SHOW
AUTOMATED URBAN MOBILITY

UITP — ADVANCING PUBLIC TRANSPORT

Large-scale demonstration of AVs for shared mobility

United Nations WP.29/GRVA #16 | May 2023

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 (GA No. 875530)

Real-life services on open roads have started and will last until end of 2023

70 Automated Vehicles
Robotaxis, buses & shuttles

- From **12 to 30 months** of operation – and beyond grant period
- Covering **real mobility needs** and travel demand
- Residents, commuters, visitors, children, elderly, students
- **On-demand & shared** services
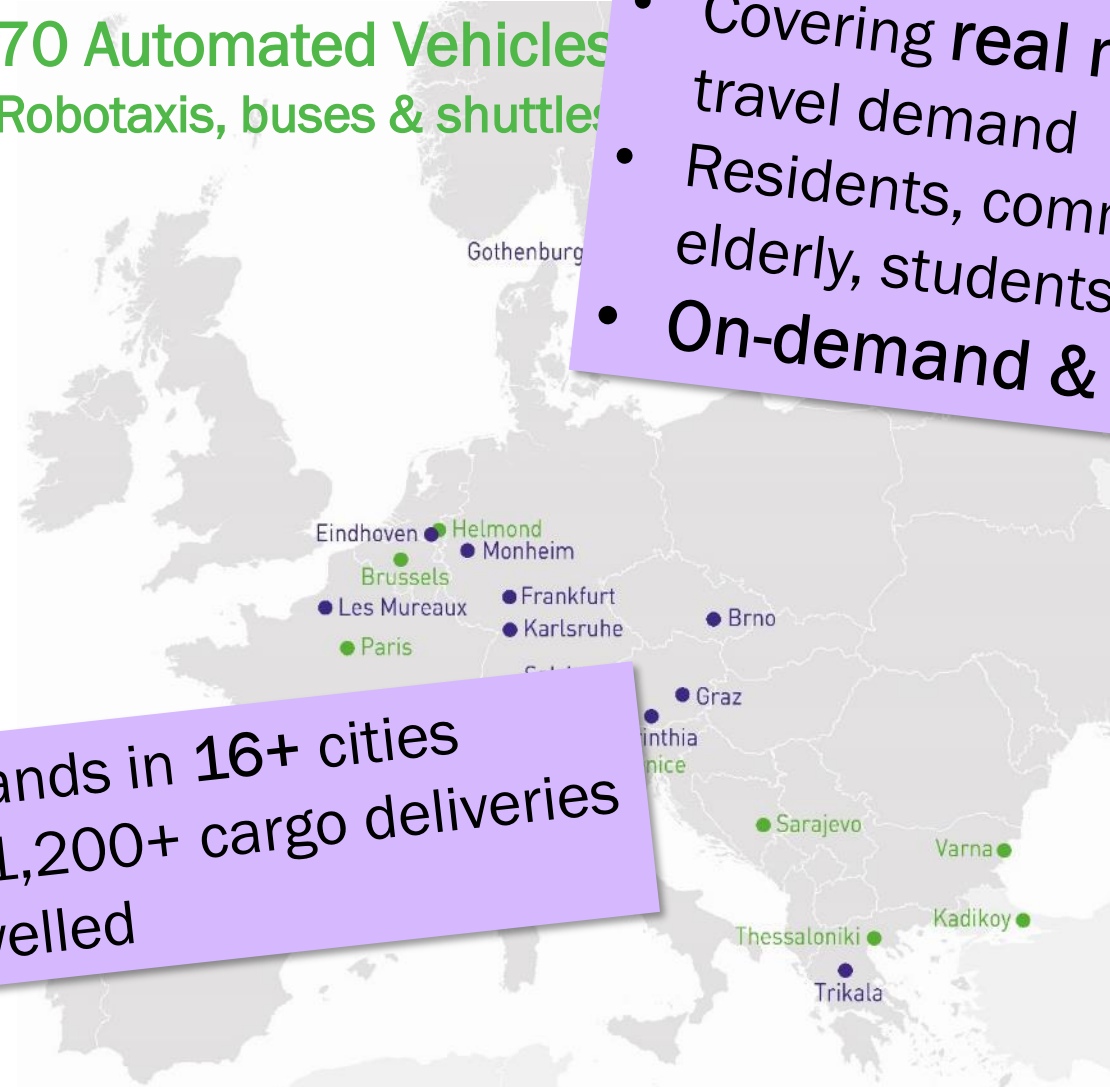
- **70+ AVs** multi-brands in **16+** cities
- **50,000+ trips** | **1,200+** cargo deliveries
- **120,000 km** travelled

Gothenburg

Eindhoven ● Helmond
● Monheim
Brussels
Les Mureaux ● Frankfurt
● Paris ● Karlsruhe ● Brno

● Graz
inthia
nice

● Sarajevo
● Varna

● Kadikoy
Thessaloniki ●

Trikala

SHOW pilots cover a diversity of services and innovations for shared mobility

Brno, Czech Republic
Retrofitted Grifo shuttles
Feeder services
Harsh weather environment

Karlsruhe, Germany
Retrofitted EasyMile shuttles
Driving behaviour +
Mix cargo/passenger
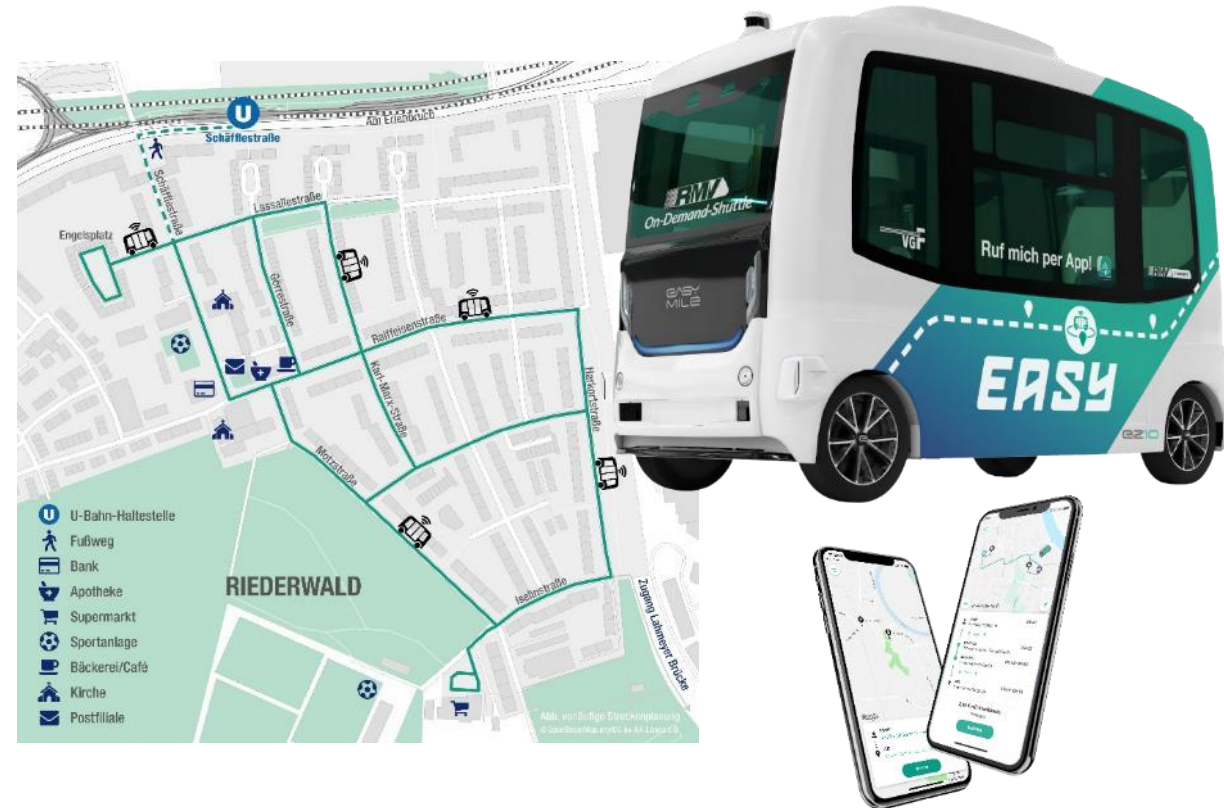
Crest, France
NAVYA shuttles
Rural services

SHOW pilots cover a diversity of services and innovations for shared mobility

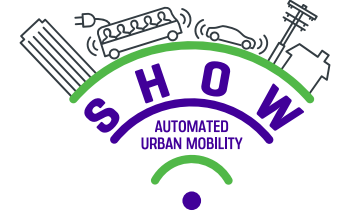**Madrid, Spain**
Retrofitted IRIZAR buses
Depot management

Frankfurt, Germany
EasyMile shuttles fully integrated
to public transit services

SHOW pilots cover a diversity of services and innovations for shared mobility

Graz, Austria
Retrofitted passenger car
Robotaxi
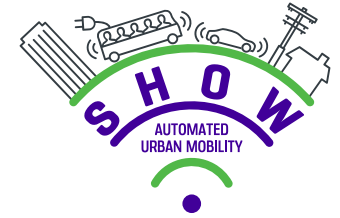Curb management at bus
terminal

Les Mureaux, France
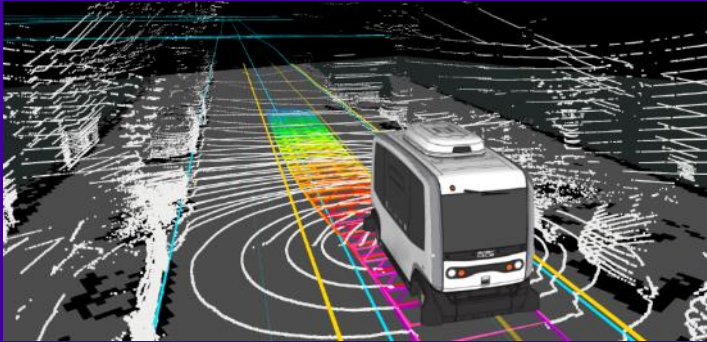No safety operator on-board
One remote supervisor for 3
shuttles

Trikala, Greece
Retrofitted vans
On demand Automated Mobility as
a complement of Public Transport

SHOW building blocks paving the way for Automated Shared Mobility
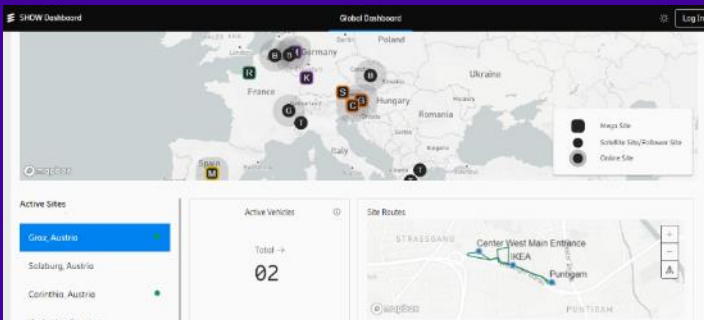

Technical development

Stakeholders' engagement

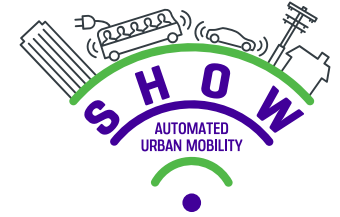**Business models & services**

Impact assessment

Guidelines & recommendations

Trainings for PTO/PTA & public

Credits: SHOW partners, www.shutterstock.com

Pilots' validation & commissioning

1. **Technical verification & commissioning phase**, on individual technical aspects, including the typical vehicles commissioning and other standard processes required from the legislation perspective, among others. Focus on automated driving vehicle **Safety, Performance, Communications and Cybersecurity.**

2. **Technical validation/commissioning on integrated service** level phase, Addresses **Safety, Performance and Quality of Service.**
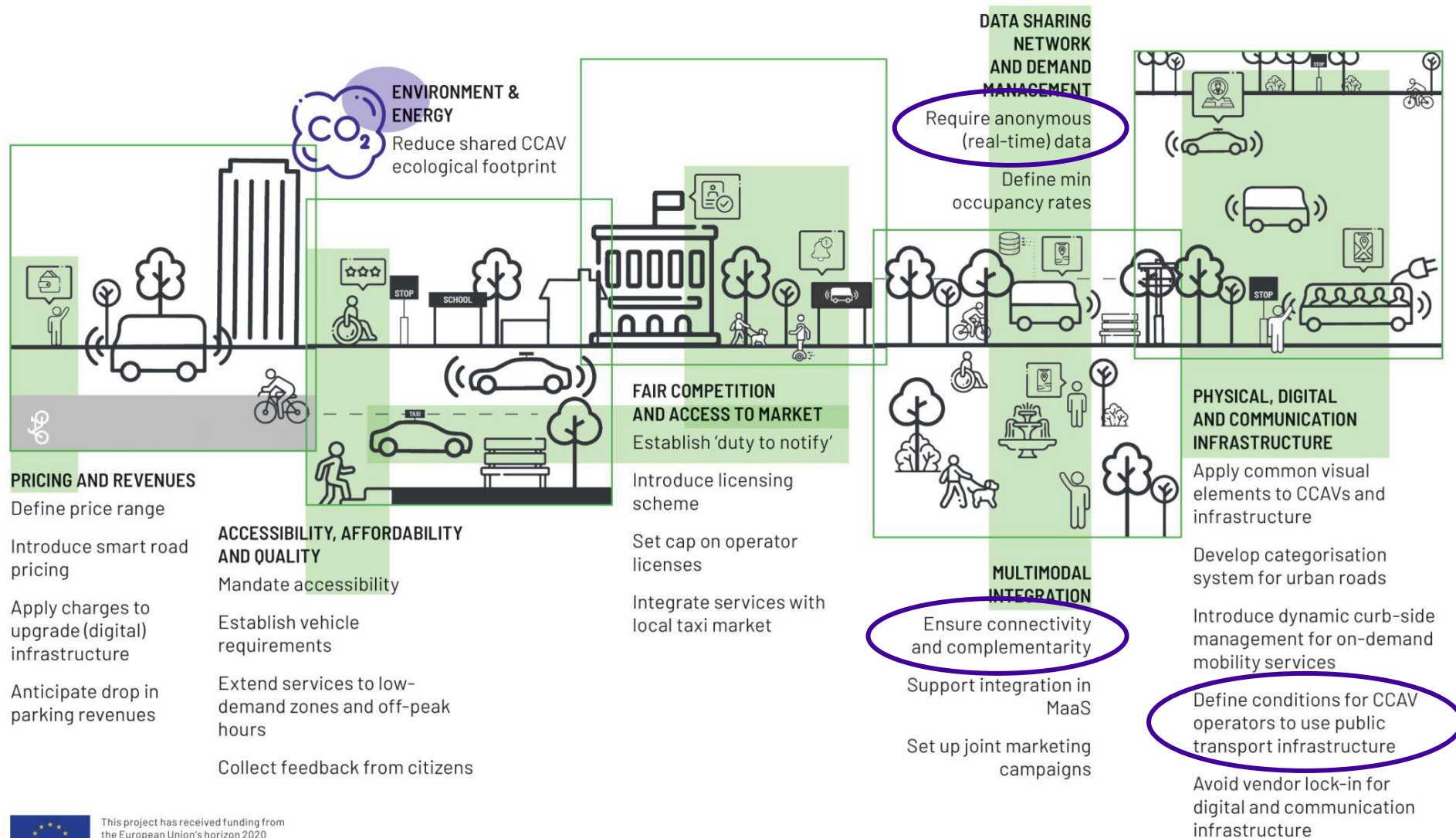
For instance:
- Safety test scenario 5: Handover to driver when approaching end of ODD
- Safety test scenario 6: Handover to driver due to emergency
- Risk assessment towards 17 cybersecurity threats, e.g., unauthorized access, code modification, jamming

RECOMMENDATIONS FOR ADAPTING REGULATORY STRATEGIES FOR SHARED CONNECTED, COOPERATIVE AND AUTOMATED VEHICLES (CCAV) AT LOCAL LEVEL

SHOW
AUTOMATED URBAN MOBILITY

ENVIRONMENT & ENERGY
CO_2
Reduce shared CCAV ecological footprint

DATA SHARING NETWORK AND DEMAND MANAGEMENT
Require anonymous (real-time) data
Define min occupancy rates

PRICING AND REVENUES
Define price range

Introduce smart road pricing

Apply charges to upgrade (digital) infrastructure

Anticipate drop in parking revenues

ACCESSIBILITY, AFFORDABILITY AND QUALITY
Mandate accessibility

Establish vehicle requirements

Extend services to low-demand zones and off-peak hours

Collect feedback from citizens

FAIR COMPETITION AND ACCESS TO MARKET
Establish 'duty to notify'

Introduce licensing scheme

Set cap on operator licenses

Integrate services with local taxi market

MULTIMODAL INTEGRATION
Ensure connectivity and complementarity

Support integration in MaaS

Set up joint marketing campaigns

PHYSICAL, DIGITAL AND COMMUNICATION INFRASTRUCTURE
Apply common visual elements to CCAVs and infrastructure

Develop categorisation system for urban roads

Introduce dynamic curb-side management for on-demand mobility services

Define conditions for CCAV operators to use public transport infrastructure

Avoid vendor lock-in for digital and communication infrastructure

*More information:* https://show-project.eu/media/deliverables/ *D3.3 Recommendations for Adapting Regulatory and Operational Strategies for CCAV deployment at Local and Regional Level*

EURO CITIES

Lessons Learned, impacts & transferability
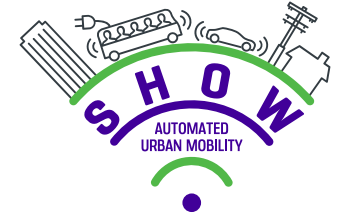
- The future of **Public Transport is on-demand & shared**
  - → *Automated operation is the next evident step*

- Business cases are envisioned <u>if regulations enable operations</u>:
  - without extra **speed limitation** for AVs
  - at intersections without **constant interventions** of safety operator
  - integrated in PTO **fare systems**
  - With *reasonable/fair* **data set exchange** between private/public
  - *Middle term:* with more robust & **homologated / diversified** vehicles
  - *Longer term:* without a **mandatory safety operator** on board

International Collaborations in SHOW
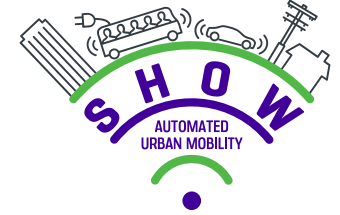
- US
  - Exchanges on **Accessibility of automated public transport services** with US-DOT Volpe Center
  - Cooperation on **robotaxi** services with the University of San Francisco / Cruise (NDA in preparation)
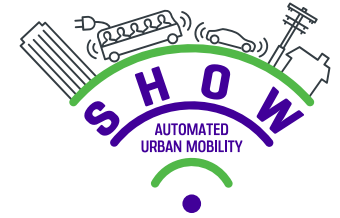
- Japan
  - MoU signed in October 2021
  - Identification of topics:
    - AV driving behavior
    - Regulations
    - Public perception of shuttles services
  - Joint events (ITS WC, TRA, etc.)

Other collaborations are happening at academic levels with the George Institute of Health, the National Cheng Kung University (NCKU), & the Beijing Jiaotong Technical University.
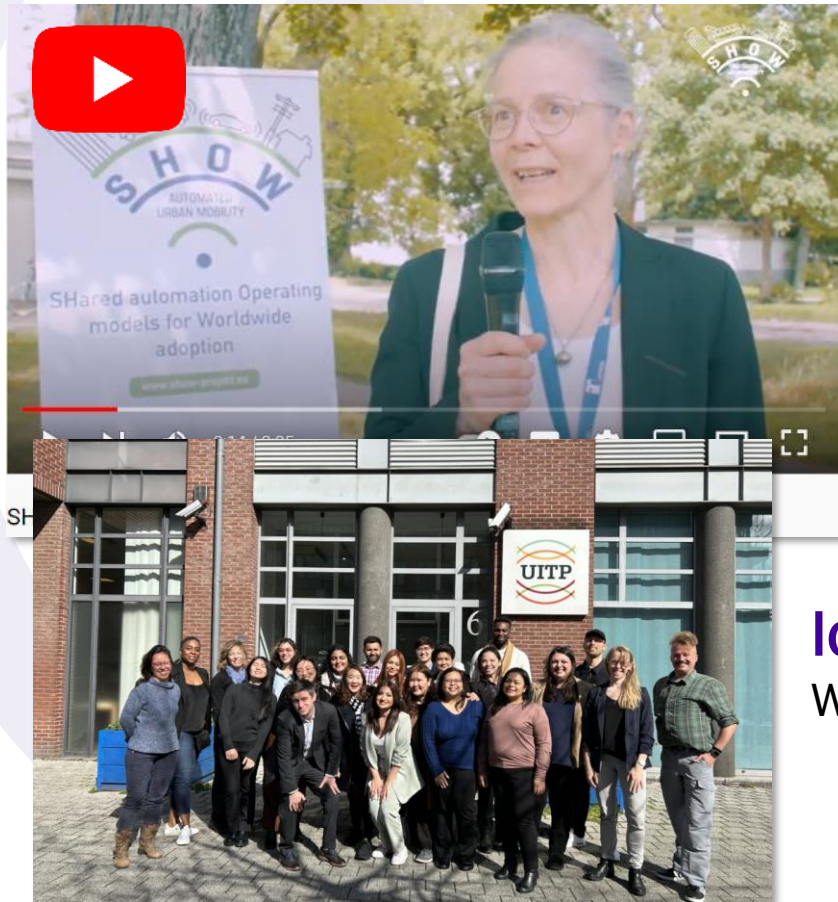
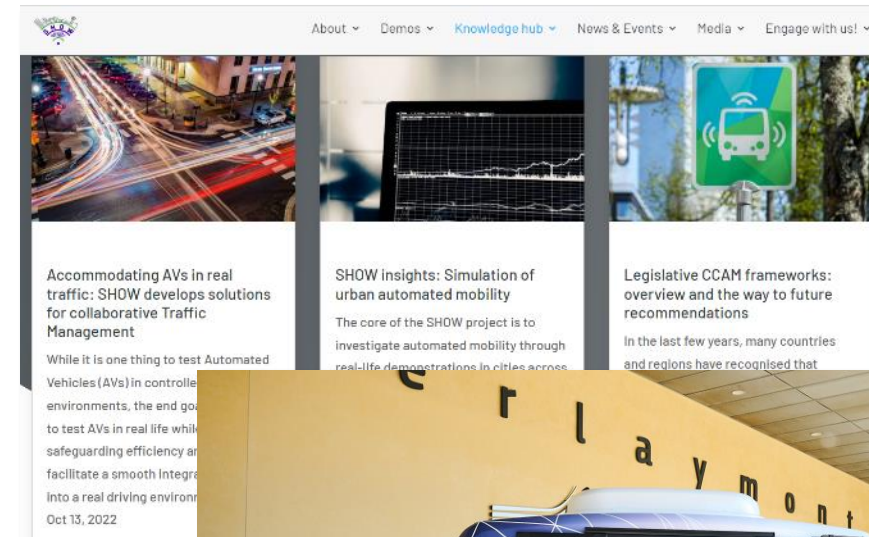# Dissemination activities

Demo videos on YouTube
3000 views*

Podcast
1200 downloads*

AUTOMATED MOBILITY
THE PEOPLE BEHIND THE WHEEL

All-public articles
https://show-project.eu/insights/

Accommodating AVs in real traffic: SHOW develops solutions for collaborative Traffic Management

While it is one thing to test Automated Vehicles (AVs) in controlled environments, the end goal is to test AVs in real life while safeguarding efficiency and facilitate a smooth integration into a real driving environment

Oct 13, 2022

SHOW insights: Simulation of urban automated mobility

The core of the SHOW project is to investigate automated mobility through real-life demonstrations in cities across

Legislative CCAM frameworks: overview and the way to future recommendations

In the last few years, many countries and regions have recognised that

Ideathons
With students & citizens

V.I.P. events
https://show-project.eu/news/

*Accessed in May 2023

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