TM4CAD - Traffic Management for Connected and Automated Driving

CEDR Programme: Call 2020 Impact of CAD on Safe Smart Roads

Project Duration 09.2021 – 03.2023

Partners: MAP traffic management (the Netherlands, coordinator), Traficon (Finland), Transport & Mobility Leuven (Belgium), University of Warwick (United Kingdom), Steven Shladover (independent consultant) and Keio University (Japan).

TM4CAD explores the role of infrastructure systems across various Infrastructure Support for Automated Driving (ISAD) levels in creating ODD awareness for CAD systems.

As a starting point, the project will propose various system architectures for distributed ODD attribute information and define acquisition principles of the information based on exchange between the architecture elements, ultimately to enable CAD systems to be aware of their ODD in real-time. Moreover, TM4CAD will demonstrate the basic mechanisms of ODD management via two real-world use cases, which build on the premise of interaction between traffic management systems and CAD vehicles. This will provide NRAs insight in methods to inform CAD systems about the kinds of support they can provide for CAD operations on European roads.

To gain a complete understanding of traffic management for CAD, the TM4CAD project will:

- Identify the full range of ODD attributes for consideration, based on experience from working on ODD issues in standardization activities and in other related research projects;
- Integrate the very different perspectives of the CAD vehicle system developers and the road authorities and operators to focus on the areas of intersection between them;
- Introduce the concept of ODD attribute awareness and the role of infrastructure in it;
- Develop recommendations based on understanding the technical constraints on the ODD-relevant information that can be perceived and exchanged in real time by the NRAs and the sensing systems on the CAD-equipped vehicles;
- Provide insights on how to support CAD operation and ODD management, and how ISAD should be refined for traffic management use, and
- Detail how traffic management systems and CAD vehicles can best interact to improve traffic operations.

TM4CAD will bring the NRAs and their viewpoints into discussions with manufacturers, which is key for safe deployment of CAD systems. TM4CAD aims to increase understanding of the issues associated with providing real-time information about ODD-relevant conditions and the role of the national road authorities and operators, including specifically traffic management centres in providing these solutions. This will highlight any needs to improve information flows and quality and develop traffic management processes and tasks while revealing existing gaps of knowledge in the domain.

To identify NRA requirements on automated vehicle behaviour from a traffic operations perspective, TM4CAD provides the road authorities a recommended set of issues to discuss with OEMs, automated driving system developers, and automated vehicle fleet operators. In addition, TM4CAD will point out the priority areas in infrastructure support for automated driving requiring close dialogue and agreement between road authorities, traffic managers, CAD system developers and automated vehicle fleet managements to arrive at solutions that are acceptable regarding the safe, efficient and clean road network operation.

TM4CAD runs from September 2021 to March 2023 and the work is divided in five work-packages:

WP1 - Project management
WP2 - Concept of ISAD and ODD management
WP3 - Information exchange between traffic centres and automated vehicles
WP4 - Specific cases of ISAD and ODD management
WP5 - NRA and traffic centre requirements to automated vehicles