Cooperative Automated Transportation (CAT) Coalition
Peer Exchange & Outreach Working Group
November 16, 2018 Webinar
Notes and Summary of Discussions

Summary of Action Items

- ***Doug Hohulin to outreach to Elizabeth Harman (International Association of Fire Fighters) to inquire about her participating in future discussions about outreach to the emergency responders.***
- ***This group to continue discussion about the role of capability maturity assessment as an outreach mechanism for CAT.***

Welcome

Ed Seymour had a last-minute emergency and was unable to chair the meeting., Dean Deeter welcomed everyone to the webinar and recapped the planned agenda items.

Outreach and Peer Exchange

Dean introduced the outreach and peer exchange topic for today's webinar. Dean reminded members that they are welcome to send a request to present during this portion of the bi-monthly webinars. To request to present, email Ed and Dean at: *catoutreachwg@gmail.com.*

Outreach and Peer Exchange Topic #1: Capability Maturity Models for CAT

Steve Lockwood presented "Implications of CAT for State DOT Programs". Steve's presentation explored the topic of preparing for CAT, looking beyond technologies. He introduced the five dimensions typically used in capability maturity model (CMM) assessments (business processes, systems and technology systems, performance, organization/structure/culture, and collaboration).

Steve explained details of a half-day workshop he and Erin Flanigan led for the Iowa DOT to assess their CAT capability levels. The workshop followed the proven approach used for other CMM workshops. During the workshop, participants discussed each dimension as it relates to CAT, and documented:

- Strengths (as identified by participants);
- Weaknesses (as identified by participants);

- Consensus on the current CMM level of each dimension; and
- Action items to improve to higher CMM levels.

A PDF version of Steve's presentation is attached to the end of this summary. *Note: Steve has made some clarifications to the attached presentation in light of comments entered into the chat box during the webinar.*

Identification of More Formal Outreach Needs and Approaches

One of the intents of the presentation on the assessment of CAT capability maturity was to initiate discussion about the role that similar workshops or analyses could play in performing outreach. Both Steve and Dean expanded on the Iowa workshop experience, explaining the benefits of a wide group of stakeholders participating in the discussions, learning the perspectives from other stakeholders.

Dean suggested continuing to discuss the role of CAT CMM assessments in performing outreach during the next webinar.

Dean reminded members of the Florida AV Summit happening on November 27-28 in Tampa, Florida.

Dean reminded members of this group's interest in conducting outreach to the emergency responder community. In the chat box, Doug Hohulin noted that Elizabeth Harman (Assistant to the General President at International Association of Fire Fighters) attended the FHWA National Dialogue on Highway Automation - Workshop in Dallas, November 14-15. Doug offered to outreach to Elizabeth to inquire if she would be interested in assisting this group in initiating outreach to the emergency responders.

Associations Announcements of Upcoming Meetings, Conferences and Webinars

Nicola Taveras (ITE) provided a recap of the recent National Rural ITS (NRITS) Conference conducted by ITE in Arizona, and noted several near term activities ITE will be conducting.

ITS America was not available for this webinar, but will provide a summary at the next webinar.

Michael Stelts noted that there will be a V2X session at the upcoming SAE World Congress meeting and anyone interested in presenting in this session should email Michael at: michael.stelts@us.panasonic.com.

Doug Hohulin noted (through the chat box) that he is on the 5GAA US IOO Community Outreach Team and requested to provide a peer exchange presentation on 5GAA and the IOO Community Outreach plans. *Note: Dean has followed up with Doug and the plan is for him to present during the January webinar.*

Comments Received on the Chat Box

The following comments and input were received on the chat box. Dean will work with Ed to discuss responses or the need for future webinar agendas to respond to the comments received.

After reviewing the material and benefits and what you are moving toward - I am concerned that dealing with the fundamentals is very misleading; deployers need to consider what data, how to collect the data, how to protect the data, backhaul bandwidth, system operations monitoring, and above all the implications of security on their networks, existing infrastructure, required updates to the traffic controller to insure the integrity of the links, certification, and live SCMS interfaces as well as such topics as OTA updates, - - - These are all essential but the folks purporting to provide peer to peer assistance haven't any practical experience in solving these problems - - we are currently headed (spat challenge) to constructing a bunch of isolated systems which do not interoperate in a meaningful manner! Backhaul is NOT an issue - depending on what you want to collect! Too many people today seem to think the right thing to do is collect BSMs from everyone and send it to the "TMC" which is nonsense - - think edge computing! Big data is the solution - it is identifying what you need and turing raw data into useful information at the edge !

deployment needs a reality check - - there is huge difference between pilots and real deployment - and people are not understanding what is actually involved in bring this technology online

How does microcell and edge computing within the 5G networks impact the need for heavy buildouts by DOTs of a fiber optic network? Does it accelerate it? Does it make it obsolete?

Machine vision systems like Tesla Autopilot are using the current road network for lane guidance. Should this group focus on the potential liability and system harmonization pressures as a result of widespread adoption of these types of Level 2 technologies.?

There has been heavy focus on traffic signals due to connectivity (DSRC) because of perceived systemic benefit? Should DOTs prioritize digital work zone communication protocols and pavement marking performance since level 2/3 automated vehicles will be the first deployed? It depends on the Level of Automation and the technology the vehicle is deployed. Agencies need to determine whether or not they are willing the support level 2 (machine vision) or simply provide data from existing systems (signals).

Upcoming Webinar Topics & Close

The next Peer Exchange & Outreach Working Group webinar will be January 18, 2019 at 2:00PM Eastern. Dean reminded members of the email address to send any ideas or suggestions: catoutreachwg@gmail.com.

Session Title

Implications of CAT for State DOT Programs

"The future has already arrived; its just not evenly distributed"

Steve Lockwood, LLC
lockwood@slockwood.com

CATT CENTER FOR ADVANCED TRANSPORTATION TECHNOLOGY

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Preparing for CAT – Beyond Technology

1. CAT is not a "Program" It is technologies and applications that support other DOT programs"
   - Safety (HSIP strategies)
   - TSMO (traffic ops, freeway management, incident and workzone management, etc.
   - Asset Management (pavement conditions assessment
   - Road weather information
2. CAT is evolving: key issues related to V2I technology, day one applications, relative B/C not likely to be settled in short run
3. Key Question: What DOT capabilities improvements are needed now which are:
   - Technology-neutral
   - Future proof
   - Have payoffs in alternative CAT scenarios

CATT

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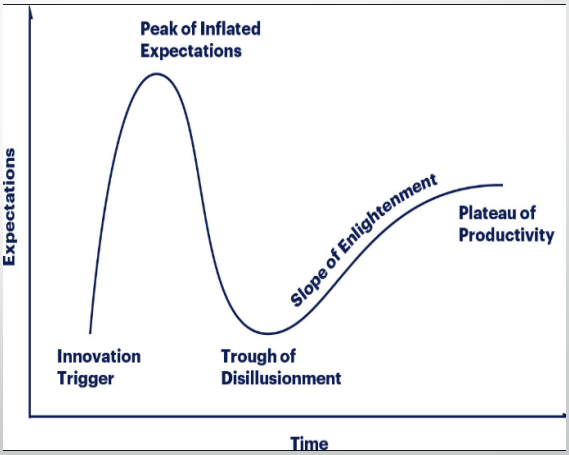
Session Title

Caveats

WSP/Lockwood

Gartner Hype Curve



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CAT-supportive Actions Now

- Recognize that CAT technology is part of "system" with other non-technical long lead-time challenges
- Continue to learn about systems/technology/apps via pilots and testing

IN THE MEANTIME

"Make no-regrets/future -proof capability improvements needed to support CAT -- that DOTs can take today – as they are needed for a range of DOT program purposes (independent of CAT timing/form of arrival)"

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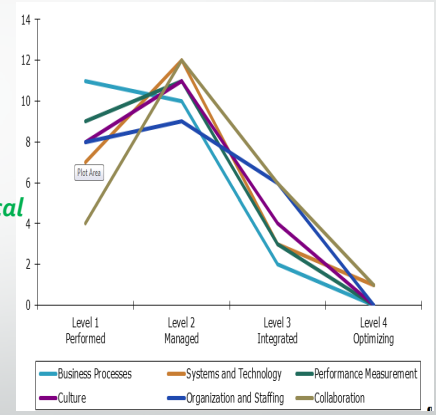
Session Title

Beyond Pilots: Agency Readiness for CAT can be Assessed Now

Business & technical support processes

Institutional & Organizational Strategies



FHWA

Lessons from 30 state DOTs

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Improving Capabilities Now for Realizing CAT:

1. Policy, Planning, Programming, Funding
2. Systems Engineering and Technology Evolution
3. Performance Measurement, Business Case
4. Culture and Institutional Roles
5. Organizational Structure and Workforce
6. Collaboration -- Public, Private)

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Session Title

D-1: Planning and Programming

- Recognizing here CAT fits into DOT programs (TSMO, AM, RWIS, etc.)
- Integrating TSMO (to be CAT-enhanced) into planning Process
- Realistic timing
- TSMO strategy V2I enhancements: Incremental approach (no mandate): selected day one apps
- Working with MPOs and local governments re CAT start-ups

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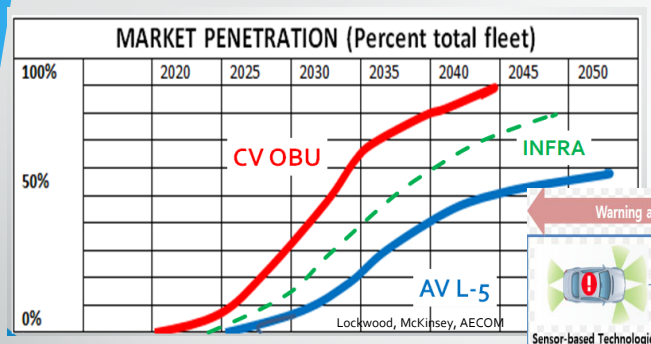
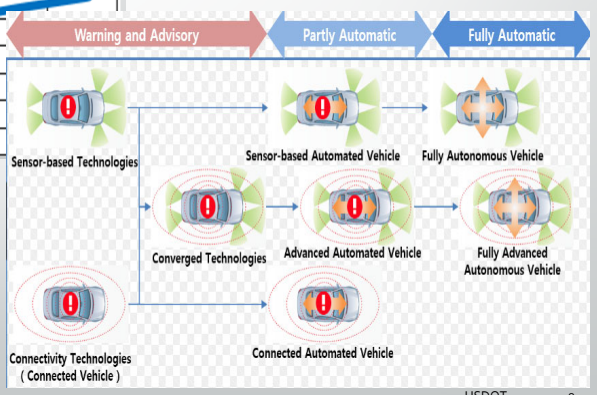
When CAT Arrives: Market Penetration Time Line





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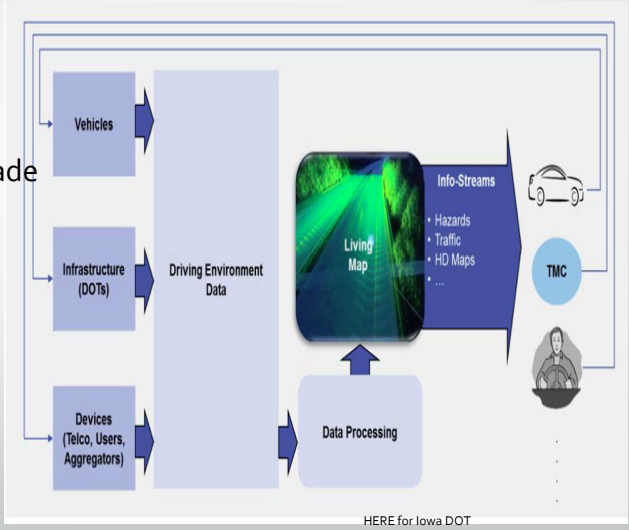
USDOT 8

Session Title

D-2: Systems and Technology (1) -- AV

- Life-cycle TC device updates (V2I technology neutral)
- 3-D Digital Info structure:
  - ✓ authoritative/automotive-grade
  - ✓ static and dynamic
- Back-haul:
  - ✓ technology options
  - ✓ multi-purpose
- Accommodate enclaves and new business models



HERE for Iowa DOT

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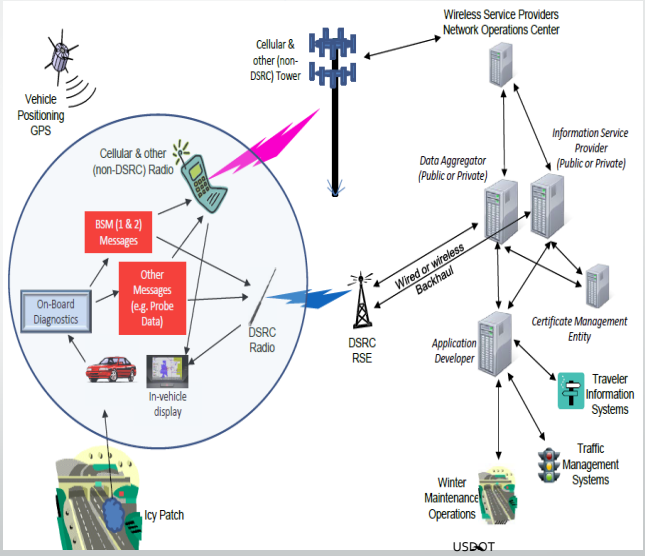
D-2: Systems and Technology (2) -- CV

- Technology neutrality
  - ✓ BSM 1&2, BCM, BMM
  - ✓ multiple technologies
- National standards
  - ✓ comms, apps, platforms
- Security (SCMS)
  - ✓ who and when?



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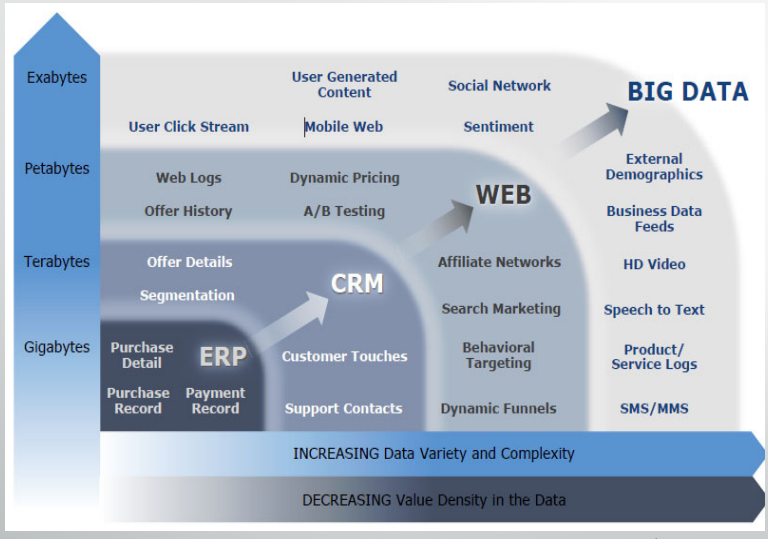
Session Title

D-3: Performance Measurement/Data

- Preparation for upgrading to reactive/proactive TSMO strategies
- Big data management/analytics/integration
- Business case (B/C) for V2I investment (penetration levels, ODDs, efficacy

Handling Big Data



Bob Mcqueen

Operations as a significant data generator (Ex)

- SANDAG 1 TB per day
- Assumed 200 days per year operation: 200 TB per yr annum
- Connected vehicles 2ZB per yr

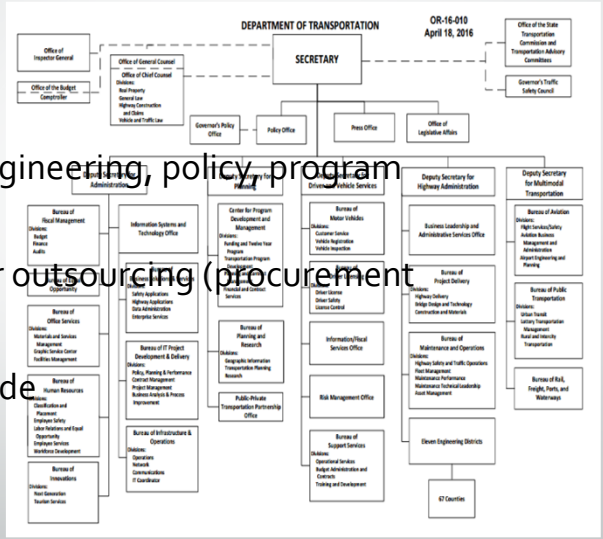
Session Title

D-4: Culture

- New DOT role (integrate service delivery with private sector initiatives)
- New forms of public-private information sharing
- Public acceptance (education) role, privacy
- Intergovernmental focus: federal (DOT 3.0) vs state
- Data Ownership
- New delivery models

D-5: Organization and Staffing

- Changing Role of TMC
- Staff core capabilities – engineering, policy, program development, outreach
- Policy and mechanisms for outsourcing (procurement mechanisms)
- IT issues: TSMO vs statewide



Session Title

D-6: Collaboration

- Within state: DOT, DMV, DOC, Governor's Office
- IOO/OEM network development
- New system/service delivery models/players
- CV PPP and cost-sharing
- New forms of long-term procurement &contracting for global players

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Using CMM Tool in an Agency Capabilities Improvement for CAT

- Improvement in capabilities is incremental
- Successive cycles of capability
- Evaluation and action plans essential
- Need to track performance impacts and key interactions to determine payoffs

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Session Title

The Capabilities Self-Evaluation Tool

CMM DIMENSION	V2I PROGRAM CAPABILITY LEVEL SELF ASSESSMENT CRITERIA			
	Level 1 Pilot Underway	Level 2 V2I Program Initiated	Level 3 V2I Program Integrated	Level 4 V2I Program Mainstreamed
BUSINESS PROCESSES Planning, programming and budgeting, work flows	Agency is considering or conducting initial V2I pilot project(s) and developing plans for business processes.	Agency(s) has conducted a pilot project and is now developing V2I plans, programs, budgets and workflows.	V2I plans, programs and workflows are being implemented and institutionalized.	A CV program is established as part of normal agency operations.
SYSTEMS AND TECHNOLOGY Systems engineering and decision-support (Field / TMC)	Agency has developed and deployed prototype V2I pilot systems.	Agency is developing a V2I systems plan—including back office and field components.	Standard approach to back office and field component deployment developed.	V2I back office and field component development and deployment fully integrated with TSMO systems.
PERFORMANCE Use of V2I information for analytics, reporting, evaluation, management	V2I performance measures, data and analytics are being identified.	Performance measurement, data and analytics processes are under development.	V2I performance measurement "system" has been developed for V2I and utilized for routine TSMO operational management and reporting.	V2I is fully integrated into the agencies performance measurement program—including both the performance of V2I as well as the use of V2I information regarding performance of other TSMO activities.
ORGANIZATION, STAFFING AND CULTURE Technical understanding, leadership, policy, security and authorities, organizational structure, and staff capacity	Need for changes in policy, staffing, organization, culture and legal protections are identified.	Changes to policy, staffing, organization, culture and legal protections are being implemented.	Modifications to policy, staffing, organization, culture and legal protections are accepted and institutionalized.	Continuous improvements to staffing, organization, culture and policy are routinely made.
COLLABORATION Public and Private Partnerships	Pilot program arrangements informal (public-public and public-private).	Public-private and public-public partnership needs and approaches identified.	Public-private and public-public partnerships are accepted and standardized.	New and updated partnership arrangements mainstreamed.

FHWA

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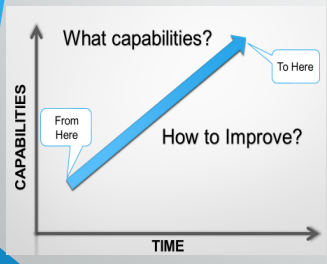
CAT Capabilities Improvement Process



Facilitated Workshop Process

Strengths Cited

- Agency is working with FHWA to optimize federal funding for programming.
- Agency has a statewide ITS Architecture
- Agency has ITS plans for major regions, and a statewide DMS plan.
- Agency provided input for the ITS Strategic plan.
- Agency is moving towards programming projects with a regional approach rather than an isolated, local intersection/segment approach.
- The department is reevaluating the ITS plans in the context of TSM&O potential, rather than capacity expansion opportunities alone.

Weaknesses Cited

- Agency does not have a comprehensive formal statewide TSM&O Plan.
- Projects are selected based on funding sources available, rather than by their benefits/impact potential. System performance does not dictate where funding is allocated
- TSM&O projects use ad-hoc funding process.
- Performance—the emphasis is on highway and other modes.
- Compartmentalization of budgets within Agency limits the funds available for programming processes and TSM&O initiatives. Lack of understanding of the trade-off between funding various TSM&O strategies
- Life cycle equipment costs are not being considered in programming.

Level	1 — Performed	2 — Managed	3 — Integrated	4 — Optimized
Criteria	Individual projects implemented with agency without strategic context, priorities or integration with other jurisdictions	Consensus statewide approach developed [illegible] goals, deficiencies, B/C, network [illegible] common priorities with other jurisdictions	Statewide program integrated [illegible] multimodal transportation plan with related [illegible] program	TSM&O integrated into agency multi-sectoral plans and programs, based on formal, continuing planning processes and sustainable funding
Consensus	1			

Workshop Actions to Advance to the Next Level

- Develop a comprehensive formal statewide TSM&O program plan.
- Continue to develop a planning process to score and rank projects related for MAP-21 performance measures.
- Educate decision-makers regarding the business case for TSM&O utilize full range of outreach materials—with short, yet powerful publicity pieces—that are persuasive to the specific audience being targeted (e.g., local officials, politics, [illegible]
- Implementing the Planning-to-Programming platform for TSM&O, to demonstrate the greater benefit/cost ratios associated with these projects compared to conventional expansion initiatives.
- Given the cost-effectiveness of TSM&O, consider opportunities for reprogramming and reallocating funds away from other functions and needs to provide more funding to TSM&O. Begin having these potentially difficult discussions and [illegible] department.

List of strengths identified by participants

List of weaknesses identified by participants

Consensus about current CMM level by participants

Action items contributed by participants

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