

AASHTO Updates on Connected and Automated Vehicle Programs

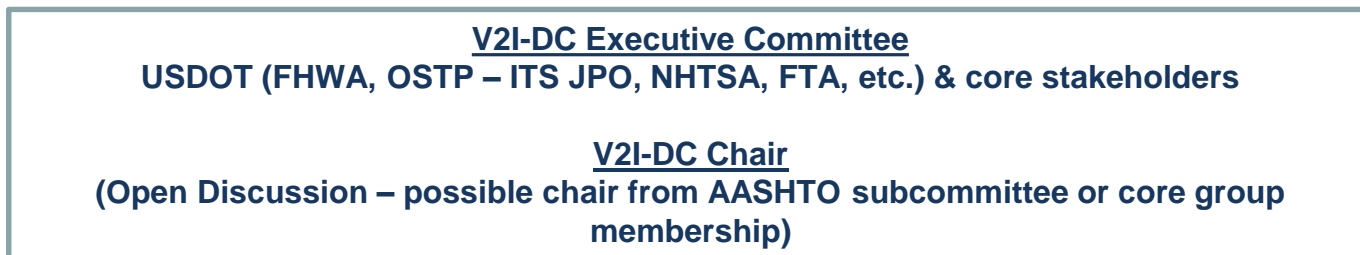
June 21, 2016

I-95 CC CAV Summit

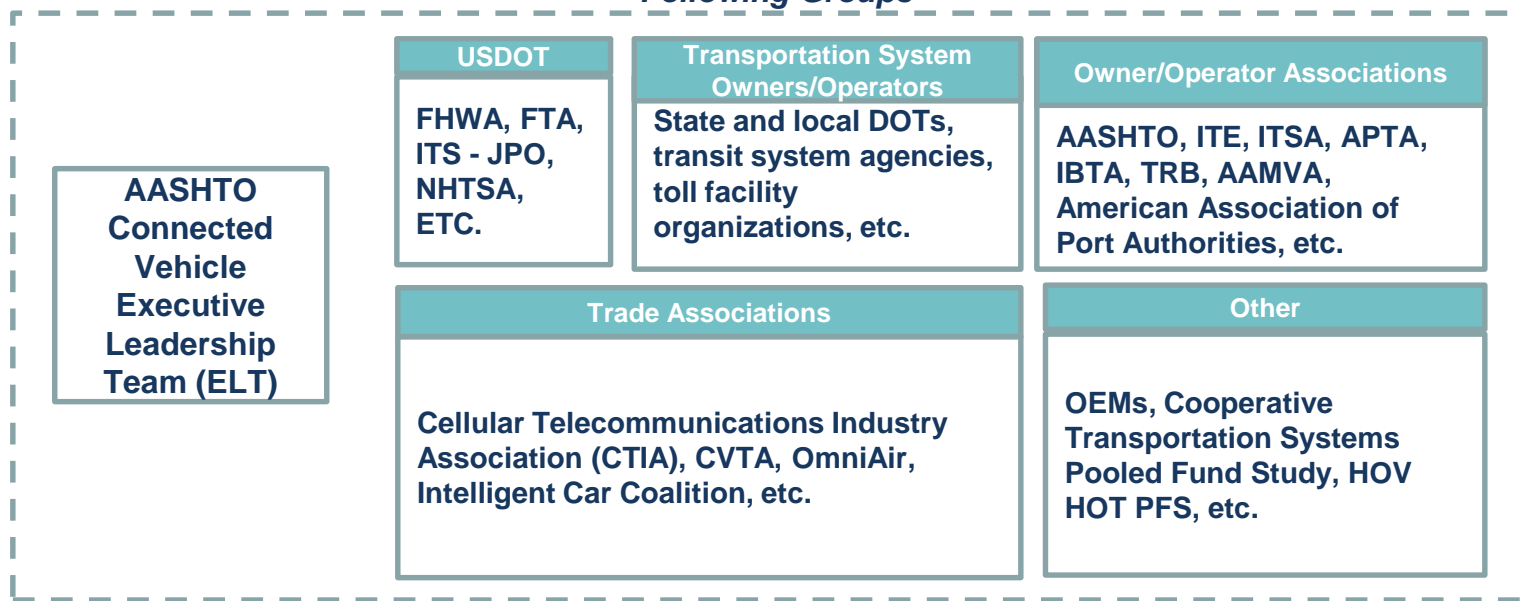
AASHTO CV AV Programs

1. V2I Deployment Coalition (V2IDC)
 - Phase 2 Priority Focus Areas
2. CAV Executive Leadership Team (CAV
ELT)
 - Priority Focus Areas
3. AASHTO STSMO CAV TWG

Evolution of V2I DC



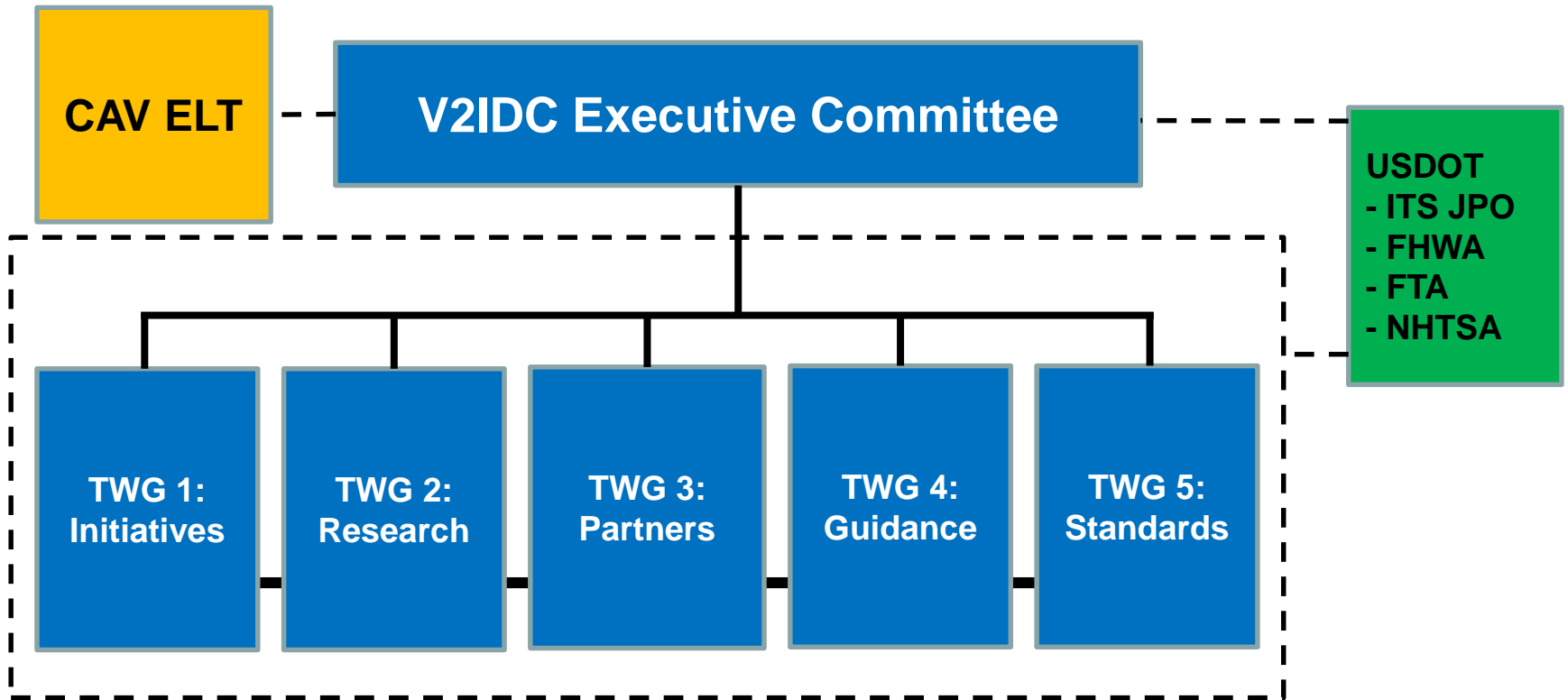
Vehicle-to-Infrastructure Deployment Coalition will be Supported by the Technical Teams drawn from the Following Groups



Connected Vehicle Deployment Coalition key functions

1. Collaborate with FHWA on 2015 connected vehicle deployment guidance
2. Promote streamlining among USDOT, owner/operator associations, AASTHO, and trade & professional associations
3. Support the development of second phase Connected Vehicle Footprint Analysis
4. V2I-DC Chair will also serve on the CV ELT and provide overall technical support to the Connected Vehicle Executive Leadership Team
5. The Vehicle-to-Infrastructure Deployment Coalition Chair and Connected Vehicle Executive Leadership Team Chair to provide executive input to other Federal, State, and local transportation groups associated with V2I technology deployment.

V2I DC Structure



V2I DC Applications Focus (as set by the Executive Committee)

- To help accelerate deployment of V2I applications related to:
 - **Intersections (signalized & non-signalized)**
 - **End of queue warnings**
 - **Work zone management**
 - **Curve warning systems**

V2I DC Efforts

TWGs approach to the 4 Focus Areas:

- Addressing 16 key issues impacting V2I deployment
- Each TWG has a Work Plan of activities
- ‘Fishbone Diagrams’ will help coordinate activities of TWGs
- Monthly TWG webinars
- Coalition wide meetings/calls

Four Focus Areas

1. Intersections
2. Queue Warnings
3. Work Zone Management
4. Curve Warnings

Deployment Issues

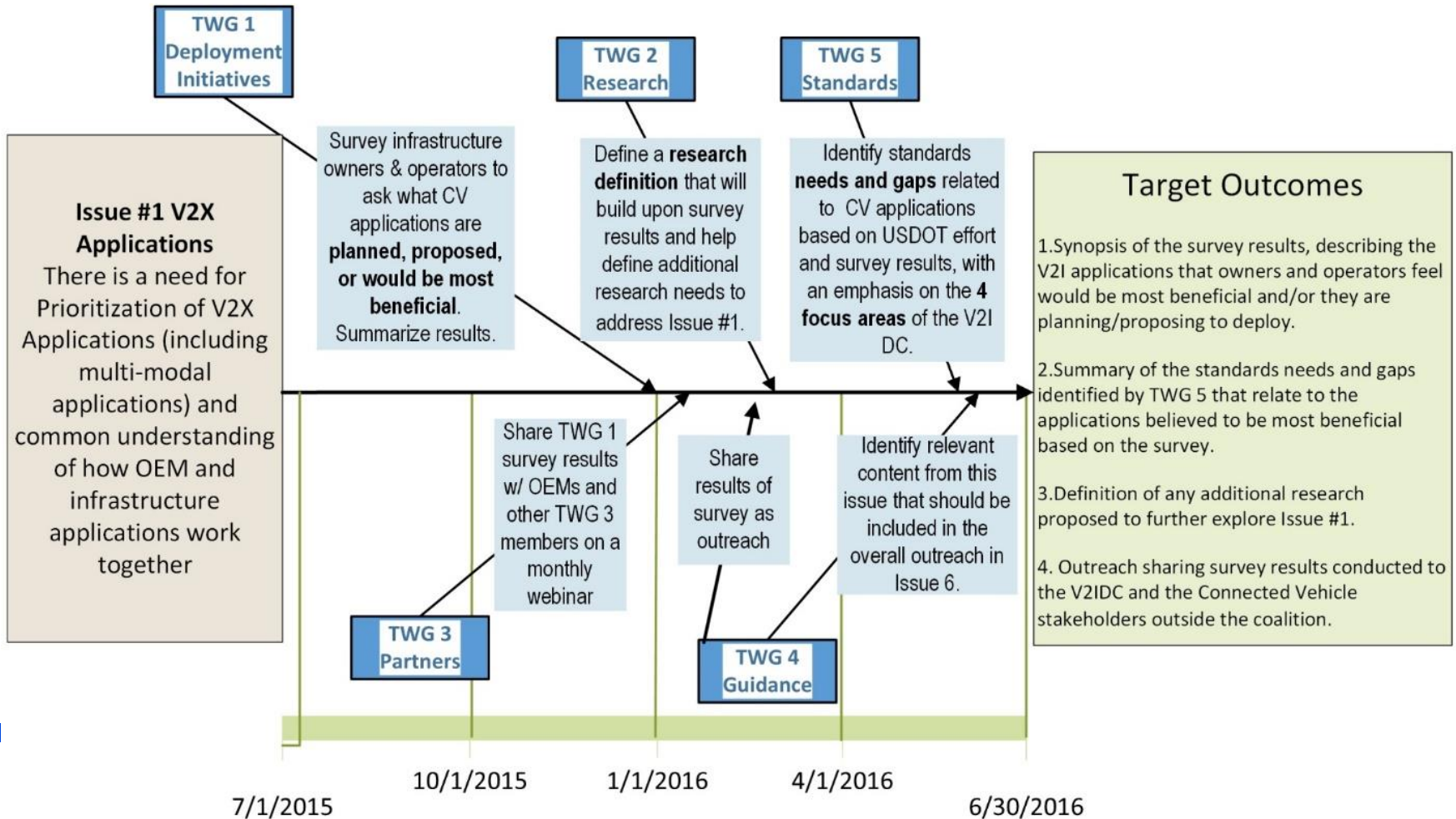
Issue	TWG 1 Initiatives	TWG 2 Research	TWG 3 Partners	TWG 4 Guidance	TWG 5 Standards
Issue 1: V2X Applications	P	S	S	S	S
Issue 2: Complementary Communications to DSRC	N	P	N	N	N
Issue 3: V2I Data	N	S	P	N	S
Issue 4: Patents-Intellectual Property	N	P	N	N	N
Issue 5: Security	No action planned at this time				
Issue 6: V2I Outreach	N	S	N	P	S
Issue 7: Understanding the Benefits and Costs of V2I Deployment and Operation	S	S	P	S	N
Issue 8: V2I Standards	N	N	N	N	P
Issue 9: Understanding V2I Liability Assignment	N	P	N	S	N
Issue 10: V2I Synergies with Other Emerging Technologies	No action planned at this time				
Issue 11: V2I Consumer Messaging	N	N	N	P	N
Issue 12: V2I Multimodal Applications	No action planned at this time				
Issue 13: Infrastructure Processes as V2I Obstacles	P	N	N	S	N
Issue 14: Federal V2I Policy Statement	P	N	N	S	N
Issue 15: Maintaining V2I Infrastructure	P	N	N	N	N
Issue 16: Operator and OEM Goals for V2I	N	N	P	N	N

Deployment Issues

Issue	TWG 1 Initiatives	TWG 2 Research	TWG 3 Partners	TWG 4 Guidance	TWG 5 Standards
Issue 1: V2X Applications	P	S	S	S	S
Issue 2: Complementary Communications to DSRC	N	P	N	N	N
Issue 3: V2I Data	N	S	P	N	S
Issue 4: Patents-Intellectual Property	N	P	N	N	N
Issue 5: Security	No action planned at this time				
Issue 6: V2I Outreach	<div style="background-color: red; color: black; padding: 10px; text-align: center;"> Some issues have been addressed by multiple TWGs </div>		N	P	S
Issue 7: Understanding the Benefits and Costs of V2I Deployment and Operations			P	S	N
Issue 8: V2I Standards			N	N	P
Issue 9: Understanding V2I Liability Assignment			N	S	N
Issue 10: V2I Synergies with Other Emerging Technologies	No action planned at this time				
Issue 11: V2I Consumer Messaging	N	N	N	P	N
Issue 12: V2I Multimodal Applications	No action planned at this time				
Issue 13: Infrastructure Processes as V2I Obstacles	P	N	N	S	N
Issue 14: Federal V2I Policy Statement	P	N	N	S	N
Issue 15: Maintaining V2I Infrastructure	P	N	N	N	N
Issue 16: Operator and OEM Goals for V2I	N	N	P	N	N

Issue Coordination

- Example: Coordination among multiple TWGs on Issue 1



V2I DC Phase 2 Focus Areas

1. Increased OEM Interaction (e.g. data needs of OEMs & Owners/Operators)
2. Guidance Document – In between Guidance document releases, how can we develop interim information to support end user needs?
3. Encouraging SPaT Deployments Nationwide
4. V2I Security Activities – Define V2I Approach
5. Roadmap for 4 Focus Areas (Map CVRIA & FHWA V2I Applications to focus areas & prioritize them)
6. V2I Outreach - needs priority & direction, consistent terminology
7. Mining data from completed/underway projects/proposals

V2I DC Business Plan

- Focus for V2I DC from 2016-2021
 - Track and support resolution of initial 16 issues
 - Initiate a process to address Issue 5: Security
 - Identify and define additional issues
 - Facilitate peer to peer / best practice exchanges
 - Help 'early adopters' plan for deployments
 - Help identify funding sources to assist V2I deployments
 - Feedback to pilot sites
 - Feedback to CAMP and VIIC
 - Alignment and support of training / education
 - Support activities of CAV ELT
 - Seek ongoing funding sources for V2I DC to continue operations

CAV Executive Leadership Team (CAV-ELT)

Updated CAV ELT Roster Today

Entity	# of Members
USDOT	7 Liaisons
State DOTs	15 members
Local Governments	5 members
AASHTO	3 members
ITE / ITS America	1 member each
Automotive Industry	15 – 20 members
TRB	1 member
NACO / NACTO / IBTTA / VII / AAMVA/ Others	9 members

CAV ELT Purpose & Context

- CAV ELT met in Detroit (April, 2016)
- Discussed & Agreed overall purpose:
 - *To discuss and develop policies that accelerate deployment of AV, in convergence with CV*
 - *Be proactive and be the voice of our ultimate customers – the roadway user!*

April 22nd Detroit CAV ELT Focus Areas

1. Policy Initiatives are essential **18**
 - Collaborative effort of federal, state, local, academia, and associations
2. Standards/guidelines for AV (AASHTO)**21**
 - Roles & Responsibilities of states, Federal, county, locals
 - Seamless guidelines applicable nationwide
3. Taking a Long Term View for Transp. Community **3**
 - Use Cases & scenario planning
 - “What if” scenarios – How safe is safe enough?
4. Biggest Risks Identified in CAV are Spectrum & Security/Privacy & GPS **19**
5. Planning Assumptions & Tools for Agencies**8**
6. Readiness Timing & Ramifications (policy & institutional) **6**
7. Workforce to Support Deployments **5**
8. Data (who has access) **10**
9. Comprehensive Outreach & Education of Constituencies **10**
10. Focusing on long term research implications **4**
11. A Study of the Ramifications of Increased Risks Associated with AV for State Agencies **0**
12. Federal Actions over State Actions **5**
13. A Study of the feasibility of multi-state truck platooning **2**
14. Information needed from the states vs. Info needed from OEMs for Readiness **10**
15. Address the Impacts of Freight, Parking, Urban Land Use & other transformational technologies related to AV **3**
16. A study of the feasibility of need and timing of roadside units information systems **2**
17. Policies related to interoperability issues **14**
18. Signing and striping readiness **0**
19. Roadside and Intersection communication units common development platform **6**
20. Geometric readiness based on deployment scale and readiness **3**

CAV ELT Priority Focus Areas

- 1. Need for Leadership in the Development of National Guidelines for the introduction of AV**
- 2. Early-stage risks to CAV deployment:**
 - **5.9GHz spectrum protection &**
 - **Security and privacy of networked technologies**
- 3. The interoperability of CV and AV throughout the country, crossing borders and in cities and regions**
- 4. Information exchange between Industry and Government**
- 5. Policies for CV and AV data access provisions**
- 6. Comprehensive public outreach and education for CAV (travelers, elected officials, public and private entities)**
- 7. Agencies need a common set of planning assumptions, scenarios, and tools for long term planning for CAV.**

Next steps for CAV-ELT

- Wide sharing of the ELT's purpose and objectives
- ELT assessment of the key policy issues for CAV deployment
 - Issues to be addressed directly by the ELT
 - Issues for partnership with other entities
- Preparation of a white paper on CAV policy issues, including the convergence of CV and AV
- Development of guidance concerning State DOT readiness for AV deployment

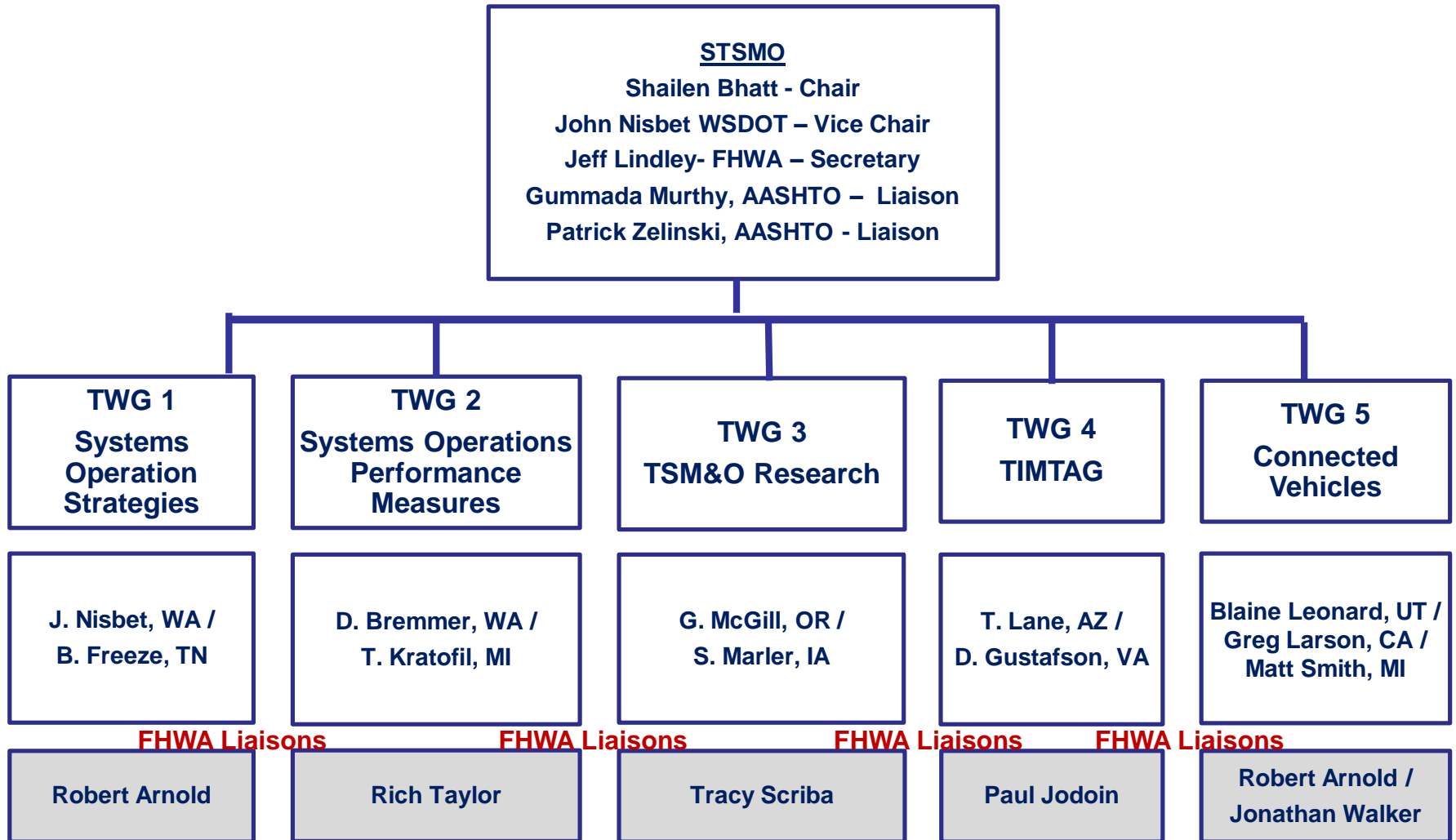
NOCoE Website & V2I Site

The screenshot shows the homepage of the National Operations Center of Excellence (NOCoE). The header includes the NOCoE logo and navigation links for Home, About, Contact Us, and SHRP2. There are also social media icons for Twitter and LinkedIn, and buttons for Login, Subscribe, and Search. A horizontal menu below the header lists sections: KNOWLEDGE CENTER, DISCUSSION, CALENDAR, TSM&O RESOURCES, WHY TSM&O?, NEWS, and BLOG. The main content area features a large banner for the '2015 ANNUAL REPORT A REVIEW OF ITS FIRST YEAR' with the NOCoE logo. To the right, there is a 'HEADLINE NEWS' section with two articles: 'USDOT Updates the Connected Vehicle Reference Implementation Architecture and the Systems Engineering Tool for Intelligent Transportation' (dated May 06, 2016) and 'PennDot Looking at Challenges of Self-Driving Technology' (dated May 05, 2016). A sidebar on the right contains buttons for 'Industry Developments', 'Upcoming Events', and 'Center News'. The Windows taskbar at the bottom shows the system clock at 7:34 PM on 5/16/2016.

The screenshot shows the homepage of the Vehicle to Infrastructure Deployment Coalition (V2I DC). The header features the V2I DC logo and navigation links for Home, About, Contact Us, and SHRP2. There are also social media icons for Twitter and LinkedIn, and buttons for Login, Subscribe, and Search. A horizontal menu below the header lists sections: KNOWLEDGE CENTER, DISCUSSION, CALENDAR, TSM&O RESOURCES, WHY TSM&O?, NEWS, and BLOG. The main content area features a large banner for the 'VEHICLE TO INFRASTRUCTURE DEPLOYMENT COALITION' with logos for AASHTO (The Voice of Transportation), ITS AMERICA, and ite. Below the banner, there is a paragraph of text: 'The Vehicle to Infrastructure Deployment Coalition (V2I DC) began as a concept to create a single point of reference for stakeholders to meet and discuss V2I deployment related issues. To accomplish this concept, U.S. DOT asked the American Association of State Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the Intelligent Transportation Society of America (ITS America) to collaborate on organizing...'. A sidebar on the right contains a list of links: 'V2I DC Home', 'About', 'Executive Committee', 'Technical Working Groups', 'TWG 1: Deployment Initiatives', 'TWG 2: Deployment Research', 'TWG 3: Instructure Operator, OEM and Supplier Partnerships', and 'TWG 4: Deployment'. The Windows taskbar at the bottom shows the system clock at 7:34 PM on 5/16/2016.



2015 STSMO Leadership Team



For Additional Questions

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