SELF-DRIVING VEHICLE INITIATIVES IN SINGAPORE

4 April 2017
Key Drivers of Urban Mobility

Increased Travel Demand

- Planning parameters for resident population is 6.5-6.9 million by 2030

Competing Land Uses

- >12% of land is used for road infrastructure (compared to housing at 14%) today, not feasible for land-take of road infrastructure to continue expanding

More Diverse Transport Needs and Wants

- Rapidly ageing population – number of seniors aged 65 years and above will almost triple from 365,000 in 2010 to over 900,000 in 2030
- More travel options to match variety of lifestyle wants and needs

Increasing Manpower Constraints

- More than 1/3 of labour force aged at least 50 in 2014, compared to 1/5 in 2004
- Labour force growth expected to slow significantly
Vision of SDV deployment in Singapore

Fixed & Scheduled Services
Reliable and efficient mass transport of residents for intra and inter-town travel on a scheduled basis

Point-to-point Mobility-on-demand
Shared service with dynamic routing and pricing. Responsive to residents’ one-touch demands for 1st/last mile or point-to-point journey. Deployed on roads and pathways.

Freight
Reliable and safe carriage of goods during off-peak hours for last mile or longer distance delivery

Utility (e.g. rubbish truck, road sweeping)
Effective navigation and utility operation during off-peak hours (e.g. navigation close to road kerbs for cleaning)

Enablers
Technology, Regulations and Public Acceptance

Enablers
Utility (e.g. rubbish truck, road sweeping)
Effective navigation and utility operation during off-peak hours (e.g. navigation close to road kerbs for cleaning)
Concept of a Future Town Centre with Self-Driving Vehicles (Day Time)
Concept of a Future Town Centre with Self-Driving Vehicles
(Night Time)
Committee on Autonomous Road Transport for Singapore (CARTS)

Chaired by PS/MOT
Comprising public & private sector members

WG1 on Visioning SDV Deployment in SG

WG2 on Regulations & Implementation

WG3 on Industry Development

Govt Agencies

Private Organisations
Current SDV Developments

Fixed & Scheduled Services

Self-driving Vehicle Trials @ NTU-CleanTech Park

Self-driving Bus Trials

Self-driving Shuttle @ Gardens by the Bay

Point-to-Point Mobility on-Demand Services

Self-driving Vehicle Mobility-on-Demand Trials @ one-north

Self-driving Shuttle @ Sentosa

- Trials on roads, mixed-use traffic
- Fleet management system
- Public acceptance
- Partnership between MOT-SDC-STE
Current SDV Developments

Self-driving Truck Platooning for Port Operations

- Partnership between MOT and PSA
- Self-driving truck platooning concept of 1 human-driven truck with 3 driverless follower trucks
- Trial in enclosed port area and open roads on West Coast Highway

Utility

- Common mobility platform, multiple use cases
- Functional autonomy, road sweeping and refuse collection etc.
- Specialized self driving capabilities, eg. kerb following and obstacle avoidance etc.
- Trials on road, light mix-use traffic
SDV Test-Bed @ one-north

The test-bed serves as a proof-of-concept for SDV testing, paving the way for future test-sites and deployment of SDVs.

LTA and industrial land planner (JTC Corporation) have drawn up a specific set of requirements which interested applicants are required to adhere to when conducting on-road testing at one-north.

4 participants have been granted approval to conduct AV test-beds in one-north

Centre of Excellence of Testing & Research of AVs-NTU (CETRAN)

On 1 August 2016, CETRAN was launched to:

- build up technical capabilities and knowledge in the testing and certification of SDV capabilities,
- to facilitate the drafting of regulations to allow eventual deployment of SDVs on public roads.

NTU is appointed by LTA to host CETRAN.

The test circuit, jointly developed by JTC and LTA is located at CleanTech Park and will also support these SDV testing and certification activities.

**Vision:**
To position Singapore as a renowned SDV Knowledge and Research Centre to catalyse the testing and certification of SDV Technology for urban cities.
Overview of CETRAN Focus Areas

- Functional Safety
- Testing and performance evaluation
- V2X
- Cyber Security
- Technology Roadmapping/Standards Development (tbc)
- Outreach Programme

In development with CETRAN Partners:

With engagement of AV Trial Participants:
Legislative Amendments

- To provide Minister for Transport with the power to make subsidiary legislations to regulate the use of AVs

- Powers in the Road Traffic Act (RTA) include the ability to exempt or modify existing provisions
  - Changes, if required, can be made quickly to adapt the regulations in response to rapid development of AV technology
International collaboration opportunities

➢ Technology developers
  • Test your SDVs in Singapore
  • Participate in our trials, based on what a urban city such as Singapore requires

➢ Research institutions, testing houses
  • Partner Singapore / CETRAN in developing test scenarios, testing standards

➢ National Authorities
  • Share experiences and insights gained from trials in your countries
  • Update one another on our rules and regulations, come together to establish commonly agreed standards
Collaborations with the European Commission (EC)

- Signed EC-MOT MOU on ITS Collaboration on 13 Feb 2012
- Hosted visit by Mr Henrik Hololei, Director-General of DG MOVE to Singapore on 28 Oct 2016
- Regular video conference between Singapore and EC-DG-MOVE for projects update and sharing
  - Autonomous and Connected Vehicles
  - V2X Standards
  - Cyber-security
  - Traffic Management
Active Participation and Sharing at ITS World Congresses and International Forums
Close Collaborations within the Asia Pacific Region

New Zealand

Japan

Korea

Malaysia

Indonesia
Collaboration with Contra Costa Transportation Authority (USA) and GoMentum Station

[Image of collaboration meeting]

Randy Iwasaki @riwasaki2 - Apr 19
The beginning of a great partnership! @gomentum & @LTAsg sign a collaborative agreement to advance autonomous tech.
See you at 26th ITS World Congress 2019

Thank You!!