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TransAID
« Transition Areas for Infrastructure Assisted Driving »

European H2020-MG-2014-2015 project

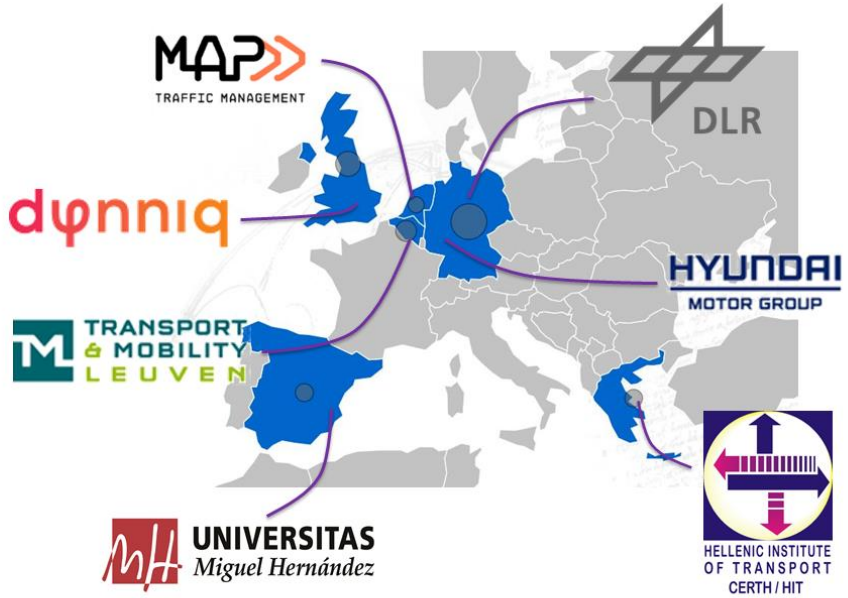
- ART-05-2016 - Automated Road Transport
- Period: 01-09-2017 ~ 31-08-2020
- Budget: € 3,836,353
- 7 partners + 12 associated partners

Main objective:

To develop and demonstrate

- infrastructure-assisted traffic management procedures,
- protocols and
- guidelines

for smooth coexistence between automated, connected and conventional vehicles especially at *Transition Areas.*



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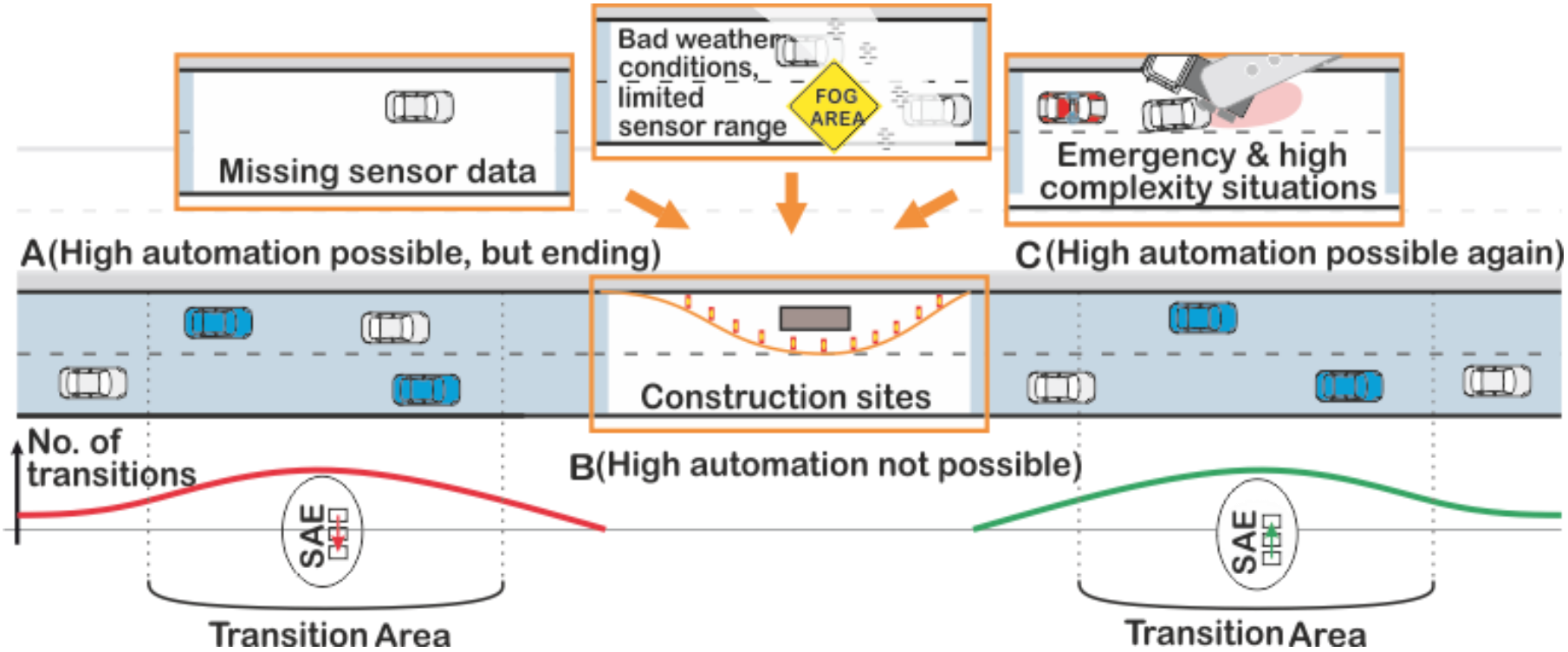
Definition: “Transition Areas”



“Transition Areas” are areas on the road where many highly automated vehicles (blue) are changing their level of automation due to various reasons.

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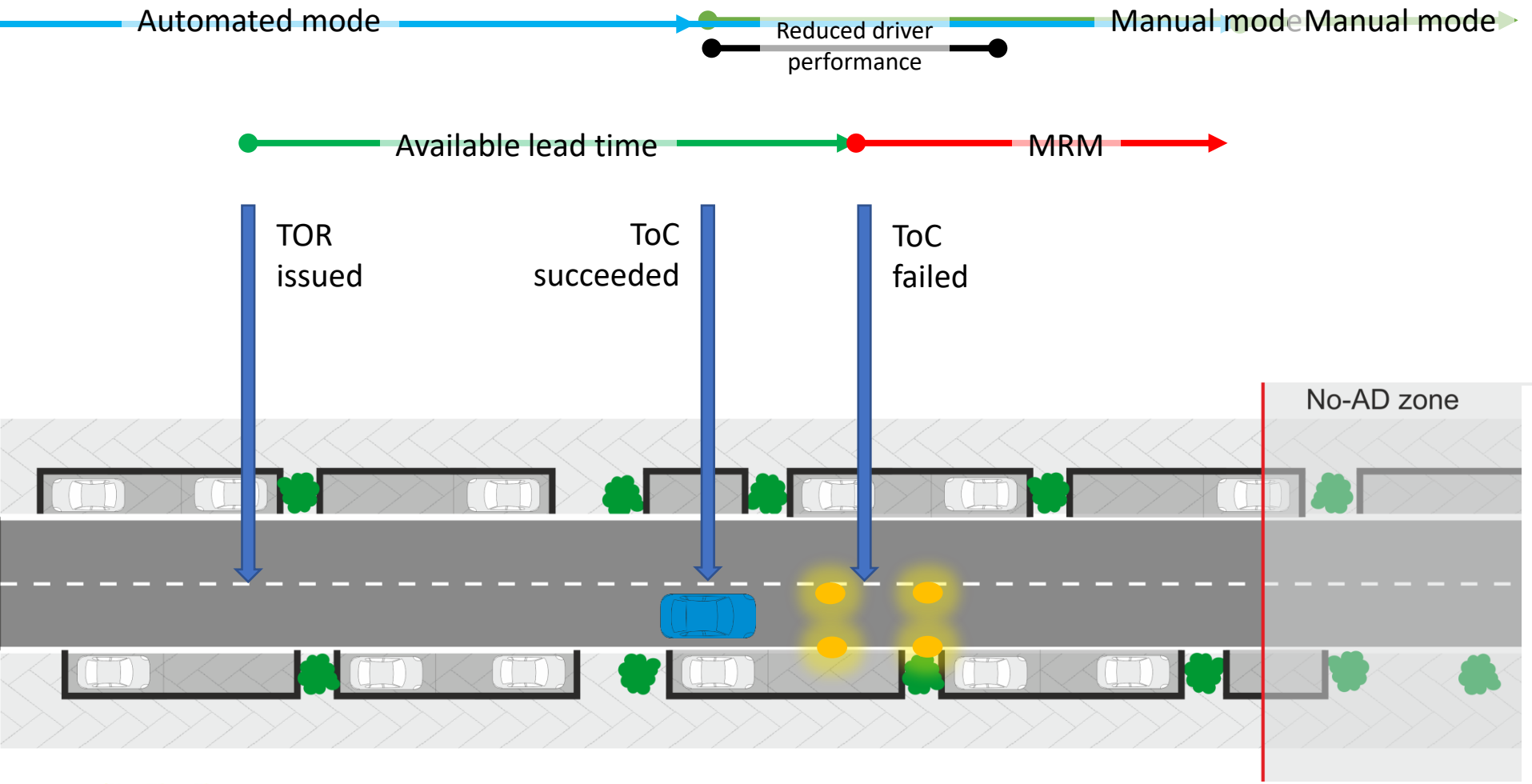
Definition: ToC, TOR & MRM



- ToC:
Transition of Control

- TOR:
Take Over Request

- MRM:
Minimum Risk Maneuver

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Objectives

1) Evaluation and **modelling of current automation prototypes** and their drivers' behaviour.
2) **Assessment of the impact of Transition Areas** on traffic safety and efficiency. Generate requirements on enhanced traffic management procedures
3) Development of **infrastructure-assisted management procedures and protocols** to control connected, automated and conventional vehicles at Transition Areas.
4) Definition of **V2X message sets** and communication protocols for the cooperation between connected/automated vehicles and the road infrastructure.
5) Development of procedures to enhance the **detection of conventional vehicles** and obstacles on the roads and to inform/influence conventional vehicles.
6) **Integration, test and evaluation** of the TransAID infrastructure-assisted traffic management protocols and procedures in a **simulation** environment. Validation and demonstration of them by means of **real world** prototypes at test sites.
7) Provision of a **guideline/roadmap** to stakeholders regarding the requirements on traffic infrastructure and traffic management in order to cope with Transition Areas considering mixed traffic

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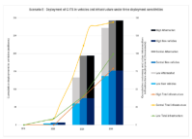
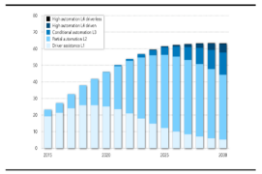
Troublesome first steps: Scenario and timeline definition

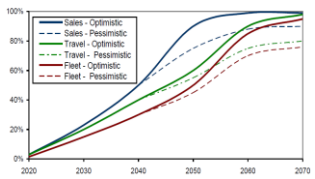
Performed literature studies, expert interviews and stakeholder workshops with mentimeter surveys

→ Various parameters (environmental causes, vehicle behaviour, HMI, driver reaction, time …)

→ only limited data available







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Prevent ToC/MRM

Manage or support ToC/MRM

Distribute (in time and space) ToC/MRM

Mix#	Year	LV	LV-A	CV-1	CV-2	AV-L3	AV-L4	CAV-L3	CAV-L4	AD*
1	2025	90%	6%	4%	-	-	-	-	-	10%
2	2030	85%	6%	4%	2%	2%	-	1%	-	15%
3	2035	80%	6%	4%	3%	3%	1%	2%	1%	20%
4	2040	70%	6%	4%	4%	5%	4%	4%	3%	30%
5	2045	60%	5%	3%	4%	9%	6%	8%	5%	40%
6	2050	50%	5%	3%	4%	12%	8%	12%	6%	50%
7	2055	40%	5%	3%	4%	15%	12%	15%	9%	60%
8	2060	15%	5%	3%	4%	22%	11%	22%	10%	70%

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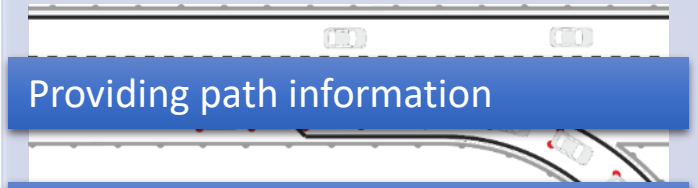
Scenarios

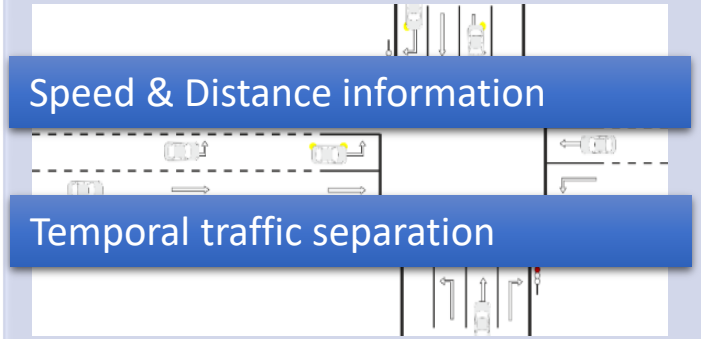
Prevent ToC/MRM



Providing path information

Temporarily change lane category

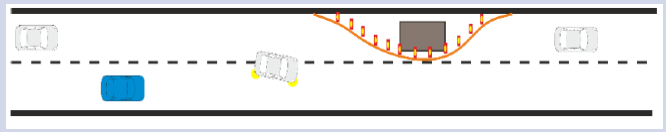
Cooperative lane changes

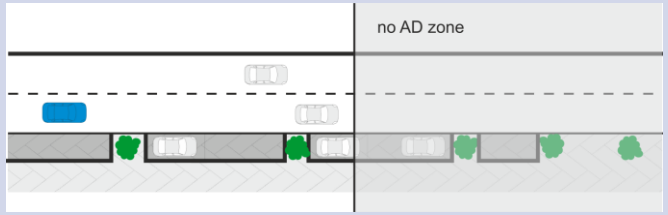


Speed & Distance information

Temporal traffic separation

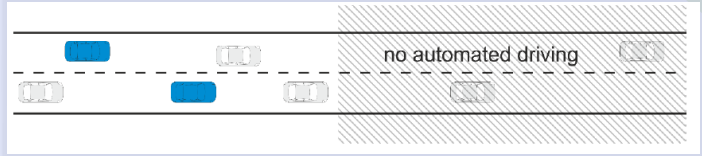
Manage or support ToC/MRM





Find safe spot for stopping without harming traffic

Distribute (in time and space) ToC/MRM



Distribute transitions of control to flatten effects

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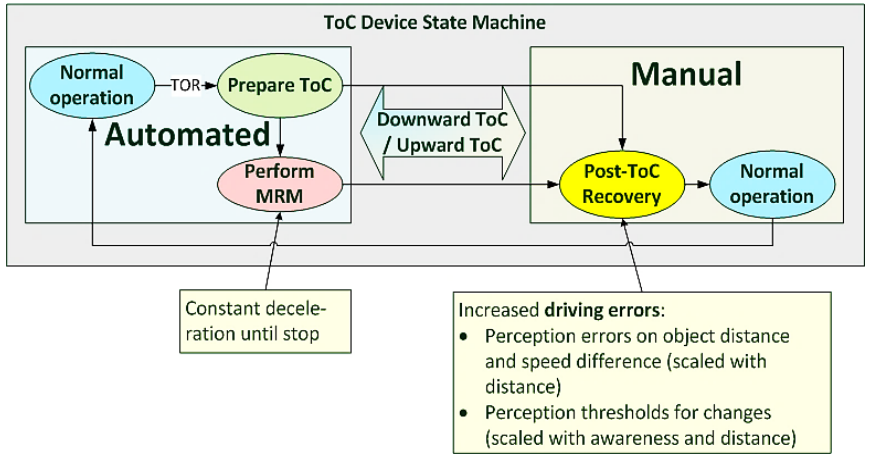
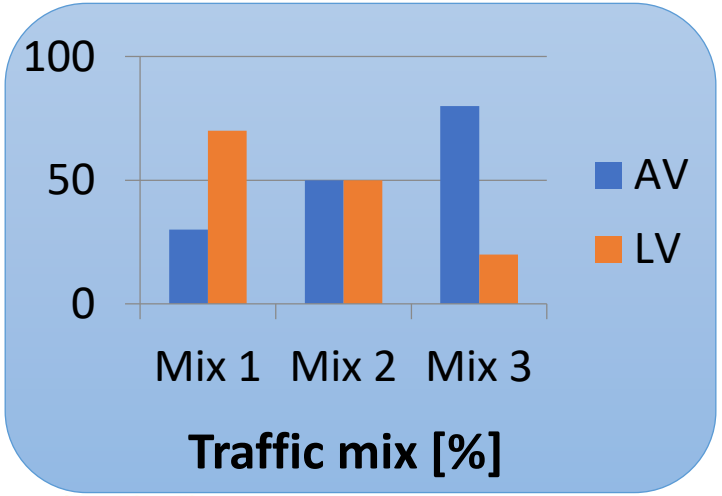
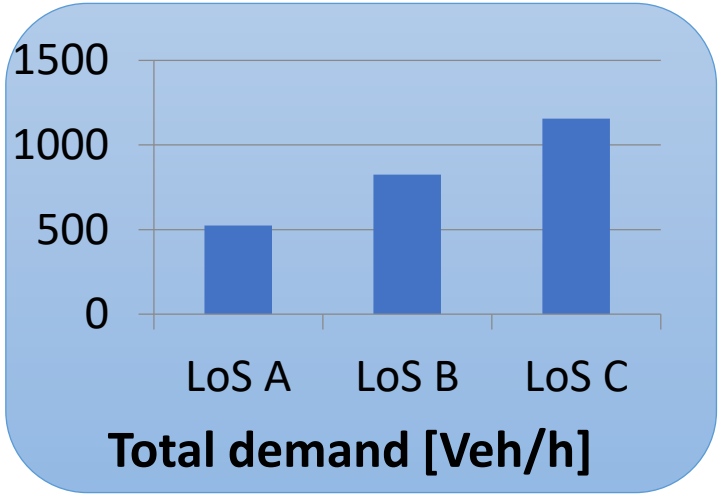
Objectives #1 & #2:
Modelling and First Impact Assessment

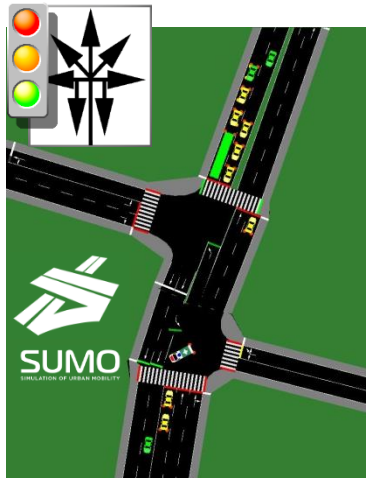
1. Modelling of AV/CAV behaviour
   - Longitudinal Control (ACC, C-ACC)
   - Lateral Control (Lane Keeping, Lane Change)
   - Transition of Control

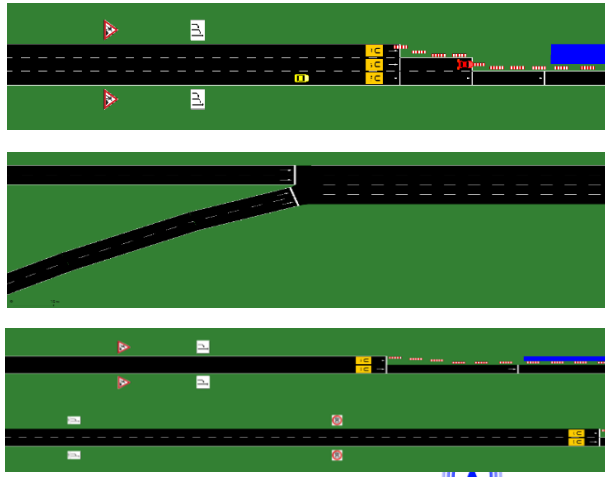
2. Impact Assessment











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Objectives #3, #4 & #5:

Management procedures, message sets & obstacle detection

- Providing path information
- Temporarily change lane category
- Cooperative lane changes
- Speed & Distance information
- Temporal traffic separation
- Find safe spot for stopping without harming traffic
- Distribute transitions of control to flatten effects

CAM

DENM

Extensions needed

MCM

CPM

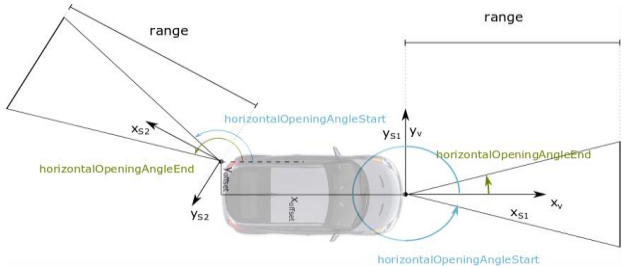
Proposal

Optimization

MAPEM

IVIM

Approach: standard-compliant, backward compatibility and interoperability.



Detection of obstacles

&

Sensor data sharing

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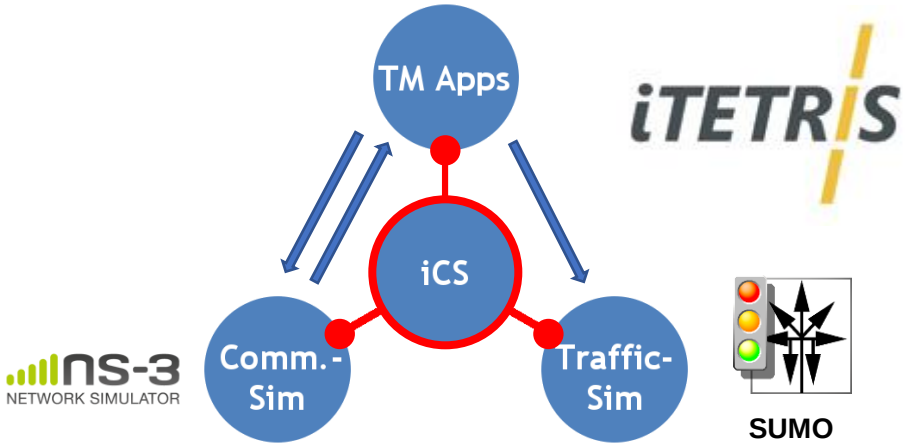
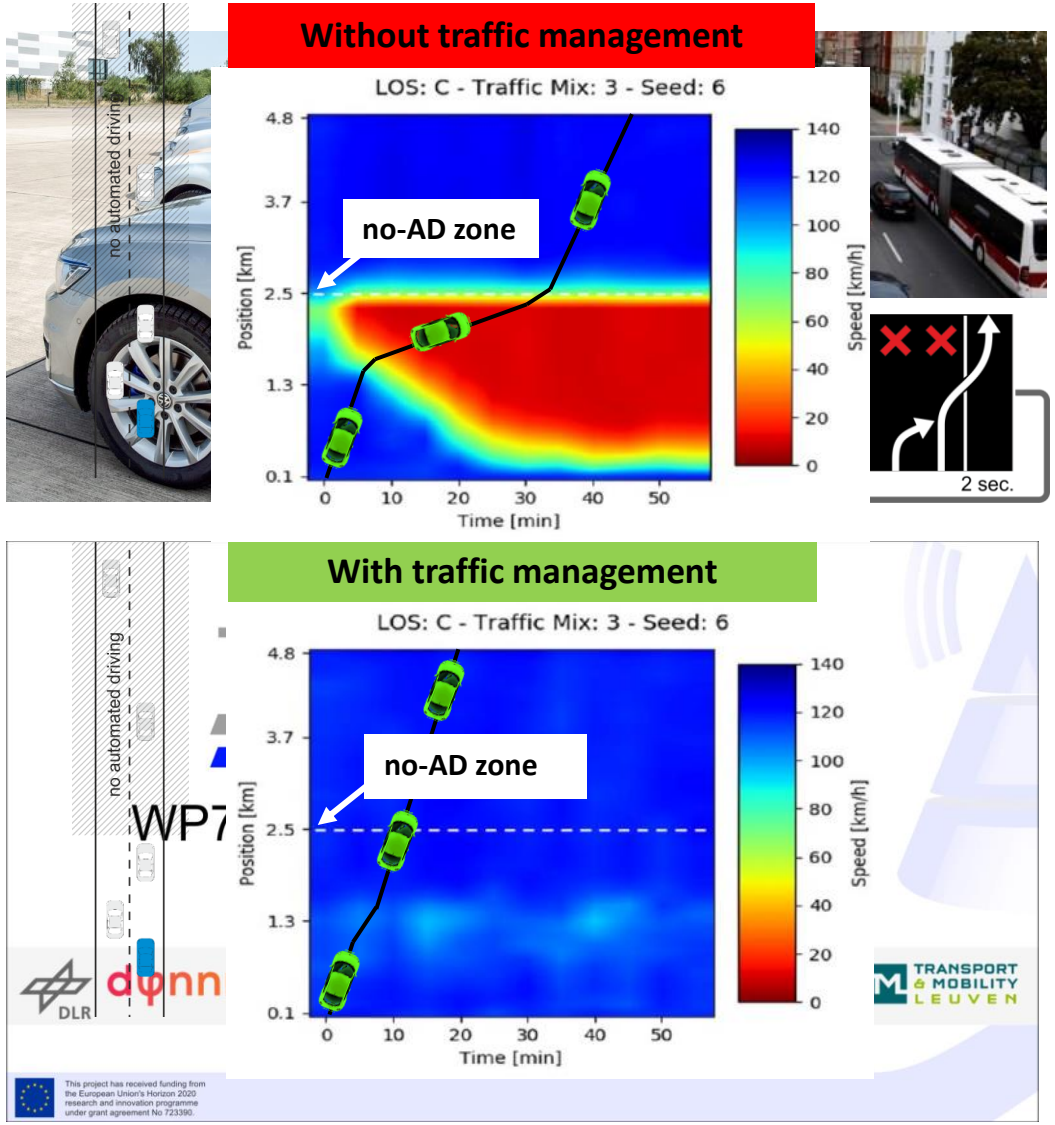
Objective #6:
Test & Evaluation in Simulation & Real World





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Objective #7:
Roadmap/Guideline development

- Stakeholder consultation results
- Mentimeter survey results
- Simulation results
- Real-world feasibility results
- Communication standardization

Roadmap &
Guidelines for stakeholders
(road authorities, cities,
OEMs, standardization bodies,
legislation entities…)

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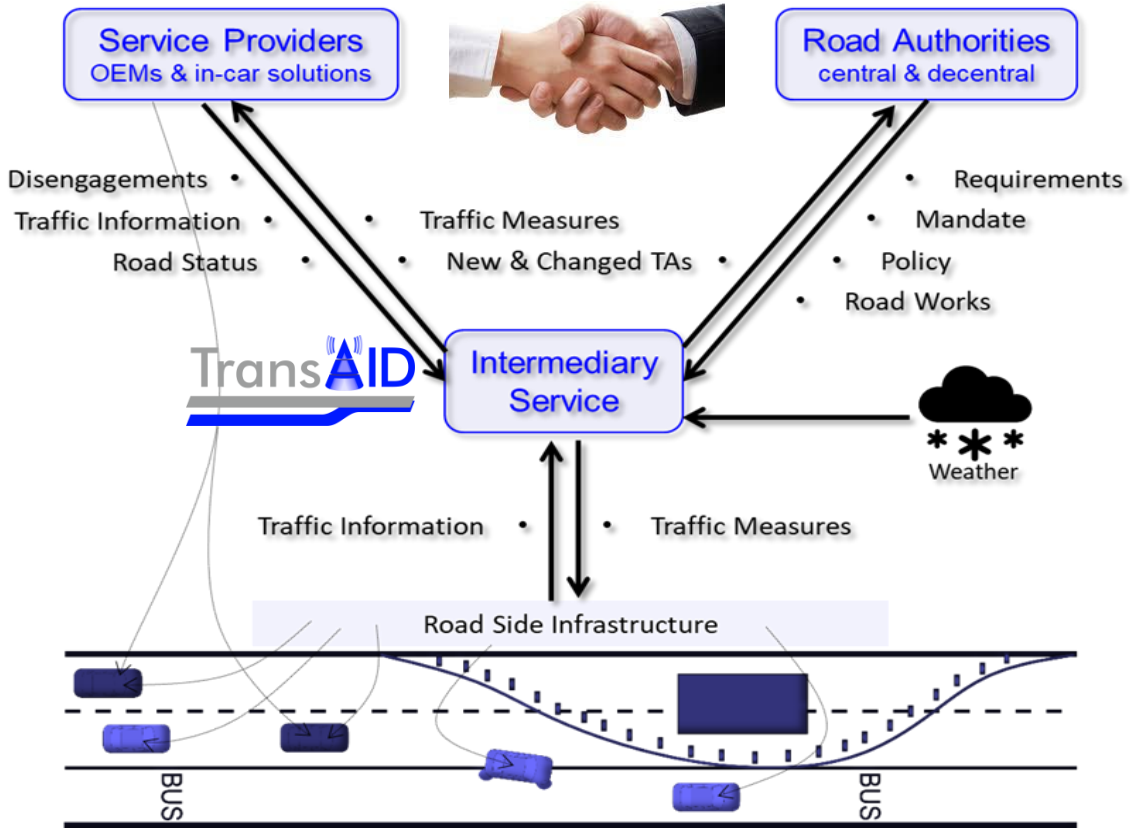
Approach: Intermediary Service



- Automation-ready networks
- Smooth introduction of automated vehicles
- Less congestion
- Lower emissions
- More safety
- Better comfort

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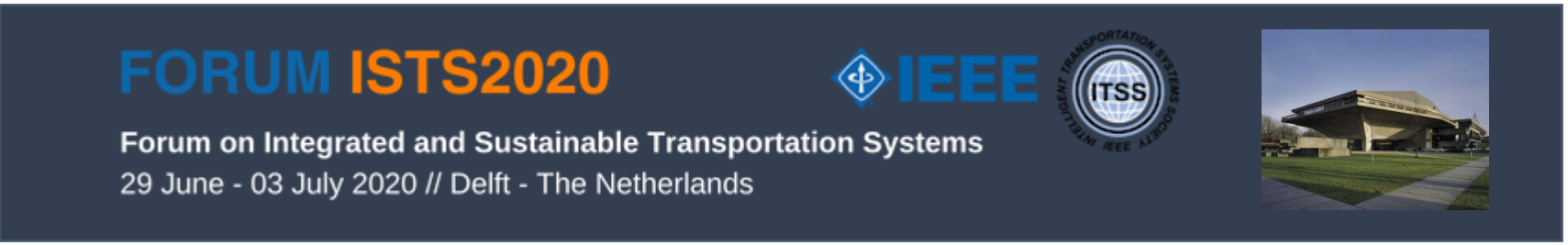
Thanks for listening!



Please join us at our final event!

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