Transition Areas for Infrastructure-Assisted Driving

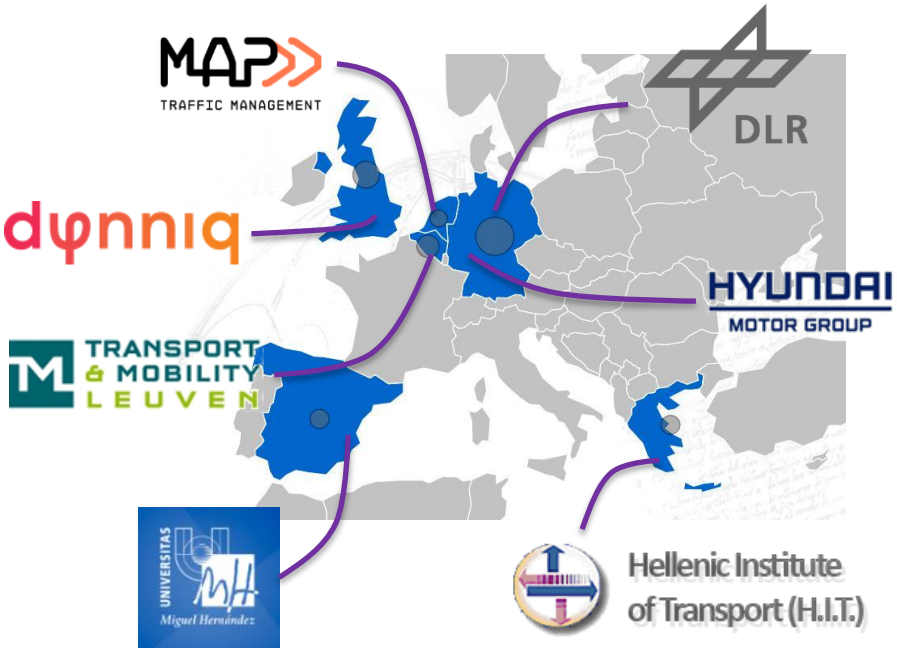
Julian Schindler (DLR)

www.transaid.eu
@transaid_h2020
www.linkedin.com/groups/13562830/
www.facebook.com/transaidh2020/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723390

Project Details

- 7 partners from 6 European countries (technology providers, automotive industry, academia)
- 12 associated partners
- Coordinator: Julian Schindler, DLR (julian.schindler@dlr.de)
- Start: September 2017 (36M)
- Budget: 3.8 m€

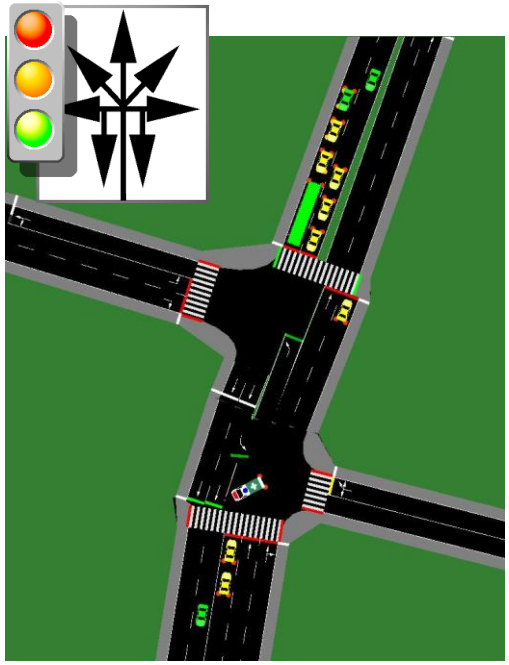


Research questions

- There are several possible reasons for current and future vehicle automation systems to stop working, e.g.
  - missing or wrong sensor inputs,
  - high complexity situations,
  - system failures and system limitations
- What should a vehicle do when the automation system fails?
  - Just drop the control to the driver?
  - Stop the vehicle where it is?
  - Perform a more complex minimum risk maneuver according to the remaining options?
- What is the **impact on traffic safety and efficiency?**
- What is going to happen when several vehicles have the same problems at the same spot?

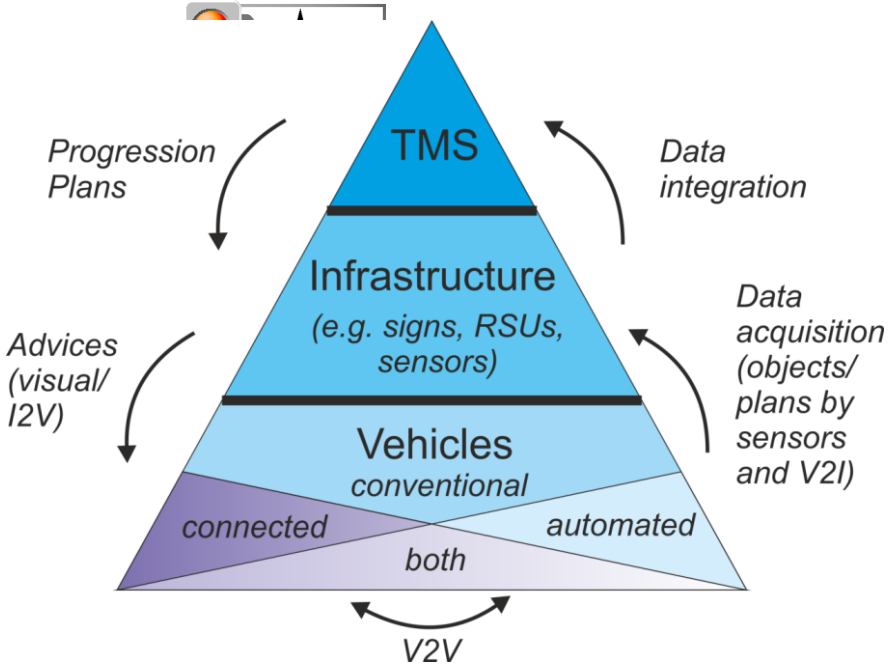
Approach & Expected Results

- **Simulations** with vehicles in different levels of automation are performed



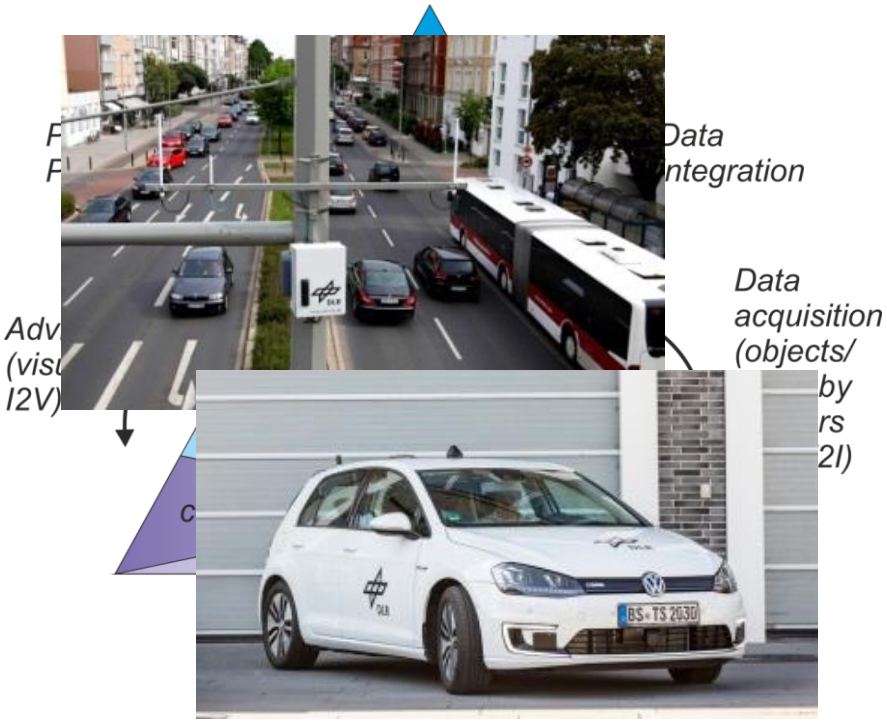
Approach & Expected Results

- **Simulations** with vehicles in different levels of automation are performed
- Different approaches in terms of **hierarchical traffic management** are investigated
  - Help vehicle automations to find optimal solutions in case of Minimum Risk Maneuvers and transitions of control
  - Help surrounding vehicles
  - Optimize traffic safety and efficiency
- Development of **new V2X message sets**



Approach & Expected Results

- **Simulations** with vehicles in different levels of automation are performed
- Different approaches in terms of **hierarchical traffic management** are investigated
  - Help vehicle automations to find optimal solutions in case of Minimum Risk Maneuvers and transitions of control
  - Help surrounding vehicles
  - Optimize traffic safety and efficiency
- Development of **new V2X message sets**
- Prototypical **field implementations**
- **Guidelines** and a **roadmap** for stakeholders (OEMs, road authorities, cities…) are provided

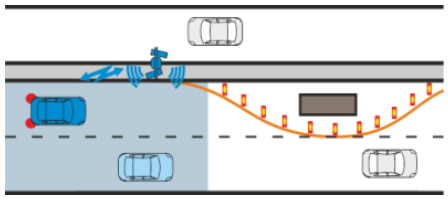


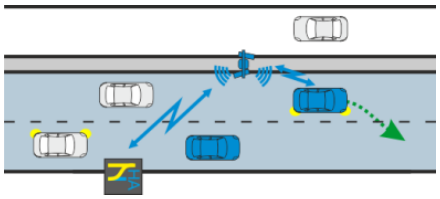
Desired Areas of Cooperation: Use Case Definition

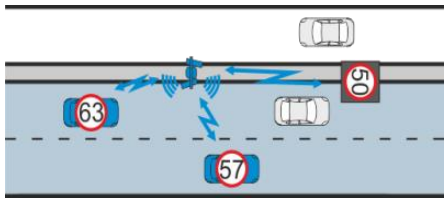
- Definition is currently running
- Various dimensions:
  - Causes for transitions
  - Different vehicle automations
  - Environmental circumstances
  - Available infrastructure
  - Goal of countermeasures
- Which use cases have highest relevance?

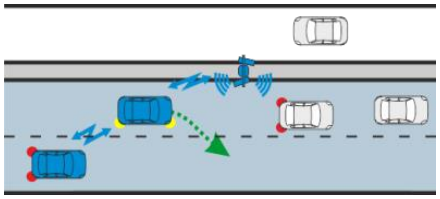
  → Expert interviews

  → Other projects‘ areas of interest?









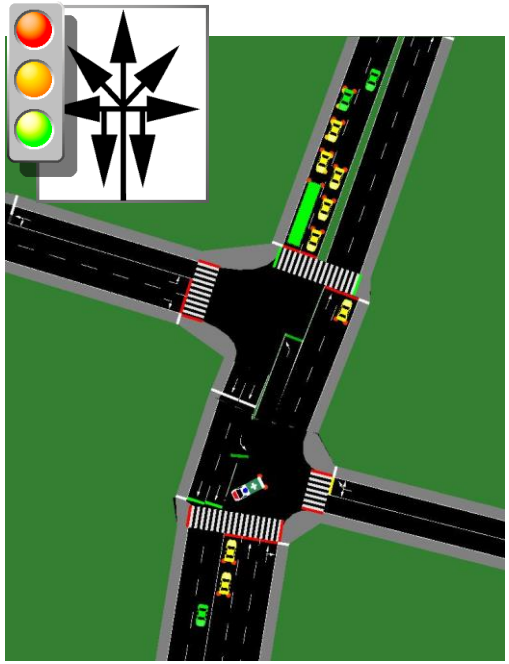
Desired Areas of Cooperation: Simulation and Modelling

- Framework: SUMO, ns-3, iTETRIS

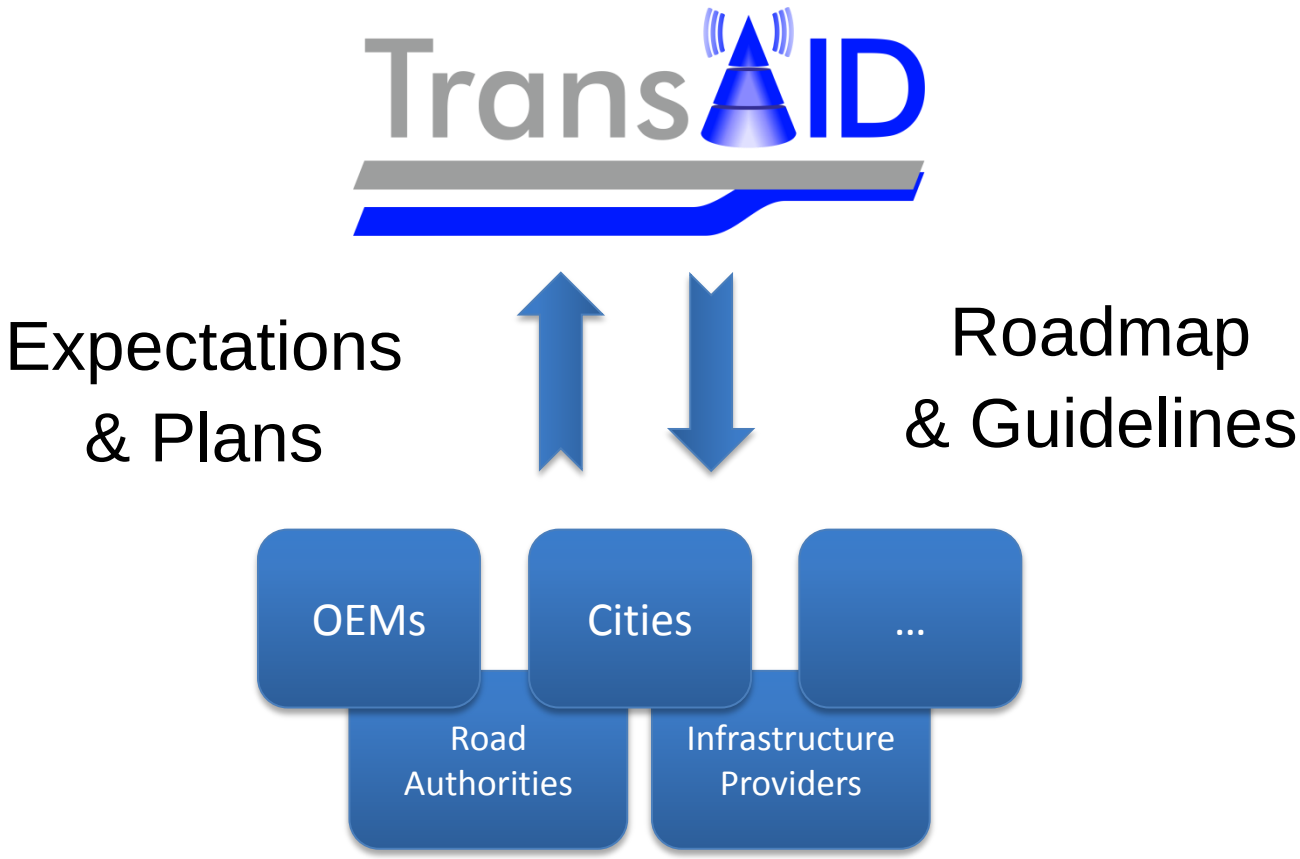
- Modelling of vehicle automations
  - CACC
  - Lanekeeping
  - Platooning
  - etc.

- Modelling of driver behaviour
  - Esp. in case of transitions of control

→ Which models can be exchanged between partners?



Desired Areas of Cooperation: Stakeholder involvement / Guidelines / Roadmap



Thanks for your attention!
Any questions?

Julian Schindler
German Aerospace Center (DLR)
julian.schindler@dlr.de

www.transaid.eu
@transaid_h2020
www.linkedin.com/groups/13562830/
www.facebook.com/transaidh2020/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723390