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| **Collaboration on Intelligent Transport Systems Communication Standards** | |
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**Draft Report – Meeting of Collaboration on ITS Communication Standards**

***(26 March 2021, E-meeting)***

**<http://www.itu.int/go/ITScomms>**

**1 Introduction**

The meeting of the Collaboration on ITS Communication Standards (CITS) took place virtually on 26 March 2021. T. Russell Shields (RoadDB) chaired the meeting supported by Stefano Polidori (ITU/TSB Advisor), Mythili Menon (ITU/TSB Project Officer) and Carolina Lima (ITU/TSB Study Group Assistant).

**2 Opening, meeting participants and adoption of the agenda**

**T. Russell Shields**, Chair of CITS, opened the meeting and welcomed the participants. In keeping with its scope, CITS continues to facilitate the coordination of internationally accepted, harmonized set of ITS communication standards of the highest quality in the most expeditious manner possible to enable the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

Given the diversity of inputs received from other SDOs, Mr Shields appreciated their interest and commitment and thanked the representatives for facilitating the exchange of information related to ITS communications standards from their respective organizations to the database being maintained by CITS. Through the discussions at the CITS meetings, the ITS Communication Standards Database will be regularly updated with relevant standards from various SDOs and other relevant entities.

**30** (thirty**)** participants joined the meeting representing various Standards Development Organizations (SDOs) and other stakeholders. The list of participants is available as [[DOC 30](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/30_List%20of%20participants_CITS_meeting_March_2021.pdf)].

A total of 28 meeting documents were submitted. This meeting report was posted after the meeting as Doc 29. All related meeting documents were openly accessible on the CITS site [here](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/meeting-documents.aspx?RootFolder=/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting&FolderCTID=0x0120008D91490DA7927C4D8A0BB5A73929B07D&View=%7b73BE16B3-22C9-43D5-A9FD-D8BC067A87FF%7d#InplviewHash73be16b3-22c9-43d5-a9fd-d8bc067a87ff=). The meeting itself was recorded and made available from the [CITS webpage online](http://www.itu.int/go/ITScomms).

The draft agenda as contained in [[Doc 1R2](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/01R2_Chair_draft_agenda.docx)] was adopted.

**3 Status of ITS communications work in various SDOs and ITU**

**3.1** [**ITU-R SG5**](https://www.itu.int/en/ITU-R/study-groups/rsg5/Pages/default.aspx)

[[Doc 09R1](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/09_ITU-R_SG5_report.pptx)] was submitted and presented by Uwe Loewenstein, Counsellor, ITU-R SG5.

This presentation underscored the updates regarding the work within the ITU-R Study Groups (WP 5A and WP 5D). It highlighted that Land Mobile Handbook – Vol. 4: ITS was updated in February 2021. This handbook contains a description of the wireless communication leveraged for Intelligent Transport Systems and also provided an overview of the communication architecture required for ITS along with the radio technologies and frequency usage for such systems. The presentation also briefly elaborated on other Report including:

* Report M.2445 (11/18) - Intelligent transport systems (ITS) usage
* Rec. M.2121 (01/19) - Harmonization of frequency bands for Intelligent Transport Systems in the mobile service
* Rec. M.2084-1 (11/19) - Radio interface standards of vehicle-to vehicle and vehicle-to-infrastructure two-way communications for ITS applications
* Rec. M.1036-6 (10/19) – Frequency arrangements for IMT
* Rec. M.2150 (02/21) – Terrestrial Radio interface standards for IMT-2020 (5G Standards)

The Counsellor also touched upon the importance of IMT-2020 for ITS system and presented a tentative timeline of future trends on the topic.

[[Doc 27](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/27__ITU-R-SG5-updated-Report-M.%5bIMT.C-V2X%5d.docx)] was also briefly presented. This contained the preliminary draft of the new report ITU-R The use of the Terrestrial Component of IMT for [Cellular-Vehicle-to-Everything] Application.

**3.2** [**UNECE TF CS/OTA**](https://wiki.unece.org/pages/viewpage.action?pageId=40829521)

[[Doc 04](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/04_UNECE-TFCS-OTA_status_report.pptx)] was submitted and presented by Tetsuya Niikuni, Co-Chair of UNECE TF CS/OTA.

This presentation contained an overview of the organization structure of the group along with the key list of the cybersecurity related deliverables under its remit. It also briefly highlighted the software update regulation and related guidance. The next UNECE GRVA is expected to take place in September 2021.

**3.3** [**IETF-IPWAVE**](https://datatracker.ietf.org/wg/ipwave/about/)

[[Doc 16R1](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/16R1_IETF-IPWAVE-Progress-Report.pptx)] was submitted and presented by Alex Petrescu.

This presentation highlights the role of IP Wireless Access in Vehicular Environments (IPWAVE) as a Working Group at the Internet Engineering Task Force (IETF). It works on “V2V and V2I use-cases where IP is well-suited as a networking technology”. The presentation underscored the RFC 8691 on “Basic Support for IPv6 Networks Operating Outside the Context of a Basic Service Set over IEEE Std 802.11, which was published in December 2019. It also elaborated on the topologies for using IPv6 for vehicular networks:

* Vehicle-to-Vehicle IP network topology
* Vehicle-to-Internet IP network topology; and
* Other variations

The presentation also noted the draft- IETF IPWAVE-Vehicular Networking, which:

* identifies gaps and open areas, prioritize for potential upcoming work
* analyses address autoconfiguration, routing, mobility management, DNS, service discovery, security and privacy – for IP networking in vehicular environments

**3.4** [**5GAA**](http://5gaa.org/)

[[Doc 24](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/24_5GAA_Progress-Report.pdf?csf=1&e=ne2HGO)] submitted and presented by Maxime Flament *(CTO, 5GAA)*. The presentation highlights the priority areas of the organization: trust, digital roads, vulnerable road users, mobile networks, interoperable ecosystems, precise positioning, flexible service architectures, sustained technology evolution.

The main Work Items approved since WG Meeting Q4 include:

* C-V2X Market Dashboard (CMDB)
* V2X System Application Layer Reference Architecture (V2XSRA)
* High accuracy positioning for C-V2X (V2XHAP)

**3.5** **[ETSI TC ITS](https://www.etsi.org/committee/1402-its)**

[[Doc 26](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/26_ETSI-TC-ITS_Update.pptx)] was submitted and presented by Niels Peter Skov Andersen *(Chair ETSI TC ITS)*. The presentation highlighted scope of ETSI TC ITS which includes:

* the development and maintenance of Standards, Specifications and other deliverables to support the development and implementation of ITS; and
* communication media, and associated physical layer, transport layer, network layer, security, lawful intercept and the provision of generic web services.

The presentation noted that the ETSI ITS Release 1 has been completed and is entering maintenance mode.

As a part of its ongoing work, ETSI is developing the following:

* Collective Perception Service
* Platooning (Pre-standardization Study)
* Vehicular Communications
* Users and Applications Requirements
* Vulnerable Road Users
* Facilities Layers Functions
* Multi-channel operations
* Study on receiver requirements
* Security

[[Doc 25](https://staging.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/25_LS_ETSI_TC_ITS.zip)] contains a Liaison Statement from ETSI TC ITS to invite CITS to provide feedback on the STF 858 work realizing the Multi-Channel Operation (MCO) specifications for ITS with specific operation in the 5.9 GHz spectrum band with current focus on the MCO study mature document TR 103 439. Additionally, the LS also lists other relevant standards within the ITS domain:

* TR 103 439 (V1.1.1): Intelligent Transport System (ITS); Multi-Channel Operation Study
* TS 103 696 (V1.1.1): Intelligent Transport System (ITS); Communication Architecture for Multi-Channel Operation (MCO)
* TS 103 697 (V1.1.1): Intelligent Transport System (ITS); Multi-Channel Operation (MCO) for ITS
* TS 103 141 (V1.1.1): Intelligent Transportation Systems (ITS); Facilities layer function; Communication Congestion Control
* TS 102 636-8-1 (V1.1.1): Intelligent Transportation Systems (ITS); Communications; GeoNetworking: Part 8: Transport Protocols for Multi-Channel Operation (MCO): Sub-Part 1: Basic Transport Protocol
* TS 103 695 (V1.1.1): Intelligent Transportation Systems (ITS); Access Layer specification for Multi-Channel Operation (MCO) in the 5GHz frequency band

**3.6 [Car2Car Communication Consortium](https://www.car-2-car.org/)**

[[Doc 20](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/20_Car2Car-CC_Status-Report.pptx)] was submitted and presented by Niels Peter Skov Andersen *(General Manager C2C-CC)*. The presentation highlighted the new publications prepared by Car2Car Communication Consortium including:

* Technical Report on Collective Perception Messages (CPM) Object Quality
* Safety related message sets – Selection of DATEX II Situations, DENM and TPEG2-TEC Causes and TMC Events for EC high level Categories
* Study of Vulnerable Road User awareness
* Multi-Channel Operation (MCO); Part 1; Functional requirements
* Multi-Channel Operation (MCO); Part 2; Technical capabilities and limits
* Basic System Profile Published version 1.5.3 (March 2021)

The main ongoing areas of work include:

* Multi-channel Operation
* Position and Time improvement
* Post quantum cryptography for C-ITS
* Misbehavior Detection
* Technical Functional Safety Concept

C2C-CC has also published a White Paper on Safety spectrum needs for single short-range V2X communication technology in MHz bandwidth.

**3.7** [**WWRF VIP WG The Connected Car**](http://www.wwrf.ch/vip-wg-the-connected-car.html)

[[Doc 17](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/17_WWRF-CVWG-Update.pdf)] was submitted and presented by Seshadri Mohan *(Chair, WWRF VIP CV WG)*. Through this presentation, the main objectives of this Group were reiterated to the participants as follows:

* Develop future vision of the wireless world
* Inform and educate on trends and developments
* Enable and facilitate the translation of the vision into reality
* Bring a wide range of parties together to identify and overcome significant roadblocks to the vision

It was highlighted that WWRF is not an SDO and serves as a research funding body, which conducts its activities based on membership. Within WWRF, VIP CV WG: The Connected Vehicle conducts research with the aim of meeting the needs of the automotive sector based on the next generation wireless technology, including the identification of relevant use-cases.

As a part of its mandate, VIP CV WG aims to create a better understanding in the automotive industries of the potential and capabilities of future wireless technologies.

Currently, the Group is working towards the development of r the second white paper on “The Role of AI/Machine Learning in Connected Vehicles”.

**3.8** [**UNECE WP.29**](https://www.unece.org/trans/main/wp29/introduction.html)

[[Doc 28](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/28_UNECE-WP29-Update.pdf)] was submitted and presented by François Guichard (*UNECE WP.29/GRVA, Secretary*).The presentation highlights the role of United Nations Economic Commission for Europe (UNECE). Through UNECE WP.29, it conducts transport related activities. The UNECE Roadmap on ITS was adopted in 2012 and contains relevant information on definitions, cooperation, ensuring data protection and across transport modes. This roadmap was revised in 2020, and subsequently adopted in February 2021. The framework document for automated vehicles, adopted in June 2019, has also been developed to guide WP.29’s groups programme management.

Within the Working Party on Automated/Autonomous and Connected Vehicles (GRVA), the meeting of IWG on Validation Method for Automated Driving (VMAD) are organized. IWG on Validation Methods for Automated Driving (VMAD) is dealing with:

“demonstration of a robust design and validation process based on a systems-engineering approach with the goal of designing automated driving systems free of unreasonable safety risks and ensuring compliance with road traffic regulations and the principles listed in this document.

Design and validation methods should include a hazard analysis and safety risk assessment for Automated Driving System (ADS), for the OEDR, but also for the overall vehicle design into which it is being integrated and when applicable, for the broader transportation ecosystem.

Design and validation methods should demonstrate the behavioural competencies an Automated/autonomous vehicle would be expected to perform during a normal operation, the performance during crash avoidance situations and the performance of fall back strategies. Test approaches may include a combination of simulation, test track and on road testing”

It functions through the following sub-groups: (a) Scenarios (b) Simulation (c) Audit and Monitoring (d) Track Test and Real World Test

The following deliverables have been developed by VMAD and submitted to WP.29 for its consideration:

* New Assessment/Test Method (NATM) of automated driving system (ADS)
* Review of existing and upcoming methods and a proposed way forward for the assessment ADS
* The test and assessment for automated lane keeping systems for SAE Levels 3/4 compatible as a new UN Resolution for contracting parties to the 1958 agreement

**3.9** [**IEEE VTS Standards**](https://vtsociety.org/member-resources/standards/)

[[Doc 19](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/19_IEEE-1609WG-Progress-Report.pptx)] was submitted by Justin McNew *(IEEE 1609 Chair)*. The presentation provided an overview of the IEEE 1609 Working Group status, including the list of published standards on “Wireless Access in Vehicular Environments”:

* 1609.0: Architecture Guide
* 1609.2: Security Services
* 1609.2.1: Certificate Management Interface
* 1609.3: Networking Services
* 1609.4: Multi-Channel Operation
* 1609.11: Electronic Payment
* 1609.12: Identifier Allocations

The presentation also highlighted that the following standards had been updated:

* 1609.2: Security Services
* 1609.3: Networking Services
* LTE-V2X support (3GPP PC5 Interface) Release 14, 15

During the pandemic, IEEE 1609 has been meeting online every three to four months to ensure continued progress of its activities.

**3.10 CEN TC278**

[[Doc 21](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/21_CEN-TC_278-Liaison-Report.pptx)] was submitted by Hans Nobbe *(Ministry of Infrastructure and Water, The Netherlands)*. The presentation highlighted the following focus areas:

* automated and connected vehicles
* mobility and multi-modality
* electronic fee collection

The main elements of the EC Rolling Plan 2021 are as follows:

* Defining the priorities of the EC Digital Single Market
* Intelligent Transport Systems (E-call, Public Transport, Cooperative systems, and Urban ITS)

**3.11 IEC SEG11**

[[Doc 14](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/14_IEC-SEG11_Status-Report.pdf)] was submitted by Gennaro Ruggiero (Secretary of SEG11 Future Sustainable Transportation). Within IEC SEG 11 deals with Future Sustainable Transportation. This Group aims to:

* Collect best practices and use cases of public, shared transportation for developed and developing economies
* Engage with TC/SCs including ISO and other market stakeholders on status and use of existing standards and on the need for new standards related to Future Sustainable Transportation
* Formulate recommendations to SMB as appropriate
* Carry out outreach activities to attract new stakeholders for IEC’s technical work

The IEC 62559 is the reference to describe Use Cases. In order to transition to negative emission within the transportation sector, the “Integration of Transportation and the Energy systems (ITE)” is being worked upon within IEC.

During the meeting there was mention of the standards work on electrification of vehicles. ITU-R SG1 has some activities on electrification of vehicles. Within the IEC, there are various committees on electric powers for vehicles and the work is a dispersed that may need to be harmonized and collected for help coordination.

**3.12** [**IEEE 802.11 TGbd**](https://www.ieee802.org/11/Reports/tgbd_update.htm)

[[Doc 08](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/08_IEEE_802-11_TGbd_report.pdf)] was submitted by Bo Sun *(Chair, IEEE 802.11bd)*. The presentation noted the following key points of progress:

* No face-to-face meetings have been arranged since Jan 2020. Instead, virtual IEEE 802.11 plenary/interim meeting and weekly teleconferences are organized
* IEEE P802.11bd D1.0 and Co-existence Assurance Document (CAD) have been released in October 2020
* The TGbd’s prioritized work after LB251 is proceeding comment resolutions for LB251
* The TGbd has appointed Yan Zhang as Secretary with James Lepp’s (Blackberry) stepping down

**3.13** [**SAE International**](https://www.sae.org/)

[[Doc 18](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/18_SAE-Advanced-Vehicle-Safety-Technology-Standards_Status-Update%20.pdf)] was submitted and presented by William (Bill) Gouse, SAE International. As a part of the SAE ADAS Vehicle Standards Activities, the following Taskforces are now active:

* Roadside Object Surrogate Task Force
* Sensor Calibration Task Force
* ADAS Feature Rating System Task Force

The main focus areas for standards include: Mobile Devices, Roadside Equipment, Traffic Information Management, Systems and Data Back Haul, Service Providers, Message Security, Road Weather, Curve Warning, Traveler Information, Work Zone Warning, Maps, Adaptive Signal Control, Platooning, and Disabled/Vulnerable Road Users.

It also underscored the following foundational documents:

* J2735 Message Set Dictionary: It defines Standardized Message Sets and supports Interoperability
* J2945 SEP Guidance for J2945/X Documents: It provides System Engineering Guidance & Example, defines Communication Protocol and specifies Communication Performance Requirements

**3.14** [**TTC WG on Connected Car**](https://www.ttc.or.jp/e)

[[Doc 11R1](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/11R1_TTC-WGConnectedCar_Activity-report.docx)] was submitted and presented by Hideki Yamamoto *(TTC-Telecommunication Technology Committee)*. It underscores Japan-specific V-HUB guideline (V-HUB) system, which is the entire information and communication system using vehicles in the advent of a disaster. The presentation also noted that the initial draft Technical Paper ITUT-T FSTP.SS-OTA on “Standardization survey for over-the-air updating in vehicle” and accordingly TTC plans to submit a contribution to ITU-T SG16 (19-30 April 2021) to update contents and move to Approval in the plenary of the next ITU-T SG16 (19-30 April 2021).

**3.15** [**CCSA**](http://www.ccsa.org.cn/english/)

[[Doc 13R1](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/13R1_CCSA_Status-Report.pdf)] was submitted and presented by Yuming Ge *(Researcher, China Academy of Information and Communication Technology)*. The presentation highlighted the main topic-specific standardization underway in CCSA:

* MEC and Road Side related:
* MEC service architecture and requirements for LTE-V2X
* MEC capability opening and interface technical requirements for C-V2X (Phase I)
* Operation and maintenance management platform for vehicle road collaborative roadside equipment
* Technical requirements of cross domain collaborative interaction based on edge computing
* Test Method of MEC platform for LTE-based Vehicular Communication
* Measurement methods of Roadside-LiDAR in Vehicle-Infrastructure Cooperation system
* Research on the coordinated deployment of smart pole/tower and vehicle-road collaboration roadside facilities
* Research on infrastructure data collaboration and sharing technology based on V2X
* Upper Layer – application and message:
* Technical requirements of Message layer of LTE-based vehicular communication
* Technical requirements of network layer of LTE-based vehicular communication
* Test method of network layer of LTE-based vehicular communication
* Test method of message layer of LTE-based vehicular communication
* 5G enables remote driving: technical requirements for 5G Communication System
* Research on 5G based internet of vehicles communication technology
* Application identity assignment and mapping of internet of LTE based vehicle wireless communication technology
* The requirements standard for enhanced V2X application layer data interaction
* Access Layer:
* General technical requirements of LTE-based vehicular communication
* The air interface technical requirements of Vehicular Communication on LTE
* Technical Requirement and Test Method of Base Station Equipment for LTE-based Vehicular Communication
* Test Method of Base Station Equipment for LTE-based Vehicular Communication
* Cyber-Security:
* Technical Requirement of Security Certificate Management System for LTE-based Vehicular Communication
* Technical Requirements of Vehicle Misbehavior Management for C-V2X
* Test method of Security Certificate for LTE-based Vehicular Communication
* Technical Requirement of Authentication and Authorization System for C-V2X Vehicular Communication

**3.16** [**ISO TC241**](https://www.iso.org/committee/558313.html)

[[Doc 10](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/10_ISO_TC_241_WG6_report.pptx)] was submitted and presented by Dave Conway *(Head of UK Delegation to ISO/TC241)*. This presentation detailed the scope of ISO 39003, which elaborates on the aspects of an autonomous vehicle that require considerations to made by the designer/manufacturer to ensure that key aspects are not overlooked or disregarded. Additionally, it was noted that this standard does not offer the technical precision to prescribe the required controls but would, rather, offer a set of “protocol guidelines” that a vehicle manufacturer might choose to self-certify against to assure that the desired necessary ethical considerations were addressed during design and effectively controlled. The next meeting is expected to take place in September 2021.

**4 Status of ITS communications work in ITU**

**4.1** [**Overview of all ITS work items in ITU**](http://www.itu.int/en/ITU-T/extcoop/cits/Documents/ITS-work-items.xlsx)

The [spreadsheet](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/ITS-work-items.xlsx) (freely available online) contains information about all ITS related work items in ITU. Covering the work of ITU-T (Study Groups 12, 13, 16, 17, 20) and ITU-R (WP5A), the spreadsheet will be updated based on inputs received from constituent Study Groups and other relevant groups.

**4.2 ITU-T** [**SG16**](https://www.itu.int/en/ITU-T/studygroups/2017-2020/16/Pages/default.aspx) **(**[**Q27/16**](http://www.itu.int/ITU-T/workprog/wp_search.aspx?isn_sp=3925&isn_sg=3934&isn_qu=4207&isn_status=-1,1,3,7,2&details=0&field=acdefghijo)**)**

[[Doc 12](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/12_ITU-T_SG16_Status-Update.pptx)] was submitted and presented by Hideki Yamamoto *(Vice-chairman, SG16)*. This presentation provided an overview of the current structure of SG16 which touches upon multimedia coordination, multimedia content delivery, e-services, media coding and immersive devices and vehicular multimedia communications. ITU-T SG16 has also established two ITU-T Focus Groups, which focus on topics within the ITS domain:

* Focus Group on Vehicular Multimedia ([FG-VM](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx)): See section 4.3.
* Focus Group on AI for Autonomous and Assisted Driving ([FG-AI4AD](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx)): This FG is working on the following deliverables:
* TR01: “Automated driving safety data protocol – Specification”
* TR02: “Automated driving safety data protocol – Public safety benefits of continual monitoring”
* TR03: "Automated driving safety data protocol – Practical demonstrators”

Additionally, work has also commenced on a new ITU-T F.VG-AD-Reqs on information requirements for automated driving, and on a Technical Paper FSTP.SS-OTA with a survey on over-the-air updates.

Q12/16 on “Intelligent visual systems and services” may also have relevant work within the topic of ITS.

**4.3 Focus Group on Vehicular Multimedia (**[**FG-VM**](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx)**)**

[[Doc 15](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/15_ITU-T_FG-VM_Status-Update.pptx?csf=1&e=NUNulh)] was presented by Stefano Polidori *(Advisor, TSB/ITU)*. The Focus Group on Vehicular Multimedia (FG-VM) has the following structure:

* Working Group 1: VM use cases and Requirement
* Working Group 2: VM Architecture
* Working Group 3: Implementation aspects of VM

As a part of the FG-VM’s work, the following deliverables are being or have been finalized:

* “Use cases and requirement for the Vehicular Multimedia system”: This Technical Report was finalized at the Focus Group as [FGVM-01R2](https://www.itu.int/en/ITU-T/focusgroups/vm/Documents/FGVM-01R2.pdf?csf=1&e=uVY5lV) (also available as a [Flipbook](https://www.itu.int/en/publications/Documents/tsb/2020-FG-VM-Use-cases-and-requirements-for-the-vehicular-multimedia-networks/index.html#p=1)) and subsequently, it was transferred to the parent Study Group 16, where it was updated and endorsed as Recommendation [ITU-T F.749.3](https://www.itu.int/rec/T-REC-F.749.3-202008-I/en)
* The second Technical Report on “Architecture of Vehicle Multimedia” is currently being finalized and will be submitted to ITU-T SG16 for consideration
* “Implementation aspects of Vehicular Multimedia”: This deliverable is being developed under FG-VM Working Group 3

**4.4 ITU-T** [**SG17**](https://www.itu.int/en/ITU-T/studygroups/2017-2020/17/Pages/default.aspx) **(**[**Q13/17**](https://www.itu.int/itu-t/workprog/wp_search.aspx?isn_sp=3925&isn_sg=3935&isn_qu=6705&isn_status=-1,1,3,7&details=0&field=acdefghijo)**)**

[[Doc 23](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/23_ITU-T_Study%20Group17_Q13_Status-Report.pptx?csf=1&e=iEBwn9)] was submitted and presented by Koji Nakao *(SG17 Vice-Chair)*. Within SG17, Question 13 serves as the lead Question for developing Recommendations regarding security aspect for ITS including road transport, railway, maritime and air transport as well. Some of the key standards developed include:

* X.1371: Security threats in connected vehicles
* X.1372: Security guidelines for Vehicle-to Everything(V2X) Communication
* X.1374: Security requirements for external interfaces and devices with vehicle access capability
* X.1375: Methodologies for intrusion detection system on in-vehicle networks
* X.1376: Security-related misbehaviour detection mechanism for connected vehicles

**4.5 Focus Group on AI for Autonomous and Assisted Driving (**[**FG-AI4AD**](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx)**)**

[[Doc 22](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/22_FG-AI4AD-Update.pdf?csf=1&e=lcuPwO)] was submitted and presented by Bryn Balcombe, FG-AI4AD Chair.

This presentation elaborated on the behavioural evaluation of AI responsible for the dynamic driving task, while ISO looks into behavioural safety. The presentation provided key insights into “[The Molly Problem](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/MollyProblem.aspx)”, which is a concept created by the FG and will be explored further as it pertains to the following ethical conundrum:

*“A young girl called Molly is crossing the road alone and is hit by unoccupied self-driving vehicle. There are no eye-witnesses.”*

The Molly Problem raises key questions on the reasonable expectations from the self-driving software including (but not limited to) the following:

– bringing vehicle to a safe stop

– recalling information about collision

– alerting emergency services

– detection of Molly by the software

– Mitigating action for avoiding collision

The FG-AI4AD is progressing on three deliverables as follows:

– TR01: “Automated d​riving safety data protocol – Specification” ([FGAI4AD-I-100​](https://extranet.itu.int/sites/itu-t/focusgroups/ai4ad/input/FGAI4AD-I-100.zip))

– TR02: "Automated driving safety data protocol – Public safety benefits of continual monitoring” ([FGAI4AD-I-114](https://extranet.itu.int/sites/itu-t/focusgroups/ai4ad/input/FGAI4AD-I-114.zip)​​)

– TR03: "Automated driving safety data protocol – Practical demonstrators” ([FGAI4AD-I-064​](https://extranet.itu.int/sites/itu-t/focusgroups/ai4ad/input/FGAI4AD-I-064.zip))

**4.6 Organizations that did not send a progress report at this meeting**

– [ATIS](https://www.atis.org/01_strat_init/connectedcar/)

– [ITU-T SG12](https://www.itu.int/en/ITU-T/studygroups/2017-2020/12/Pages/default.aspx) ([Q4/12](https://www.itu.int/itu-t/workprog/wp_search.aspx?isn_sp=3925&isn_sg=3931&isn_qu=4155&isn_status=-1,1,3,7&details=0&field=acdefghijo))

– [ISO TC 22](https://www.iso.org/committee/46706.html)

– [ARIB](http://www.arib.or.jp/english/index.html)

– [IMDA](https://www.imda.gov.sg/)

– [TIA](http://www.tiaonline.org/all-standards/committees/tr-48)

– [TTA](http://www.tta.or.kr/English/new/standardization/Committee_newEngList.jsp)

– [TIAA](http://www.tiaa.org.cn/EN/)

– [ISO TC 204](https://www.iso.org/committee/54706.html)

– [W3C](https://www.w3.org/)

– [TSDSI](https://tsdsi.in/)

– [CSAE](http://www.csaeconf.org/)

**4.7 Incoming Liaison Statements**

Three liaison statements received: [[Doc 5](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/05_LS_ETSI_TC_ITS.zip)] [[Doc 06](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/06_LS_ITU-R_WP5D.zip)] [[Doc 07](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/06_LS_ITU-R_WP5D.zip)].

* [Doc 05](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/05_LS_ETSI_TC_ITS.zip): LS/i on Open contribution or Review of initial Multi-Channel Operations study results, Mature Draft ETSI TR 103 439 from ETSI TC ITS - "Intelligent Transport Systems (ITS); Multi-Channel Operation Study; Release 2" [from ETSI TC ITS]

*Abstract:* This LS was presented by Niels Peter Skov Andersen *(Chair ETSI TC ITS)*. It contained the current draft of ETSI TR 103 439 – V0.0.3 (2020-10) on “Intelligent Transport Systems (ITS); Multi-Channel Operation Study; Release 2” along with the comment form.

* [Doc 06](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/06_LS_ITU-R_WP5D.zip): LS/i on Development of a draft new Report ITU-R M.[IMT.C-V2X] - The use of the terrestrial component of IMT systems for Cellular-Vehicle-to-Everything [from ITU-R WP 5D]

*Abstract:* This LS contains the preliminary draft of “The use of the Terrestrial Component of IMT for Cellular-Vehicle-to-Everything Application”. This report aims to address the mutual relationship between IMT technologies and Cellular-Vehicle-to-Everything (C-V2X) as a specific application and elements of functions in IMT technologies that are used to realize C-V2X application.

* [Doc 07](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/07_LS_ITU-T_SG20-LS195.zip): LS/i on draft Recommendation ITU-T Y.4471 (ex Y.NDA-arch) “Functional architecture of network-based driving assistance for autonomous vehicle” [from ITU-T SG20]

*Abstract:* This LS was presented by Marco Carugi *(ITU SG20 Q2)*. This liaison requests comments from ITU-T SG16, CITS and FG-AI4AD on draft Recommendation ITU-T Y.4471 (ex Y.NDA-arch) “Functional architecture of network-based driving assistance for autonomous vehicle”.

An outgoing Liaison Statement may be sent to relevant SDOs and other entities to provide a status update on the ITS Standards database, while inviting them to provide additional inputs for inclusion.

**5 ITS Standards Online Repository**

Based on the inputs received and presentations delivered from the various SDOs, the [ITS communication standards database](https://www.itu.int/net4/ITU-T/landscape#?topic=0.131&workgroup=1&searchValue=&page=1&sort=Revelance) will be updated.

As a part of suggested action, the relevant inputs from the presentations will be incorporated into the ITS database.

**6 Next meeting**

The upcoming CITS meeting will be held on 10 September 2021. More information will be circulated via email list.

**7 Closure of the meeting**

The Chair, Russ Shields, thanked ITU for remotely hosting the CITS meeting and having supported its organization. The Chair expressed his gratitude to the representatives from the various SDOs who attended the meeting and thanked them for their contributions to the meeting, which will serve as the stepping stone for further populating the database with inputs. He also expressed his appreciation to the ITU Staff (Mr Polidori, Ms Menon and Ms Lima) for organizing the CITS meetings and building of the ITS communication standards database. The meeting closed at 17h40 hours local Geneva time.

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