



## VTS Standards Activities

This is an exciting month in IEEE Vehicular Technology Society (VTS). We look forward to seeing many of you at the 99th IEEE Vehicular Technology Conference to be held on 24–27 June 2024 at the Marina Bay Sands, a landmark destination in Singapore. Many thanks to J. R. Cruz as Vice President of Conferences, Sumei Sun as General Chair, Chen Hui Ong as General Co-Chair, and Chau Yuen as Technical Program Committee Chair of VTC2024Spring.

In this article I will provide an overview of various standards activities in our society. VTS is one of the IEEE societies that develop standards under the auspices of the IEEE-Standards Association. IEEE standards drive the functionality, capabilities, and interoperability of a broad range of products and services that transform the way people live, work, and communicate.

Within the three technical fields of interest in VTS, there are seven active VT standards committees, led by VP of Standards Oliver Holland and the newly formed Standards Development Board, chaired by Yousef Kimiagar. The contact information of all the committee chairs can be found on the VTS website.

### Land Transportation

#### *VT Communications Based Train Control and Signals*

**Chair: Yousef Kimiagar**

The primary activity of the VT Communications Based Train Control

(CBTC) and Signals standards committee is organized in working groups and study groups. The working groups focus on IEEE Standards 1474 Parts 2, 3, and 4, which include user interface requirements, recommended practice for system design and functional allocations, and recommended practice for functional testing of CBTC systems. The study groups recently finalized a report on cybersecurity in CBTC and have ongoing work for a new report on artificial intelligence in rail transit.

Working groups are currently being formed for the following standards:

- P1570: Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection
- 1698: Guide for the Calculation of Braking Distances for Rail Transit Vehicles
- P1483: Verification of Vital Functions in Processor-Based Systems Used in Rail Transit Control
- 1475: Functioning of Interfaces Among Propulsion, Friction Brake, and Train-Borne Master Control on Rail Rapid Transit Vehicles.

VTS members are encouraged to contact the committee chair, Yousef Kimiagar, to express interest in these newly formed working groups.

#### *VT High-Speed Train and Maglev*

**Chair: Jianghua Feng**

The VT High Speed Train and Maglev (HSTM) standards committee has contributions from 100 committee members in 10 different countries. The technical areas of interest include

HSTM's train-borne electrical equipment, signaling and control systems, and fixed installation on the ground. The committee mainly develops standards related to HSTM's electrical systems, safety, reliability, and operational maintenance.

The VT High Speed Train and Maglev standards committee has two published standards:

- P2753: IEEE Guide for Measurement of Pantograph Off-Line and Evaluation of Current Collection Performance for High-Speed Railway
- P2956: Test Method for Surface Transfer Impedance of Shielded Power Cables and Connectors for Rail Vehicles.

There are five ongoing projects, including “P2950: Electric Traction System for High-Speed Electric Multiple Units,” which is slated to publish in 2024.

The standards committee will establish two study groups related to urban rail operation and maintenance, as well as low-carbon railway technology. If you are interested in joining either study group, please contact the committee chair, Jianghua Feng.

#### *VT Overhead Contact Systems*

**Chair: Stephen Norton**

The VT Overhead Contact Systems (OCS) standards committee's technical areas of interest include all areas of overhead catenary systems, poles, support structures, messenger and contact wires, feeder cables, disconnect and distribution switches, and third rail and associated cabling

and switches. The mission of the committee is to create and review standards that shall be adopted and adhered to by those associated with the light rail and trolley bus industry.

Recently completed standards include:

- 1627: IEEE Standard for Transient Overvoltage Protection of Direct Current (DC) Electrification Systems by Application of DC Surge Arresters
- 1791: IEEE Recommended Practice for Terminology Used for DC\* Electric Transit Overhead Contact Systems
- 1833: IEEE Guide for Design of DC Overhead Contact Systems for Transit Systems.

Standards in development include supporting structures for OCS, pole grounding recommended practice, and OCS testing and commissioning.

VTS rail agency members are encouraged to contact committee chair Stephen Norton to become involved, and pass committee and standards information around to your peers.

### *VT Traction Power Systems*

**Chair: Andrew Jones**

The VT Traction Power Systems standards committee was established in 2002 with the mission of serving the rail and transit industry through developing new standards, recommended practices, and guides; coordinating with other organizations, such as the American Public Transportation Association and American Railway Engineering and Maintenance-of-Way Association, and within the IEEE; providing up-to-date information on professional activities of interest; and soliciting recommendations, ideas and suggestions that would improve the industry practices.

The committee is composed of engineers from transit agencies, consultants, and manufacturers, and meets twice a year at the various rail transit systems in North America. It has several active published standards, as well as the following working groups:

- P1884: Guide for Stray Current/Corrosion Mitigation for DC Rail Transit Systems
- P1887: Wayside Energy Storage System Guide for DC Traction Applications
- P2720: Rail Potential Management Guide for DC Traction Electrification Systems
- P2853: Draft Recommended Practice for System Grounding of Traction Power Systems.

If you are interested in joining any of the working groups, please contact the committee chair, Andrew Jones.

### **Mobile Radio**

#### *VT Mobile Radio*

**Chair: David Michelson**

The VT Mobile Radio standards committee is a new addition to the VTS standards portfolio. It oversees the development of standards associated with mobile communications and land/airborne/maritime mobile services. The committee's scope includes propagation and channel models, the verification and application of wireless test and measurement equipment, field and bench testing practices, communication protocols and infrastructure, wireless system planning practices, wireless system deployment practices, and communication security.

The committee currently oversees or supports two working groups that focus on the development of best practices for wireless channel sounding:

- P2982: Verification of Millimeter-Wave Channel Sounders
- P3162: Synthetic Aperture Channel Sounding.

Interested VTS members are encouraged to subscribe to the committee's announcements mailing list, and to consider joining the committee and participating in its working groups, webinars, and workshops. Please contact the committee chair, David Michelson.

### **Motor Vehicles**

#### *VT Automated Vehicles*

**Chair: Ricardo Pinto de Castro**

The VT Automated Vehicles standards committee supports the development of technical standards that address the lack of standardized best practices on how to develop, test, and validate automatic vehicles, how to ensure interoperability, and how to guarantee safety and reliability.

The targeted standardization areas include (but are not limited to) automated vehicular systems and technologies, sensing, detection, controls and decision-making, artificial intelligence, machine learning, reliability of sensing and decision-making, human-vehicular interaction, and vehicle power systems. Ongoing standards projects that the committee is (co)-sponsoring include:

- P3116: Automotive Radar Performance Metrics and Testing for Verification of Autonomous Driving and ADAS
- P2846: Assumptions for Models in Safety-Related Automated Vehicle Behavior
- P2979: Edge Intelligent Terminal for Expressway Cooperative Transportation
- P3359: Testing Methods for Proton Exchange Membrane Fuel Cell Systems in Automotive Applications Using Compressed Hydrogen as Fuel.

The standards committee is currently evaluating two new standards proposals related to the safety and architecture of parallel autonomy systems, and the monitoring of autonomous driving agents.

The committee is actively seeking new members who can address problems in standardization. If you are interested, please contact the committee chair, Ricardo Pinto de Castro.

#### *VT Intelligent Transportation Systems*

**Chair: Thomas Kurihara**

The VT Intelligent Transportation Systems standards committee oversees

more than 10 standards working groups in the technical areas of interest of wireless access in vehicular environments and motor vehicle event data recorders (MVEDRs).

Recent standards projects include:

- P1609.2: Wireless Access in Vehicular Environments—Security Services for Applications and Management Messages
- P1609.2.1: Wireless Access in Vehicular Environments—Certificate Management Interfaces for End Entities – Corrigenda
- P1609.2.2: Wireless Access in Vehicular Environments—Security Services for Multijurisdictional Interoperability

- P1609.3: Wireless Access in Vehicular Environments—Network Services
- P1616: Motor Vehicle Event Data Recorders, Amendment 1: Brake and Electronic Control Unit (ECU) Electronic Fault Code Data Elements
- P1616.1: MVEDR Data Storage System for Automated Driving (DSSAD).

Participation in the IEEE 1609 Working Group is open to all interested VTS members. Meetings are currently held every two months. The IEEE 1616 Working Group is without an active project and open to suggestions for topics. VTS members are invited to contact the

committee chair, Thomas Kurihara, for more information.

I would like to thank all the committee chairs for their contributions in leading the standards activities and Katie Becker Colón for her help in putting this article together.

As always, I would like to know how the VTS can better serve you. Please do not hesitate to contact me with your ideas, suggestions, comments, questions, or concerns. If you have not already engaged in one of the standards committees introduced here, I hope you will consider doing so in 2024!

**VT**



## DISTINGUISHED LECTURER PROGRAM

- A remarkable technical program to serve our members via VT chapters worldwide
- One of the largest such programs within IEEE
- 75+ leading experts in mobile radio, vehicular electronics, and intelligent transportation
- Delivery of lectures on cutting-edge research and on technology advances
- Meet in person or virtually with our Distinguished Lecturers and Speakers



For more information, visit [vtstudies.org](https://vtstudies.org)