ARTS22 Breakout Session Title:
253-Remote Assistance and Teleoperation for Automated Vehicle Operations

Session Contact/Organizers:
- Scott J. McCormick, President and CEO of the Teleoperation Consortium
- Jaap Vreeswijk, Traffic Architect, MAP traffic management

Session Description
Remote assistance and teleoperation has been receiving increasing attention, but taxonomy and standards remain largely undefined while ART stakeholders apply terminology inconsistently. Typically, a remote human operator provides instructions, permission or waypoints to the vehicle, or remotely drives it. However, the purpose and tasks of the operator are very diverse for different modes and environments. This session will increase awareness and understanding of Remote Assistance and Teleoperation by sharing recent achievements, approaches, standards and guidelines. During the session technological, operational and human factors requirements will be discussed and reviewed.

Goals/Objectives/Outputs
The goals of the session are:
- Increase awareness and understanding of Remote Assistance and Teleoperation for Automated Vehicle Operations;
- Share best practices, study results and updates on standardization activities;
- Gather input from the attendees on the Teleoperation Guidelines and Approach Categories that were developed (to be published as NIST special publication);
- Solicit input on relevant areas that guidelines should be developed for that the publication does not address;
- Identify research questions and future research needs;

Agenda
1:30 PM – 2:45 PM Remote Assistance and Teleoperation achievements and approaches
Description: Practical experiences and different examples of concepts of operations and the solutions developed will be shared and discussed. Study results and technological aspects related to remote assistance and teleoperation will be addressed, such as: taxonomy, human factors, connectivity and communication, vehicle and roadside surveillance equipment, standardization, scalability, cybersecurity, etc.

Moderator:
- Tom Alkim, Strategic Advisor Connected & Automated Mobility, MAP traffic management

Panelists (four to be selected based on their availability/ability to travel):
- John McNicol, CEO, Nova Modus (rep. British Standards Institute) (UK)
- Tao Zhang, Manager, Emerging Network Technologies, National Institute of Standards and Technology (US)

Invited:
- David Jenkins, Safety and Risk Consultant, TRL (UK)
- Azra Habibovic, Human Factors Specialist, Scania (Sweden)
- Sigma Dolins, Researcher and Member of Mobility Transformations Group, RISE (Sweden)
- Stefan Myhrberg / Alejandro Gil, Ericsson (Sweden)

3:00 PM – 4:15 PM Teleoperation Guidelines and Approach Categorization Report
Description: Although there are all sorts of approaches to vehicle communications around the world, few relate to teleoperations. The Members of the Teleoperation Consortium are working to define important areas to address with regards to developing industry guidelines.

One area would be how we would talk to vehicles. Another would be with regards to relevant standards. Other areas might include latency requirements for types and purposes of communications, VDS and other safety requirements, as well as how to address the challenges related to deploying the technology on a large scale.

In terms of Approach Categories, Telepresence may require huge amounts of bandwidth, whereas remote control requires extremely low latency. Determining if the teleoperation is safe, and providing more definition around those areas and regulatory efforts. There is some effort within the industry toward normalization. Work is in process for the update of the OBDII port, as well as over-the-air communications in SAE J3138. Categories would include: within the system, between the system and the network, to the cloud, etc. The final paper will identify the categories that are already being working on, as well as relevant standards.

1. Overview of the teleoperation Consortium
2. Purpose of the Teleoperation Guidelines Committee
3. Important areas identified for Guidelines development
4. Report on Guidelines completed
5. Attendee input on guidelines
6. Report on Approach Categories developed
7. Attendee input on those and other potential categories
8. Summary and call to action

Moderator:
- Scott J. McCormick, President and CEO, Teleoperation Consortium

Panelists:
- Tao Zhang, PhD – National Institute of Standards and Technology
- Stan Schneider – CEO, RTI
- Chuck Brokish – Green Hills Software

4:30 PM – 5:00 PM Conclusions, research questions and future research needs
Moderators:
- Scott J. McCormick, President and CEO, Teleoperation Consortium
- Tom Alkim, Strategic Advisor Connected & Automated Mobility, MAP traffic management