Intelligent Transport Systems standardization in ITU
8-9 October 2018 Detroit Michigan USA
international organization with global presence

~750 Staff from ~80 Countries
Membership driven (193 M.S., +700 private entities, +150 Academia)
6 UN Official Languages: Arabic, Chinese, English, French, Russian, Spanish
Headquarters in Geneva with Liaison Office in New York
Regional offices in Addis Ababa, Bangkok, Brasilia, Cairo
Area offices in Bridgetown, Dakar, Harare, Jakarta, Moscow, Santiago, Tegucigalpa, Yaoundé

ITU-T Standardization

ITU-R Radiocommunication

ITU-D Development

Committed to Connecting the World
A Focus on the standardization work for Intelligent Transport Systems (ITS)
ITU-T Recommendations

International Standards
Developed and adopted by 193 Member States, 700 Private Sector, and 150 Academia
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)
ITU allocates spectrum for vehicles

Intelligent Transport Systems

Long-Range Radar
LIDAR
Camera
Short-/Medium Range Radar
Ultrasound

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
ITU-R: Radiocommunication and ITS (1/2)

Radiocommunication Sector (ITU-R)

- 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
Radiocommunication Sector (ITU-R)

- 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
  - Plans to take necessary actions to facilitate global or regional harmonized frequency bands to support railway radiocommunication systems
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SG17: ITU standards secure over-the-air software updates for vehicles

ITU-T X.1373 (2017-03)

A successful future automated driving car must ensure security and safety through cybersecurity mechanisms and secure over-the-air software updates.
ITU-T Recommendation X.1373 “Secure software update capability for intelligent transportation system communication devices”

ECUs - Electronic control units
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

https://www.youtube.com/watch?v=x4dtjvLHXds

ITU Telecom World 2017 Busan

ITU Telecom World 2016 Bangkok

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

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
SG2: Numbering for In Car Emergency Communication (ICEC) calls

• Global numbering resources used for ICEC calls is under consideration.
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
- Need solutions to processing the data efficiently. This will have a positive impact on safety, as well as improving assistance.
- 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) → Vehicles will be able to reduce their speed prior to reaching them, which will increase safety and improve traffic flow.
ITU-T SG20 - IoT and Smart Cities & Communities - develops international standards to enable the coordinated development of IoT technologies in smart cities, including related big data.
SG20: Standards for IoT and Smart Cities

Completed standards work

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

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
An IoT-based automotive emergency response system is expected to reduce the automobile accident detection and reporting times using automatic accident detection-report procedures. Furthermore, since a sensor assisted geographical positioning allows the AERC to pinpoint the exact location of the accident, the time for rescue to reach the accident scene is expected to be shortened significantly.
SG16: Vehicle gateway platform (VGP) functional and service requirements

- **HSTP-CITS-Reqs** *Technical Paper on ITS Comms Requirements*
ITU-T 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-Req (2014) "Global ITS Communication Requirements"
New ITU-T 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
New ITU-T FG-VM “Vehicular Multimedia”  2/3

FG-VM Goals

(1) To study, gather information and develop a standards research orientation and standards research plan related to vehicular multimedia in the fields of intelligent voice interaction, interconnection between vehicular terminal and smart phone, connectivity for high precision navigation and various other applications;

(2) To develop corresponding use cases and requirements of vehicular multimedia enabled by converged networks;

(3) To study architectures, interfaces, protocols, data formats, interoperability, performance evaluation, security and protection of personal information for vehicular multimedia;

(4) To produce a gap analysis of vehicular multimedia standardization in order to identify the relevant scope of possible future ITU-T Recommendations on these topics and develop a roadmap for vehicular multimedia;

(5) To establish liaisons and relationships with other organizations which could contribute to the standardization activities for vehicular multimedia.
New ITU-T FG-VM “Vehicular Multimedia” 3/3
(established on 20/07/2018) (Proposed by TIAA)

FG-VM Management
– Chairman: Jun (Harry) Li (TIAA, China)
– Vice chairmen: Gaëlle Martin-Cocher (Blackberry, Canada)
– 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.

FG-VM Meetings
– Plans to meet 4 times a year
– Extensive use of remote meetings
– First meeting planned (TBC) on 10-11 October 2018, Detroit, USA

https://www.itu.int/en/ITU-T/focusgroups/vm ↔ tsbfgvm@itu.int
ITU and Vehicle Connectivity: Yearly Events (EUROPE, ASIA, AMERICA)
Successful 13th Symposium (FNC-2018) on the Future Networked Car (@ Geneva International Motor Show)

FNC Symposia organized since 2005 by ITU


https://www.itu.int/en/fnc
Recent & future ITS events organized by

  6-7 September 2018, Nanjing, China
  ➢ **CITS meeting** (7 Sept PM, Nanjing, China)

- **ITU/SAE: Workshop on "How Communications will Change Vehicles and Transport"**
  8-9 October 2018, Detroit, USA

- **FNC-2019**
  planned 7 March 2019

[http://itu.int/go/ITScomms](http://itu.int/go/ITScomms)
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

http://itu.int/go/ITScomms

Subscribe to the CITS mailing list!
Please contact Stefano POLIDORI (Advisor at the ITU) for more information and opportunities for collaboration on:
- Intelligent Transport Systems (ITS) and
- Future Networked Car activities

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