Singapore's first Smart Mobility consortium launched to test new tech on NTU campus

The NTU-NXP Smart Mobility Consortium brings together over 10 international and local companies to contribute their expertise from different parts of the V2X ecosystem, such as wireless communication design, data analytics and network security

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Above photo (front, from left): Professor Yoon Soon Fatt, Chair of NTU's School of Electric and Electronics Engineering and Dr. Wang Hai, Senior Vice President, Global Technology Innovation, NXP Semiconductors officiate the launch of the NTU-NXP Smart Mobility Consortium at NTU on 18 January 2017. Photo: Dean Koh

In the near future, cars could have in-vehicle smart displays that alert drivers in advance to tolls, road works and traffic jams, while switching traffic lights to go in the driver's favour. When approaching a carpark, it could also display the number of parking lots available and the hourly charges. Most significantly, these new technologies could help motorists, driverless cars and other road users avoid traffic accidents and improve overall road safety.

In line with Singapore's Smart Mobility 2030 vision and with the aim of moving towards the above mentioned scenarios, Nanyang Technological University, Singapore (NTU) and NXP Semiconductors N.V., the world-leading automotive semiconductor supplier in secure connected

cars, have today launched Singapore's first Smart Mobility consortium to focus on testing and developing smart mobility technologies.

The technologies will be tested in the NTU campus, which serves as living test bed, bringing together 12 industry partners to form the NTU-NXP Smart Mobility Consortium. To develop innovations in smart mobility, the consortium will harness an international wireless standard for vehicular use known as the vehicle-to-everything (V2X) communication technology. This standard has also been adopted by the United States and Singapore for use in its transportation system and is an essential part of autonomous vehicle networks.

The 12 companies bring together their different expertise from the V2X innovation ecosystem, such as wireless communication design, data analytics and network security. The industry partners include electronics giant Panasonic, American software multinational Red Hat, automotive system manufacturers Schaeffer and Denso, as well as ST Kinetics, the land systems and speciality vehicles arm of ST Engineering.

Back in April 2015, NTU and NXP Semiconductors launched the four-year S$22 million NTU-NXP Smart Mobility Test Bed to advance the testing and development of V2X technology. Companies, research institutes and government agencies will be able to deploy, test and validate future V2X solutions in a real world scenario within the NTU campus. The test bed was enhanced in December 2016 to cover the entire 200-hectare campus, and includes a command centre that can monitor traffic in real time and ensure the maximum safety and security of traffic flow.

At the launch of the NTU-NXP Smart Mobility Consortium, NTU EEE Associate Professor Guan Yong Liang (above photo, right), who is also the Lead Principal Investigator of the NTU-NXP Smart Mobility Consortium, shared 4 possible use cases relating to the consortium:

1. An Integrated Parking System which can provide onboard parking availability, parking surveillance and faciliate parking fees collection

2. Smart Gantry-Less Parking which can help users find their vehicles, particularly in big multi-storey car parks, provide security surveillance and real-time onboard parking availability advisory

3. Connected Autonomous Vehicles (AV), Electric Vehicles (EV) and All-Vehicles – the ability to

utilise V2X technologies to add on to smart mobility solutions on new and existing vehicles

4. Extending Connected to Personal Mobility Devices (PMDs) – this is especially important as bicycles and PMDs are essential to Singapore's car-lite drive and V2X technologies could potentially provide real time traffic information for both motorists and PMD users for greater road awareness and safety

Assoc Prof Guan also added that since NTU is located in the Jurong Innovation Distinct, an upcoming 600-hectare innovation district which covers NTU, CleanTech Park, and the surrounding areas of Bulim, Bahar and Tengah, the NTU-NXP testbed can be extended to host an entire ecosystem of next-generation manufacturing. It also presents opportunities to test new innovations in a real-life environment in the new district.

Above photo: Control centre of NTU-NXP Smart Mobility Test Bed. Photo credit: NTU

The complete deployment of campus-wide V2X infrastructure within NTU currently consists of:
-A smart mobility experience lab
-35 roadside units
-24/7 data centre
-8 research engineers
-82 traffic cameras

In a live demonstration of the capabilities of the V2X infrastrcuture under the Smart Mobility Consortium, some of the full-stack use cases include:

-Video conferencing capabilities
-In-vehicle road sign indicators
-Points/Places of interest indicators
-Carpark slot notification system

-Gantry-less distance-based toll charging
-In-vehicle road sign indicators with speed limit notice
-Smart traffic light (V2X enabled)

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Dean Koh is a Content Producer based in OpenGov Asia's Singapore office. He studied sociology in university and enjoyed modules on organisational theory, education and technology. He was the former editor of a Singapore-based cycling publication. Dean aspires to be a documentary photographer and enjoys taking photos at events and weddings.

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