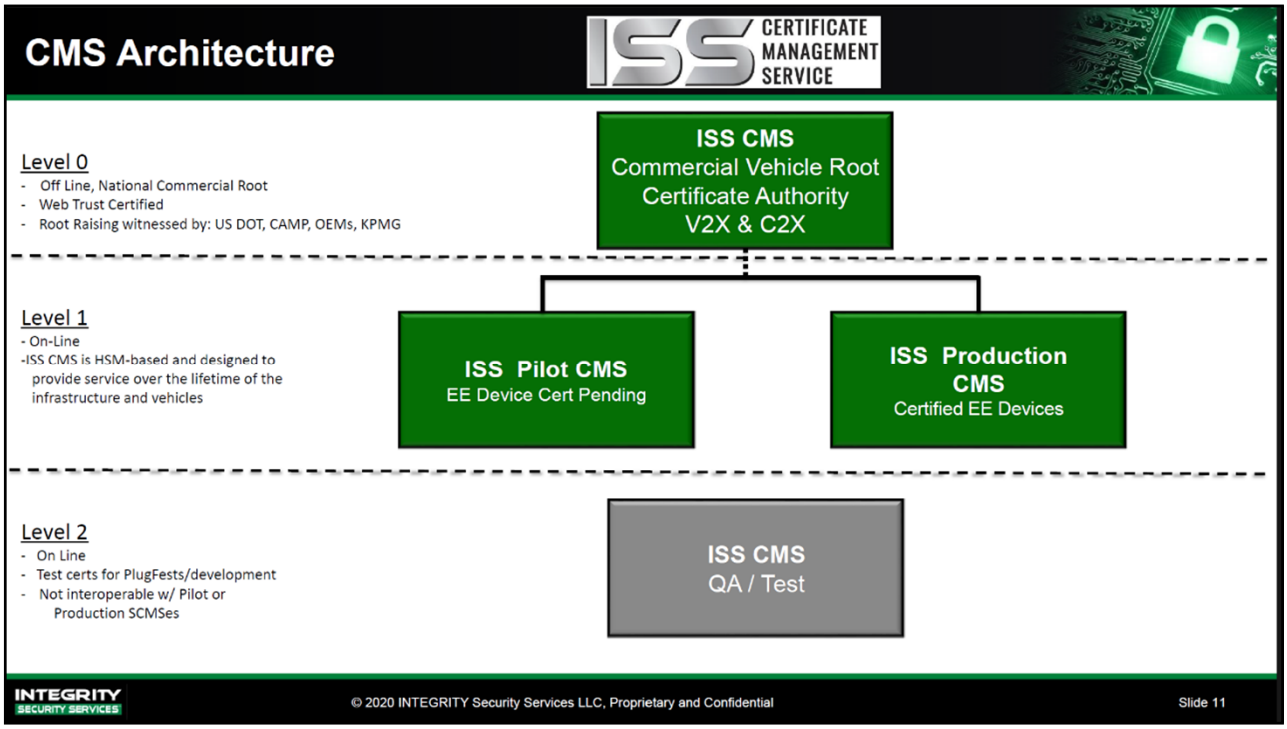
CMS Architecture
CERTIFICATE MANAGEMENT SERVICE
Level 0
- Off Line, National Commercial Root
- Web Trust Certified
- Root Raising witnessed by: US DOT, CAMP, OEMs, KPMG
ISS CMS
Commercial Vehicle Root Certificate Authority
V2X & C2X
Level 1
- On-Line
-ISS CMS is HSM-based and designed to provide service over the lifetime of the infrastructure and vehicles
ISS Pilot CMS
EE Device Cert Pending
ISS Production CMS
Certified EE Devices
Level 2
- On Line
- Test certs for PlugFests/development
- Not interoperable w/ Pilot or Production SCMSes
ISS CMS
QA / Test
INTEGRITY SECURITY SERVICES
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Slide 11

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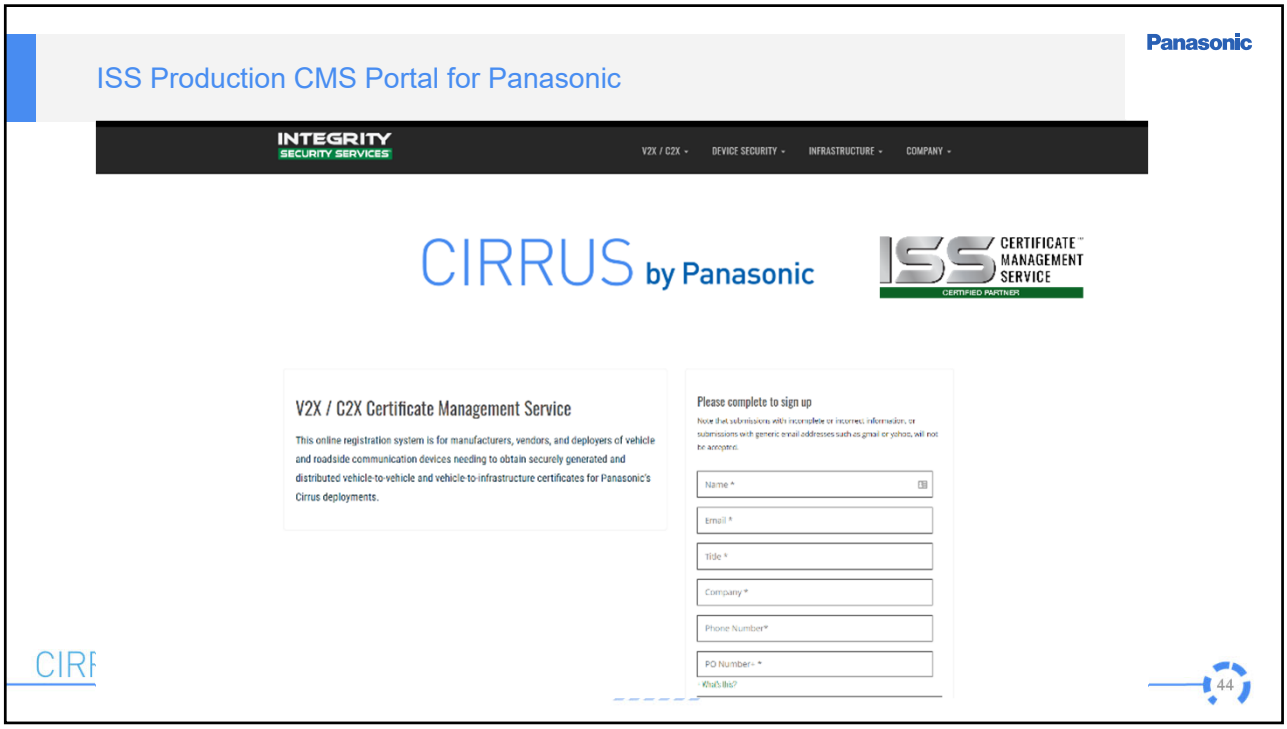
ISS Production CMS Portal for Panasonic
Panasonic
INTEGRITY SECURITY SERVICES
V2X / C2X
DEVICE SECURITY
INFRASTRUCTURE
COMPANY
CIRRUS by Panasonic
CERTIFICATE MANAGEMENT SERVICE
CERTIFIED PARTNER
V2X / C2X Certificate Management Service
This online registration system is for manufacturers, vendors, and deployers of vehicle and roadside communication devices needing to obtain securely generated and distributed vehicle-to-vehicle and vehicle-to-infrastructure certificates for Panasonic's Cirrus deployments.
Please complete to sign up
Name *
Email *
Title *
Company *
Phone Number*
PO Number* *
What's this?
CIRF
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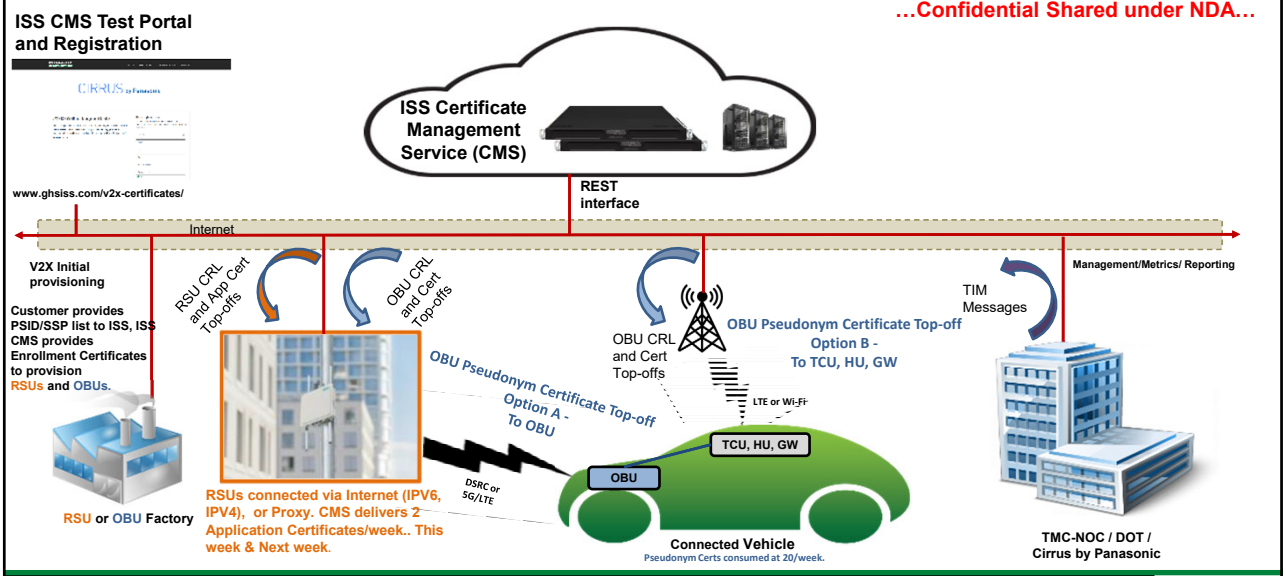
CMS Connectivity Lifecycle: From RSU & OBU Enrollment, to Production, to Top-Off

…Confidential Shared under NDA…



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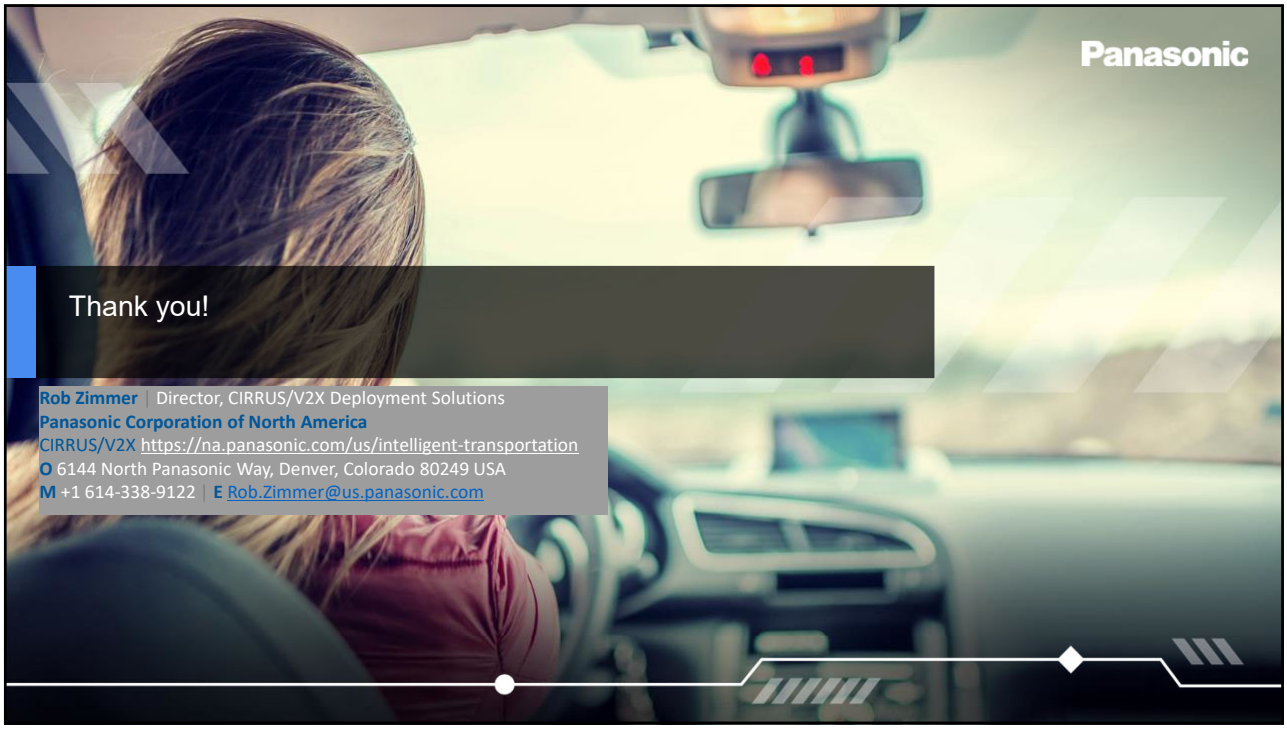

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Brief Update from the Focus Area Working Group: Policy, Legislative, Regulatory (PLR) WG

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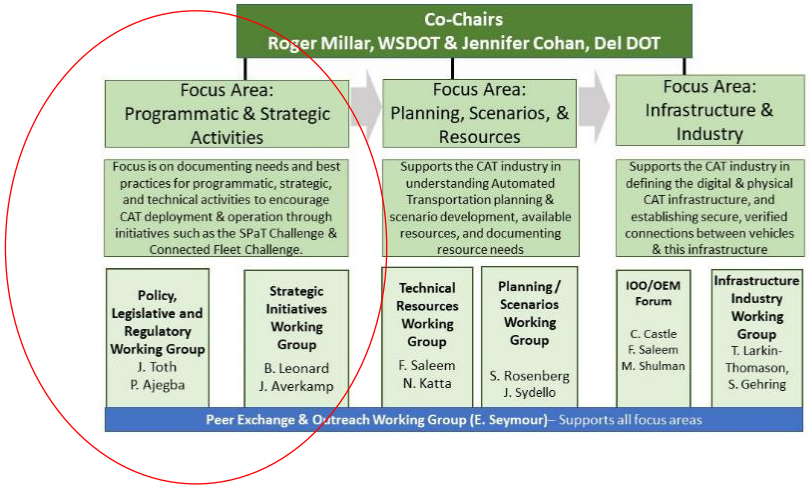
Programmatic & Strategic Activities Focus Area



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PLR Working Group – April 2020 Update

February 13th webinar:

- Presentation from the University of Washington School of Law
  - Researching CAV policies across the United States
  - Research of states with comprehensive definition language
  - Insight into likely impacts of automated vehicles on vehicle liability and insurance
- **June 16, 2020 Webinar:**
- Presentation from UC Davis on a Roadmap for State AV Legislation
- Polling members for additional topics and focus areas of the group

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Agenda Item #5: Partner Reports

USDOT

AASHTO

ITS America – Carlos Alban

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ITE Update

Two ITE standardization efforts:

1) RSU Standardization effort; and
2) The Connected Intersection Standardization effort

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Next Strategic Initiatives WG Webinar

- Next Webinar:
  - July 23rd, 2020 2:00 PM Eastern

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