ITU activities on Intelligent transport systems

Bilel Jamoussi, PhD
Chief Study Group Department,
Telecommunication Standardization Bureau, ITU
ITU - What we do

Allocation of radiofrequency spectrum and satellite orbits
Bridging the digital divide
Establishing international standards
Setting the standard

ITU - Who we are - Who are our Members

Unique in the standards ecosystem – only body including governments

Unique in the United Nations system – only body including the private sector

193 MEMBER STATES
700+ PRIVATE-SECTOR ENTITIES
150+ ACADEMIA
ITU allocates spectrum for vehicles

Setting the standard

Adaptive Cruise Control
Traffic Sign Recognition
Emergency Braking
Pedestrian Detection
Collision Avoidance
Lane Departure Warning

Cross Traffic Alert
Blind Spot Detection
Park Assist
Rear Collision Warning
Surround View

GPS
Car Radio
Mobile communication and Internet access

Long-Range Radar
LIDAR
Camera
Short-/Medium Range Radar
Ultrasound
Setting the standard

Standardization on Intelligent Transport Systems (ITS): Multiple Study Group approach

Radiocommunication Sector (ITU-R)
- Working Party 5A (spectrum allocation & harmonization, automotive radar)

Telecommunication Standardization Sector (ITU-T)
- Study Group 17: ITS and automotive cybersecurity (remote SW update)
- Study Group 12: Quality of Service of speech and audio in vehicles
- Study Group 2: Numbering for In Car Emergency Communication (ICEC)
- Study Group 20: ITS and Internet of Things and Smart Cities
- Study Group 16: Vehicle gateway and in car multimedia platforms
  - ITU-T Focus Group on Vehicular Multimedia (FG-VM)
Techniques to transfer data over short distances between a roadside infrastructure and mobile units (V2V and V2X) - M.2084-0
Technologies and characteristics for Dedicated Short Range Communications (DSRC) - 5.8 GHz - M.1453-2
System characteristics and applications for Automotive radar in various frequency bands) - M.1452, M.1453, M.1890, M.2057
System requirements for Millimetre wave radiocommunication (including Collision avoidance radar) ~ 60-80 GHz - M.1452-2
Automotive Radar technologies and possible interference with incumbent services – 78 GHz - M.2322-0
Usage of ITS technologies, frequency bands, status of standardization, and related applications and deployments in ITU Member States M.[ITS_USAGE]
Studies on harmonisation of frequency bands for ITS services M.[ITS_FRQ]
Currently working on studies in preparation of WRC-19: Plans to consider possible global or regional harmonized frequency bands for evolving ITS
A successful future automated driving car must ensure security and safety through cybersecurity mechanisms and secure over-the-air software updates.
SG17: Ongoing ITS Security standards work

- X.itssec-2: Security guidelines for V2X communication systems; (2018-09)
- X.itssec-3: Security requirements for vehicle accessible external devices; (2019-09)
- X.itssec-4: Methodologies for intrusion detection system on in-vehicle systems; (2020-03)
- X.itssec-5: Security guidelines for vehicular edge computing; (2020-03)

In ITS environment a vehicle may act as router to transmit to other vehicles. So the vulnerability of a vehicle can be propagated to the other vehicles. → Security is very important

ITU-T SG17 collaborate actively with UNECE WP.29

[UN Task Force on Cyber Security and OTA Issues (CS/OTA)]
Regulations for cyber security and over-the-air updates in progress
SG12: ITU standards improve quality of hands-free communication in vehicles

ITU-T P.1100
ITU-T P.1110
ITU-T P.1120
ITU-T P.1130

ITU Telecom World 2016 Bangkok
ITU Telecom World 2017 Busan

ITU conducts test events of mobile phones and vehicle hands-free systems
SG12: ITU standards make e-calls intelligible

ITU-T P.1140: Speech communication requirements for emergency calls originating from vehicles

Referenced in new UN regulation on automatic emergency call system for road traffic accidents (UNECE WP.29)

Source: Continental - Automatic Emergency Call
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SG2: Numbering for in Car Emergency Communication (ICEC) calls

Global numbering resources used for ICEC calls are under consideration
SG20: Standards for IoT and Smart Cities

Managing data in the connected car

- Today’s cars are already connected and smart
- Built-in cameras, radars and lidars can be used for real-time analysis of the vehicle’s environment (lots of data)
- Need solutions to processing the data efficiently
- Data transmitted from the infrastructures or from vehicle to vehicle enables both the vehicles and remote systems to manage potential dangers and issue warnings
  - Thanks to these warnings (road accidents, weather changes, faults in the road or blockages) the vehicles will be able to reduce their speed prior to reaching them, which will increase safety and improve traffic flow)
SG20 - IoT and Smart Cities & Communities - develops international standards to enable the coordinated development of IoT technologies in smart cities, including related big data

Completed standards work
- ITU-T Y.4116: Requirements of transportation safety services including use cases and service scenarios.
- ITU-T Y.4119: Requirements and capability framework for IoT-based automotive emergency response system

Ongoing standards work
- Y.IoT-ITS-framework: Framework of Cooperative ITS based on the IoT
- Y.IoT-UAS-Reqts: Use cases, requirements and capabilities of unmanned aircraft systems for IoT
- Y.AERS-mtp: Minimum set of data structure for automotive emergency response system
- Y.AERS-mtp: Minimum set of data transfer protocol for automotive emergency response system
- Y.SSC-AISE-arc: Reference architecture of artificial intelligence service exposure for smart sustainable cities
- Y.TPS-afw: Architectural framework for providing transportation safety service
- Y.FW.IC.MDSC: Framework of identification and connectivity of Moving Devices in Smart City
SG16: Vehicle gateway platform (VGP) functional and service requirements

ITU-T F.749.1, F.749.2, H.550, H.560
HSTP-CITS-Req Technical Paper on ITS Comms Requirements
SG16: ITS Standards for vehicle gateway platform (VGP)

Vehicle gateway platform (VGP) Standards

- ITU-T F.749.1: Functional requirements for vehicle gateways
- ITU-T F.749.2: Service requirements for vehicle gateway platforms
- ITU-T H.550: Architecture and functional entities of vehicle gateway platforms
- ITU-T H.560: Communications interface between external applications and a vehicle gateway platform

ITS Technical Paper

HSTP-CITS-Reqs (2014) - Global ITS Communication Requirements
New ITU-T Focus Group on “Vehicular Multimedia” (FG-VM)

Join us and contribute!
Focus Group on “Vehicular Multimedia” (FG-VM)

Vehicular multimedia system
- 4th screen after TV, PC & Mobile Phone
- 3rd infotainment space after home, office

Aim of FG-VM
- Integration of Terrestrial and Satellite networks
- Integration of Broadcasting and Internet services
- Reduce costs using converged networking
- Provide wide area coverage

Challenges
- Integration and compatibility with mobile communication: 3, 4, 5G and beyond
- Software protocols and hardware specifications standardization and adoption
- Harmonization of Transport regulations
- Involve international experts and stakeholders
Focus Group on “Vehicular Multimedia” (FG-VM)

FG-VM Established on 20/07/2018 → Proposed by

FG-VM Management

- Chairman: Harry Li (TIAA, China)
- Vice chairmen: Gaëlle Martin-Cocher (Blackberry, Canada); Kaname Tokita (Honda, Japan)
- Interested candidates to join the management team as vice-chairs are requested to contact TSB at tsbfgvm@itu.int. Those candidatures will be evaluated and agreed by the FG-VM and announced at their meetings.

Terms of reference

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Phases after FG-VM establishment

6-7 Sept 2018
Recruitment and promotion at ITS-Forum and CITS Meeting Nanjing, China (C-ITS)

23-25 Jan 2019
Workshop + 2nd Meeting Tokyo, Japan (TTC)

23-25 Jan 2019
Honda

11 Oct 2018
Mini-workshop + 1st Meeting Ottawa, Canada (BlackBerry)

18-19 Mar 2019
3rd Meeting co-located with SG16 meetings Geneva

7 March FNC-2019
Progress TR on Requirements and Use Cases

11-14 July 2019
4th meeting Co-located with TIAA Conference, Changchun, China

8-9 Oct 2018
Workshop on “Connected-car” Detroit, USA (SAE)

11 Oct 2018
Working Structure and leadership of WG1

18-19 Mar 2019
Plan to progress the TR and appoint leadership of WG2

Future plans
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date/Location</th>
<th>Hosted by</th>
</tr>
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<tbody>
<tr>
<td>1st meeting</td>
<td>11 October 2018, Ottawa, Canada</td>
<td>Blackberry</td>
</tr>
<tr>
<td>2nd meeting</td>
<td>23-25 January 2019, Tokyo, Japan</td>
<td>TTC</td>
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<tr>
<td>3rd meeting</td>
<td>18-19 March 2019, Geneva, Switzerland</td>
<td>ITU</td>
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<tr>
<td>4th meeting</td>
<td>TBD in May</td>
<td>(e-meeting)</td>
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<td>5th meeting</td>
<td>11-14 July 2019, Changchun, China</td>
<td>TIAA</td>
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<tr>
<td>6th meeting</td>
<td>TBD Sept/Oct 2019, collocated with SG16</td>
<td>(Hosted by ITU)</td>
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Focus Group on “Vehicular Multimedia” (FG-VM) – Status of the work

- Two events were organized to brainstorm on the future of vehicular multimedia: mini-Workshop (Ottawa) and Workshop (Tokyo).
- Agreed working structure:
  - WG1: VM use cases and Requirements
  - WG2: VM Architecture
  - WG3: Implementation aspects of VM
- Started developing a Technical Report: “Use cases and requirement for the Vehicular Multimedia system”
- Calling for proposals to join the management team of WG2
- Calling for contributions to progress the TR above and start discussing a VM Architecture
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ITU and Vehicle Connectivity: Yearly Events (Europe, Asia, America)
Future Networked Car Symposium

7 March 2019
Geneva, Switzerland

Geneva International Motor Show

#ConnectedCar

https://www.itu.int/en/fnc/2019
tsbcar@itu.int
AI for Good Global Summit

Accelerating progress towards the SDGs

28-30 May 2019
Geneva, Switzerland

#AIForGood
FUTURE OF SMART & SAFE MOBILITY - FRIDAY 31 MAY (DAY 4)

**Keynotes**

- CARSTEN BREITFELD  
  CEO of Byton

- ROBORACE

**Aim**

- Identify the opportunities and challenges associated with smart and safe mobility
- How the future of mobility will affect the way we live and transform urban environments

**Subject Areas**

- Autonomous cars & augmented driving
- AI driving coaches & driving licenses
- Future transport models & ride sharing
- Vertical liftoff & people carriers
- e-bikes
- Road safety
FUTURE OF SMART & SAFE MOBILITY- EARLY SPEAKERS

OLGA ALGAYEROVA
Executive Secretary, UNECE

CARSTEN BREITFELD
CEO of Byton

LUCAS DI GRASSI
Racing driver, Audi Sport ABT Schaffler
CEO, Roborace

MANUELA PAPADOPOL
CEO, Designated Driver

CHRISTOPH PEYLO
Global Head of Bosch Center for Artificial Intelligence (BCAI)

T. RUSSEL SHIELDS
Chairman of Ygomi, Founder Navteq

BRYN BALCOMBE
Chief Strategy Officer at Roborace;
Member of the Global Future Council on Computing at the World Economic Forum
FUTURE OF SMART & SAFE MOBILITY - EXHIBITS/DEMOS

Gold Sponsor

AUTONOMOUS DRIVERS ALLIANCE

ROBORACE
The world’s first driverless electric racing car
Opportunities for Collaboration

Collaboration on ITS Communication Standards (CITS)

- Established by the ITU to provide a Platform to share knowledge and coordinate ITS standardization
- Attended by worldwide SDOs
- Three meetings x year, back to back with the ITS-related regional events: Asia (~July), America (~Dec.) Geneva (~March)
- Aims for a coordinated set of interoperable ITS Communication Standards

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