Transition Areas for Infrastructure-Assisted Driving

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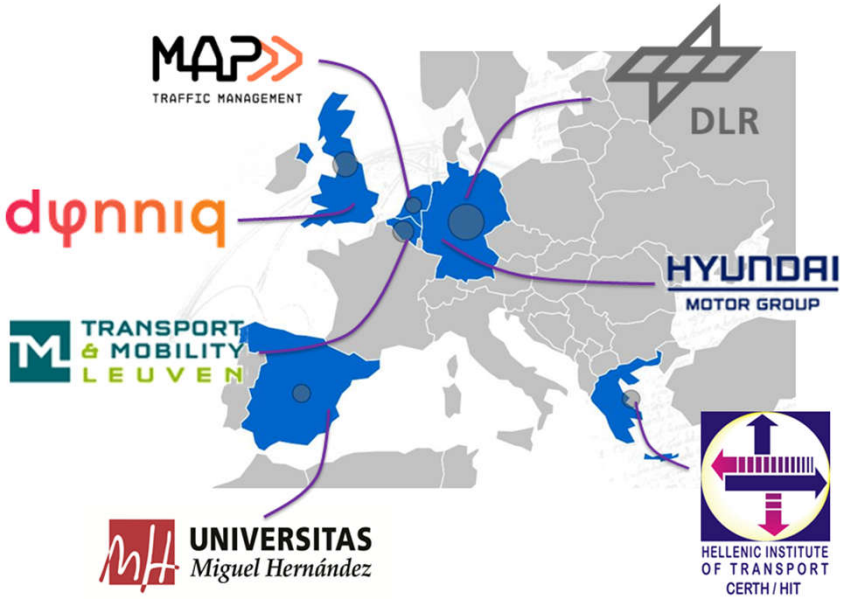
Some general information

- About the EC call:
  - Horizon 2020 ART-05-2016 (Automated Road Transport)
  - Grant Agreement Nr.: 723390

- About the project:
  - Duration: 36 months
  - Start date: September 2017
  - Total budget: 3.8 M€
  - Consortium: 7 partners from 6 European countries
    - ICT infrastructure providers
    - Automotive industry
    - Academia
  - 12 associated partners

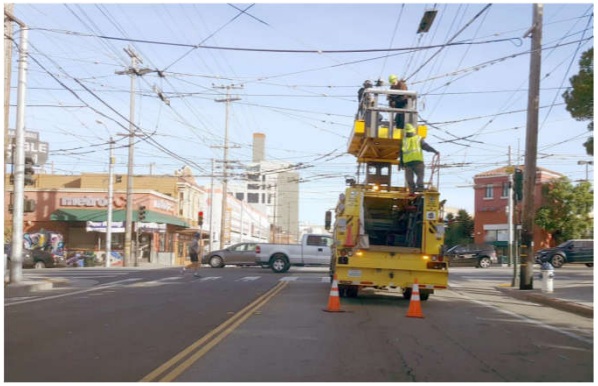


What if…

- …your automated vehicle is not able to solve the situation ahead?

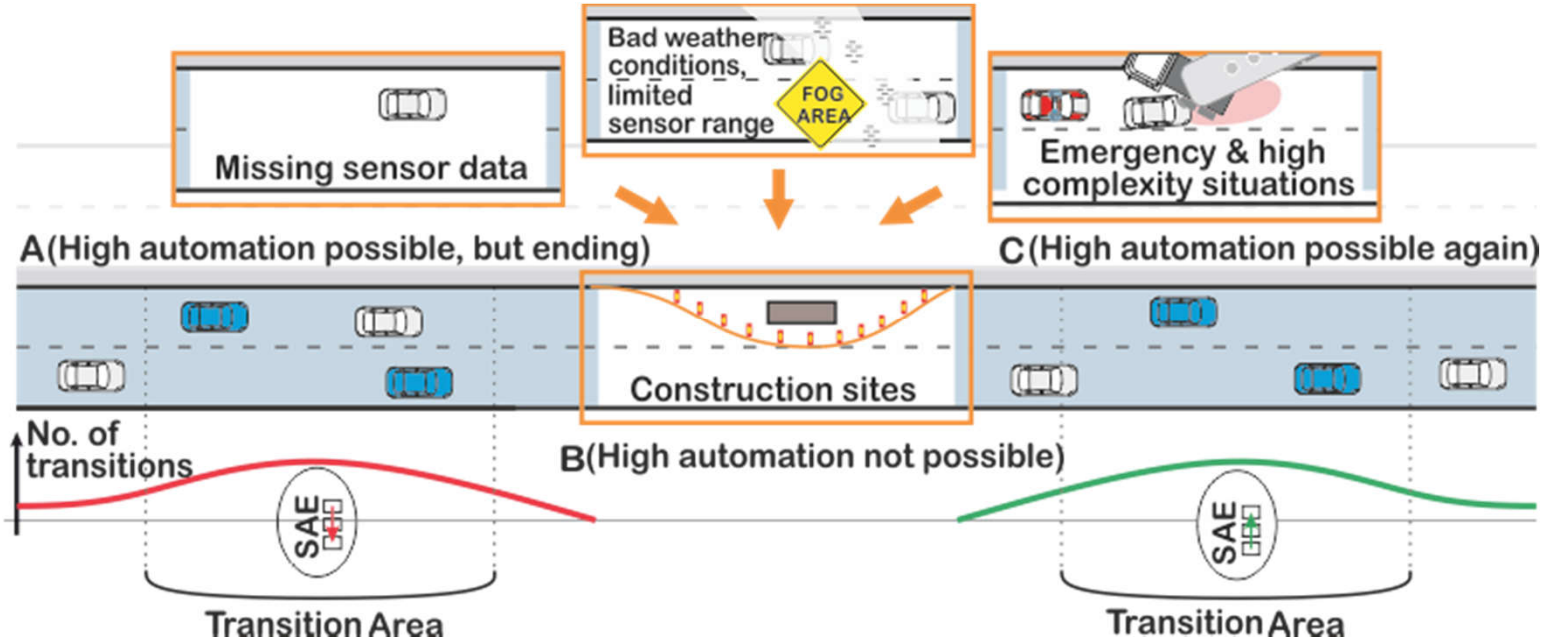






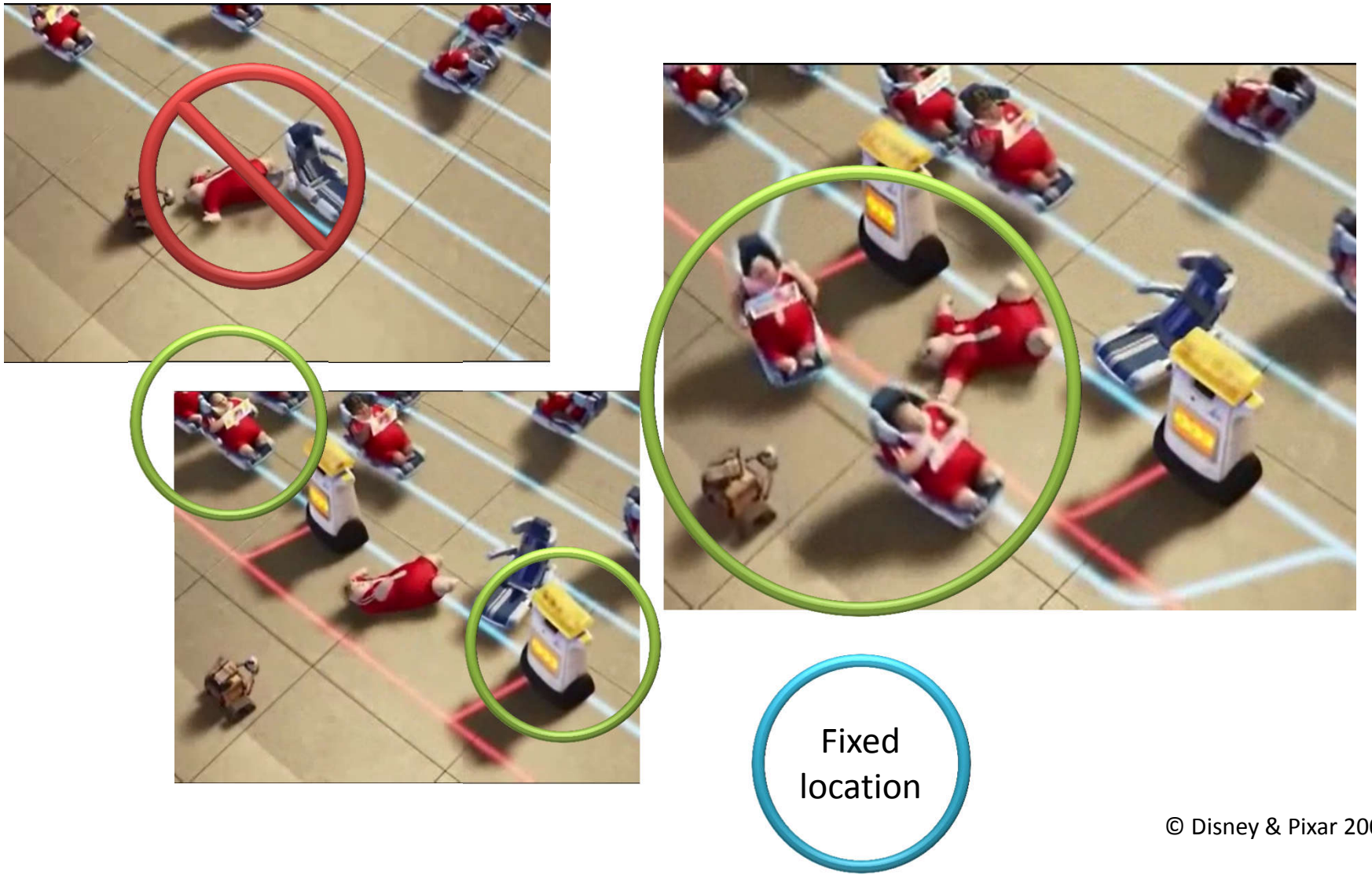

- …this happens not to single vehicles only, but to several?
- …it always happens on the same location?

Transition Area



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

Detailed Analysis



TransAID Goals

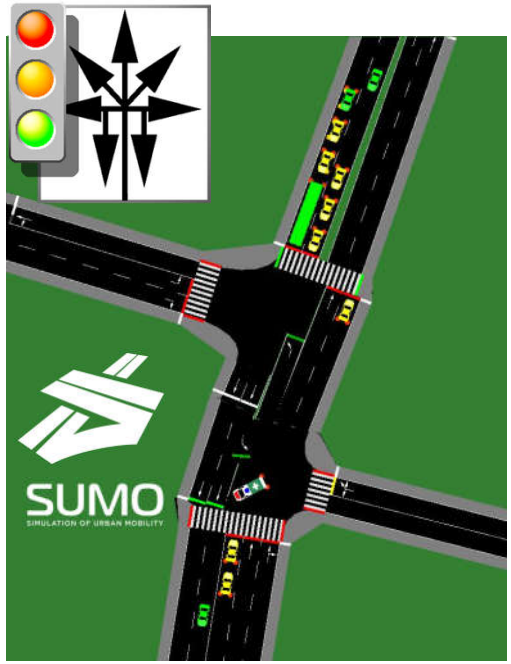
- Estimate impact on traffic safety and efficiency
- TransAID develops and demonstrates traffic management procedures and protocols
- To enable smooth coexistence of automated, connected, and conventional vehicles, especially at Transition Areas
- A hierarchical approach is followed where control actions are implemented at different layers including centralised traffic management, infrastructure, and vehicles

Expected impacts

- Improved traffic safety and efficiency
- Innovative traffic management and intelligent vehicle communications
- Support of stepwise introduction of road automation

Approach & Expected Results

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



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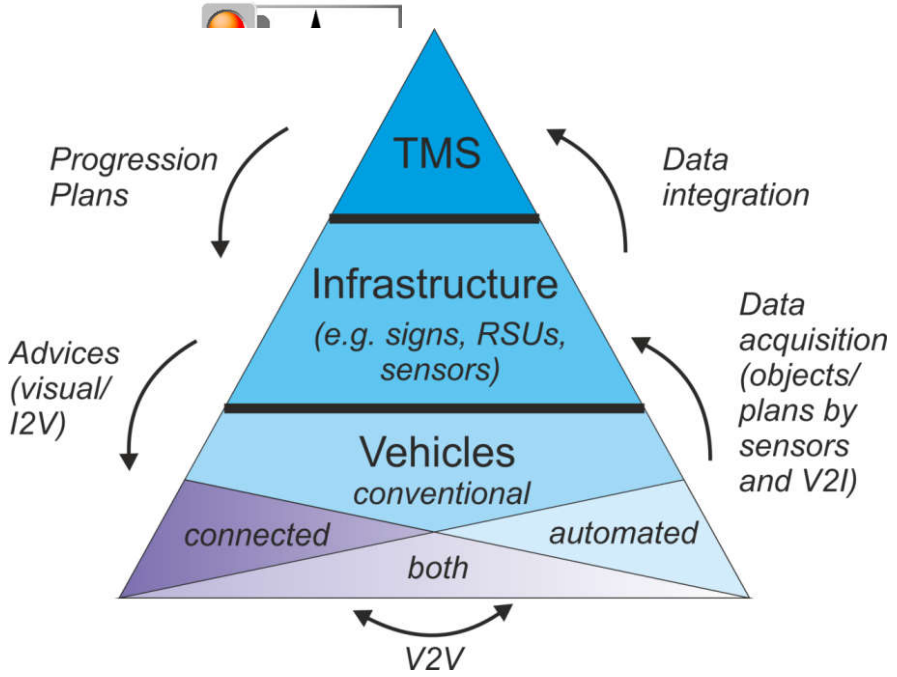
- Different approaches in terms of **hierarchical traffic management** are investigated
  - Help vehicle automations to find optimal solutions
  - Help surrounding vehicles
  - Optimize traffic safety and efficiency
- Development of **new ITS-G5 V2X message sets**



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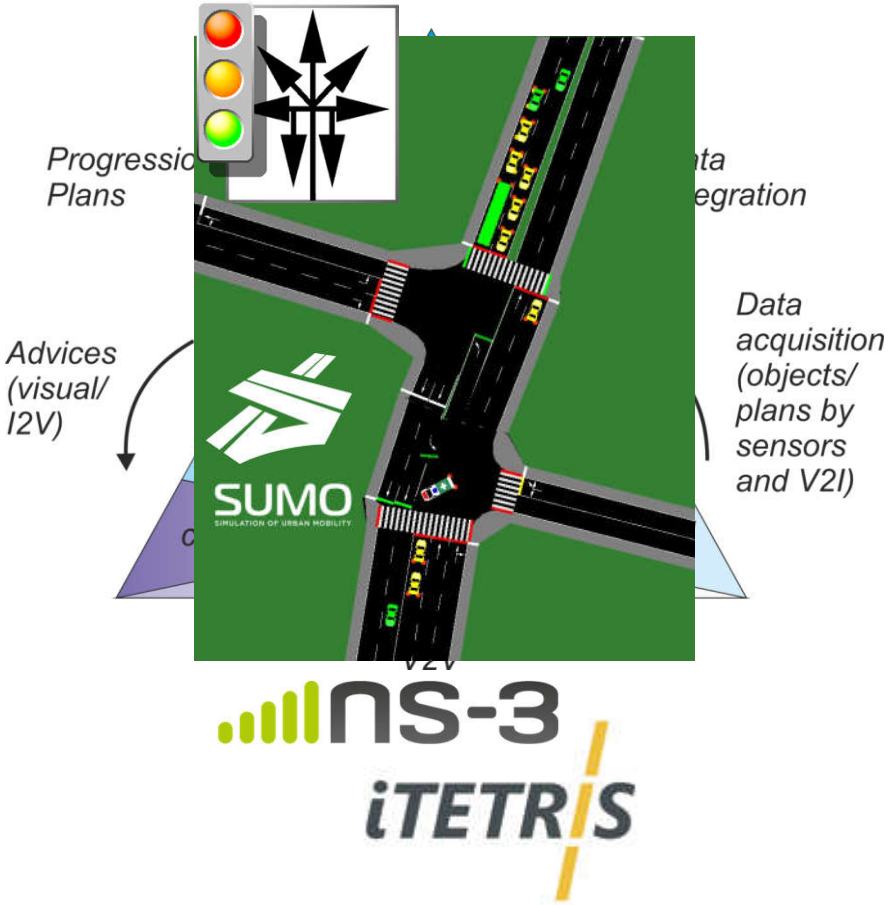
- **High fidelity simulations**



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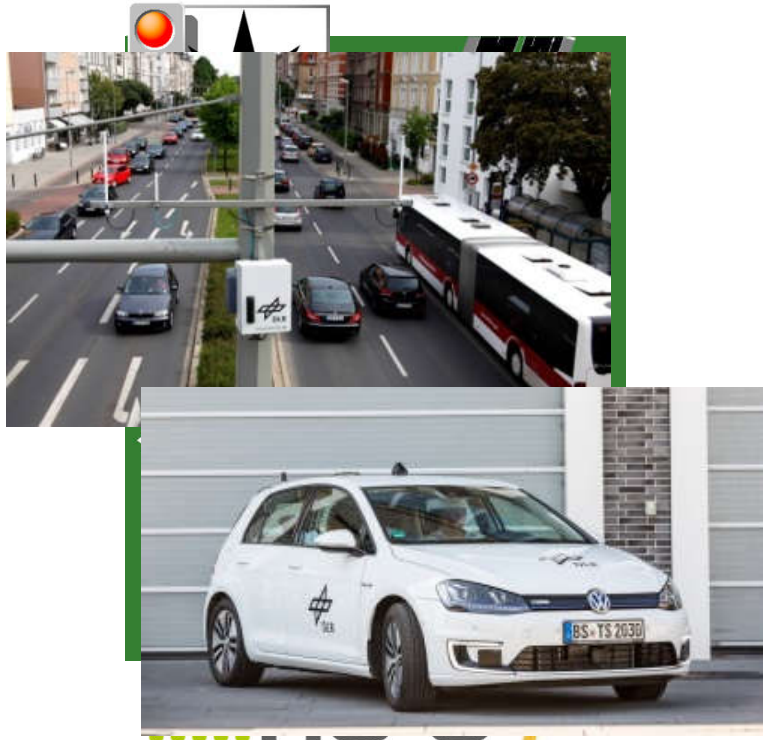
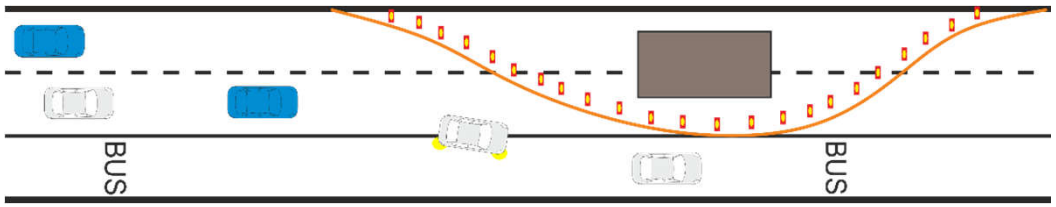
- Development of **new ITS-G5 V2X message sets**
- **High fidelity simulations**
- Prototypical **field implementations**
- **Guidelines** and a **roadmap** for stakeholders (OEMs, road authorities, cities…) are provided

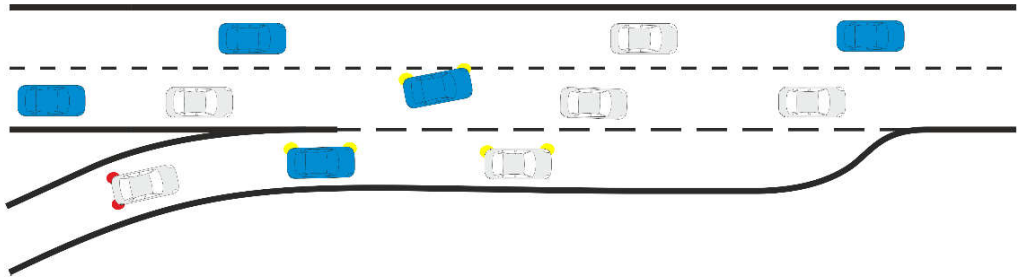


Use Cases & Service Definitions



- **Lane not usable for vehicles strictly following rules**
- Vehicles may stop before obstacle

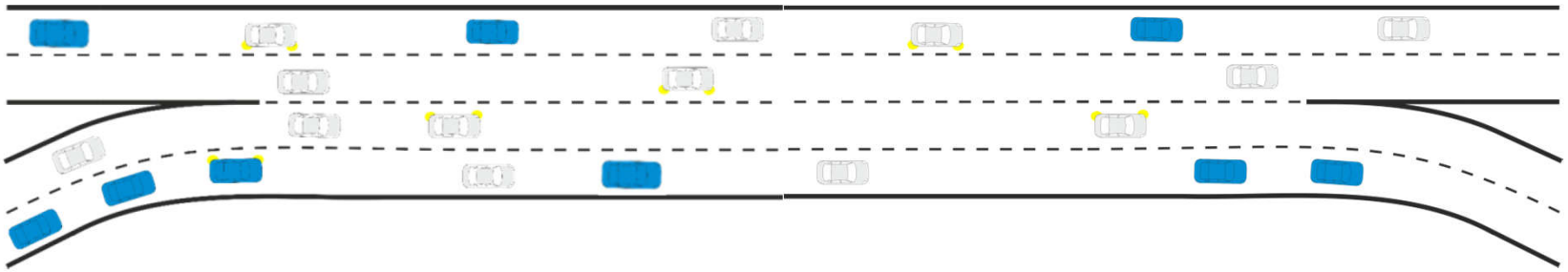
→ Providing path information or temporarily change lane category



- **Automated vehicles unable to enter highway**
- Vehicles may stop or issue take over request

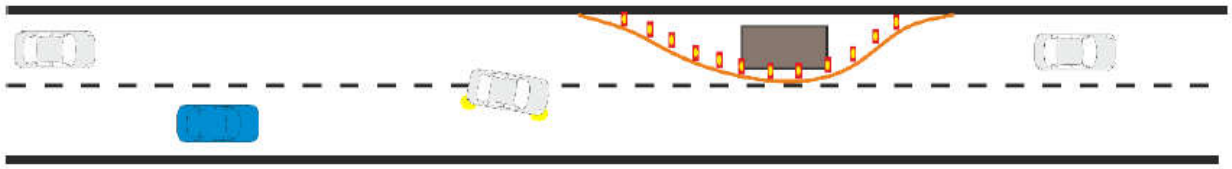
→ Cooperative lane changes
Speed & Distance information

Use Cases & Service Definitions



- **Risky situations in highway merge areas**
- Vehicles may issue take over request

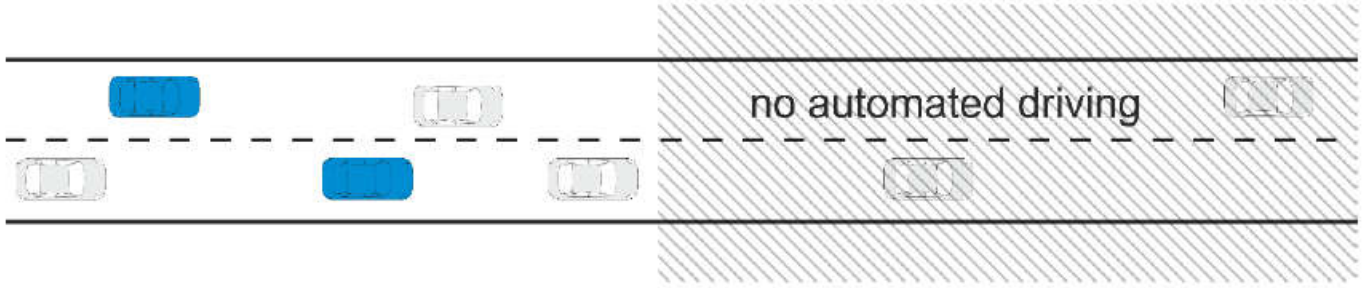
→ Cooperative lane changes
Temporal traffic separation



- **Automated vehicles unable to pass area**
- Vehicles may stop (e.g. due to failed transitions) and block free lane

→ Find safe spot for stopping without harming traffic

Use Cases & Service Definitions

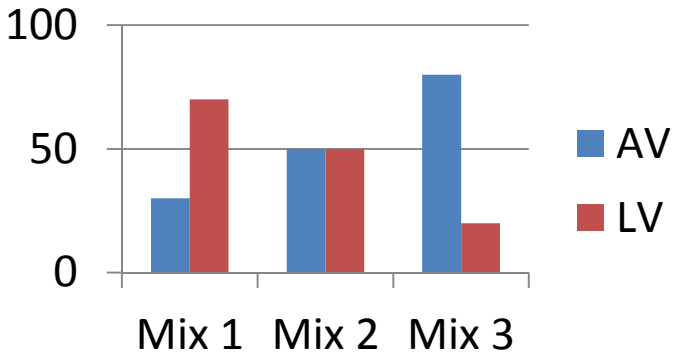


- **Transitions of control in small area**
- Higher risk of dangerous situations

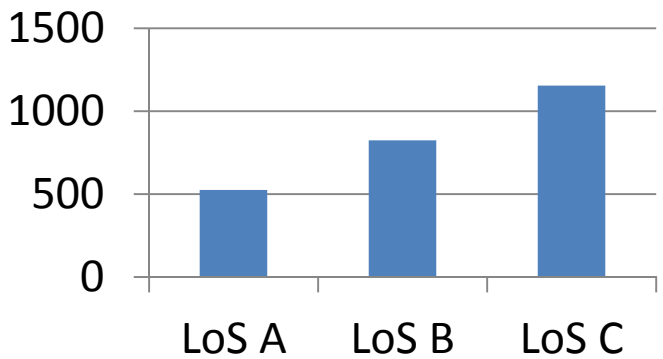
→ Distribute transitions of control to flatten effects

Recent work:
Preliminary simulations

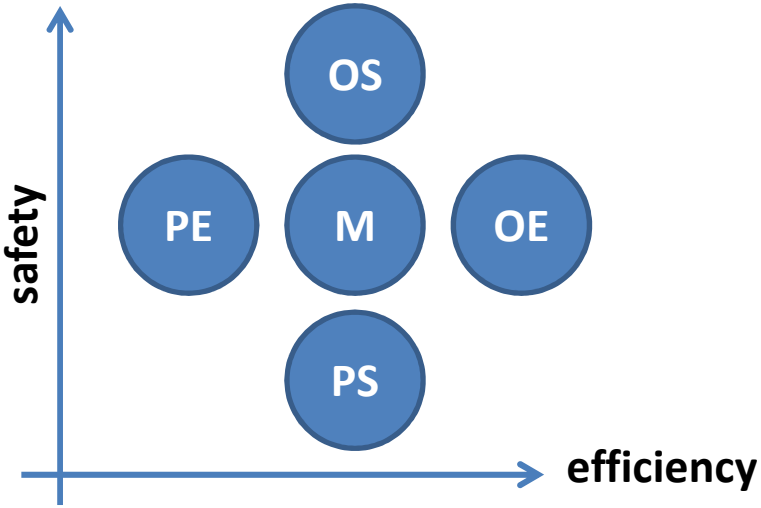
Traffic mix [%]



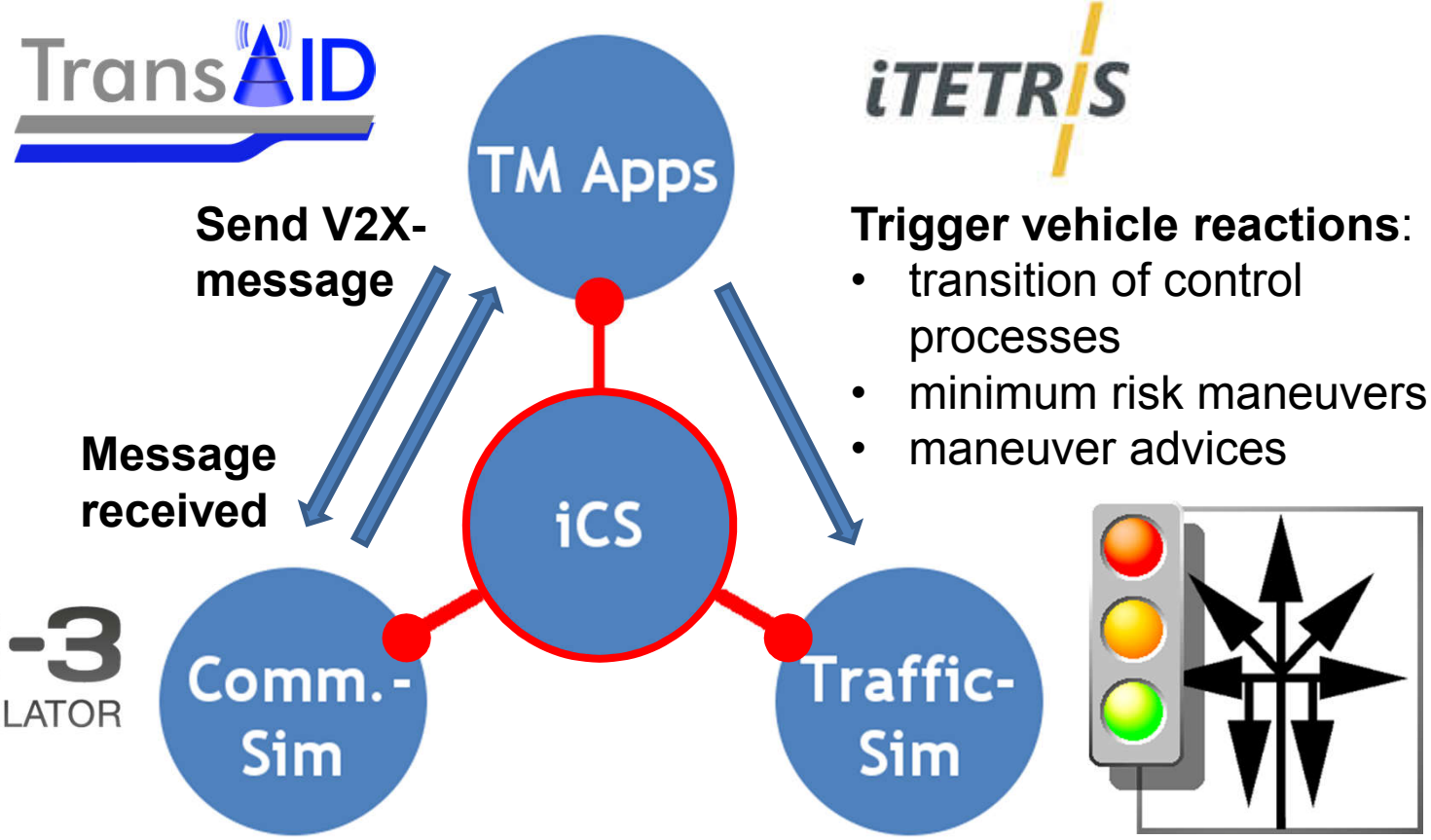
Total demand [Veh/h]



Parameter schemes:



Recent work:
Preparation of high fidelity simulations

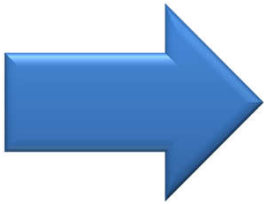


Trigger vehicle reactions:

- transition of control processes
- minimum risk maneuvers
- maneuver advices

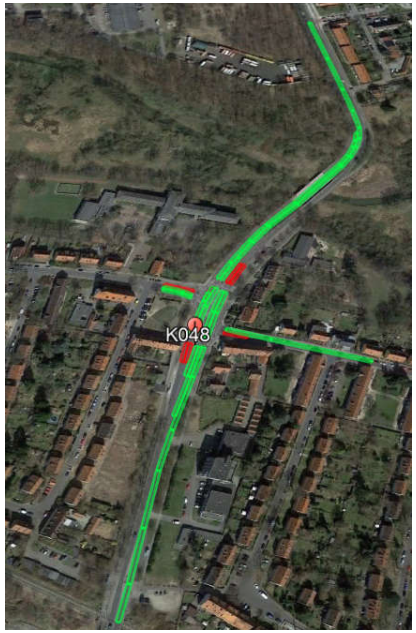
Recent work:
Message Set Definition

- CAM Extensions
- DENM Extensions
- MAPEM
- Collaborative Perception Message
- Maneuver Coordination Message



Session II: Roadmap, Use Cases and Services
Tomorrow, 11:00 am

Recent work:
First steps to real world integration



Any questions? Contact us!

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