IEEE SA STANDARDS ASSOCIATION

Intelligent Transportation Systems (ITS) Testbed Development for Dynamic Road Traffic Management and Control at Electronic City – Bangalore INDIA

Industry Connections Activity Initiation Document (ICAID)

Version: 1.0, 23 January 2020

IC20-002-01 Approved by the IEEE SASB 5 March 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: Subhas C Mondal (Chair)
Email Address: subhas.mondal@wipro.com
Employer: Wipro India
Affiliation: Wipro India

Name: Dr. Navin Kumar (Secretary)
Email Address: navinkumar@ieee.org
Employer: Amrita University
Affiliation: Amrita School of Engineering, Bangalore Campus

Name: Subodh Gajare (Vice Chair)
Email Address: sugajare@cisco.com
Employer: CISCO
Affiliation: CISCO India

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).

"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.

Traffic congestion and road safety is of great concern not only in India but throughout the globe. Especially in India, because of road traffic congestion, undisciplined driving, condition of road, etc; the time spent in traffic, fuel consumption, fatalities, loss of materials encumber the growth of gross domestic product (GDP). Bangalore (India) is considered the sixth most painful city in the world for the traffic congestion. Despite huge investment on infrastructure and transportation, the condition is not improving. Furthermore, the digitalization and usage of information and communication technology (ICT) has impacted almost all sectors including transportation. Intelligent transportation system (ITS) is expected to address the issues to some extent. In fact, many cities have developed few components of ITS which have improved the situation.
Our main objective is to develop a test bed for the traffic management and control to regulate the traffic in one part of the city using 10-12 signal junction points. For example, electronic city; the industrial corridor of Bangalore would be investigated, feasibility study will be undertaken and test bed is planned to be developed. Under this objective, we would focus on traffic problems, develop solutions approach, identify the components and systems for the solution and create a testbed so that:

- traffic flow is monitored, regulated and smoothened
- traffic situation is detected and dynamically controlled
- traffic violation is detected and notified
- real time information exchange is enabled
- green corridor creation is catalyzed
- a control station is created for unified monitoring and control
- a white paper is published to enable adoption across India and outside

The Government is all supportive and would like to improve situation with the usage of technology. For example, recent government announcement of 100 smart cities is ambitious plan and ITS being inherent in it. Looking at the available opportunity, we

would like to work aggressively bringing experts on one platform and showcase our design to be adoptable in the entire city and other cities in India and other neighboring countries. This collaborative work would be a good initiative to start with.

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.).

Many cities in India, like Mysore, Ahmedabad, Indore have implemented few components of ITS. Automatic Vehicle Location System, Passenger Information System, Driver and Fuel monitoring, Automatic Fare Collection are some of the partial implementations in cities like Indore (MP), Bhuvaneswar (Odisha). However, no information is found on meeting any standards in reference to ETSI ITS reference architecture or US department of transportation ITS reference architecture.

3.3 Previously Published Material

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

Following the ITS reference architectures, research on safety, mobility, intermodal, policy etc. is ongoing. Countries like Japan, China are following and developing their national ITS reference architecture. Indian government is yet to plan and develop such national reference architecture. However, it is important and necessary to explore. Currently, few use cases and prototype development of efficient and effective systems would motivate and encourage the stake holders to plan in future.

3.4 Potential Markets Served

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

The primary objective is to improve the safety of people, smoothen the traffic so that productivity is improved. Thus, the main beneficiary is the society at large and the research community involved in the activities. The impact seems to be significant.

3.5 How will the activity benefit the IEEE?

There are number of ways IEEE would benefit with this activity. Firstly, engaging and bringing onboard industry into action in line with IEEE. Secondly, creating a community who will address a societal and necessary problem. Thirdly, creating awareness about IEEE and its seriousness towards solving a real problem at the same time, attracting more people in the community. This activity is expected to create knowledge and would serve as a precursor towards standardization activity by IEEE in future.

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: 3/2022

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.

- A strategy and roadmap document
- Implementation plan
- Pilot projects
- Related capacity building programs
- White paper

1) A well-planned road map would be made within 8 weeks of recommendation as deliverable-1. This will include different working groups to take up the project.
2) By the end of first year that is Dec 2020, we expect to have completed half of the project with at least one major part of phase 1 including control and command station. They will be available for demonstration and detail report will be prepared as deliverable-2.
3) In Mar-Apr 2021, we would conduct a workshop and hackathon to demonstrate our prototype and working of few of the components. The report will be submitted on completion of the workshop as deliverable-3
4) By the end of Oct 2021, we expect to demonstrate other works as proof of concept (PoC). This can be another small workshop to showcase the product. Resulting summary would be submitted as deliverable-4.
5) A white paper will also be published to enable adoption across India and outside

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?: Yes/No

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 ICCom.

This Activity will largely operate using the standard support and tools provided by IEEE SA to Industry Connections activities.

Additional funds would be necessary for hardware/software development in the tune of around 11,000 USD (approximately). These funds are planned to be obtained by participating industry in terms of hardware/software.

The project also involves meetings every alternate month (6 meeting each year) in addition to two workshops. Additional funds, (110x10 + 800x2 = 2700 USD).Participating organizations would provide the funding. We expect many organizations coming forward when we start the project.

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

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.

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).

The activity will have an executive committee made up of the Phase 1 participants.

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.

The Industry Connections baseline entity policies and procedures document will be used.

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.

In Phase 1, Wipro Ltd, CISCO, IEEE ComSoc Bangalore, Academic Institution – Amrita School of Engineering

In Phase 2, BMTC State Govt., City head, CDoT, Nokia. Harman.

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.

5-10 entities

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
Wipro Ltd	Subhas C Mondal Chief Architect Wipro EC-II Bangalore	
CISCO	Subodh Gajare Lead Architect	
Amrita School of Engineering, Bangalore, Amrita Vishwa Vidyapeetham	Dr Navin Kumar Associate Professor Amrita School of Engineering	