

AutoMotive Week 2017 Where Smart Mobility meets Traffic

MAVEN project: sharing dynamic intelligence between vehicles and infrastructure

## MAVEN

### (Managing Automated Vehicles Enhances Network)

www.maven-its.eu



AutoMotive Week, Helmond, 28 March 2017



Commission



# **General information of MAVEN**

Project period

- ✓ 01-09-2016 ~ 31-08-2019
- Funded by EC Horizon2020 Research & Innovation Programme
  - ✓ Budget: EUR 3,149,661.25
    - Nine partners from five countries: DE, NL, CZ, BE, UK
- Main goal
  - Enhancing intelligent urban road transport network and cooperative systems for highly automated vehicles



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**Consortium partners** 

dynniq

energising mobility



HYUNDAI

MOTOR GROUP

**Gemeente Helmond** 









TU CZECH TECHNICAL UNIVERSITY IN PRAGUE



TRAFFIC MANAGEMENT



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MAVEN is funded by the EC Horizon 2020 Research and Innovation Framework Programme, under Grant Agreement No. 690727

### **Project summary**

- Management regimes for automated driving in urban areas
- Monitoring, support and orchestration of movements of road users to guide vehicles at signalised intersections
- Further enhancement for ADAS and C-ITS applications





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#### MAVEN concept and scope Road Authorities Roadmap





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### **Assessment approach**





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# Scenarios (1/2)

#### Initialization



Joining a platoon



Vehicle order

- Speed/lane change
- Passive I2V-initiated
- Active I2V-initiated





• Break-up



- Reorganisation of roles
- Platoon split or dissolving



- I2V or V2V initiated
- V2V organised
- Speed/lane change
- · Vehicle order



- Due to non HA vehicle
- Reorganisation of roles
- Re-negotiation behaviour
- New signal timing





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# Scenarios (2/2)

#### Speed changes



- Prepare to stop
- Unexpected situations
- Corridor GLOSA
- I2V: platoon size



Lane changes

- Lane load balancing
- Obstacle avoidance
- Local detours

Departure from intersection



- Min start delay
- Coordinated crossing
- Low internal delay





- Make way
- Trajectory changes



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### **MAVEN** facilities

- Helmond pilot
  - ✓ offering ICT infrastructure with all major intersections equipped with cooperative RSUs; the adaptive traffic control algorithm ImFlow
- Braunschweig pilot
  - ✓ offering the latest with respect to infrastructure detection as part of the Application Platform for Intelligent Mobility (AIM) test site; stereo video detection combined with radar and hemispherical dome camera's enable the infrastructure to enhance the safety of automated driving
- Prague and Greenwich simulations
  - impact assessment of scaling up the MAVEN use cases such as platoon orchestration, Green Light optimal Speed Advice, enhanced queue modelling and green wave with platoon priority







# General concept of in-vehicle architecture for fully-automated cooperative vehicle





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## **MAVEN high level simulation architecture**





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### **MAVEN** benefits



#### Infrastructure service providers

MAVEN is testing cost-effective technical solutions for the deployment of autonomous vehicles using real-world prototype vehicles and traffic simulation studies



#### Cities

MAVEN is helping road authorities and cities reach the understanding of the requirements for a smooth transition towards integrated, safe and sustainable automated vehicles and their impact



#### **Automotive industry**

MAVEN is developing C-ITS communication standard interactions between vehicles (V2V) and the infrastructure (V2I) to support platooning, negotiation and scheduling algorithms





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When do you think 10% of the vehicle fleet in your city will be automated vehicles?

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Mentimeter

22

5 4 1 0-5 5-10 10-20 20-30 30+ years years years years years Previous session @backtocurrent

Is your local authority preparing for the introduction of automated vehicles?

Mentimeter



Which vehicle class has the most potential for automation?

Mentimeter



What are the most critical issues in your city related to mobility and infrastructure [no spaces]?



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What is MAVEN for you [no spaces]?



Thank you!

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