SHOW: SHared automation Operating models for Worldwide adoption

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Presenter introduction

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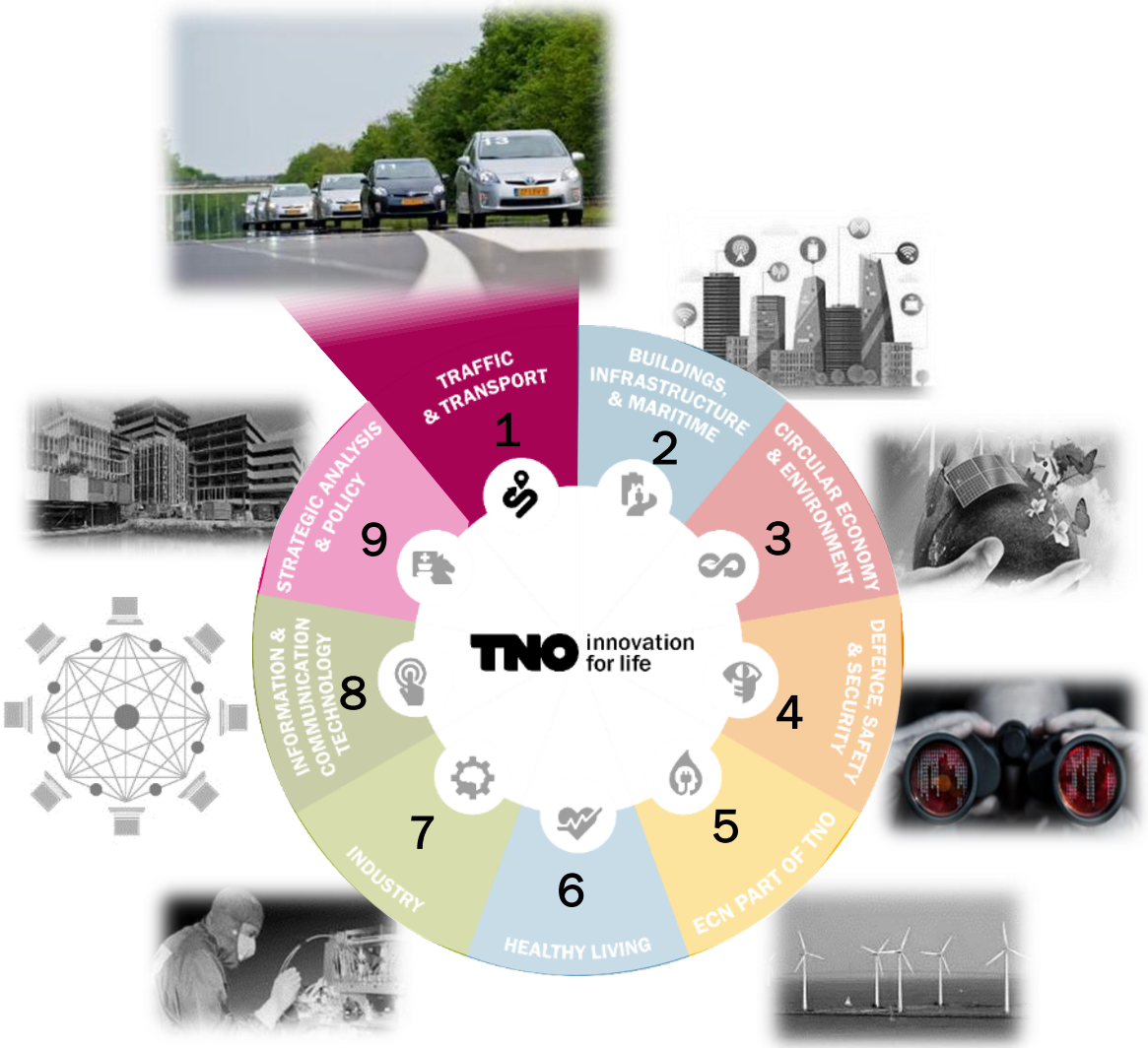
SHOW: Demo site leader NL



SHOW in a nutshell

Deployment of shared, connected and electrified automated vehicles to advance sustainable urban mobility

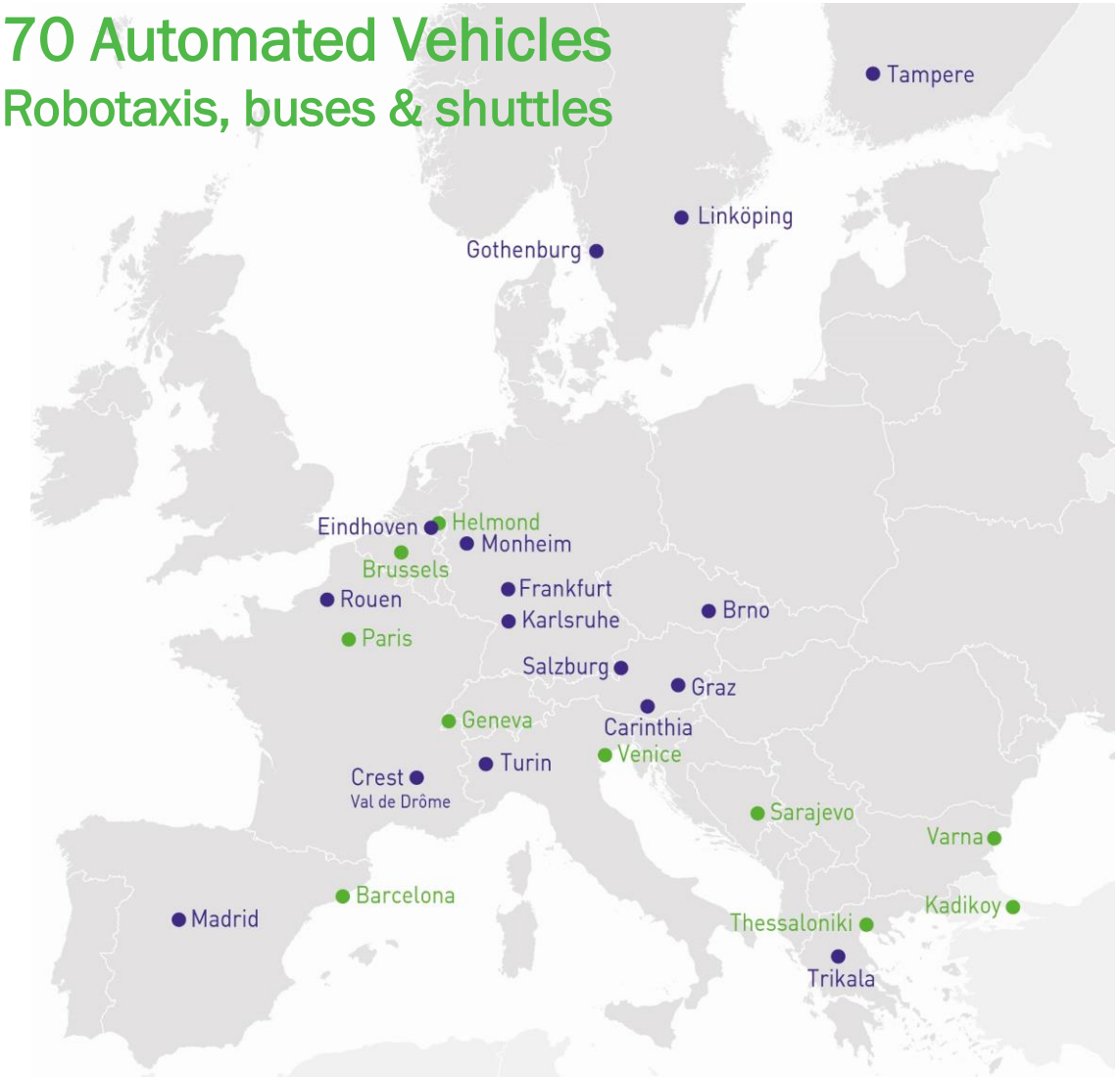
- Coordinated by UITP
- 70 partners from 13 EU-countries
- January 2020 – December 2023
- 30 Mio. EUR funding from European Commission

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 875530.

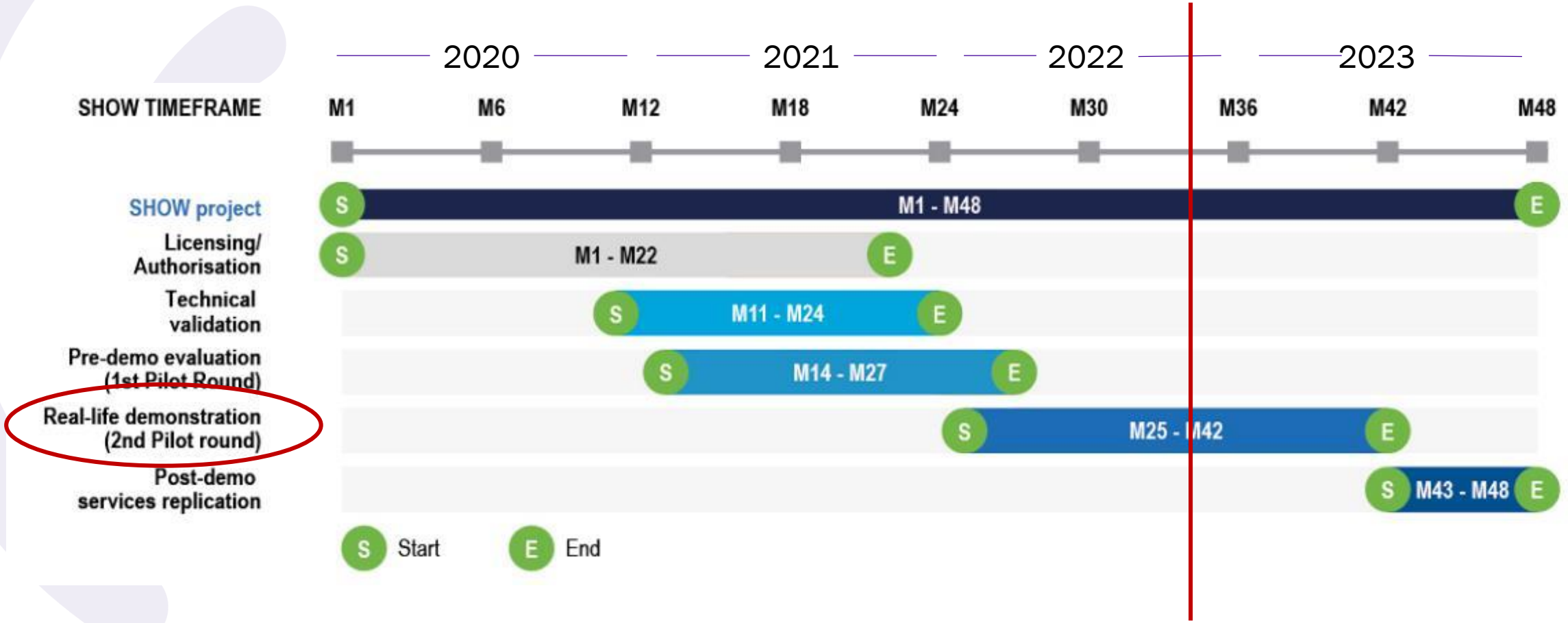
SHOW is the largest initiative for shared Automated Mobility in Europe

70 Automated Vehicles

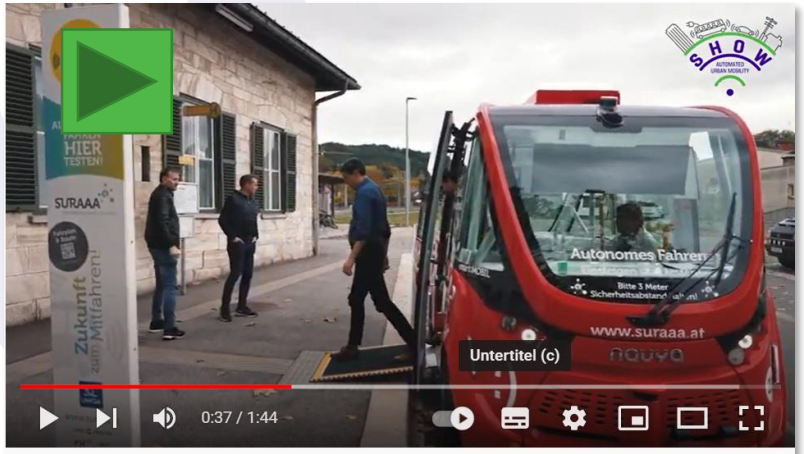
Robotaxis, buses & shuttles



Demonstration Plan
(currently running services)

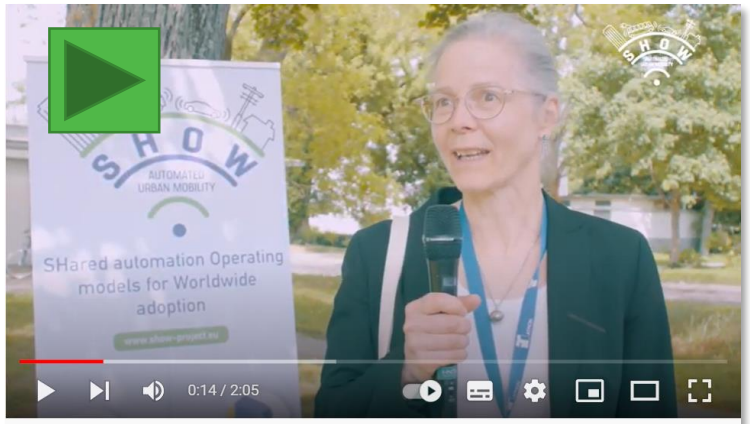


On-going real-life pilots (large variety of conditions)



SHOW – Demo site for autonomous shuttles in Carinthia

Take a ride in an automated vehicle in snowy Tampere



SHOW: Demo preview in Karlsruhe

Check out SHOW on YouTube!

3 Families of Use Cases (highlight are use cases in NL)

UC1: Automated mobility in cities (operational conditions)

1. Automated passengers/cargo mobility in Cities under normal traffic & environmental conditions
2. **Automated passengers/cargo mobility in Cities under complex traffic & environmental conditions**
3. **Interfacing non automated vehicles and travellers (including VRUs)**
4. Energy sustainable automated passengers/cargo mobility in Cities
5. Actual integration to city Traffic Management Centre
6. Mixed traffic flows; AVs and non AVs mixed in the same traffic flows
7. **Connection to Operation Centre for tele-operation and remote supervision**
8. **Platooning for higher speed connectors in people transport**
9. Cargo platooning for efficiency
10. Seamless autonomous transport chains of Automated PT, DRT, MaaS, LaaS

UC2: Automated mixed mobility in cities (service integration)

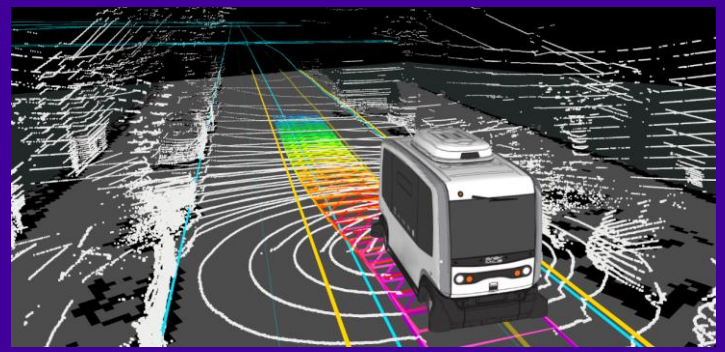
1. Automated mixed spatial mobility
2. Automated mixed temporal mobility

UC3: Added Value services for CCAM in cities (service concepts / business case)

1. Self-learning Demand Response Passengers/Cargo mobility
2. Big data/AI based added value services for Passengers/ Cargo mobility
3. Automated parking applications; namely AVs self-parking functions
4. Automated services at bus stops
5. Depot management of automated buses
6. COVID-SAFE Transport

SHOW building blocks paving the way for Automated Shared Mobility

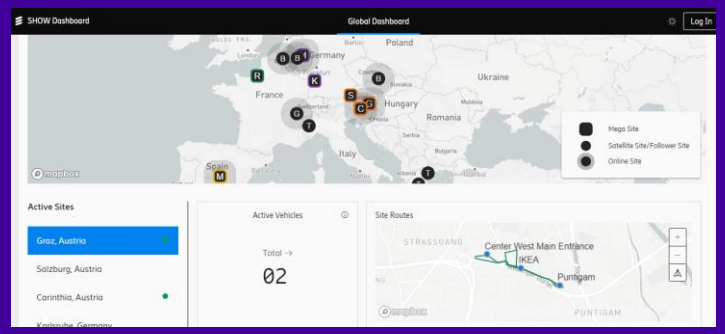
Technical development



Stakeholders' engagement

Business models & services

Impact assessment



Guidelines & recommendations

Trainings for PTO/PTA & public

Credits: SHOW partners, www.shutterstock.com

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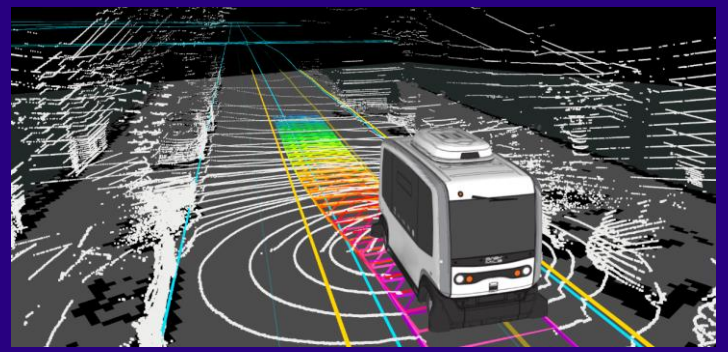

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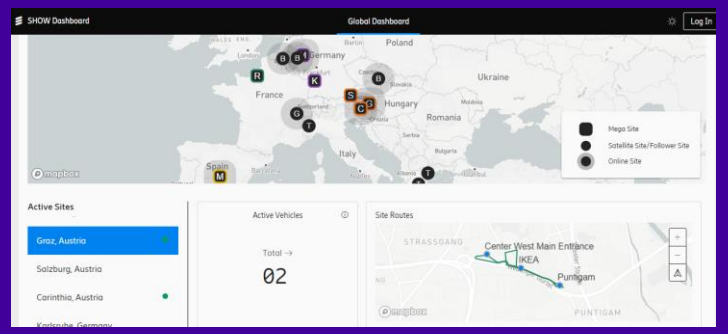

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Business model and services

- Addressed in each of the (20) deployment sites
  - Different business models

- Physical and business conditions
  - Available and planned infrastructure
  - Existing (public transport) mobility services
  - Involved service providers and operators
  - Concession based or multi-vender setup
  - ….

Business model and services

- Deployed service concepts
  - Public transport, privately operated shared vehicles
  - Service operation (scheduled, direct response transport, …)
  - User groups (inclusive transport, mass transport, ..)
  - Shared transport of people and goods
  - integration in / extending existing transport
  - Deployment area and route (city, campus, hospital, …)
  - …

SHOW building blocks paving the way for Automated Shared Mobility

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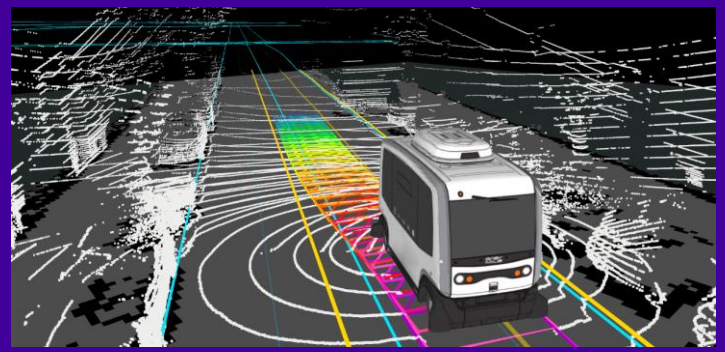

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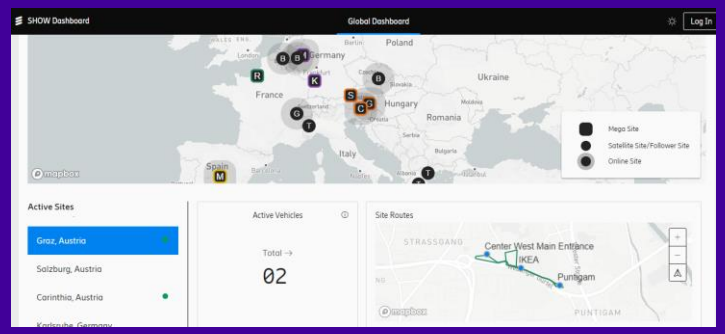

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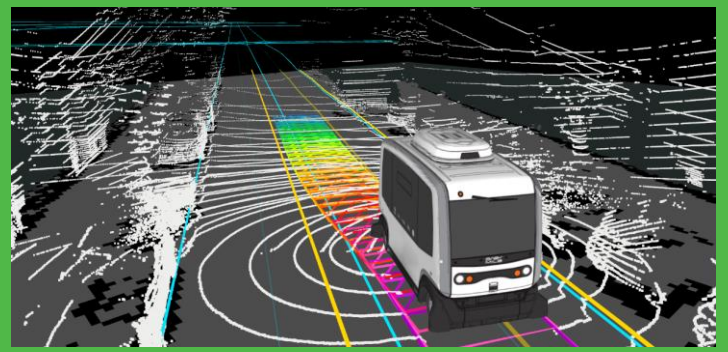

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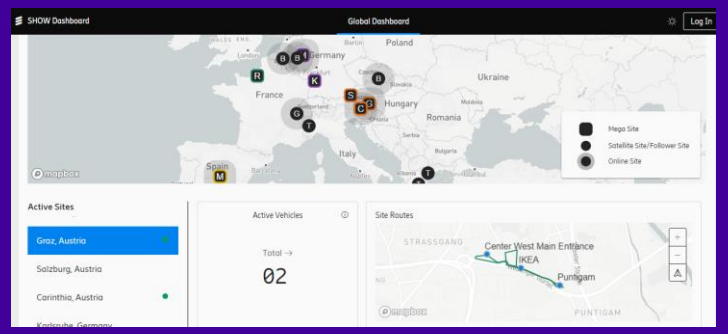

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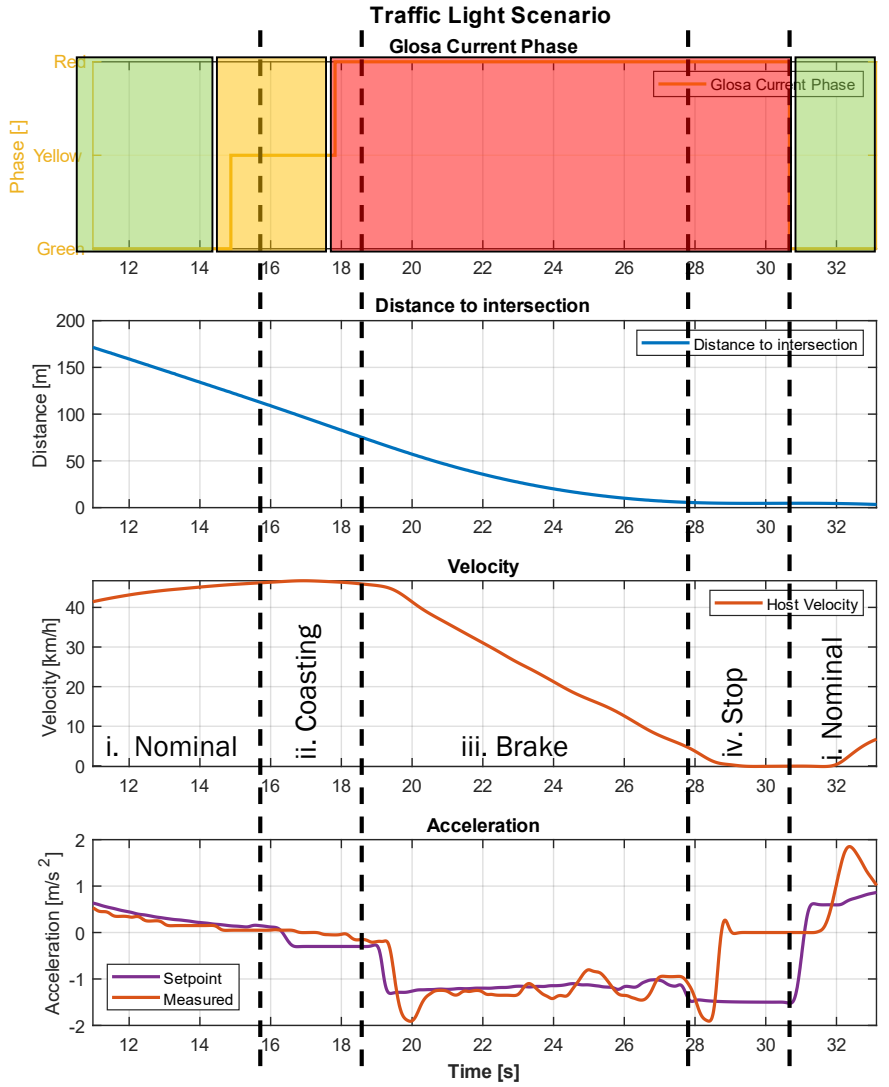
Example of Brainport Eindhoven, The Netherlands
C-ITS enabled intersection crossing

- Intersection crossing at normal operational speed to prevent traffic disruption
- C-ITS provides anticipation of traffic situation at intersection, avoiding the need for hard braking
- Validated and evaluated with user tests at proving ground for traffic light and VRU scenarios



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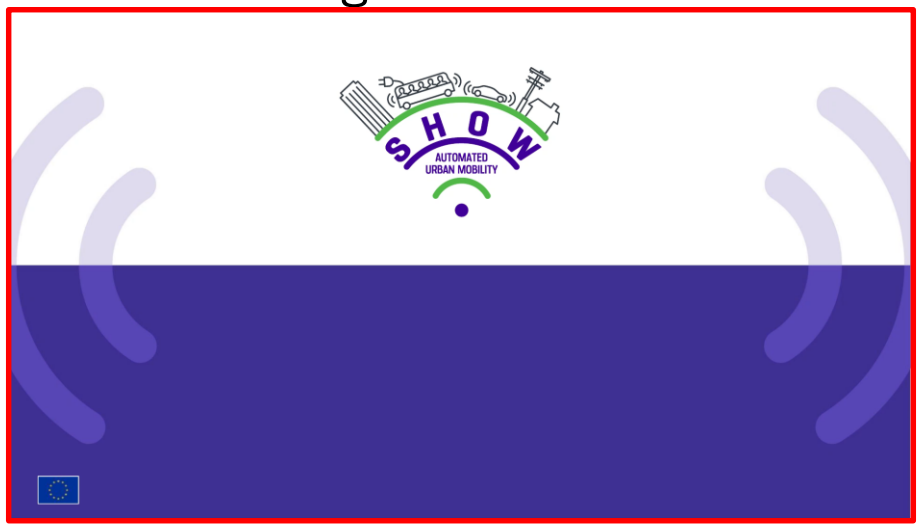
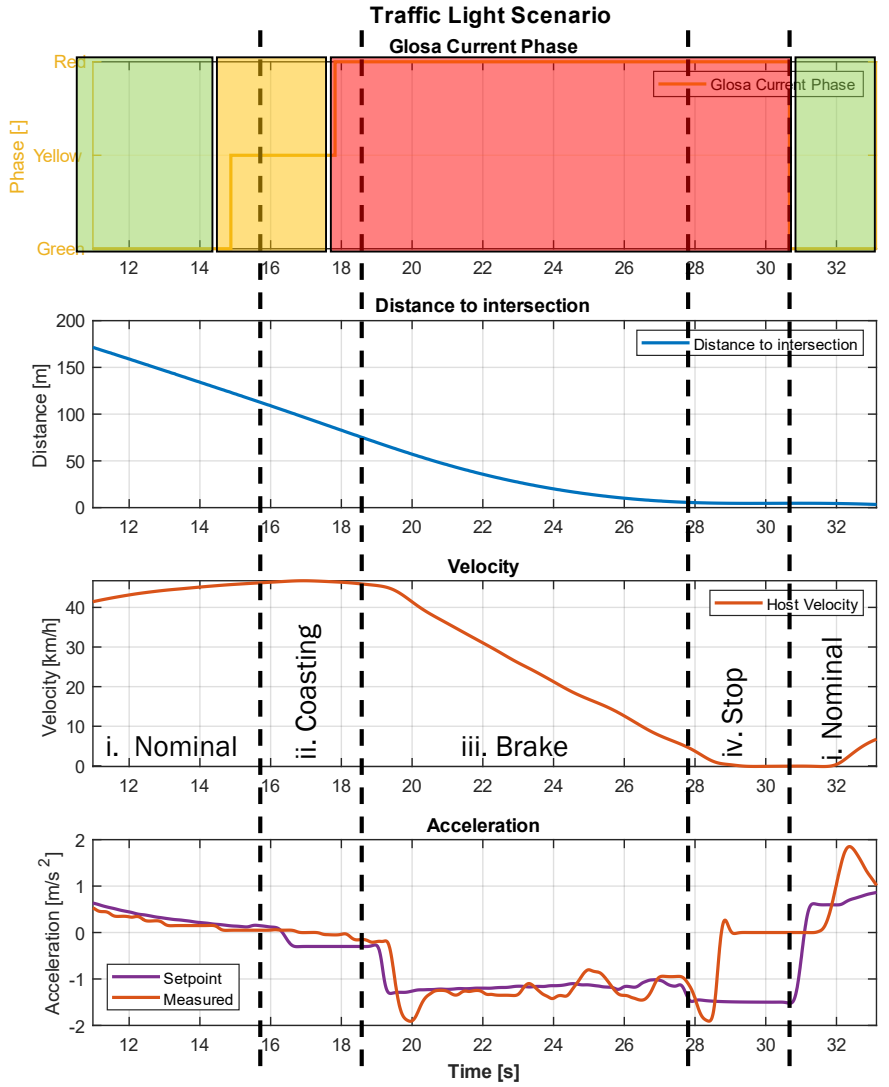
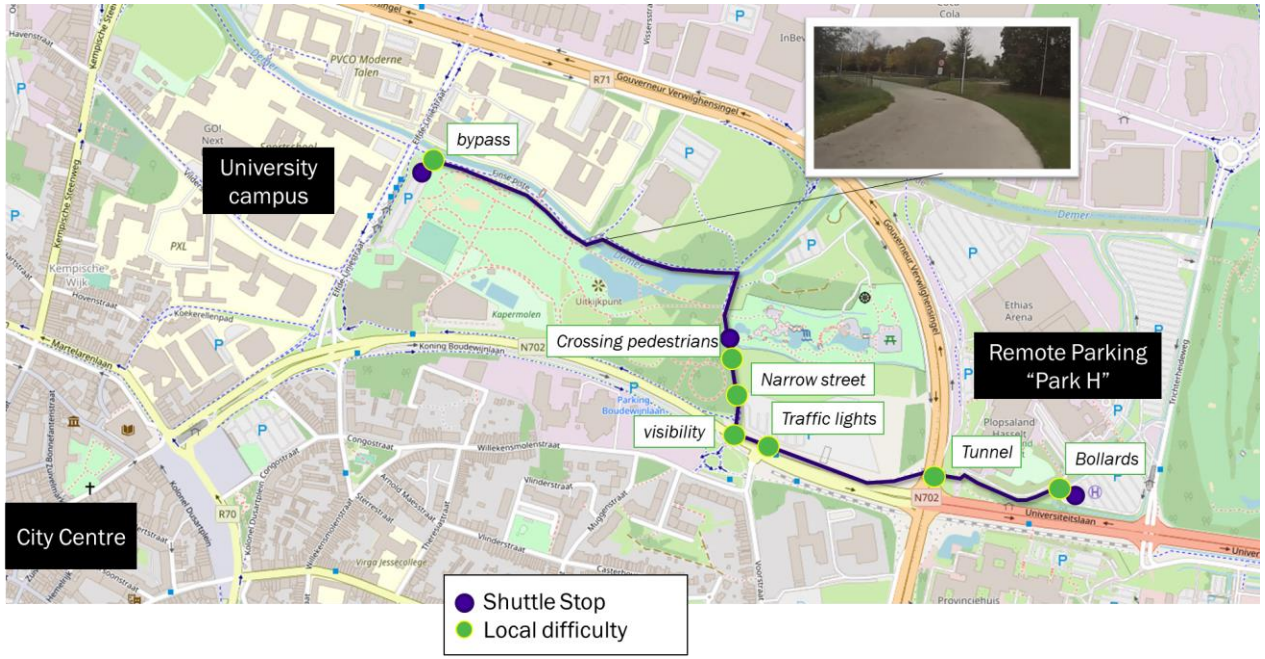




Example of Brainport Eindhoven, The Netherlands
C-ITS enabled intersection crossing

- Shuttle implementation of developed C-ITS function for traffic lights
- Operational service on challenging route from remote parking towards university



Appreciation by Royal passengers during demo event

Lessons learned from SHOW pilots in Sweden

Charging & vehicle maintenance

- Prepare for charging, cleaning and maintenance
- Specific knowledge is required

Safety operator's working conditions

- More monotonous than driving a bus
- Skills are of IT nature

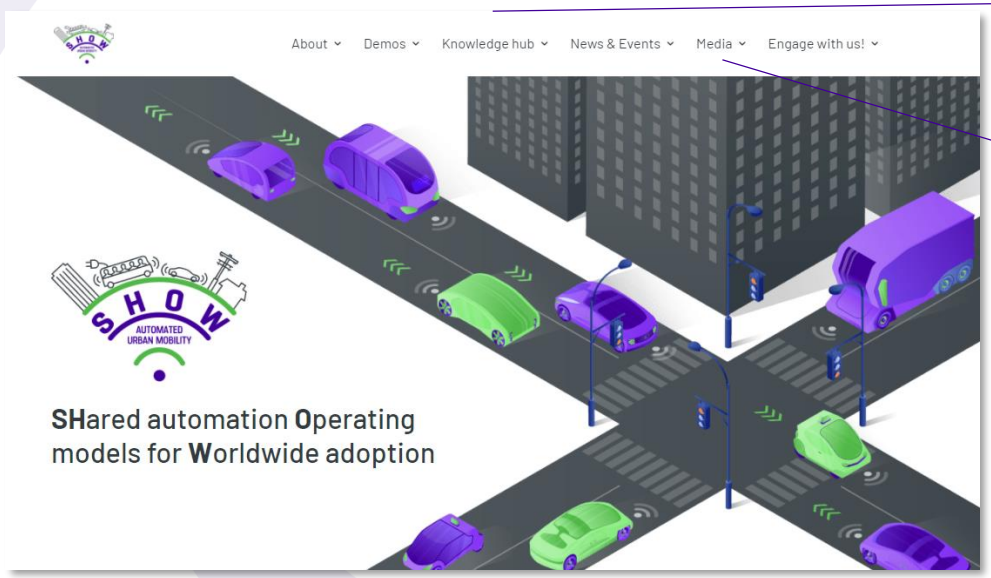
Road infrastructure

- Avoid complex road infrastructure
- The shuttle has to adapt to infrastructure (not the contrary)

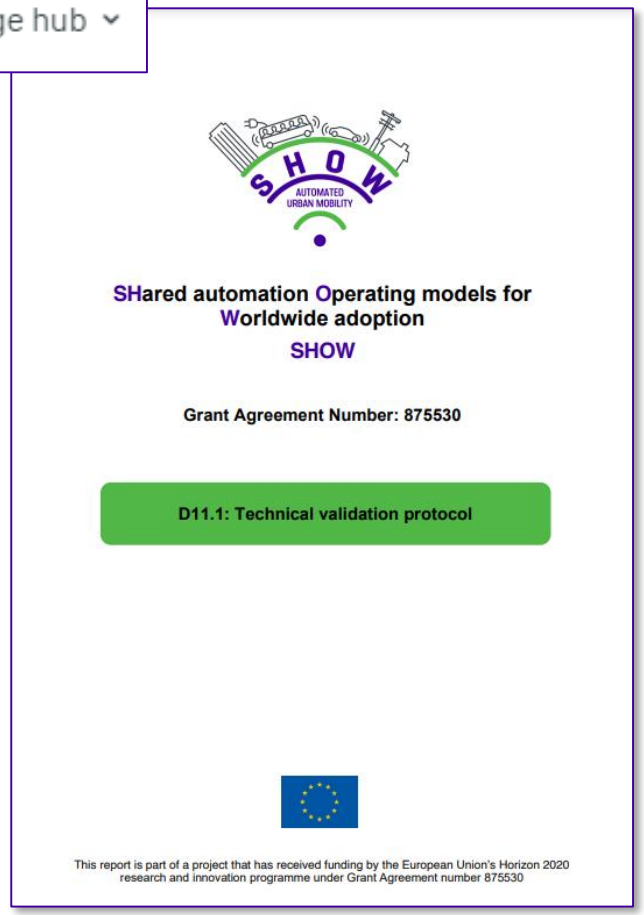
Anund, et al. (2022): "Lessons learned from setting up a demonstration site with autonomous shuttle operation – based on experience from three cities in Europe". Journal of Urban Mobility.

Get to know SHOW better

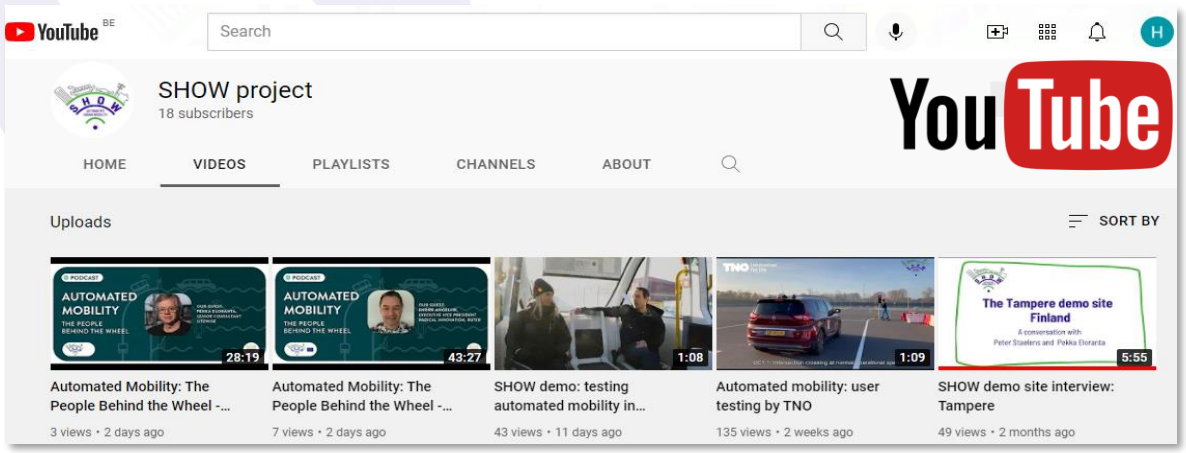
https://show-project.eu/



Knowledge hub



Media



International Collaborations

International Cooperation in SHOW

- SHOW aims at pursuing cooperation **beyond the European borders** in the context of targeted twinning actions

- **Targeted countries:** US, Japan, Singapore, Taiwan, Australia, China, and South Korea

Japan: Connection with new project CooL4

Collaboration with CooL4: **Coo**perative **L**evel **4** Automated Mobility Service in mixed environment

CooL4 Consortium

■ **Academia and Industry collaboration**

The University of Tokyo	Academia
The University of Electro-Communications	
Nagoya University	
Doshisha University	
National Institute of Advanced Industrial Science and Technology	Research Institute
Mitsubishi Research Institute	
Japan Automotive Research Institute	
Mitsui Fudosan	Developer
Shimizu Corporation	Construction
Panasonic	Electronic
BOLDLY	Fleet Management

ITS Japan

Industries & Private Sectors

Regional Organization
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Agreed topics for collaboration with SHOW

Topic 1: Automated Vehicle Behavior

- At intersection, in case of GPS-loss, to avoid parked vehicles
- Use of V2X communication
- Remote supervision and control

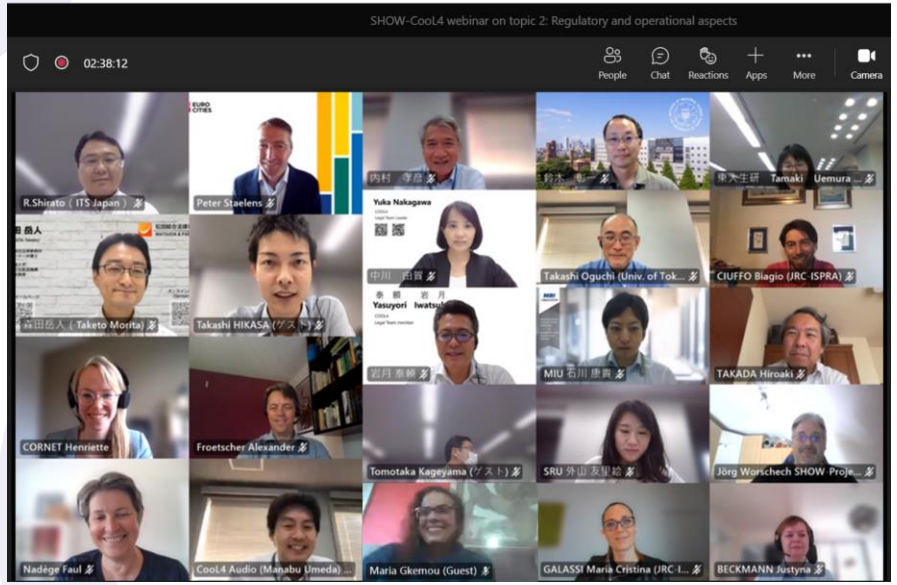
Topic 2: Regulatory issues

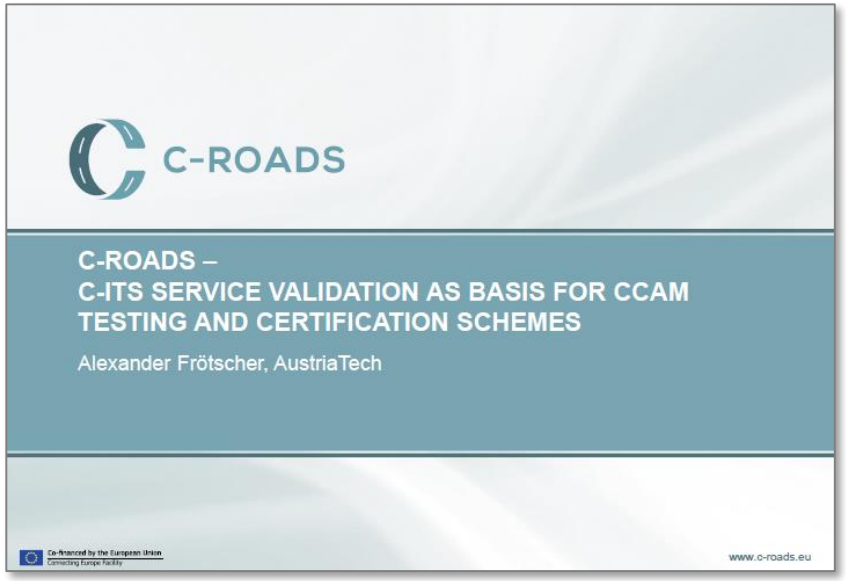
- Legal framework, type approval and homologation of L4 vehicles
- Propose modifications of relevant regulations
- Define international rules on liability

Topic 3: Stakeholders' perception of AV services

- Comparison of perception of AV services in different countries
- Business models & services

1st webinar on Regulatory Issues





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