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Validation and impact assessment

Jochen Lohmiller, PTV Group
Bernard Gyergyay Rupprecht Consult

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 723201-2

Validation and impact assessment
AV-ready microscopic and macroscopic traffic modelling tools

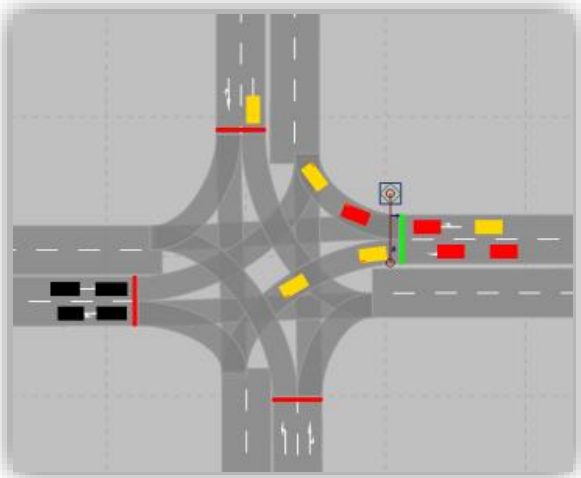
Demand Modelling

RENAULT

INSTITUT VEDECOM
DU VÉHICULE DÉCARBONÉ ET COMMUNICANT ET DE SA MOBILITÉ

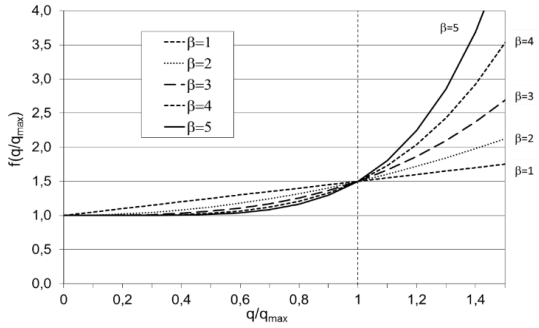
tass international

Micro



Macro

- Capacity
- Volume – Delay Function



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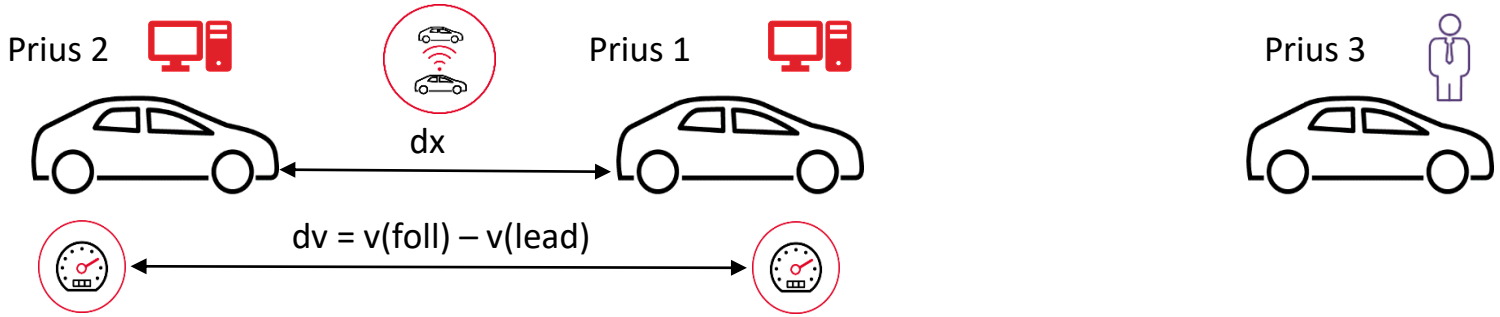
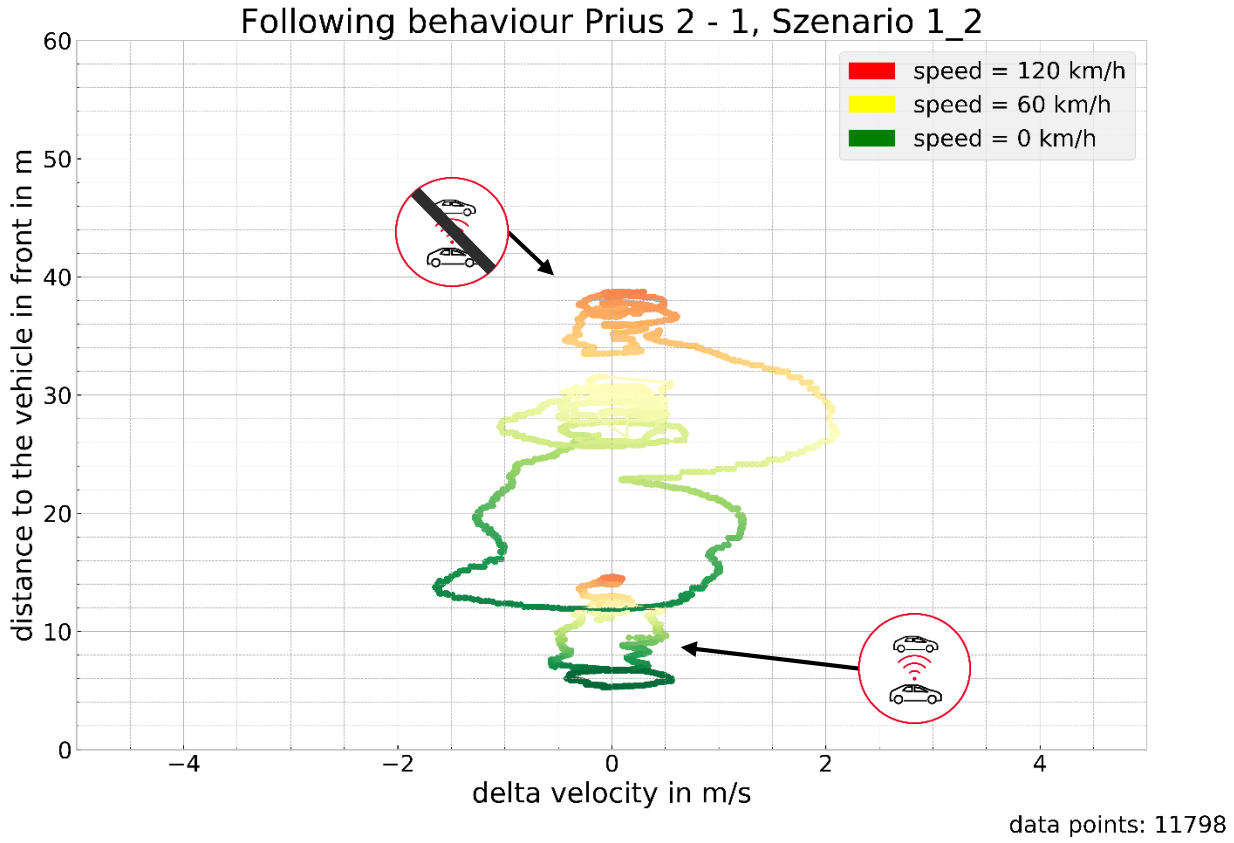
Data collection

Collect data of two CAV on the public test site for validation of microscopic modelling tool





data points: 11798

Driver logics

- Cautious driver logic:
  - respects the road-code and the safe behavior always
  - brick wall stop distance is always maintained
- Normal driver logic
  - existing average driver
- All knowing driver logic
  - predicts all other road users behavior

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EU – US Twinning

US Twinning Partner

- FHWA (Joe Bared); Leidos (Zhitong Huang) ; Principal Investigator: Steve Shladover (Berkely PATH)
  - Phase 1: Development of an Analysis/Modelling/Simulation Framework for CAV Systems
  - Phase 2: Developing AMS Tools for CAV Applications

Twinning Objectives:

- Definition of AMS Framework – globally applicable?
- Sharing of Use Cases / Case Studies
- Exchange on modelling tool development

Additional information on twinning project:

- www.fhwa.dot.gov/publications/research/operations/17033/17033.pdf

U.S. Department of Transportation Federal Highway Administration

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Transition to the traffic management of connected and automated vehicles

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Automation Readiness in brief

- **Uncertainties for Local Authorities**
  - Current hype creates unrealistic expectations of the technology (pro-innovation bias)
  - (Connected) Infrastructure requirements are not clearly formulated yet.
  - Long transition phase where conventional vehicles coexist with partially and fully automated vehicles.
  - Result: Automation not mentioned in strategic transport plans

- **Objective:**
  - The mission of the H2020 CoEXist project is to systematically increase the capacity of local authorities and other urban mobility stakeholders to get ready for the transition towards a shared road network with increasing levels of connected and automated vehicles (CAVs)

- **Output of the breakout session:**
  - CoEXist Automation-ready framework
  - SUMP2.0: Automation extension

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Automation-ready Local Authorities

The concept of “automation-readiness” is defined as:

“*The capability of making structured and informed decisions about the comprehensive deployment of CAVs in a mixed road environment. This capability requires*:

- *A **clear awareness** of the technology underpinning CAVs, the different functional uses and business models for CAVs and a high-level understanding of the impacts different deployment scenarios can have on traffic, quality of life and stakeholders involved in local transport planning.*
- *The **institutional capacity to plan** for a future with CAVs by using tools that accurately represent CAV behaviour in order to identify the impacts of different CAV deployment scenarios.*
- *A **strategic approach in deploying a wide range of measures** that will ensure a deployment of CAVs, which supports higher level mobility goals.”*

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Mapping out uncertainties

- **Creating awareness about CAVs?**
  - What is a CAV? How do they behave? What can their functionalities do?
  - What do my citizens feel about the technology?
  - Which stakeholders need to be consulted?
  - How to create awareness within the transport authority?
  - How to develop useful scenarios?
- **How to plan for CAVs?**
  - How to integrate CAVs into an overall mobility vision?
  - How do CAVs align with mobility goals in a city?
  - How to integrate CAVs into a strategic transport plan?
  - What tools to use to test the scenarios and assess impact of CAVs?
- **Implementing automation-ready measures?**
  - When and how should the organisation structure of my organisation be adjusted?
  - When and how to change public transport operations?
  - When and how to change the digital and physical infrastructure?

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Mobility Aspect	Automation Awareness	Planning for Automation Readiness	Implementation of Automation Ready Measures
Policy	**Policy screening:** Liveability as top priority – how can CAVs contribute to it?	**Reassessment** of strategic mobility plans; incorporating new mobility forms	**Mobility pricing** for "SPAM" roaming cars
Infrastructure	Is there a conflict between **people friendly** vs. automation friendly?	Preparation of **physical and digital** infrastructure	**Modifications** to infrastructure and accompanying traffic code
Planning	**Engagement** with citizens & support **testing activities** and research	Update travel demand **models** and evaluate road **capacity needs**	Assessment of required land use changes based on integrated **land use** and transport modelling tools
Capacity Building	**Try out** level 1 & 2 functionalities	Identify **new skill requirements** – 'less concrete more bytes'	**Organisational restructuring** for traffic management and public transport operations
Traffic Management	Road **authorities** need to engage with OEMs	**Back office for data exchange** in traffic management	**Defining data management responsibility** with new management schemes

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Management of CAV's in smart cities

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Demonstration of CoEXist tools in road authorities

- Gothenburg: AVs and Shared Space – does it still work?

- Milton Keynes: Replace parking with drop-off and pick-up areas for passengers and freight.

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