ARTS22 Breakout Session Title:
152-Digital Infrastructure for Roadway Transportation and Automation Integration

Session Contact/Organizers:
- John Corbin, Transportation Automation Program Manager, FHWA (Co-Organizer)
- Jim Misener, Global V2X Ecosystem Lead, Qualcomm (Co-Organizer)

TRB Sponsor/Partner Committees:
TRB Regional TSMO Committee (ACP10)
TRB Freeway Operations Committee (ACP20)
TRB Information Systems & Technology Committee (AED30)
TRB Committee on Artificial Intelligence and Advanced Computing (AED50)
TRB Standing Committee on Traffic Control Devices (ACP55)
ASCE CAV Impacts Committee

Session Description:
This session for roadway transportation agencies and industry partners will explore national research and collaboration priorities to evolve digital infrastructure across the national roadway network as an important enabler of transportation automation. The broad preliminary definition of transportation digital infrastructure encompasses the technologies, systems, and services that sense and perceive the physical environment; communicate, process, and store related data; and also the business models, institutional arrangements, and processes used to support a vital and diverse transportation system. We will emerge from this with a concise, multi-stakeholder understanding and path forward with what is meant and what needs to be done with digital infrastructure. The first part of the session will cover diverse stakeholder perspectives on definitions of digital infrastructure. The second part of the session will evolve consensus towards a definition along with strategic and institutional challenges and opportunities to advance digital infrastructure for roadway transportation at a national network level.

Goals/Objectives/Outputs:
- Explore and summarize lessons learned over the past 30 years about digital infrastructure for roadway transportation
- Discover models for collaborative research and development in digital infrastructure from the digitization of industries such as advanced manufacturing, medicine and public health, and others.
- Understand how the FHWA Roadway-ADS Integration Concept of Operations (ConOps) and other national strategic documents and roadmaps consider digital infrastructure
- Define immediate institutional and technical opportunities to nationally pilot and advance strategies for digital infrastructure for roadway transportation and automation.
- Recomment national organizational roles and priority actions to advance the concept of a national pilot program towards digital infrastructure for roadway transportation and automation.

Session Agenda:

PART 1: Definitional Panel Session – Roundtable-style Panel Discussion (45 minutes)
- Roadway Transportation Agency Perspectives
- International Perspectives
- Research & Development Perspectives

Invited Panelists:
- Rob Heilman, USDOT Highly Automated Systems Safety Center of Excellence
- Jeff Decoux, Autonomy Institute
- Martin Russ, AustriaTech
- Torsten Geissler, German Federal Highway Research Institute BASt)
- Gunnar Rhone, Pennsylvania DOT
- Ted Bailey, Washington DOT
- Amanda Hamm, Virginia DOT
- Tom Bamonte, North Central Texas Council of Governments

Moderator discussion questions with floor mics for audience engagement:
a) What do you like or resonate with in the suggested definitions of specific terms?
b) (roadway transportation digital infrastructure, digital twin, data exchange, roadway connectivity, etc.)
c) What additional terms or topics related to roadway transportation digital infrastructure need to be addressed?
d) Which national organizations and groups can contribute to evolving national strategies to advance roadway transportation digital infrastructure?

PART 2: Industry Perspectives & Interests - Seeded Conversation Circle (45 minutes)
- Automotive Industry Perspective
- Automated Driving System Developer Perspective
- Telecommunications Industry Perspective
- Cloud Services and Data Industry Perspective

Invited Conversation Circle Seed Discussants:
- Paul Carlson, Automated Roads
- Mark Davis, Mobileye
- Jumbi Edulbehram, NVIDIA
- Gary Carlin, HERE
- Randy Iwasaki, AWS
- Cisco

Moderator discussion seed questions with floor mics for audience engagement:
a) What did you hear from the Definitional Panel with which you agreed or with which you disagreed?
b) What do you consider to be the primary role of industry in evolving national strategies to advance roadway transportation digital infrastructure?
c) What do you expect of the public sector at different levels (federal, state, local) to enable planning and incremental deployment of national roadway transportation digital infrastructure?

PART 3: Table Discussions - Two 20-minute Rounds, Rotating Moderators (50 minutes)

Likely terms and topics to discuss include the following:
a) Integrating existing and emerging communications technologies
b) Sustainable national business models for digital infrastructure development and management
c) Primary immediate applications or business cases for national digital infrastructure for roadway transportation
d) Priority immediate actions for national and federal organizations
e) Strategies for national community building to advocate for and support digital infrastructure development

PART 4: Call to Action Panel – Table Moderators Debrief (30 minutes)
• Public Policy Considerations (i.e., equity, mobilty, safety)
• Critical Issues to Evolve National Digital Infrastructure for Roadway Transportation
• Alternative Approaches for National Government-University-Industry Collaboration
• The Role of a Conceptual National Pilot Program

Floor mics for audience questions, comment, and counterpoint.

ACKNOWLEDGEMENTS & ADJOURNMENT (10 minutes)