Implementing Automated Vehicles in Urban Public Transportation

The case of CityMobil2, lessons learnt & follow up activities of the AVINT project at the city of Trikala

A Holistic Approach for Automation

- From isolated automated elements towards…

Automated Transport Systems

- An Automated Transport System (ATS) is an innovative holistic mobility concept, where all its different elements (i.e. vehicle, travellers, public transport, infrastructure, operations and control) are capable of self-organizing and operating at an "automated" manner, addressing in real time the needs of all and each participant of a specific traffic scenario, applying different levels of automation and supporting all transport modes for both passenger and freight

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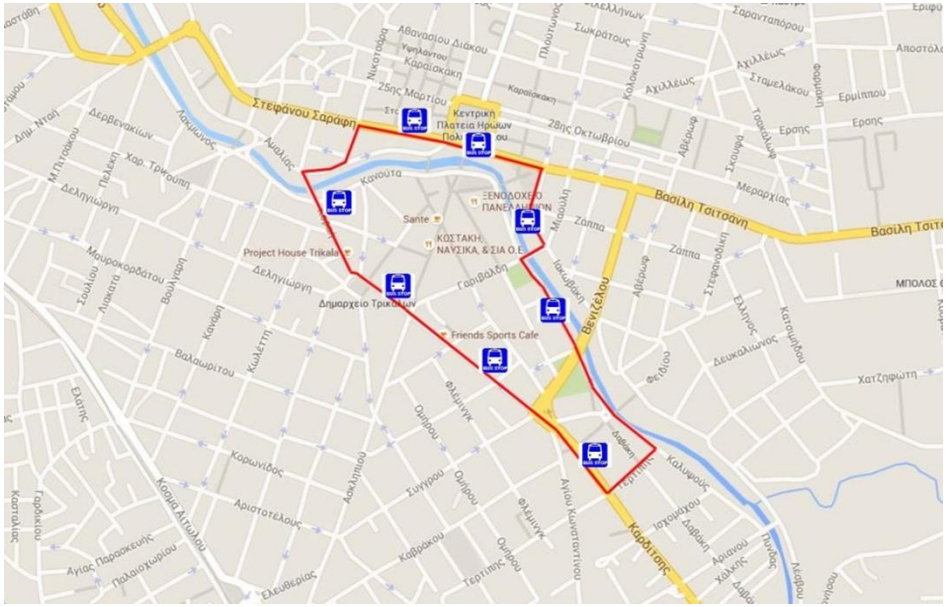
Automation and CityMobil2

- CityMobil2 **did not demonstrate** automated vehicles .
- CityMobil2 **demonstrated** automated road transport systems, implemented in several urban environments across Europe (Large scale demos - Saint-Sulpice, La Rochelle and Trikala).
- CityMobil2 vehicles were **operated** without a driver in collective mode.
- The CityMobil2 automated transport system supplied a good transport service (individual or collective) in areas of low or dispersed demand **complementing** the main public transport network.

CITY OF TRIKALA / BUS LANE & STOPS

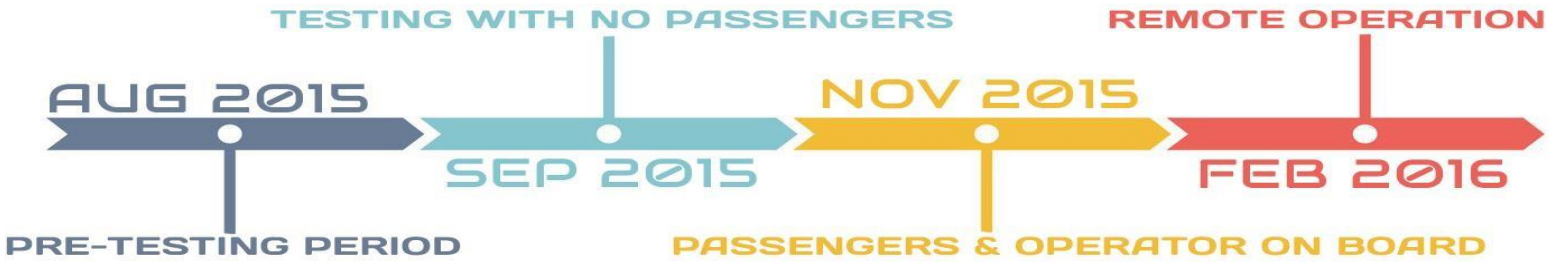
- Central Greece
- 92,000 overall population (extended municipality)
- Main economic activities
  - ✓ Agriculture
  - ✓ Tourism and
  - ✓ ICT

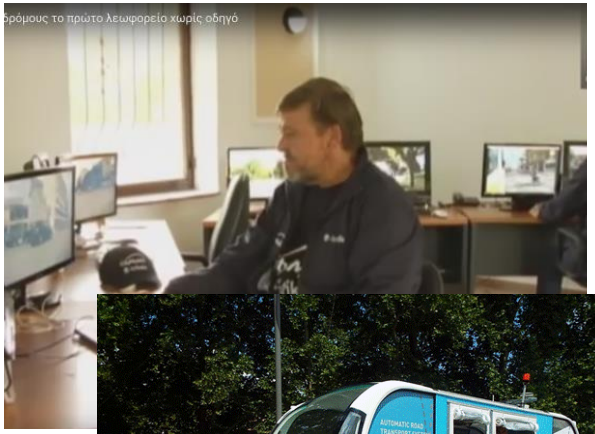


The route:

- Mixed all types of road network, pedestrian pathways, mild, normal and high traffic, near the central bus terminal
- Intersected with conventional traffic
- Operated in the city center serving multi purposes and offering solution to a number of everyday city issues
- Initiated and promoted Green transport behavior

TESTING & OPERATION





- ✓ Operator on remote control center & on board (Scalable Demo)
- ✓ 10-passengers vehicle (2 vehicles in operation at all times)
- ✓ Remote Emergency button
- ✓ Design for ALL
- ✓ Mobility scheme adjusted to the city needs and constraints

Data collection

Data from:

- ➢ sensors/cameras installed on the vehicle,
- ➢ traffic management system and
- ➢ traffic lights

Road Adjustments

- ❖ Dedicated lane (courtesy to the municipality and the citizens)
- ❖ Light segregation (cat's eyes)
- ❖ 7 new (or modified) traffic light installed that are in communication with the vehicle and the operation center

TRIKALA DEMO – THE FIGURES

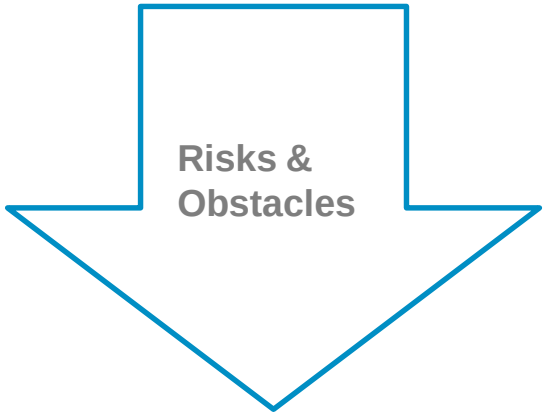
1,490
Number of total routes

3,580 km
Total distance covered

12,138
Total number of total passengers on board

BENEFITS & OBSTACLES

1. High rate of user acceptance and satisfaction
2. Touristic attraction and media coverage
3. Significant experience gained
4. City adjustments that can be used beyond CityMobil2
5. A shift in citizens way of mobility thinking



1. Need to gain the citizens cooperation well in advance
2. Legislation issues are (and will be) cumbersome
3. New mobility schemes in old cities – fit the circle in the square

LESSONS LEARNT

Conclusions

- Trikala was a successful demonstration in terms of i) safety, ii) acceptance and iii) attractiveness
- People realized that automated vehicles are the future of driving however prefer partial automation (29%) from fully automation (13%)
- Speed needs to improve without jeopardising safety – True Business cases need to be developed

Recommendations

- ARTS is not a plug-in technology – Cities are to play a dominant role in implementation
- We need to address: High vehicle purchasing cost, Legal liability, Cybersecurity issues
- The technology should be largely presented to the wider public – it is no more a futuristic experiment but a living technology
- ARTS should be integrated with the real urban transport network – heavily segregated lanes give the impression of a standalone system that is not permanent and cannot be integrated

CITYMOBIL2 AT TRIKALA

VIDEO

FOLLOW UP ACTIVITIES - THE AVINT PROJECT

Based on the CM2 experience

- AVINT will implement an automated bus line **extending** the Trikala transport network
- Attempting the **long-term use** of automated vehicles in the city transport network

AVINT will:

- Study the impact of the automated bus line on the traffic network (center – university – central bus terminal)
- Study the dimensioning of the line and the foreseen RoI
- Create the infrastructure to allow the permanent line operation (technical and legislative)
- Procure of 2 automatic vehicles
- Pilot test of the transport line for 6 months
- Evaluate traffic results, functionality, acceptance by the public, financial viability and scalability

FACTS

- National funded project
- 3 partners
- Budget: 1.000.000
- Duration: 3 years

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