

# Shared Automation Operating Models for Worldwide Adoption

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**Artificial Intelligence  
for Road Safety and Mobility Workshop**

8<sup>th</sup> UN Global Road Safety Week

Athens, 15 May 2025



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# The SHOW project

## ➤ SHOW:



"SHared automation Operating models for Worldwide adoption"  
[show-project.eu](http://show-project.eu)

## ➤ Partners:

66 project partners from 13 EU-countries, involving:  
[National Technical University of Athens](#)

## ➤ Duration of the project:

48 months (January 2020 - September 2024)

## ➤ Framework program:

[Horizon 2020](#) - The EU Union Framework Programme for Research and Innovation - Mobility for Growth  
(Grant agreement No 875530)



Co-funded by  
the European Union



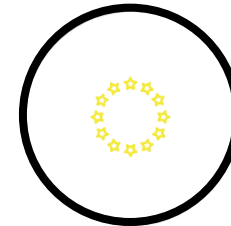
Maria Oikonomou, Shared Automation Operating Models for Worldwide Adoption



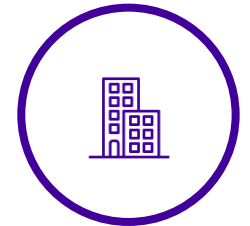
**4+** years



**66** partners



**13** European  
Countries



Over **20** cities  
involved across  
Europe



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# Objectives



- The SHOW project aimed at developing **shared automation** operating models for worldwide adoption.
- The project vision was to investigate the **integration of AVs** into various transport schemes.
- SHOW conducted **large-scale trials across 21 cities**, transporting over 150,000 passengers and completing more than 5,000 cargo deliveries.



## More than 80 Automated Vehicles

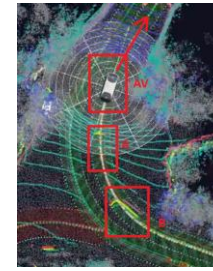
Shuttles, mid & large size buses, vans/pods, freight vehicles, delivery robots, robo-taxis and modular vehicles

- Mega & Satellite sites
- Follower Sites



# Impact on Safety

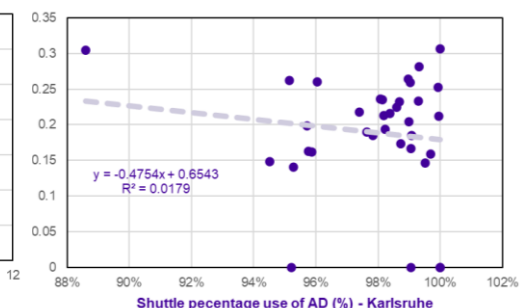
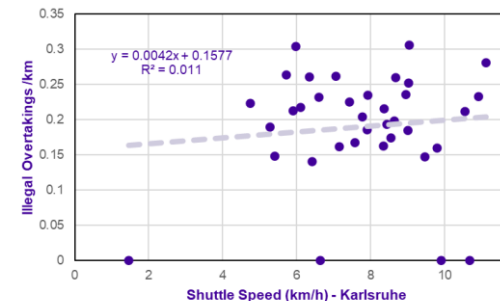
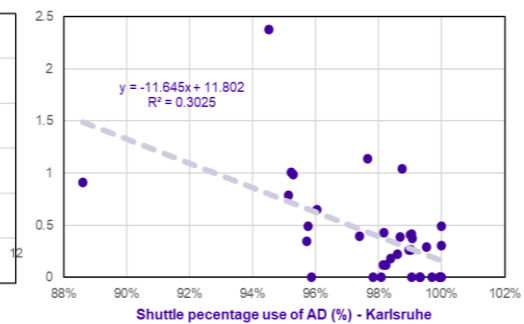
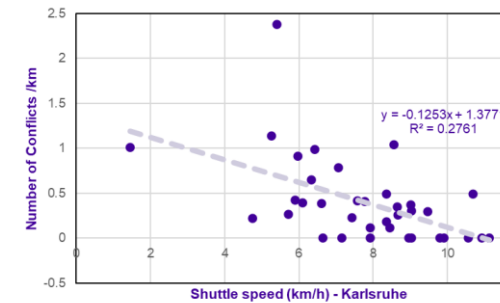
- **Ten minor crashes occurred**, primarily due to human driver errors during interactions in challenging areas (e.g., bus stops), rather than AV system failures.
- Conflicts and illegal overtaking incidents were **correlated with traffic KPIs** (e.g. speed).
- **Higher speeds and acceleration variance** are linked to fewer conflicts, indicating better quicker adaptation to traffic flow.



Crash with  
NAVYA N°P146  
in Crest, France  
August 2<sup>nd</sup> 2024



Site	Number of crashes	Cause	Manual or AD
Linköping, Sweden	2	Collisions with bus and truck near bus station	AD
Karlsruhe, Germany	1	Collision with car exiting a parking space	AD
Salzburg, Austria	1	Steered into oncoming lane	AD
Crest, France	1	Failed overtaking maneuver by another car	AD
Tampere & Kuopio, Finland	3	Early departure from stop, overtaking-related crash, sudden stop due to conditions	Manual & AD
Klagenfurt, Austria	2	Reversing car and lawn tractor collision	AD





**Simulation tools used:** VISSIM, New Mobility Modeller, Urban Strategy, SIL Simulator, ROS, Autoware Sim, SUMO, Menge, CARLA, Gazebo, AIMSUM, SSAM, ANY LOGIC, TRANSCAD, MATSim, AVSS

## Vulnerable Road Users (VRUs) level

- Ensure a higher level of detail.
- Manage interactions at bus stops.

## Street level

- Applied on pilot site level.
- Examine interactions between different road user types.
- Examine AV-logic and safety issues.

## City level

- Provide region or city-wide results.
- Examine Demand-Responsive Transport (DRT) applications.
- Address modal split changes.



# Impact on Simulated Conflicts



- Conflicts were identified by analyzing **trajectory data** from simulations.
- Time-To-Collision (TTC) was categorized to assess **conflict severity**.
- The introduction of automated shuttles **reduced the likelihood of severe conflicts** for all vehicle types.
- Automation **increased TTC**, providing more time before potential collisions.

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	-0.663	0.051	-13.014	<2e-16	***
Scenario (without or with AVs)	-0.099	0.020	-5.051	4.39e-07	***
MaxDeltaV	0.292	0.005	54.697	<2e-16	***
MaxD	-0.026	0.001	-19.54	<2e-16	***
Conflict Type: Lane Change (Ref: crossing)	-0.270	0.050	-5.43	5.64e-08	***
Conflict Type: Rear End (Ref: crossing)	-0.837	0.046	-18.117	<2e-16	***

Dependent variable: Conflict Severity (0 for low severity and 1 for high severity)

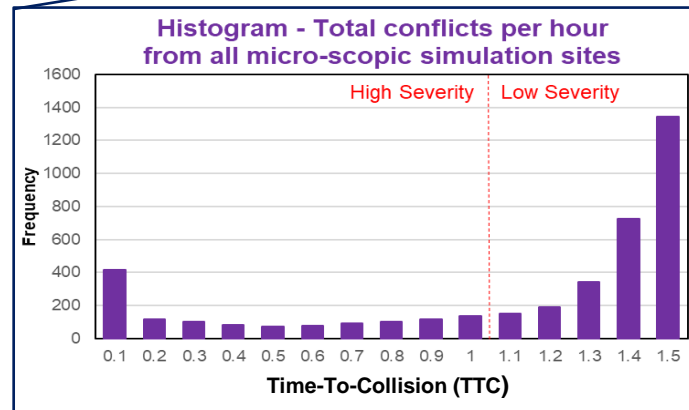
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Null deviance: 78733 on 62141 degrees of freedom

Residual deviance: 68154 on 62136 degrees of freedom

AIC: 68166

## Simulation Sites



# SHOW-Specific Policy Support Tool (PST)



- Originally developed in the LEVITATE project, the PST was adapted to assess impacts of autonomous shuttles **in real-world urban settings**.
- Updates included **city-specific data presets**, interactive guidance and a simplified interface based on stakeholder feedback.
- The **SHOW-PST supports cities** in integrating automation into mobility strategies.



This **Policy Support Tool (PST)** is an adaptation of the **LEVITATE Policy Support Tool (PST)** which was developed originally within the Horizon2020 LEVITATE project, aiming to quantitatively support decisions on **Cooperative, Connected and Automated Mobility (CCAM)** related interventions. The present PST adaptation has been developed to reflect the objectives and adapt to the specific needs of the **Horizon2020 SHOW** project, as foreseen in the SHOW proposal and grant agreement. The SHOW project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875530. The LEVITATE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824361. In order to access the original LEVITATE PST, please visit: <https://www.ccam-impacts.eu/>.



#### FORECASTING

The forecasting module, with the accompanying CBA sub-system, provides quantified and/or monetized output on the expected impacts of automation and CCAM related policies, featuring customizability of parameter quantities.



#### BACKCASTING

The backcasting module enables users to identify the sequences of CCAM measures that are expected to result in their desired policy objectives and monetize their implementation.



#### KNOWLEDGE


The Knowledge module contains the repository and recommendations of the LEVITATE project, including documentation of the project toolbox, results of the various methods, relevant literature from CCAM guidelines.

Within the context of the SHared automation Operating models for Worldwide adoption (SHOW) project, and following considerable stakeholder engagement, the **LEVITATE CATS Policy Support Tool (PST)** was reshaped to fit participant cities' needs regarding the calculation of CCAM-based urban public transport. The transformed tool constitutes an openly accessible, user-friendly dynamic tool, drawing from multidisciplinary scientific outcomes and highly compatible with any city and any amount of available data.

#### ABOUT SHOW

Shared automation Operating models for Worldwide adoption (SHOW) aims to support the migration path towards affective and persuasive sustainable urban transport, through technical solutions, business models and priority scenarios for impact assessment, by deploying shared, connected, cooperative, electrified fleets of autonomous vehicles in coordinated Public Transport (PT) and other CCAM applications. More information can be found in the project website: <https://show-project.eu/>

#### HORIZON 2020 PROJECT

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

#### CONTACT

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# Streets for Life

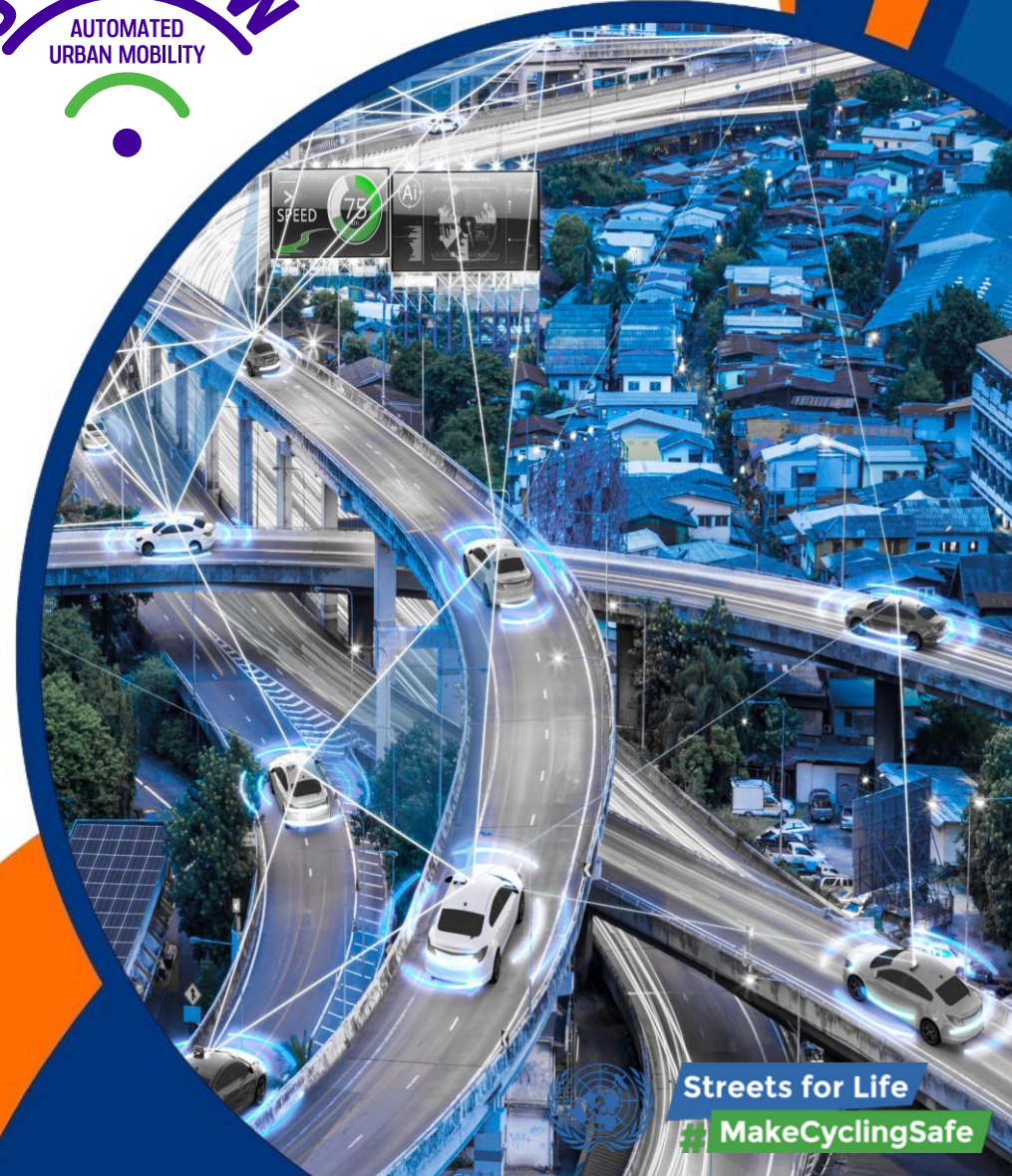
- **All road users benefit** as AVs reduce severe conflicts through cautious driving and lower speeds.
- Drivers face **fewer high-risk situations**, while they need to adapt to AV behavior, especially during unscheduled stops.
- Urban transport authorities can use these findings to **guide safe speed management** and AV integration.





# Scientific and Social Impact

- Reduction in overall traffic conflicts supports **safer, more automated mobility systems**.
- Scientific insights show AVs shift risks from **severe to low-severity incidents**.
- Encourage development of **smarter, adaptive AV technologies** and urban policies.





# Future Challenges

- Manage **AV speed profiles** to reduce risky interactions.
- Improve **AV response and communication** with human-driven vehicles.
- Develop **well-defined and concrete automation strategies** for a wider social adoption and road safety enhancement.





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