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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2017-2020 | TSAG-TD1051 |
| **TSAG** |
| **Original: English** |
| **Question(s):** | N/A | E-Meeting, 25-29 October 2021 |
| **TD** |
| **Source:** | Chairman, Collaboration on ITS Communication Standards |
| **Title:** | Report on Collaboration on ITS Communication Standards and ITS-related activities |
| **Purpose:** | Information |
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| **Keywords:** | ITS; collaboration; standards; SDOs; connected vehicles; |
| **Abstract:** | The document summarizes ITU-T activities in the field of ITS communications since the last meeting of TSAG in January 2021. |

# Action required

TSAG is invited to note the report.

ITU Study Groups with activities related to ITS communications (especially SG2, SG12, SG13, SG16, SG17 and SG20 along with ITU-R SG5) are invited to provide regular updates on their ITS work items to the Collaboration on ITS Communication Standards (CITS).

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# 1 Collaboration on ITS Communication Standards (CITS)

The intent of the Collaboration on ITS Communication Standards ([CITS](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx)) is to provide a globally recognized forum for the coordination of an internationally accepted, globally harmonized set of Intelligent Transportation Systems (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.

Two CITS meetings have been held since the last TSAG meeting (January 2021): Two virtual meetings on – one on 26 March 2021 and another on 10 September 2021. The meetings of the Collaboration on ITS Communication Standards discuss the various ITS-related standardization activities in the different SDOs, through progress and status reports submitted. The documents of the meeting in March 2021 are available [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) along with the relevant documentation for the meeting in September 2021 being made available [here](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/meeting-documents.aspx?RootFolder=/en/ITU-T/extcoop/cits/Documents/Meeting-20210910-e-meeting&FolderCTID=0x0120008D91490DA7927C4D8A0BB5A73929B07D&View=%7b73BE16B3-22C9-43D5-A9FD-D8BC067A87FF%7d).

Following the discussions during the previous two CITS meetings, several SDOs have provided information on their relevant standards for inclusion in the [online ITS Communication Standards database](https://www.itu.int/net4/ITU-T/landscape#?topic=0.131&workgroup=1&searchValue=&page=1&sort=Revelance). The CITS meetings were attended by SDOs and other organizations including IETF, CSAE, IEEE, 5GAA, ISO, CEN, W3C, ETSI, Car2Car Communication Consortium, TIAA, TSDSI, TTC, WWRF, SAE International, SAE China UNECE, among others. These entities and their related groups provided progress reports to CITS. The relevant inputs from the progress reports are to be included in the ITS communication database in due time.

The 26 March 2021 e-meeting of CITS was co-located, with the 16th **Symposium on the Future Networked Car 2021 (**[**FNC-2021**](https://www.itu.int/en/fnc/2021/Pages/default.aspx)**)**, co-organized by **ITU** and **UNECE** on **22 – 25 March 2021**. Due to the ongoing COVID-19 pandemic, the Geneva motor show was canceled. Under these circumstances, the Symposium was organized as a fully virtual meeting. **Qualcomm and XPERI** supported the event as Gold Sponsors. A credible programme was developed, with the panelists connecting to the sessions remotely from **22-25 March 2021**:

* ***22 March 2021:*** [OPENING + SESSION 1: Regulatory advances in highly automated driving](https://fnc.itu.int/event/opening-session-1-regulatory-advances-in-highly-automated-driving/)
* ***23 March 2021:*** [SESSION 2: Vehicle cybersecurity framework is ready: It’s time for deployment](https://fnc.itu.int/event/session-2-vehicle-cybersecurity-framework-is-ready-its-time-for-deployment/)
* ***24 March 2021:*** [SESSION 3: Highly automated driving - how we get there](https://fnc.itu.int/event/session-3-highly-automated-driving-how-we-get-there/)
* ***25 March 2021:*** [SESSION 4: Communication for highly automated driving](https://fnc.itu.int/event/session-4-communication-for-highly-automated-driving/)

See the final Programme at: <https://fnc.itu.int/programme/>. Recommended reading include the [ITU News Magazine](https://www.itu.int/en/myitu/News/2021/03/05/13/53/Automated-driving-in-focus-at-2021-Symposium-on-the-Future-Networked-Car).

The next CITS e-meeting was scheduled on 10 September 2021. This meeting was attended by 41 participants. As with the previous meeting, several entities provided status and progress reports for discussion. CITS have received at this meeting contributions (progress reports) from the following organizations: 5GAA, Car2Car Communication Consortium, CEN TC278, ETSI TC ITS, ISO TC22, ISO TC204, ISO TC241, ITU-T SG16, SG17, SG20, ITU-R SG5, FG-AI4AD, FG-VM, IEEE 1609 WG, IEEE VT ITS, IETF IPWAVE WG, SAE International, SAE China, TTC Connected Car WG, TSDSI, UNECE TF CS-OTA and WP.29, W3C Automotive WG, WWRF CV WG. Relevant information to update the [ITS communication standards database](https://www.itu.int/net4/ITU-T/landscape#?topic=0.131&workgroup=1&searchValue=&page=1&sort=Revelance) was provided and through its upcoming meetings, CITS will continue to work with the designated experts from each SDO to populate the database with updates on the ITS standards from the respective SDOs.

CITS continues to provide the link between ITU and the [UNECE World Forum for Harmonization of Vehicle Regulations (WP.29)](http://www.unece.org/trans/main/welcwp29.html) for topics including ITS and automated driving, for which FG‑AI4AD, SG16 and SG20 have various ongoing studies. Collaboration among the UNECE Task Force and ITU-T SG17 is useful to discuss related topics in both organizations with the participation of delegates of both UNECE WP29 and Q13/17, as well as CITS in general.

ITU delegates interested in participating in UNECE WP.29 activities are invited to consult the meeting schedule at <http://www.unece.org/trans/main/wp29/meetings_events.html> and to contact Mr Stefano Polidori (ITU/TSB) at tsbcits@itu.int for additional information and coordination. CITS will continue reviewing and discussing the progress in WP.29 and coordinate any ITS communications related input.

# 1.1 CITS-related events

# 1.1.1 Concluded meetings and events:

CITS has convened two (e-)meetings since the last TSAG:

* **E-meeting, 26 March 2021:** Collaboration on ITS Communication Standards (CITS) meeting (collocated with the Symposium on the Future Networked Car 2021, 22 – 25 March 2021)
* **E-meeting, 10 September 2021:** Collaboration on ITS Communication Standards (CITS) e-meeting

The following related (virtual) events have taken place since the last TSAG meeting:

* **Webinar, 2 March 2021:** “ [*A Regulatory Framework for Automated Driving: the Value of in-use Data for Creating a no-blame Culture of Safety*](https://aiforgood.itu.int/events/a-regulatory-framework-for-automated-driving-the-value-of-in-use-data-for-creating-a-no-blame-culture-of-safety/)*”* (organized as a part of the [AI for Good Summit](https://aiforgood.itu.int/) Webinar Series, preceding the 5th meeting of FG-AI4AD)
* **E-meeting, 3 March 2021**: 5th meeting of the Focus Group on AI for Autonomous and Assisted Driving (FG-AI4AD)
* **Symposium, 22-25 March 2021**: “[*Symposium on the Future Networked Car (FNC-2021)*](https://fnc.itu.int/)*”*, co-organized by ITU and UNECE
* **Special Session, 12 April 2021**: “[*Implementation Aspects of Vehicular Multimedia*](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/12-04_Special-session.aspx)*​”* (preceding the 12th meeting of FG-VM)
* **E-meeting, 12-13 April 2020**: 12th meeting of Focus Group on Vehicular Multimedia (FG-VM)
* **Webinar, 16 April 2021**: “[*Cybersecurity track: Automotive Cybersecurity*](https://www.itu.int/net4/wsis/forum/2021/Agenda/Session/265)*”* (organized as a part of [WSIS 2021](https://www.itu.int/net4/wsis/forum/2021/))
* **Webinar, 2 June 2021:** “[*ITU Webinar on AI Policy, Standards and Metrics for Automated Driving Safety*](https://aiforgood.itu.int/events/ai-policy-standard-and-metrics-for-automated-driving-safety/)*”* (organized a part of the [AI for Good Summit](https://aiforgood.itu.int/) Webinar Series, preceding the 6th meeting of FG-AI4AD)
* **E-meeting, 3 June 2021**: 6th meeting of the Focus Group on AI for Autonomous and Assisted Driving (FG-AI4AD)
* **E-meeting, 29 June 2021**: 13th meeting of Focus Group on Vehicular Multimedia (FG-VM)
* **E-meeting, 29 September 2021**: 14th meeting of Focus Group on Vehicular Multimedia
* **Online event, 6 October 2021**: “[*AI for Road Safety*](https://aiforgood.itu.int/event/ai-for-road-safety/)*– Launch event*” (organized as a part of the [AI for Good Summit](https://aiforgood.itu.int/) Webinar Series, preceding the 7th meeting of FG-AI4AD)
* **E-meeting, 7 October 2021**: 7th meeting of Focus Group on AI for Autonomous and Assisted Driving (FG-AI4AD)

# 1.1.2 Planned meetings and events:

* **E-meeting, 1-2 December 2020**: 8th meeting of Focus Group on AI for Autonomous and Assisted Driving (TBC)
* **December 2020**: 15th meeting of Focus Group on Vehicular Multimedia (TBC)
* **March 2022 (Date TBD):** Symposium on the Future Networked Car (FNC-2022)

Delegates are invited to consult the CITS website for further updates and information: <http://itu.int/go/ITScomms>.

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

The [ITU-T Focus Group on Vehicular Multimedia (FG-VM)](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx), established by ITU-T Study Group 16 at its meeting in Ljubljana, 9-20 July 2018, analyzes and identifies gaps in the vehicular multimedia standardization landscape and draft technical reports and specifications covering, among others, vehicular multimedia use cases, requirements, applications, interfaces, protocols, architectures and security.

Following the 1st meeting of the ITU-T FG-VM held on 11 October 2018 in Ottawa, Canada, thirteen additional meetings of the FG-VM were convened:

* 2nd FG-VM Meeting, 23-25 January 2019, Tokyo, Japan (collocated with [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20190123/Pages/default.aspx) on 23 January 2019)
* 3rd FG-VM Meeting, 18-19 March 2019, Geneva, Switzerland
* 4th FG-VM Meeting, 16-17 May 2019, e-Meeting
* 5th FG-VM Meeting, 11-12 July 2019, Changchun, China
* 6th FG-VM Meeting, 11-12 September 2019, Budapest, Hungary (collocated with [mini-Workshop](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/11-9_wsp.aspx) on 11 September 2019)
* 7th FG-VM Meeting, 12-13 December 2019, Geneva, Switzerland
* 8th FG-VM Meeting, 12-13 March 2020, Geneva, Switzerland
* 9th FG-VM Meeting, 18-19 June 2020, e-Meeting
* 10th FG-VM Meeting, 28-29 September 2020, e-Meeting
* 11th FG-VM Meeting, 10-11 December 2020, e-Meeting (collocated with [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20201210/Pages/default.aspx) on 10 December 2021)
* 12th FG-VM Meeting, 12-13 April 2021, e-Meeting (collocated with [Special Session](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/12-04_Special-session.aspx) on 12 April 2021)
* 13th FG-VM Meeting, 29 June 2021, e-Meeting
* 14th FG-VM Meeting, 29 September 2021, e-Meeting

All the documents of the FG-VM meetings are available [here](https://extranet.itu.int/sites/itu-t/focusgroups/vm/_layouts/15/start.aspx#//sites/itu-t/focusgroups/vm).

The main achievements and developments related to the FG-VM since the 1st meeting include:

* The Technical Report on “[Use Cases and Requirements for the Vehicular Multimedia Networks](https://www.itu.int/en/ITU-T/focusgroups/vm/Documents/FGVM-01R1.pdf)” has been published under FG-VM/WG1 and later updated as [FGVM-01R2](https://www.itu.int/en/ITU-T/focusgroups/vm/Documents/FGVM-01R2.pdf). A related [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) new has been developed.
NOTE: The technical report was submitted to SG16 (Q27/16) for its endorsement as an ITU‑T Recommendation. It was eventually updated and approved as [ITU-T Recommendation F.749.3](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16484).
* The Technical Report on “Architecture of Vehicle Multimedia Systems” has been published under FG-VM/WG2 as [FGVM-02](https://www.itu.int/en/ITU-T/focusgroups/vm/Documents/FGVM-02.pdf?csf=1&e=jK5KdA).
NOTE: The technical report was submitted to SG16 (Q27/16) for its endorsement as an ITU-T Recommendation. It was updated and Determined (TAP) as [H.551](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17062) (currently under approval process).
* Francois Fischer (Huawei Technologies R&D, Belgium) was nominated as WG3 Chair. Additionally, Latif Ladid (University of Luxembourg, Luxembourg), Rui Xu (Dongfeng Motor Corporation, China) and Laitu Yang (Beijing AutoAI Technology Co., Ltd., China) were appointed as WG3 Vice-Chairs.
* Under FGVM-WG3, the draft Technical Report on “Implementation Aspects of Vehicular Multimedia” is being developed. Interim WG3 e-meeting are being organized regularly to advance on the draft Technical Report within FGVM-WG3. Additional time may be required to complete work on this draft Technical Report and in this regard, FG-VM plans to request SG16 for an extension of one year.

The current management team plus editors of the FG-VM includes:

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| **Position** | **Name** | **Organization** |
| FG-VM Chair: | Jun (Harry) Li  | TIAA, People's Republic of China |
| FG-VM Vice-Chair/WG1 Chair:  | Gaëlle Martin-Cocher  | Blackberry, Canada |
| FG-VM Vice-Chair/WG1 Vice-Chair: | Kaname Tokita  | Honda, Japan |
| WG1 Vice-Chair | Lu Yu  | Changan Automobile Co, LTD, China |
| WG1 Vice-Chair | Guo Yansong  | Great Wall Motor Co, LTD, China​ |
| Editor | James Lepp | Blackberry, Canada |
| WG2 Chair | Yajun Kou | Global Fusion Media Technology and Development Co. Ltd, China |
| WG2 Vice-Chair: | Dimitri Konstantas  | University of Geneva, Switzerland |
| WG2 Vice-Chair | Jie Li | China Telecom, China |
| Editor | Srinivasagan Ayyappan | Great Wall Motors, Co, LTD, China |
| WG3 Chair | Francois Fischer | Huawei Technologies R&D, Belgium |
| WG3 Vice-Chair | Latif Ladid | University of Luxembourg, Luxembourg |
| WG3 Vice-Chair | Rui Xu  | Dongfeng Motor Corporation, ​China |
| WG3 Vice-Chair | Laitu Yang | Beijing AutoAI Technology Co., Ltd., China |
| * FG-VM Advisor
 | Stefano Polidori | ITU/TSB |
| * FG-VM Project Officer
 | Mythili Menon | ITU/TSB |

The next FG-VM meeting is planned in December 2021 as virtual meeting. See also [section 1.1](#Section11) above and FG-VM webpage:

<https://www.itu.int/en/ITU-T/focusgroups/vm>

# 3 ITU-T Focus Group on AI for Autonomous and Assisted Driving (FG-AI4AD)

The ITU-T Focus Group on AI for Autonomous and Assisted Driving ([FG-AI4AD](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx)) was established by ITU-T SG16 at its meeting in Geneva, Switzerland, 7-17 October 2019. This Focus Group delves into the behavioural evaluation of the AI responsible for the dynamic driving task of a vehicle, in accordance with the 1949 and 1968 Convention on Road Traffic of the UNECE Global Forum for Road Safety. It aims to facilitate international harmonisation on the definition of a minimal performance threshold for these AD vehicles.

Following the 1st meeting of the ITU-T FG-AI held on 21-22 January 2020 in London, United Kingdom, which was kicked-off by a Workshop on 21 January: *“*[*Explainable AI (XAI) for Autonomous and Assisted Driving*](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20200121/Pages/default.aspx)*”*, six additional meetings of the FG-AI4AD were convened virtually due to the COVID-19 pandemic:

* 2nd FG-AI4AD Meeting, 4-5 May 2020, e-Meeting
* 3rd FG-AI4AD Meeting, 16-17 September 2020, e-Meeting (collocated with online [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20200916/Pages/default.aspx) on 16 September 2020)
* 4th FG-AI4AD Meeting, 2-3 December 2020, e-Meeting (collocated with online [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20201202/Pages/default.aspx) on 2 December 2021)
* 5th FG-AI4AD Meeting, 2-3 March 2021, e-Meeting (collocated with [Webinar](https://aiforgood.itu.int/events/a-regulatory-framework-for-automated-driving-the-value-of-in-use-data-for-creating-a-no-blame-culture-of-safety/) on 2 March 2021)
* 6th FG-AI4AD Meeting, 2-3 June 2021, e-Meeting (collocated with [Webinar](https://aiforgood.itu.int/event/ai-policy-standards-and-metrics-for-automated-driving-safety/) on 2 June 2021)
* 7th FG-AI4AD Meeting, 6-7 October 2021, e-Meeting (collocated with [Webinar](https://aiforgood.itu.int/event/ai-for-road-safety/) on 6 October 2021)

All the documentation pertaining to FG-AI4AD can be found [here](https://extranet.itu.int/sites/itu-t/focusgroups/ai4ad/_layouts/15/start.aspx#//sites/itu-t/focusgroups/ai4ad).

The main achievements and developments related to the FG-AI4AD since the 1st meeting include:

* Three workstreams were established under which future activities will be carried out:
* 1st Workstream: Outreach through participation, collaborations and public engagement
* 2nd Workstream: Technical specification and demonstration
* 3rd Workstream: Research based guidance & notices

– It was agreed to develop three Technical Reports (all under progress) as follows:

* 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”
* Ms Nynke Vellinga (Univ. of Groningen, Netherlands) was appointed as Editor of TR02
* Matthew O’Kelly (Trustworthy AI) was appointed as Editor of TR03, although he recently informed the FG of intention to resign for changing job so candidates to replace him are looked for.

The current management team plus editors of the FG-AI4AD includes:

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| **Position** | **Name** | **Organization** |
| FG-AI4AD Chair | Bryn Balcombe | ADA Innovation Lab Limited, UK |
| Editor TR02 | Nynke Vellinga | University of Groningen, Netherlands |
| Editor TR03 | Matthew O’Kelly | Trustworthy AI, UK |
| * FG-AI4AD Advisor
 | Stefano Polidori | ITU/TSB |
| * FG-AI4AD Project Officer
 | Mythili Menon | ITU/TSB |

The next FG-AI4AD meeting is planned in December 2021. See also [section 1.1](#Section11) above and FG-AI4AD webpage:

<https://www.itu.int/en/ITU-T/focusgroups/ai4ad>

# 4 AI for Road Safety

The newinitiative on **“*AI for Road Safety*”** was launched during the AI for Good webinar on “[AI for Road Safety](https://aiforgood.itu.int/event/ai-for-road-safety/) ” on 6 October 2021. This initiative is a joint effort of ITU and the [UN Secretary-General’s Special Envoy for Road Safety](https://unece.org/united-nations-special-envoy-road-safety) as well as the [UN Envoy on Technology](https://www.un.org/techenvoy/). The launch event was attended by **315** participants from various organizations, including UN Organizations, Private Sectors from Transport and ICT industries, as well as Public representatives, NGOs and academia.

Speakers during the Webinar included representatives from iRAP; World Bank; Transport Research Laboratory, UK; Transport Community Secretariat, Serbia; UNECE; Flare Emergency Response, Kenya; See.Sense; Amazon Web Services; Mobileye; The Royal Society for Prevention of Accident, UK; MdGO; UNICEF), among others.

The new initiative aims to:

* leverage AI-based technologies to enhance the existing Safe System Approach to Road Safety
* study the role of AI on road safety data and regulatory frameworks;
* examine the role of AI on safer vehicles, including connected, cooperative and automated vehicles; and
* delve into role of AI on road infrastructure and role of AI on post-crash response.

In line with UN target 2030, the initiative aims to reduce road mortality by half, which could save nearly 675,000 lives a year. The AI for Road Safety initiative is also in line with the UN General Assembly Resolution ([UN A/RES/74/299](https://undocs.org/en/A/RES/74/299)) on Improving global Road Safety, which highlights the role of innovative automotive and digital technology, as well as in line with the [UN Secretary General’s roadmap on digital cooperation](https://www.un.org/en/content/digital-cooperation-roadmap/).

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