

Nurturing the Era of end-to-end Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation

Industry Connections Activity Initiation Document (ICAID)

Version: 1.0, 18 May 2020

IC20-009-01 Approved by the IEEE SASB 4 June 2020

Instructions

- Instructions on how to fill out this form are shown in red. It is recommended to leave the instructions in the final document and simply add the requested information where indicated.
- **Shaded Text** indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE-SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact

Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person's information may also be provided.

Name: Axel Deicke

Email Address: axel.deicke@gmail.com

Employer: Self-Employed (ex-BMW)

Affiliation: Independent Consultant

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

2. Participation and Voting Model

Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

Specify: "Entity-Based" or "Individual-Based".

Entity-based

3. Purpose

3.1 Motivation and Goal

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

Describe the motivation and goal.

The automotive eco-system is in transformation, driven by technology evolution, new business opportunities and policy initiatives. Future cars will have electric and other power trains. Moreover, vehicles will be connected, automated, and smart due to computerization and software embedded intelligence.

There is a shift from individually owned vehicles towards interconnected shared mobility solutions, used as an if-and-when needed service (Mobility-as-a Service (MaaS)). Drivers will be operators and eventually passengers. Autonomous vehicles will open up many more currently unknown opportunities for end-to-end ‘MaaS’.

The digital transformation of transportation is a cross-sector challenge. While vehicle manufacturers drive the evolution of Advanced Driver Assistance Systems (ADAS) towards fully automated cars, the ICT sector’s aspiration is to leapfrog autonomous driving. Stakeholders from both industries in the converging mobility eco-system face challenges, which cannot be solved by a single company or by a closed circle of a few companies. Close cooperation across a variety of disciplines and a diversity of stakeholders is needed to align technology evolution paths, to jointly evolve value networks and markets, and in general to build trust in autonomous systems. In particular, standards related activities help to reduce complexity and thus reduce risks and cost, facilitate economies of scale, enable interoperable building blocks of the end-to-end system, and ensure compliance with regulatory requirements.

A broad, open, cross-industry dialogue is needed to exchange views, to debate and to agree upon common challenges and coordinated activities needed, including;

- Technology Enablers for Autonomous Vehicles – Trade Offs
- Data driven engineering and testing
- Vehicle Platforms and Platform Business
- Infrastructure for Autonomous Vehicles
- Hitting the Safety Spot despite security risks and AI-blackbox embedded functionality

IEEE SA has organized two standards related industry workshops in a row, on 13 December 2018 and on 2-3 December 2019. Both workshops took place in Munich. The first workshop was hosted by the IBM Watson IoT Center, the second by Rohde&Schwarz.

To evolve the workshop format and further its relevance and impact it is key to

- broaden the base to build agendas more systematically bottom up according to stakeholder needs and
- grow international participation by globalizing the workshop, that is changing venue worldwide

This Industry Connection aims to provide the organizational framework needed for both, to expand volunteer engagement from the entire eco-system and to globalize participation from all over the world, in particular from Asia and Americas besides Europe.

The overall purpose of the event is multifold:

- Inform about relevant leading edge technologies
- Inform about ongoing standardization projects
- Inform about standards related initiatives
- Identify limitations and shortcomings of existing (standardized) technologies
- Identify research challenges
- Identify standardization needs
- Identify stakeholders with a vested interest to engage in a standards initiative

The workshop event invites key stakeholders to debate how to advance the development of Autonomous Vehicles and e2e-MaaS. Key industry leaders share their vision. All speakers and participants have the opportunity to discuss, and debate the tech and business challenges, and identify opportunities for standardization to help solve the issues in the eco-system, which cannot be resolved by a single company alone but require consensus among stakeholders.

Keynote speakers, decision makers, subject matter experts and technologists are invited from;

- Car Makers (OEMs)
- Tier1/2 Suppliers
- Technology Providers
- Research Institutes
- IT/Telecom Industry
- Academia
- Research Consortia
- Industry Alliances
- Regulators
- Governmental bodies

3.2 Related Work

Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

Describe the related work.

Prior to the planned launch of this IC group, two IEEE SA Industry Workshops (one in 2018, another in 2019), one Industrial Expert Consultation Workshop (2019), Webinars, and company visits were undertaken. These helped to assess the interest in cooperation and scout for potential participants.

2nd Workshop: “Nurturing the Era of e2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation. 2 - 3 December 2019, Munich, Germany”:

<https://standards.ieee.org/events/e2e-maas/index.html>

1st Workshop: “Nurturing the Era of e2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation. 13 December 2018, Munich, Germany”:

<https://standards.ieee.org/content/ieee-standards/en/events/e2e-maas/2018.html>

The workshops helped identify key themes in the autonomous vehicles space. Several proposals from speakers in various sessions were followed up after the workshop. Meanwhile two safety related standardization projects have been kicked-off (P2848, P2851). One IC proposal has been approved by IEEE SASB (IC20-004 “Assessment of standardization gaps for safe automated driving”). The workshop also opened up opportunities to enter formal relationships and work with Industry Associations e.g. with SAE ITC IAMTS.

Against the prior work undertaken, the time is hence ripe to launch an IC group that could bring the workshop series to the next level.

Several commercial conferences in the autonomous vehicle space do exist. There are also scientific and research conferences on various aspects in transportation and automated driving, including those organized by IEEE Societies: ITS and VT.

The IEEE SA Standardization Workshop is unique for following reasons

- It provides a holistic view and deals with integrated end-2-end solutions (all aspects of the digital transformation of road transportation)
- It looks at functions, architectures and processes
- It focuses on techno-economic challenges of the automotive eco-system in the context of diverging regional regulatory environments
- It has collaborative (standards related) activities in mind, not just standards setting, but also pre-standardization, testing, and certification

3.3 Previously Published Material

Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

List the previously published material, if any.

Most (but not all) presentations from past workshops have been published and are available for download from

<https://standards.ieee.org/events/e2e-maas/index.html>

3.4 Potential Markets Served

Indicate the main beneficiaries of this work, and what the potential impact might be.

Describe the potential markets.

ICT drives the digital transformation of the automotive industry. New business opportunities arise, new mobility markets evolve. To master a smooth evolution a close cooperation of automotive incumbents and IT heavyweights is crucial. IEEE has the opportunity to be the place be for both industries to work together.

The automotive manufacturers, the tier one suppliers, the IT companies, and semiconductor companies, alongside business-oriented research centers and think tanks are the primary beneficiaries of this initiative.

The initiative will address the entire market for road vehicles and mobility services as well as the many sub-segments for ADAS, automotive communication, engineering and testing, as well as the camera, LiDAR, radar and ultrasonic sensor markets, and much more. Standards help to create markets as large and homogenous as possible to maximize economies of scale.

By level of automation, this initiative will address primarily Level 3 automation and Level 4 solutions in restricted areas e.g. on highways or automated valet parking. Substantially further research is required for Level 5. IEEE SA has the capacity to facilitate the exploitation of research results through standards related activities.

Government initiatives, paired with further demand for electric and hybrid cars and the strong demand for more automated vehicles to improve safety, increase traffic efficiency and make road traffic sustainable and environment friendly, will strongly benefit the market and by consequence this initiative will also benefit from it.

3.5 How will the activity benefit the IEEE?

The IEEE is known as an international standard development organization with a record of foundational standards like Ethernet and Wifi which are fundamental for automotive too (Automotive Ethernet, TSN, 802.11p/bd based V2x communication). Other standards work addresses automotive sensors (P2020), automotive safety (P2846), charging of electric vehicles (P2030), as well as ontologies, data governance and algorithmic bias, to name a few. As such, IEEE is a platform for mutual exchange, learning, networking and for advancing the state of play of international thinking on how to jointly resolve cutting edge challenges through team work and collaboration.

This IC initiative will further benefit the IEEE SA in taking the role of an independent platform that channels cutting edge thinking on future tech hypes. The area of autonomous vehicles forms no exception to that. Against this background, this IC is yet another opportunity for IEEE SA to assume its global role as the platform of choice to come together and exchange on cutting edge issues regarding autonomous vehicles. In doing so, it builds on strengths of ongoing work and facilitates consensual standardized solutions to master a human-centric smooth evolution of the automotive eco-system.

4. Estimated Timeframe

Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: 06/2022

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCom and the IEEE-SA Standards Board. Should an extension be required, please notify the ICCom Administrator prior to the two-year mark.

5. Proposed Deliverables

Outline the anticipated deliverables and output from this IC activity, such as documents (e.g., white papers, reports), proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

Specify the deliverables for this IC activity, please be specific.

An annual IEEE-SA Workshop ‘Nurturing the Era of end-to-end 2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation’.

NOTE:

- In the future an exhibition may be collocated to the workshop
- In the future the workshop may be a paid event

The venue should change worldwide. Organizing one workshop in Asia, America and Europe every year is for further study.

The papers presented during the workshop will be available for reference by implementers for many years to come.

This IC initiative may also produce reports or whitepapers on specific subject areas as needed.

More focused industrial consultation workshops may be organized to learn from a wider crowd, gain further industry expertise, assess the need for collaboration and to draw more participants into a collaborative initiative in order to build critical mass of participation in such a joint effort.

5.1 Open Source Software Development

Indicate whether this IC Activity will develop or incorporate open source software in the deliverables. All contributions of open source software for use in Industry Connections activities shall be accompanied by an approved IEEE Contributor License Agreement (CLA) appropriate for the open source license under which the Work Product will be made available. CLAs, once accepted, are irrevocable.

Will the activity develop or incorporate open source software (either normatively or informatively) in the deliverables?: **No**

There is no intention to produce Open Source Software.

6. Funding Requirements

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICom.

Specify funding requirements and sources, if any.

No money requested from IEEE, these activities that follow would be funded by the members.

At least two standards related workshops over 24 months.

Consultancy and coordination work to steer and oversee the initiative.

No application for grants has been made.

7. Management and Procedures

7.1 Activity Oversight Committee

Indicate whether an IEEE committee of some form (e.g., a Standards committee) has agreed to oversee this activity and its procedures.

Has an IEEE committee agreed to oversee this activity?: No

NOTE: The Vehicular Technology Society/Automated Vehicles Standards Committee (VTS/AVSC) prefers a Steering Committee to steer this IC. However, VTS/AVSC is ready to consider oversight of this activity if needed.

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name

Chair's Name: Full Name

Chair's Email Address: who@where

Additional IEEE committee information, if any. Please indicate if you are including a letter of support from the IEEE Committee that will oversee this activity.

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

IEEE Computer Society/Standards Activity Board (SAB): Liaison contact Riccardo Mariani

IEEE Vehicular Technology Society/Intelligent Transportation Systems (VT/ITS): Liaison contact Tom Kurihara

IEEE Vehicular Technology Society/Automated Vehicles Standards Committee (VTS/AVSC): Liaison contact Ricardo Pinto de Castro

7.2 Activity Management

If no Activity Oversight Committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc).

Briefly outline activity management structure.

A Steering Committee, consisting of representatives of the industry and IEEE-SA, steers the IC activities and organizes the event.

The Steering Committee appoints a Program Committee for each annual event.

The Program Committee oversees the submission and review of presentations and organizes the program agenda for a specific IEEE-SA Workshop ‘Nurturing the Era of end-to-end 2e Mobility as a Service (MaaS): Standards for Connected and Autonomous Transportation’ (aka “AV4MaaS-Workshop”).

7.3 Procedures

Indicate what documented procedures will be used to guide the operations of this activity; either (a) modified baseline *Industry Connections Activity Policies and Procedures*, (b) Standards Committee policies and procedures accepted by the IEEE-SA Standards

Board, or (c) Working Group policies and procedures accepted by the Working Group’s Standards Committee. If option (a) is chosen, then ICCom review and approval of the P&P is required. If option (b) or (c) is chosen, then ICCom approval of the use of the P&P is required.

Specify the policies and procedures document to be used. Attach a copy of chosen policies and procedures.

IEEE-SA Industry Connections Committee Operations Manual

8. Participants

8.1 Stakeholder Communities

Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity, and will be invited to participate.

Specify types of entities or groups of individuals.

Representatives of car manufacturers and their value chains/supply networks.
Decision makers, engineers, technologists, including standards makers and standards users.

Why Join?

- Shape the future of e2e MaaS, autonomous vehicles and intelligent transportation systems
- Learn and engage with key industry players

- Grow your market through standards
- Add scalability to your market prospects
- Take advantage of networking opportunities
- Share your ideas and concepts and get feedback from peers
- Find supporters of your ideas

Who should participate?

- Vehicle manufacturers and automotive suppliers
- Autonomous Vehicle Developers
- Software and internet companies
- Semiconductor firms
- Telecom operators
- Road operators
- Mobility service providers
- Transportation Infrastructure Stakeholders
- Industry Alliances
- Academics
- Research institutions
- Start-ups and scale ups
- Regulators
- Governmental bodies

8.2 Expected Number of Participants

Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

Number of entities or number of individuals.

Steering Committee members: 5-10

Program Committee members: 10-20

Event attendees: 60-120 (initially)

8.3 Initial Participants

Provide a number of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Use the following table for an entity-based activity:

Entity	Primary Contact	Additional Representatives
AVL	Michael Paulweber	
BMW	Boris Schauerte	
Bosch	Peter Busch	

<i>Consultant</i>	Axel Deicke	
DLR	Ricardo Pinto de Castro	
Fujitsu	Jürgen Neises	
NVIDIA	Riccardo Mariani	
Rohde&Schwarz	Nik Dimitrakopoulos	
UniqueSec AB	Kasra Haghighi	

Use the following table for an individual-based activity:

Individual		Employer	Affiliation
Name			