



Traffic Management of Automated Vehicles in Transition Areas

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MAP traffic management (MAPtm)



TRAFFIC MANAGEMENT

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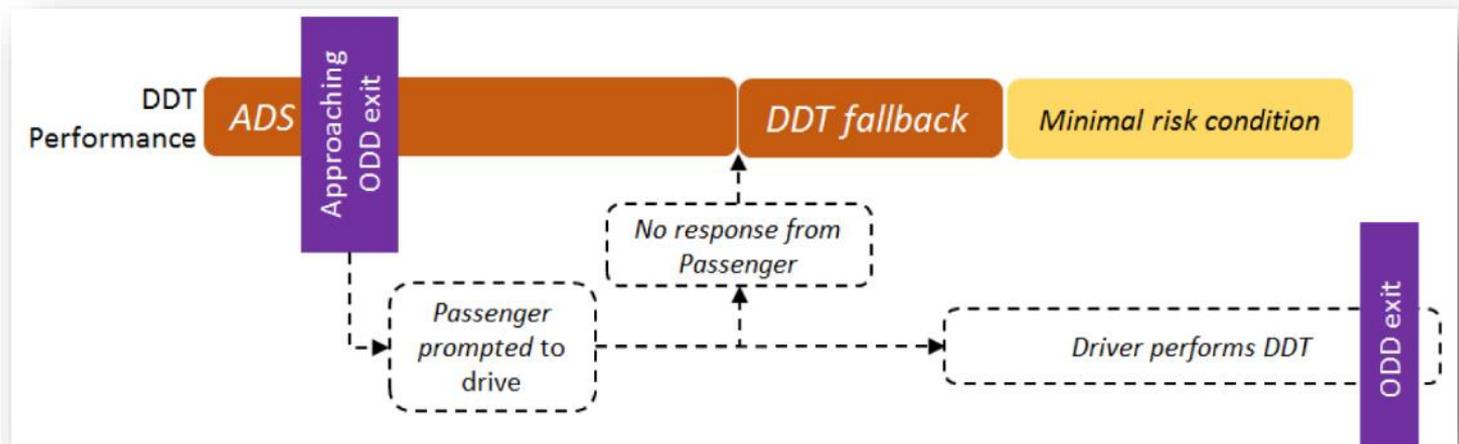
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Operational Design Domain (ODD)

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 (including weather, daytime/night-time), prevailing traffic laws and regulations, and other domain constraints

SAE, Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems J3016_201401

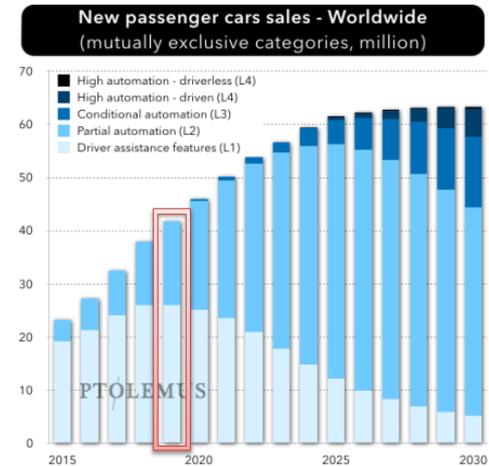


Automated Driving Limitations



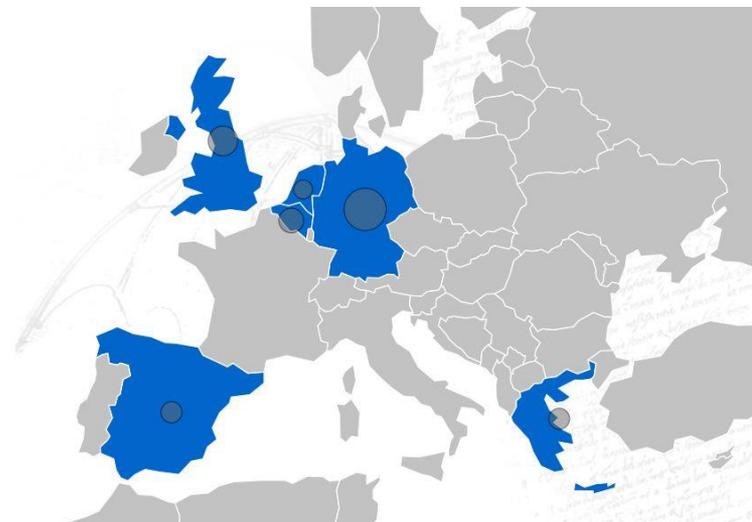
Why transition areas?

- Transition areas mark the boundaries of the ODD.
- What if an automated vehicle is unable to solve the situation ahead?
 - ...what if, this happens not to single vehicles only, but to several?
 - ...what if, it always happens on the same spot?
 - ...what if, this interrupts traffic flow, traffic safety, etc.
- TransAID aims to:
 - Identify potential risks
 - Recommend solutions
 - Coordinate movements

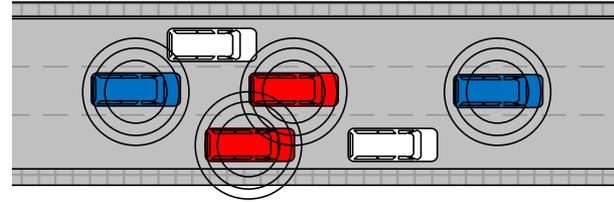
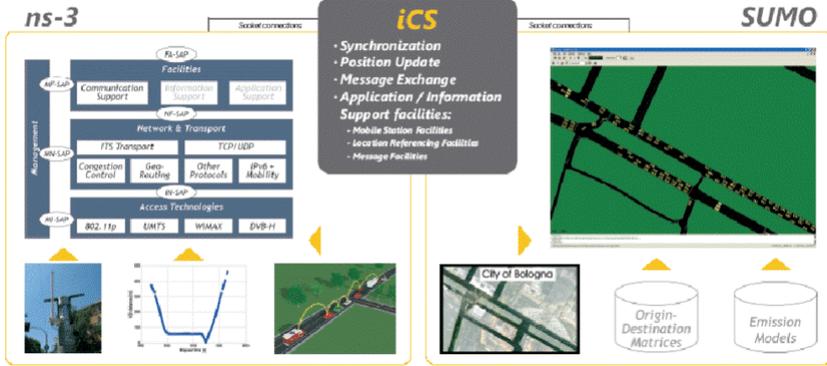


TransAID Project Overview

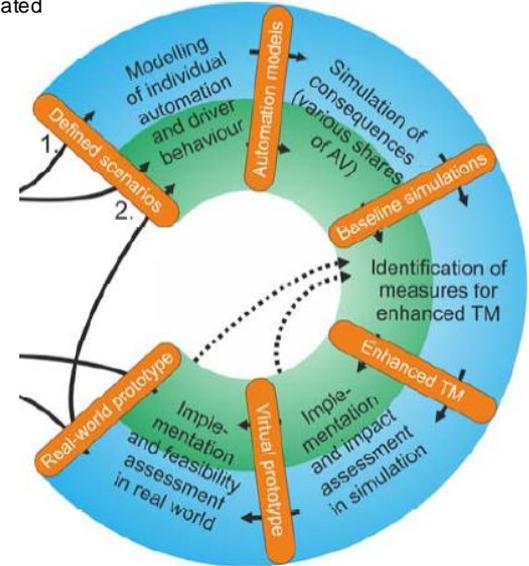
- TransAID (ART-05)
- Transition Areas for Infrastructure-Assisted Driving
- 01-09-2017 ~ 31-08-2020
- Budget: EUR 3.836.353,75
- Seven partners from 6 countries:
DE, UK, BE, NL, EL, ES
- Website: www.transaid.eu



TransAID Approach



-  Connected and automated
-  Connected
-  Conventional

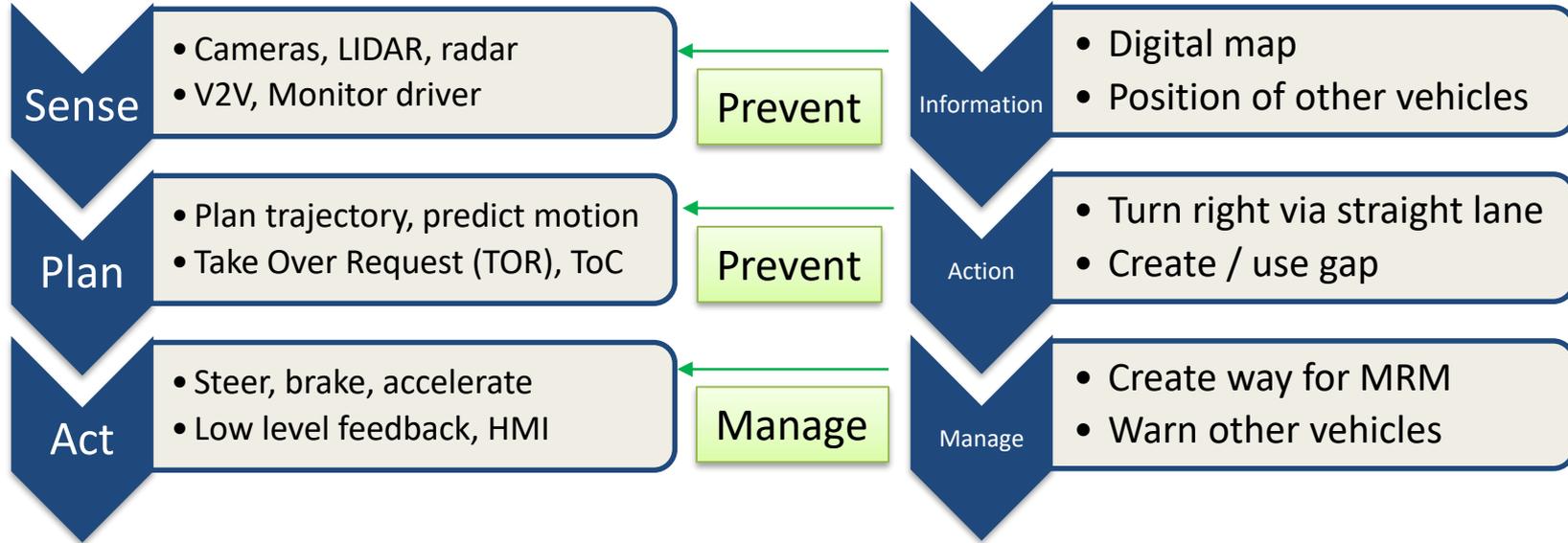


Analysing...

- What are the problems in this situation?
- What are the solutions?
- To what extent do you expect that automated cars will solve the situation?
- What behaviour do you expect of oncoming traffic? And if it is an automated vehicle?



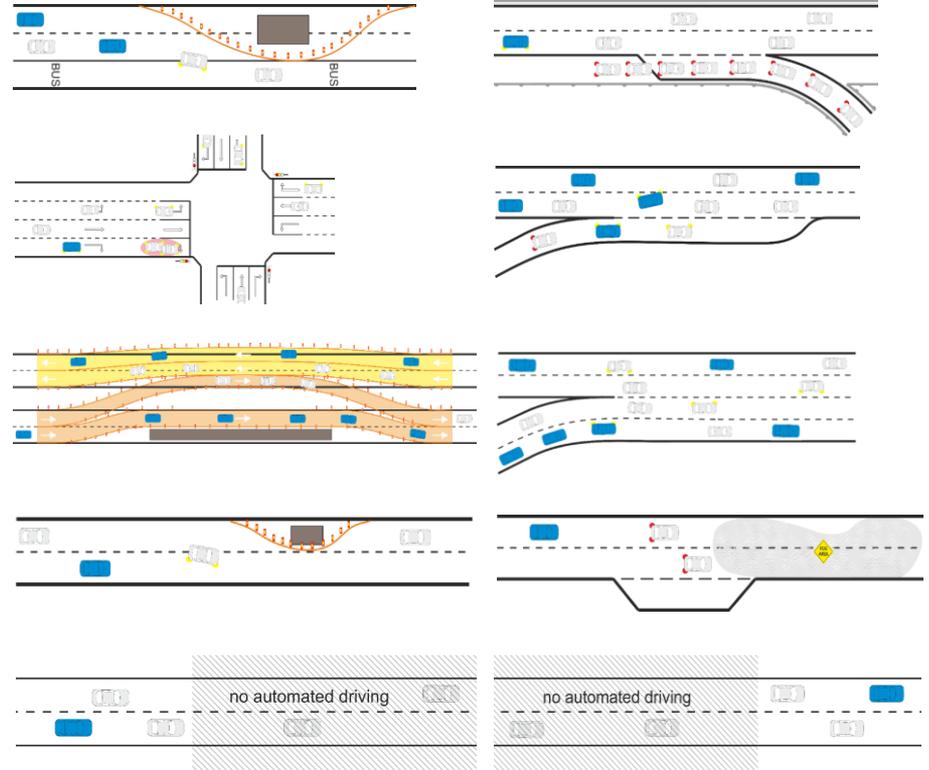
Assisting Automated Driving



+ when a ToC is not preventable, but predictable → spread the ToCs in time and space

TransAID services and use cases

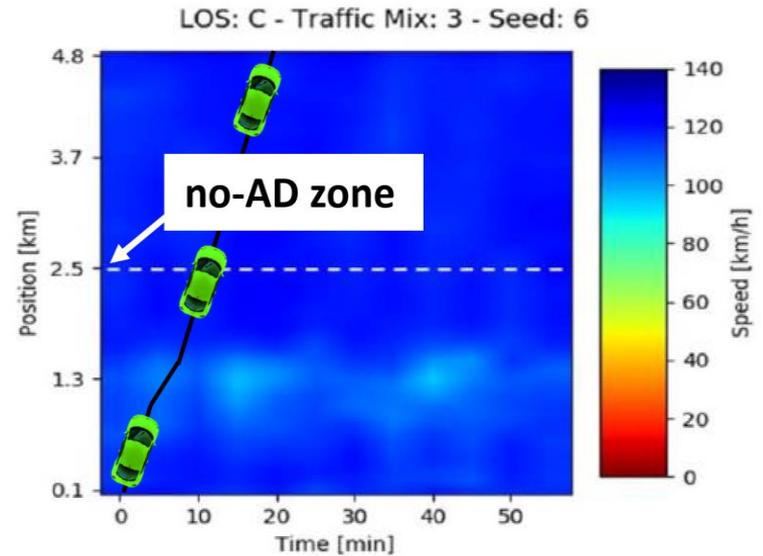
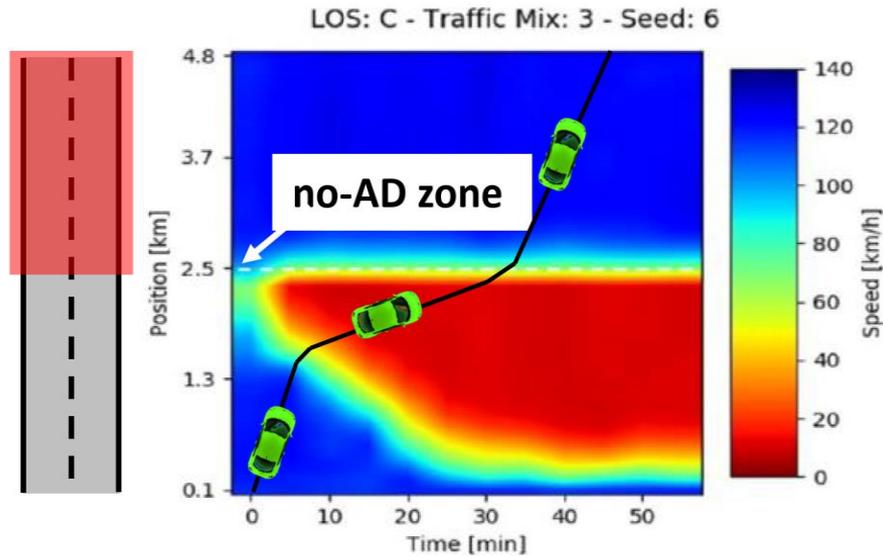
1. Provide vehicle path information.
2. Provide speed, headway and/or lane advice.
3. Traffic separation.
4. Guidance to safe spot.
5. Orchestration, distribution and scheduling.



Service 5 Result

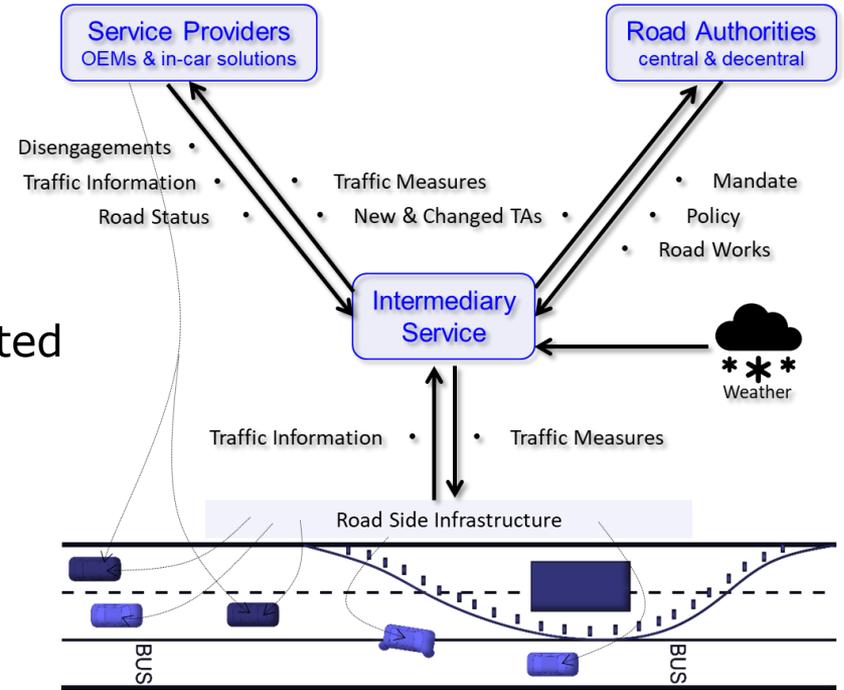
Without traffic management

With traffic management



Intermediary service

- RAs and OEMs cooperate through an intermediary service:
 - Generate trust
 - Create understanding
 - Align measures (space, time, type)
- Single point of access, possibly mandated by both RAs and OEMs.
- Consolidate knowledge / experience.
- Apply across road authority borders
 - including those that have no TMC



Expected results

- TransAID will deliver...
 - ...results on all services regarding: traffic efficiency, safety and emissions.
 - ...a *Guidelines and Roadmap* report which will contain recommendations for road authorities.
 - ...new ITS-G5 message sets and extensions / optimisations.



TransAID areas of recommendation

Information services for automated vehicles.

Traffic control measures for automated driving.

Traffic regulations for automated driving.

Spatial planning for automated driving, MRM-havens specifically.

Application of **V2X message sets** and proposed extensions.

Requirements for **roadside equipment and signalling**, for all vehicle modes.

Urgency of interventions based on market penetration (mixed traffic) forecasts.

Priority of interventions based on situational characteristics.

Actor **roles and interaction models** for automated driving and traffic management.

Development of guideline and roadmap

Create a 'how-to' guideline for road authorities and/or service providers for dealing with automated driving in the urban environment in general and in Transition Areas specifically. Finally, a roadmap for the coming 15 years will be developed, with concrete required activities and possible road infrastructure modifications that local authorities can undertake, to facilitate the introduction of automated driving.

Within broader context, largely described elsewhere:

- Evidence-based artefacts for use cases in different scenarios;
- Increase awareness of TransAID traffic management solutions;
- Recommendations and considerations, e.g. road design, organisational aspects and exploitation.



Any questions?

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