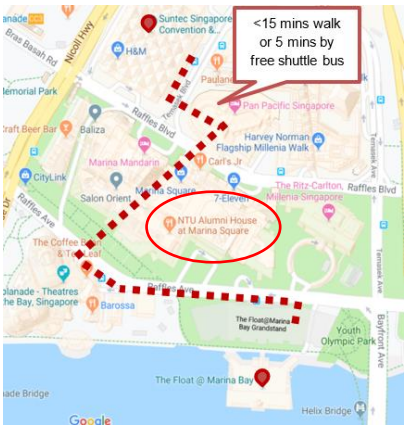
Workshop: Constructs of the Operational Design Domain (ODD) of Automated Vehicles

Date: Tuesday 22nd of October, 14:00 – 17:00

Location: Board room, Nanyang Technical University Alumni House Marina Square, 6 Raffles Blvd, Singapore

Directions: the NTU Alumni House is located between the congress venue and the demonstration site at Marina Bay (see map on the right).



Introduction

Operational design domain (ODD) is a description of the specific operating conditions in which the automated driving system is designed to properly operate, including but not limited to roadway types, speed range, environmental conditions (weather, daytime/night time, etc.), prevailing traffic law and regulations, and other domain constraints. Any automation use case of level 1-4 is usable only in its specific ODD, thereby an ODD can be very limited, for instance a segregated road or a single fixed route on low-speed public streets. The attributes of the ODD are directly connected to the way the automated driving system works and the interaction with its environment. In this session, known information about the ODD and the factors constructing it will be presented. In addition, we will discuss how automated driving can be facilitated through measures – vehicle technology, (digital) infrastructure-related and otherwise – that help preserving and extending the ODD.

Intended outcome: common white paper and joint illustration of our understanding of the interaction 'vehicle – infrastructure – regulation – use area', related to ODD.

Preparation: send 1 or 2 pictures of a real-life situation or another graphic that is illustrative to the topic of ODD, attributes of the ODD and infrastructure/remote support (jaap.vreeswijk@maptm.nl).

Agenda

14:00 Welcome, workshop introduction and objectives, self-introduction by participants
Jaap Vreeswijk, MAP traffic management, the Netherlands

14:15 Why ODD is fundamental to driving automation systems and how infrastructure can facilitate driving automation
Steven Shladover, PATH, United States

14:30 ODD management and integrated communication systems
Hironao Kawashima, Keio University, Japan

14:45 Infrastructure support classification
Jacqueline Erhart, Asfinag, Austria

15:00 Attributes of the ODD. Summary of a multi-stakeholder workshop on ODD, cost and benefits of automated driving (1-2 October '19, Turin)
Risto Kulmala, Traficon, Finland

15:15 Break

15:30 Workshop: approach ODD and vehicle automation system from the infrastructure side and define categories of infrastructure support that would enable different levels of automation. In 3 break-out groups, each addressing one of the following topics:

1. ODD continuity and coverage – what will be the minimum risk state when the ODD ends, and to prepare for this, at which points, areas and situations are infrastructure/remote support services most relevant, as seen by both the automation system providers and infrastructure owners and operators.
2. How different kinds of infrastructure features or modifications could make it easier for the automation systems to recognize and respond to all relevant hazards, and how are roles and responsibilities allocated among stakeholders (who should do what).
3. The role of infrastructure/remote support capable of supervising automated vehicles, the need of different infrastructure services and the required redundancy of external infrastructure elements to design functional safe CAV systems.

16:45 Summary of the break-out groups, conclusions and next steps

17:00 End

List of participants

#	Name	Affiliation, country
1	Jaap Vreeswijk	MAP traffic management, the Netherlands
2	Jacqueline Erhart	Asfinag, Austria
3	Steven Shladover	Path, United States
4	Stephane Dreher	Ertico ITS-Europe, Belgium
5	Risto Kulmala	Traficon, Finland
6	Hironao Kawashima	Keio University, Japan
7	Tom Alkim	European Commission, Belgium
8	Palm Magnus	Trafikverket, Sweden
9	Jane Lappin	Toyota, United States
10	Hans Nobbe	Rijkswaterstaat, the Netherlands
11	Dominic Berges	Siemens, Germany
12	Takahiko Uchimura	ITS Japan
13	Andreas Kuhn	ANDATA, Austria
14	Tsuneki Kaiho	SB Drive, Japan
15	Ed Bradley	Toyota, United States
16	Antoine Blanchard	Nanyang Technical University, Singapore
17	Martin Slavik	TÜV SÜD Asia Pacific, Singapore
18	Xavier Sellart	Idiada, Spain
19	Dick Schnacke	Transcore, United States
20	Reija Viinanen	Aurora Snowbox Oy, Finland
21	Bernd Datler	Asfinag, Austria
22	Jan Juslen	Finnish Transport Infrastructure Agency
23	Wim Broeders	MAP traffic management, the Netherlands
24	Satoshi Sato	Mitsubishi Research Institute, Japan
25	Satoru Nakajo	CSiS, University of Tokyo, Japan
26	Antoine de Kort	National Vehicle Authority, NDW, Netherlands
27	Richard Bishop	Bischop Consulting