

**46<sup>TH</sup> ASECAP STUDY & INFORMATION DAYS**

# *The Role of the Infrastructure Investments in the New EU Road Mobility Package*

*Grand Hotel Union, Ljubljana, Slovenia  
6-8 June 2018*

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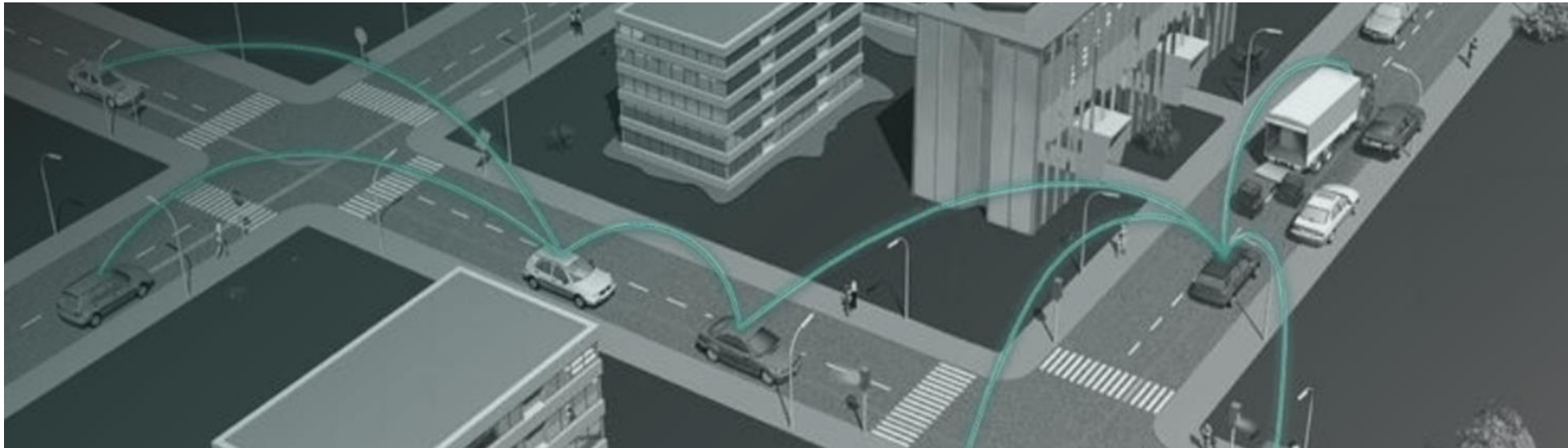
Organized by



# C-ROADS Cooperative Corridor

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# Agenda

- C-ITS pilot – Prague City and D5 as the first steps
- Cooperative corridor around Prague - part of C-Roads
- C-Roads CZ project roadmap
- Introduction of project partners

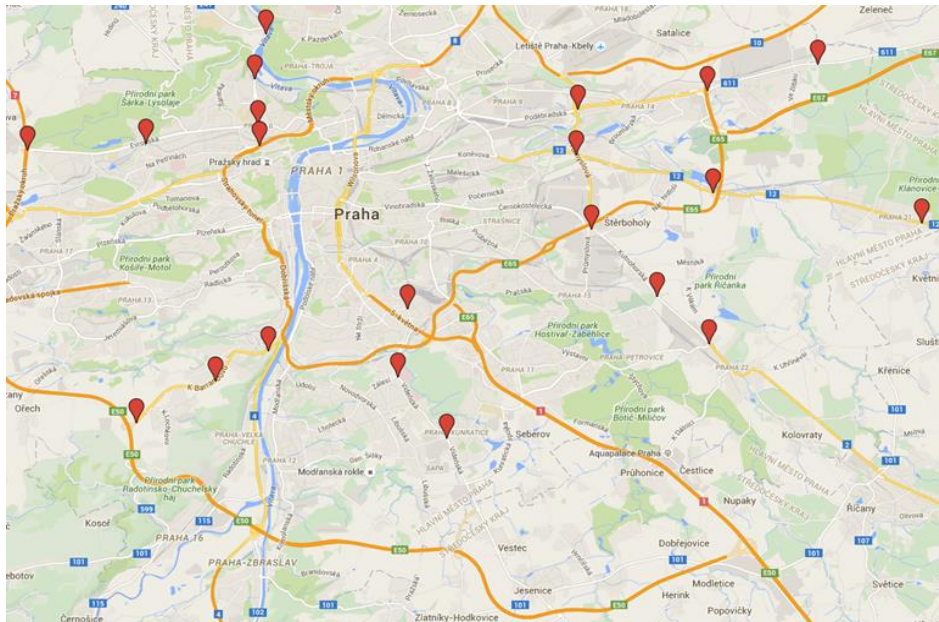
# C-ITS PILOT ON D5 MOTORWAY



- Responsibility of Road and Motorway Directorate
- Primary focus on V2V and V2I communication itself
- Deployment of C-ITS backoffice, 2 Road side units
- 4 Maintenance vehicles and warning trailers equipped with Onboard units
- Monitoring of maintenance and its performance
- Only basic use-cases tested

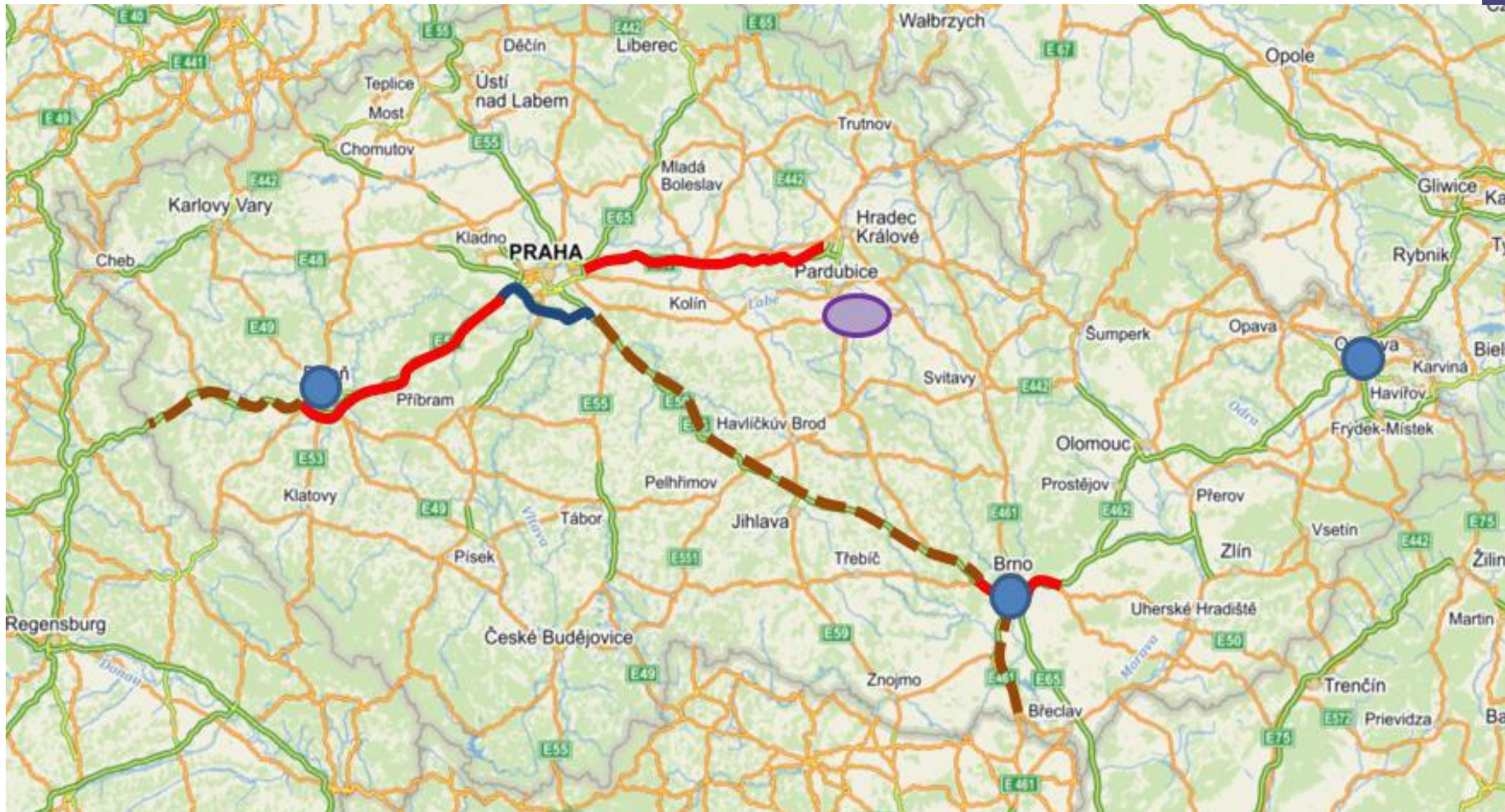
# Prague C-ITS as a subsystem of the main TMS

- 21 RSUs at main access trunks to Prague
- 2 testing OBUs
- Deployment 9/2015-11/2015
- In operation since 12/2015



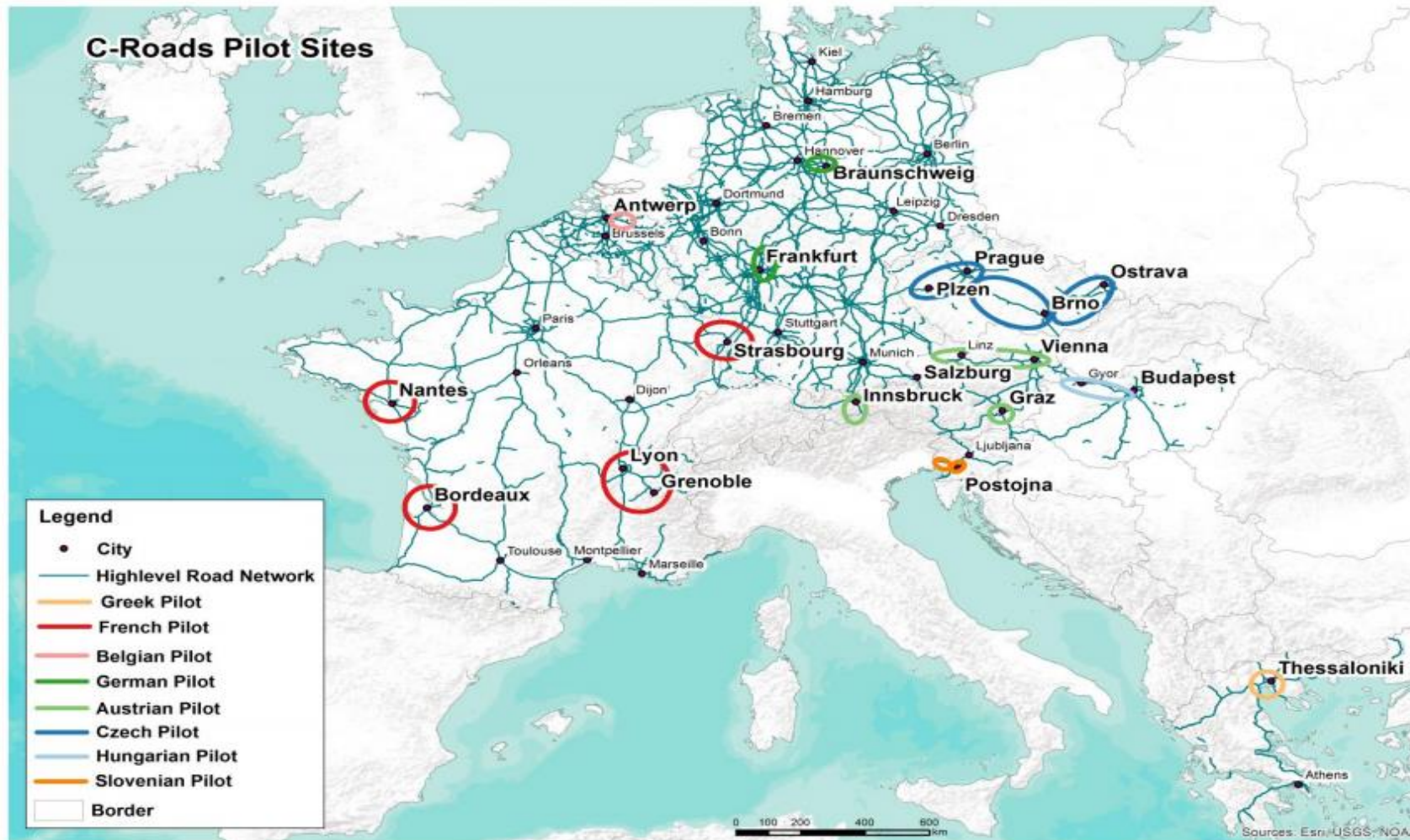
Both projects helped to set up recommendations for future C-ITS in technical, legal and operational aspects

# C-ROADS CZ: MAP OF CZECH C-ITS DEPLOYMENT SITES



# C-ROADS : MAP OF EUROPEAN C-ITS DEPLOYMENT SITES

## Concept of C-Roads – Pilot sites



# C-ROADS - CZ overview

- Core member of the C-Roads Platform
- Duration Q3/2016 – Q4/2020
- Total project budget 18,9 mil. €
- 85% CEF funding
- 9 (+4) project partners
- 6 deployment phases in different environments
- 10 (+ 2) use cases
- hybrid C-ITS solution



# C-ROADS -CZ roadmap

- 2016 Cooperative corridor around Prague – interconnection between highways D5 and D1 2016
- 2018 Brno aggregation extravilan cooperative corridor running RFP process
- 2019 Cooperative corridor along D5 Pilsen-Prague
- 2019 Cooperative corridor along D11Prague - HK
- 2018-2019 Intravilan Brno, Ostrava Pilsen
- Full completion by end of 2019
- 2019 two rail-crossing sites
- 2020 Testing of overall operation and use-cases including cross-border interoperability testing
- The overall investment at 6,5 M EURO for projects owned by RSD is being sponsored in 85% by EU

# Cooperative corridor around Prague

- First part of C-ROADS project in Czech
- 46 km stretch
- Maintained by two highway maintenance centres – Mirošovice & Rudná
- Road with the highest traffic density in CZ
- 2 tunnels (total of 3,6 km), 1 flyover (2,7 km)
- Dedicated traffic management centre in Rudná (incl. management of tunnels)
- Dynamic lane management systém
- Other ITS equipment (loops, CCTV cameras, tolling, height measurement...)
- 29 ITS G5 Roadside units incl. Bluetooth and Wifi detection
- 5 on-board units (OBU) + 43 Road-vehicle units (RVU)
- Dedicated C-ITS back office



# First experience and lesson learned



- ITS G5 coverage varies greatly, up to 2km, good overall coverage of the corridor
- Difficulties when integrating into existing systems (roadworks trailers, national traffic centre) – same issue expected in cities (traffic light controllers)
- Existing tolling system - 5,8/5,9 GHz interference had to be dealt with
- Presenting information to the driver – highly important and difficult task!
- Standardization  $\neq$  Interoperability  $\rightarrow$  harmonization needed
- Security still an issue – common European C-ITS security policy is not fixed

# Brno aggregation cooperative corridor

- Next phase of C-ROADS project
- Responses to RFP submitted on 26 April (now being evaluated)
- 25 RSUs, 70 OBUs + RVUs and integration into the C-ITS
- Bluetooth and Wifi detection
- Deployment expected at the end of 2018

# Brno aggregation cooperative corridor

## Use cases



- The following use cases specified by Steering committee of C-ROADS will be implemented and tested:
  - Road Works Warning (RWW)
  - Probe Vehicle Data (PVD)
  - Slow and Stationary Vehicle (SSV)
  - Collection of additional road information
  - In-Vehicle Information (IVI)
  - Emergency Vehicle Approaching (EVA)
  - Traffic Jam Ahead (TJA)
  - Weather Conditions Warning (WCW)
  - Electronic Emergency Brake Light (EEBL)
  - Hazardous Location Notification (HLN)

# Next phases of C-ROAD CZ

- Cooperative corridors between Pilsen (D5) – Prague – D11 Hradec Králové planned at 2019
- RFP will be released in 2018, most probably after first successful testing within current project around Brno
- About 75 RSUs and 200 OBU+RVUs expected
- Integration with City systems in Pilsen, Prague, Brno and Ostrava
- 2020 full deployment with proven operation and functionality including tested cross-border operation with other partners deploying C-ROADS projects in European scale