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Safe I Secure I Green I Integrated I Resilient

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C-ITS operation across Europe

Intelligent Transportation Systems: A Global Perspective

Martin Böhm
martin.boehm@austriatech.at
AustriaTech / C-Roads Platform

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Facts on C-ITS

- In Europe wide scale C-ITS deployments are a reality

- Without cooperation, that would not have happened
  - Cooperation between authorities
  - Cooperation between road operators
  - Cooperation with the car-industry

- Connectivity is a key enabler for C-ITS
- but the willingness to cooperate and the trust between all stakeholders forms the basis for the status quo

- The current deployment status forms the basis for further research and development activities

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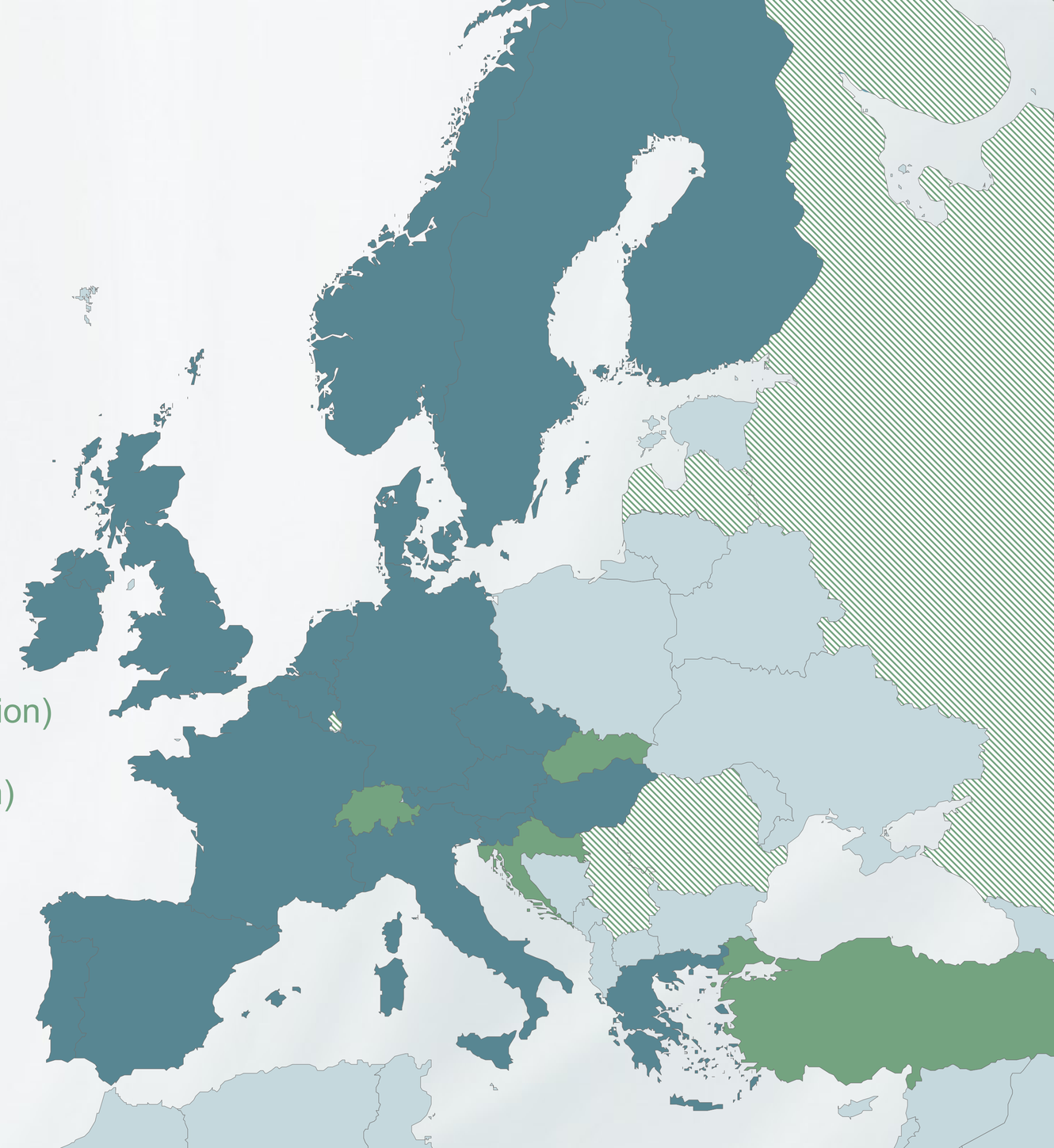
2016: Eight founding Member States

2017: Enlargement to 16 States

2019: Further enlargement to 18 States

Associated Countries

- Australia (Queensland, Victoria)
- Croatia
- Israel
- Latvia (in negotiation)
- Luxembourg (in negotiation)
- New Zealand
- Romania (in negotiation)
- Russia (frozen)
- Serbia (in negotiation)
- Slovakia
- Switzerland
- Türkiye



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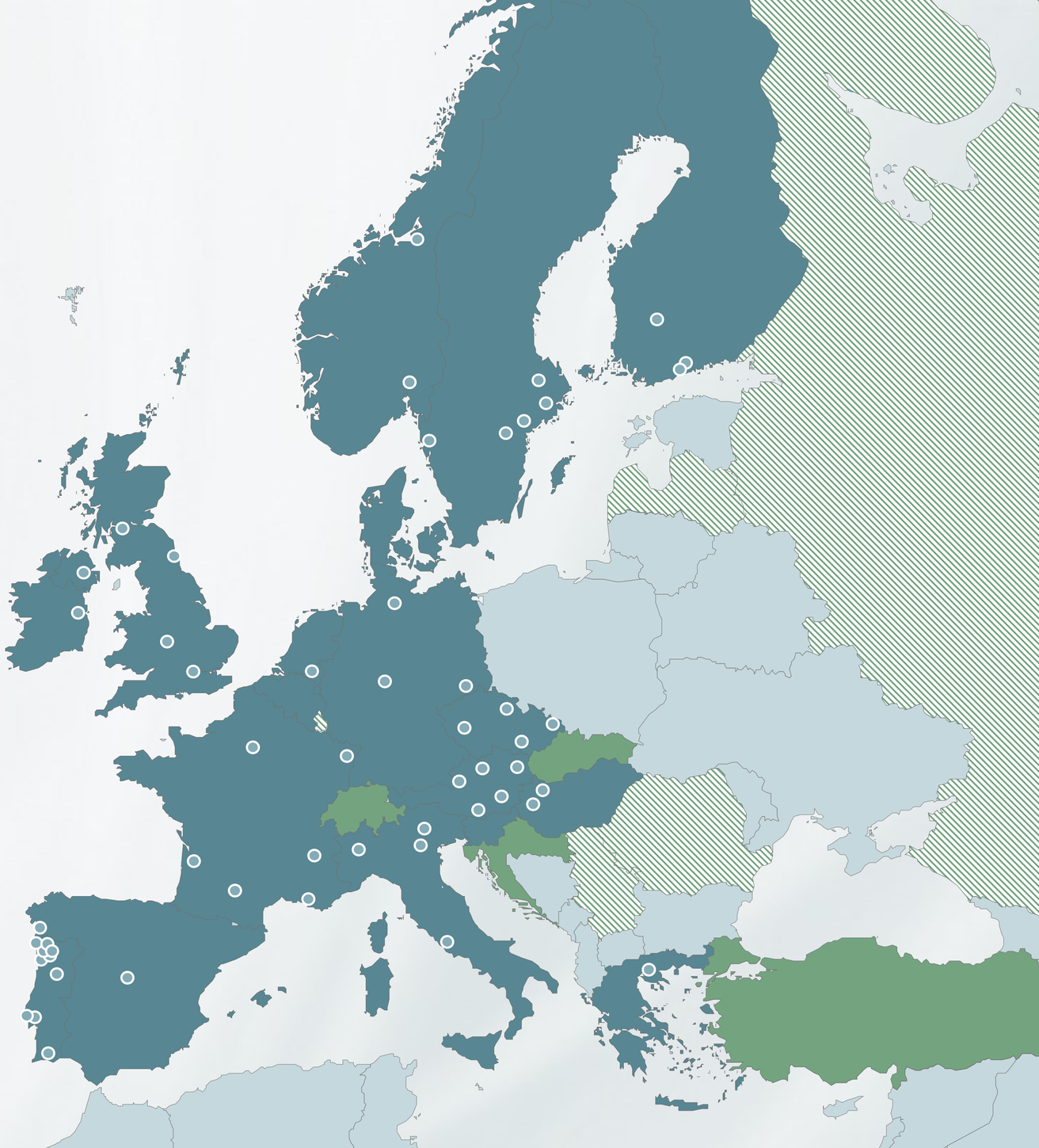
> 50 European cities
Starting with C-ITS deployment in urban areas

Short range C-ITS
20,000 km of European road sections
are equipped with C-ITS equipment

Long range C-ITS
100,000 km of European roads in total
are covered by C-ITS services

approx. 1.5 M C-ITS equipped vehicles
are connected and exchange information



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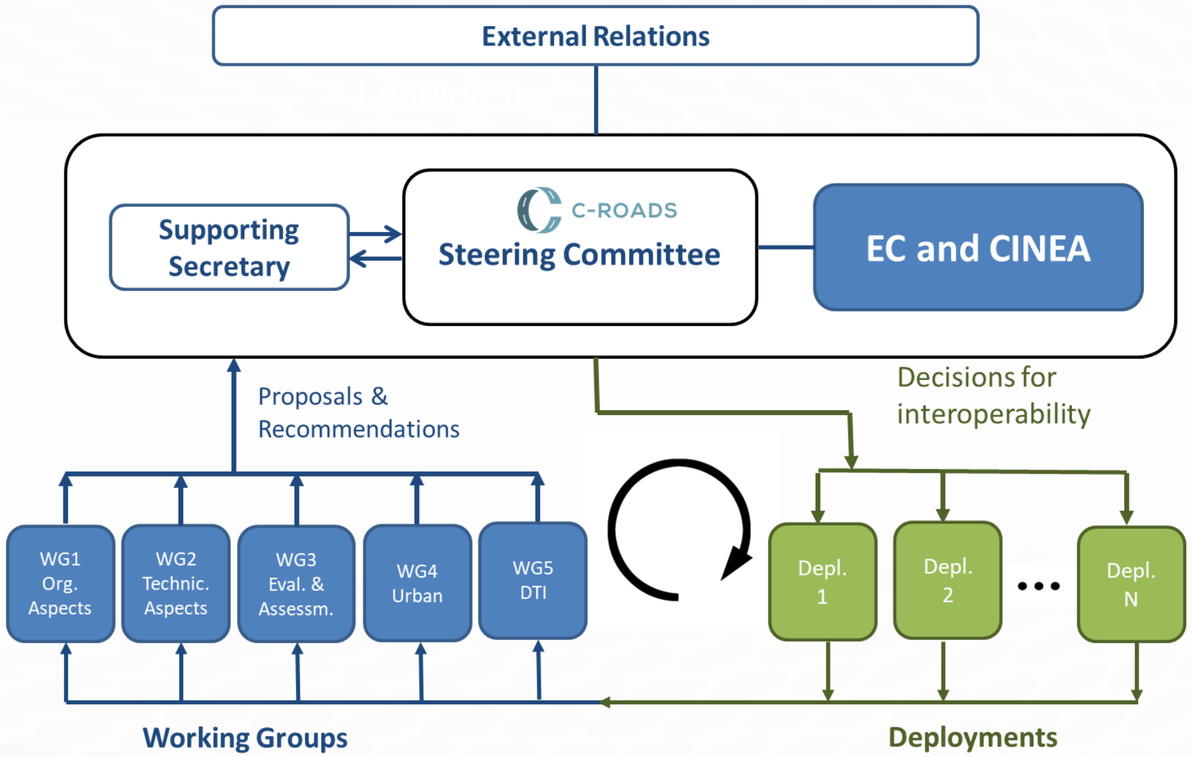
The aim of the C-Roads Platform

Starting in 2016 the aim was to

- link all **C-ITS deployments** across Europe
- develop, share and publish common **technical specifications** (including the common communication profiles) – available at www.c-roads.eu
- plan intensive cross-testing to verify **interoperability**
- develop system tests based on the common communication profiles by focusing on **hybrid communication** mix, which is a combination of ETSI ITS-G5 and operational cellular networks.



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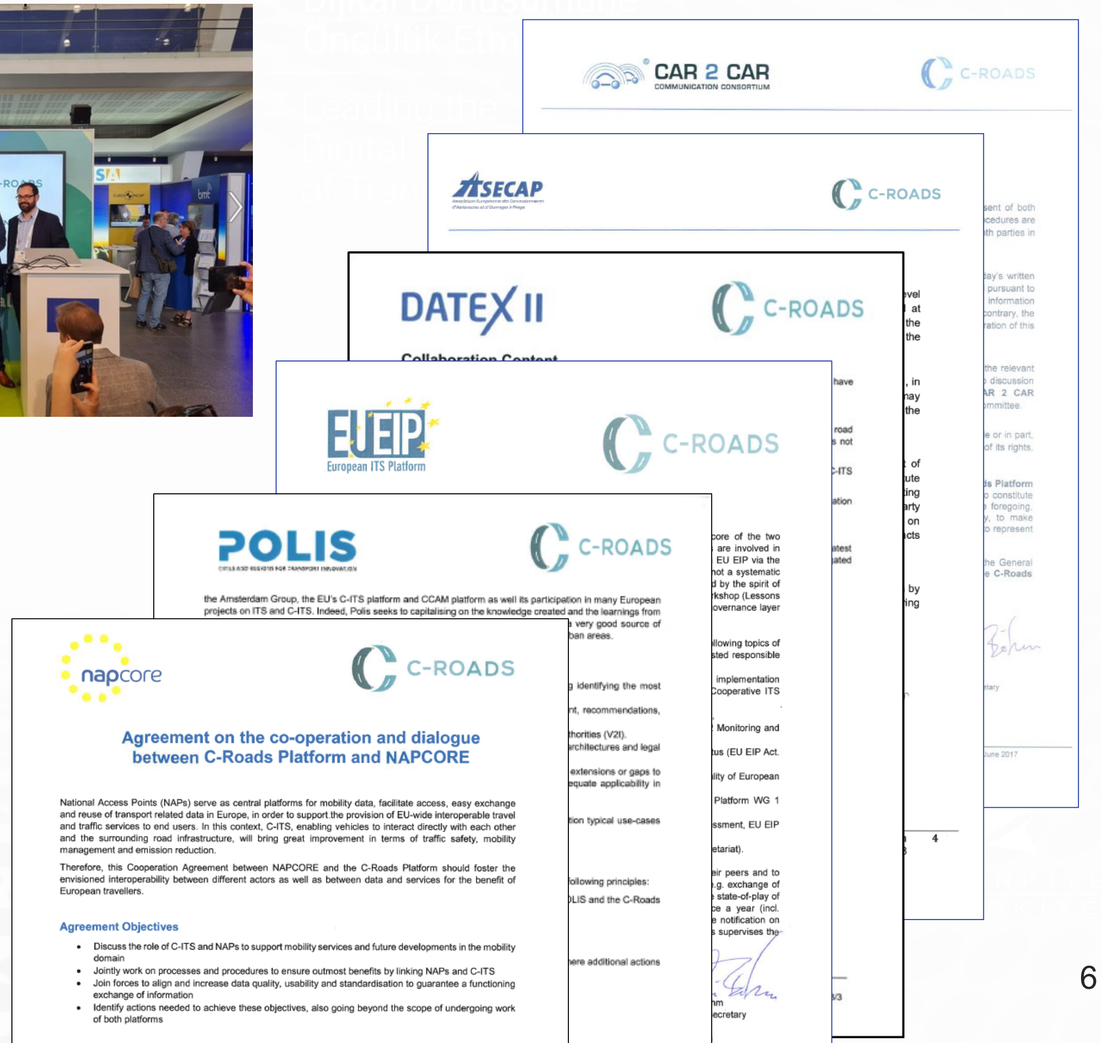
Cooperation as key factor for success



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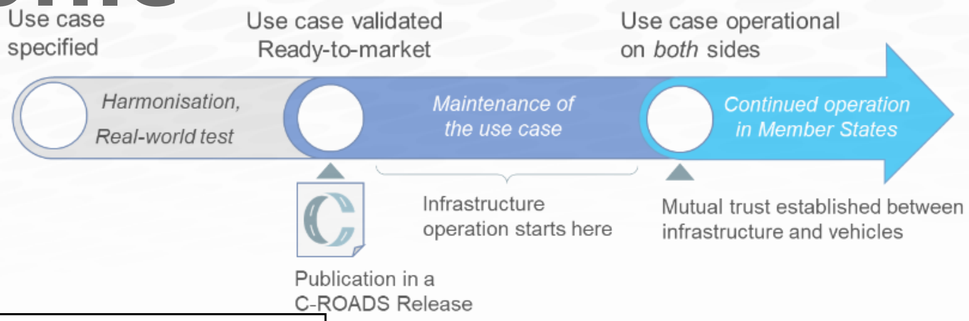
Publication of the Communication Profile



- Rel. 1.0 published on 14th of September 2017
- Rel. 1.3 published on 23rd of October 2018 (harmonised with the Car 2 Car Communication Consortium)
- Rel. 1.5 published on 8th of July 2019 – including the specification for interoperability of backend hybrid C-ITS communication
- Rel. 1.7 published on 7th of August 2020 – includes the “Cross-Border Testing and Validation Concept”
- Rel. 2.0 published on 30th of September 2021 – the first full hybrid specification
- Rel. 2.0.1 released on 16th of December 2021
- Today we stand with Rel. 2.1.0

- Access: https://releases.c-roads.eu/

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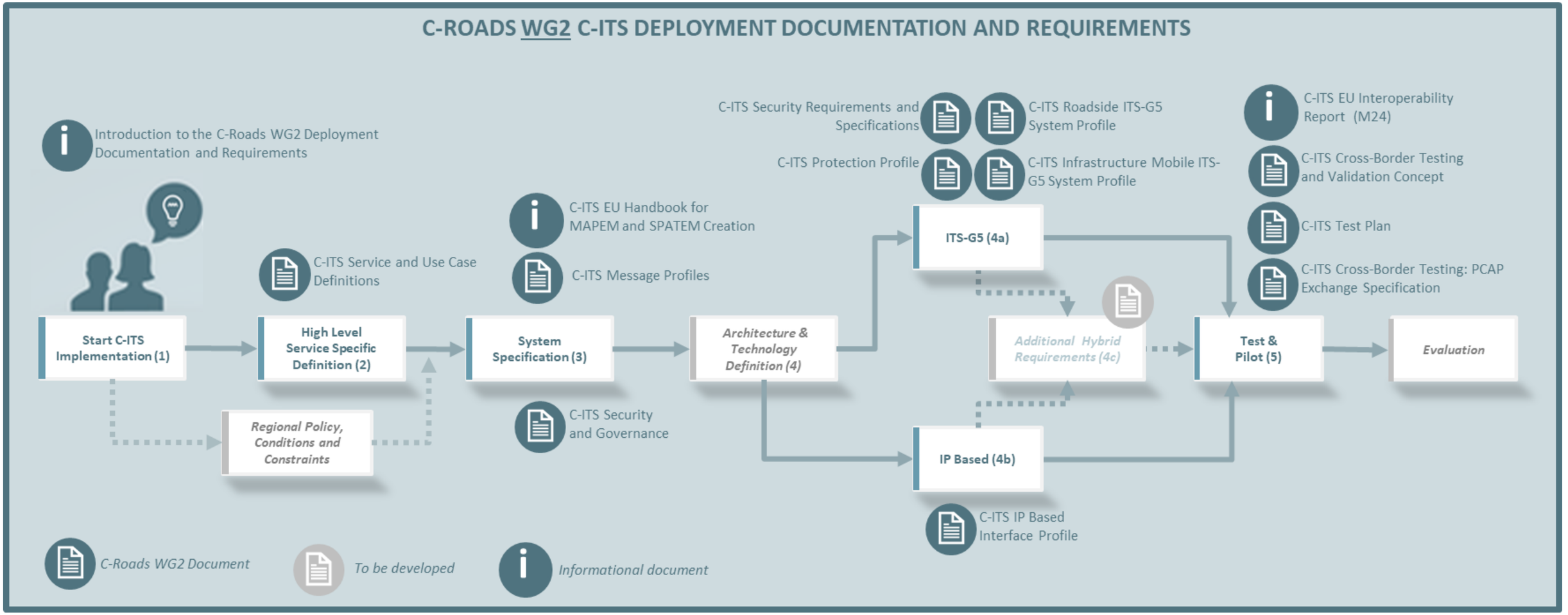
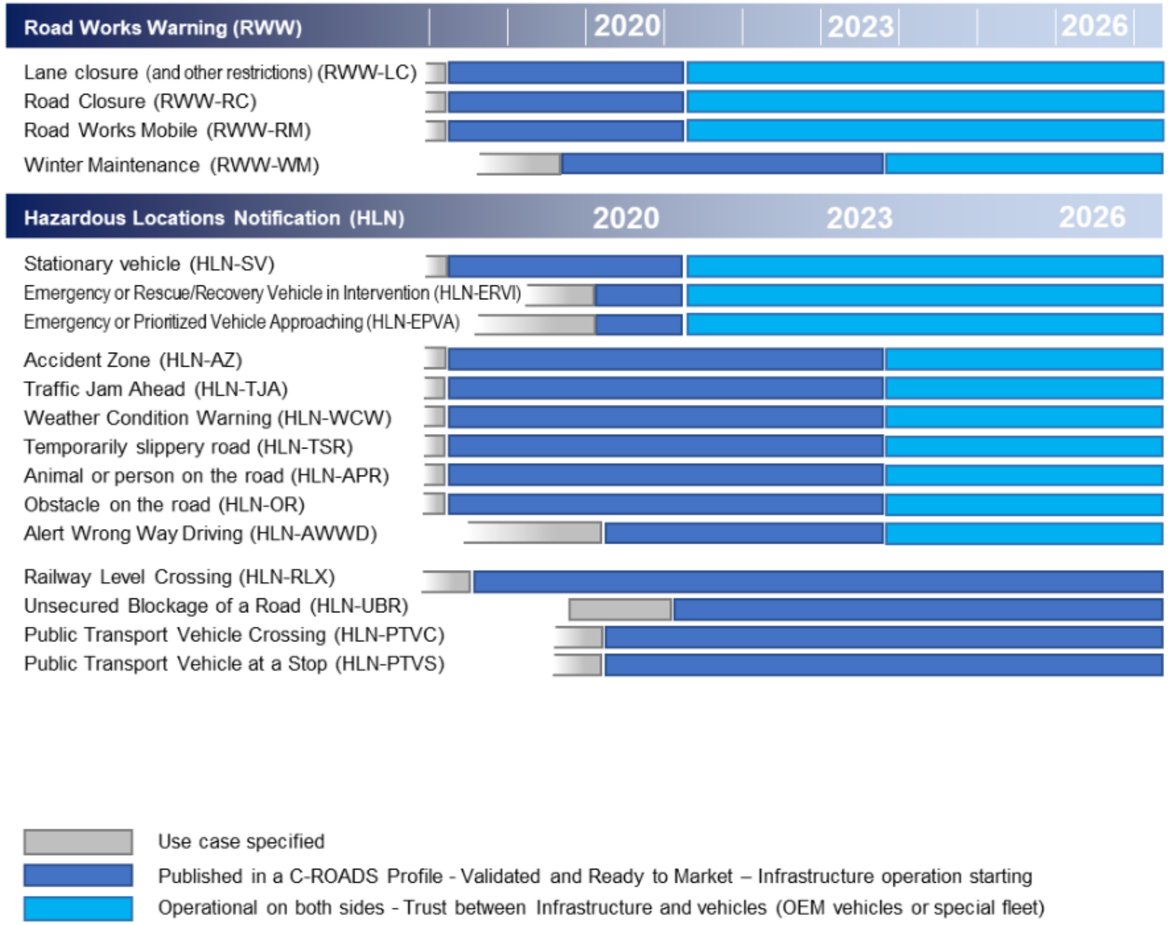
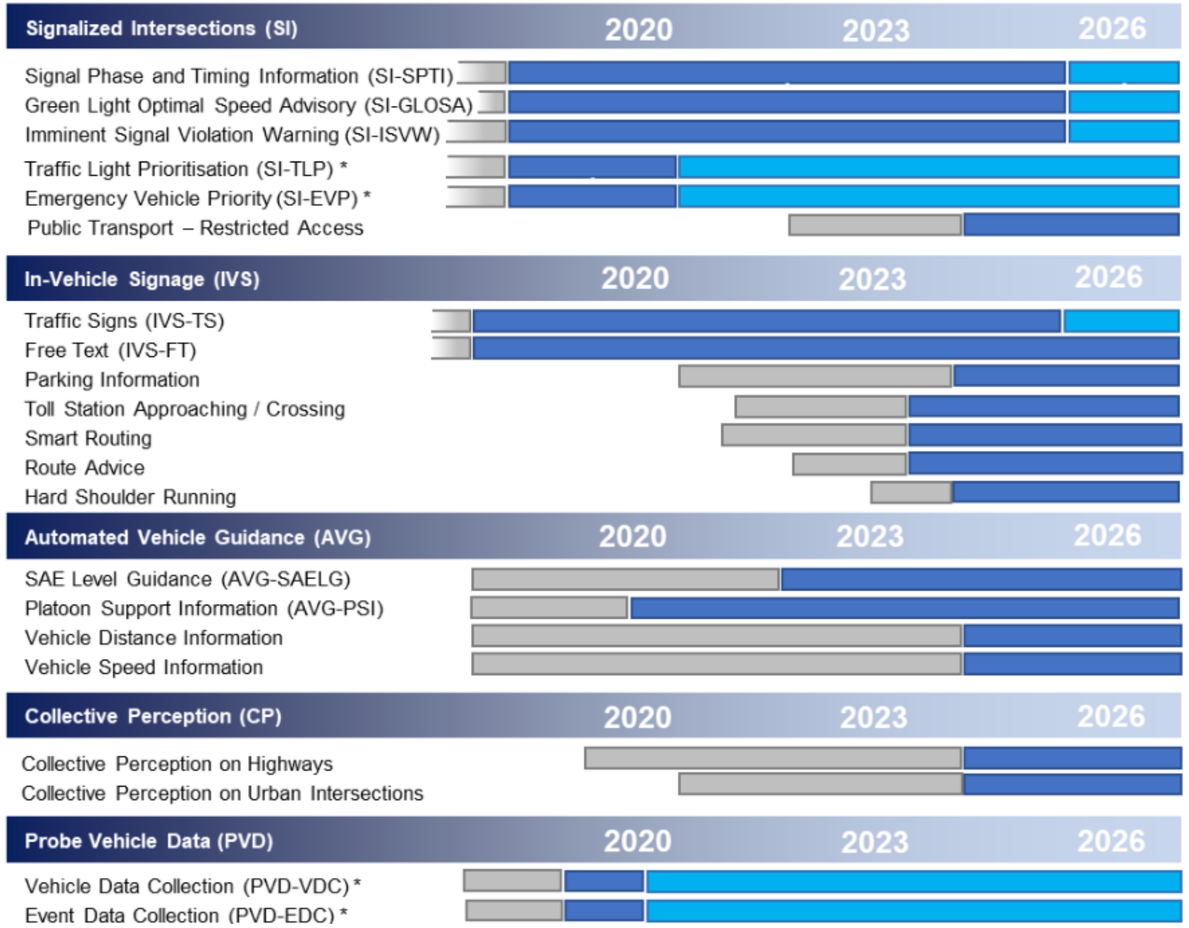
Publication of the Communication Profile



C-ITS Road Map





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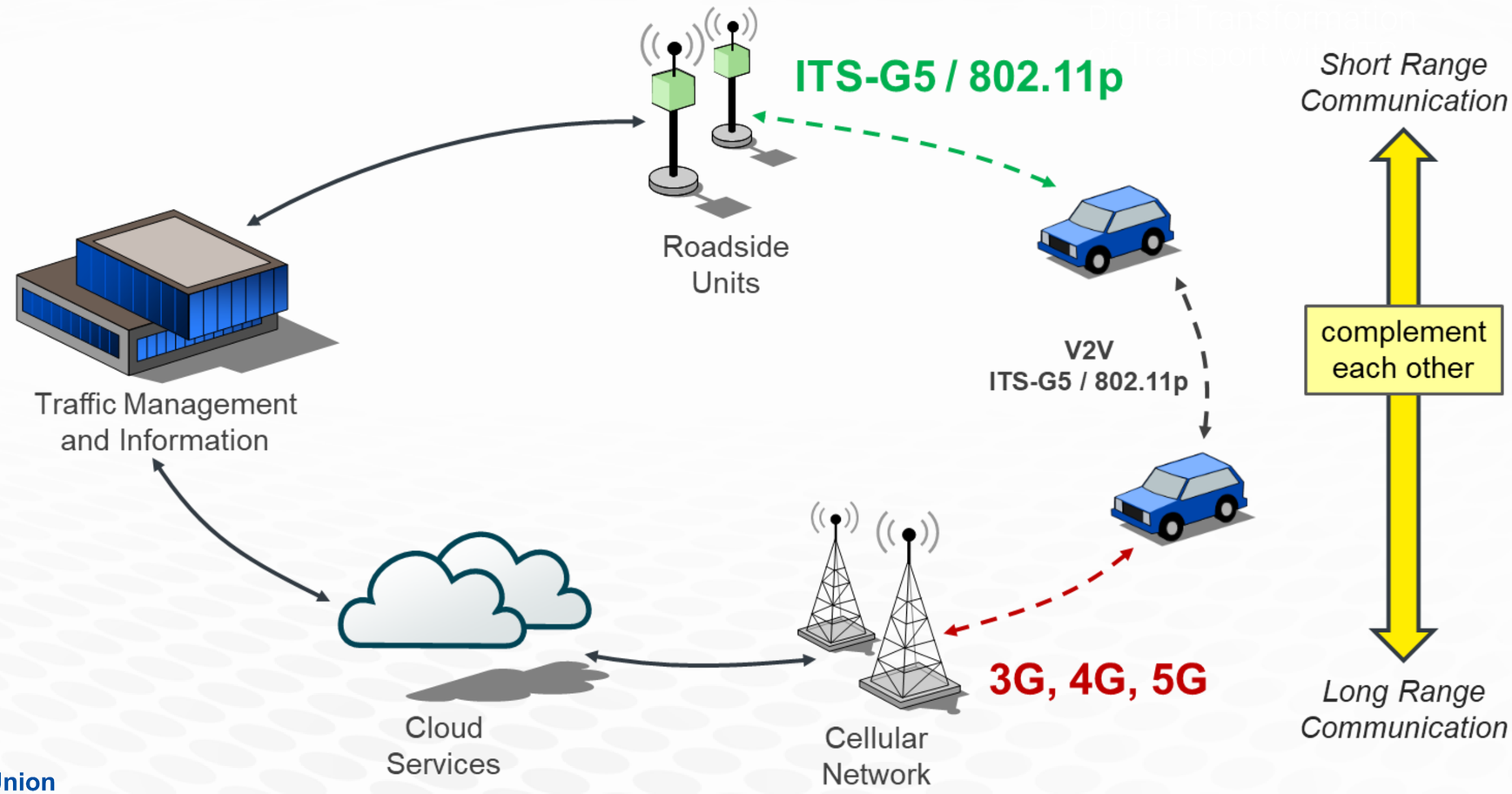
C-ITS based on a hybrid communication mix…

Short and long range communication complement each other:



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C-Roads position on C-ITS technologies

C-Roads has a clear and aligned position on short-range C-ITS technologies:

C-Roads is technology-neutral, supporting every technology that

a.) is in line with the rules of shared communication in the 5.9 GHz ITS Band and

b.) does not interfere with EU applications in the 5.8 GHz band and

c.) supports C-Roads' work on interoperability of the harmonized use cases

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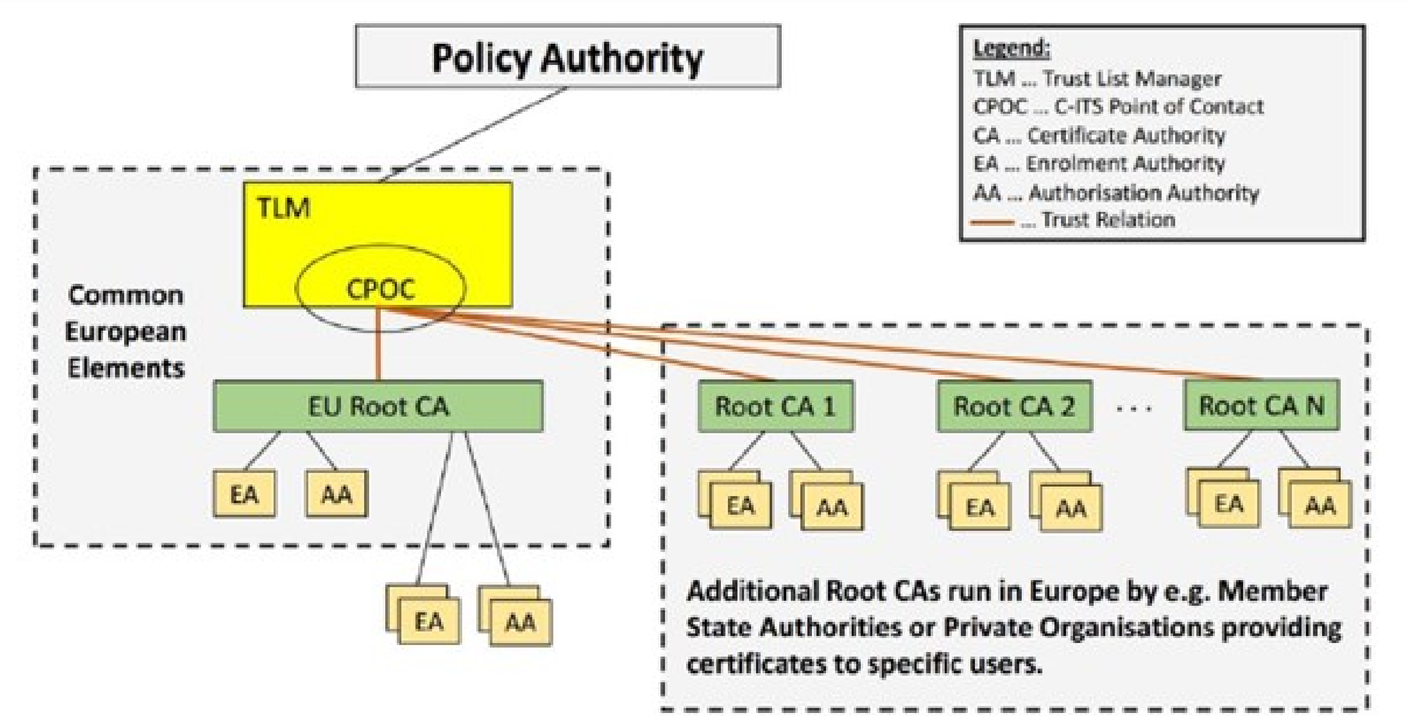
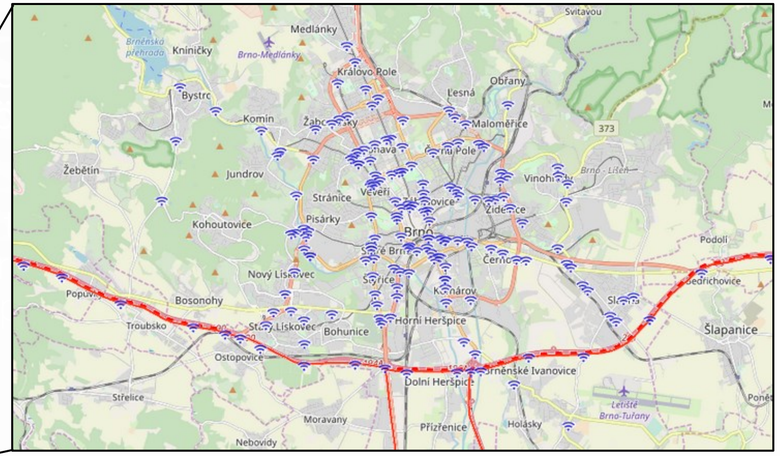
…and includes security as core element.

- with one single trust domain
- security elements for message transmission between C-ITS stations based on a PKI – Public Key Infrastructure
- Linking to the EU CCMS - EU C-ITS security credential management system



Current deployment status of ITS-G5 road side units



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https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

Today we can state

We started along motorways but see huge potential in multimodal (urban) environments

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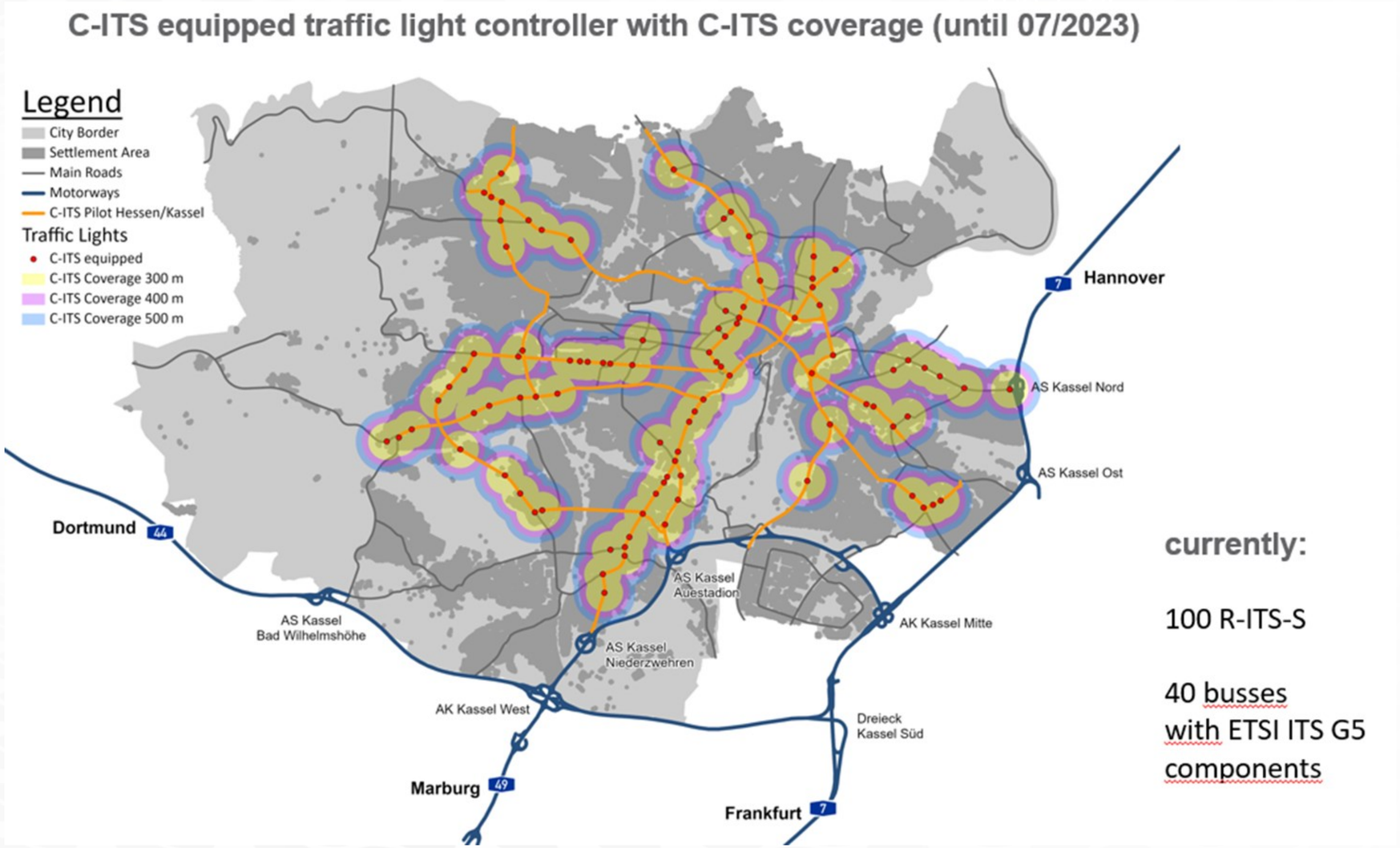
City of Kassel (GER)



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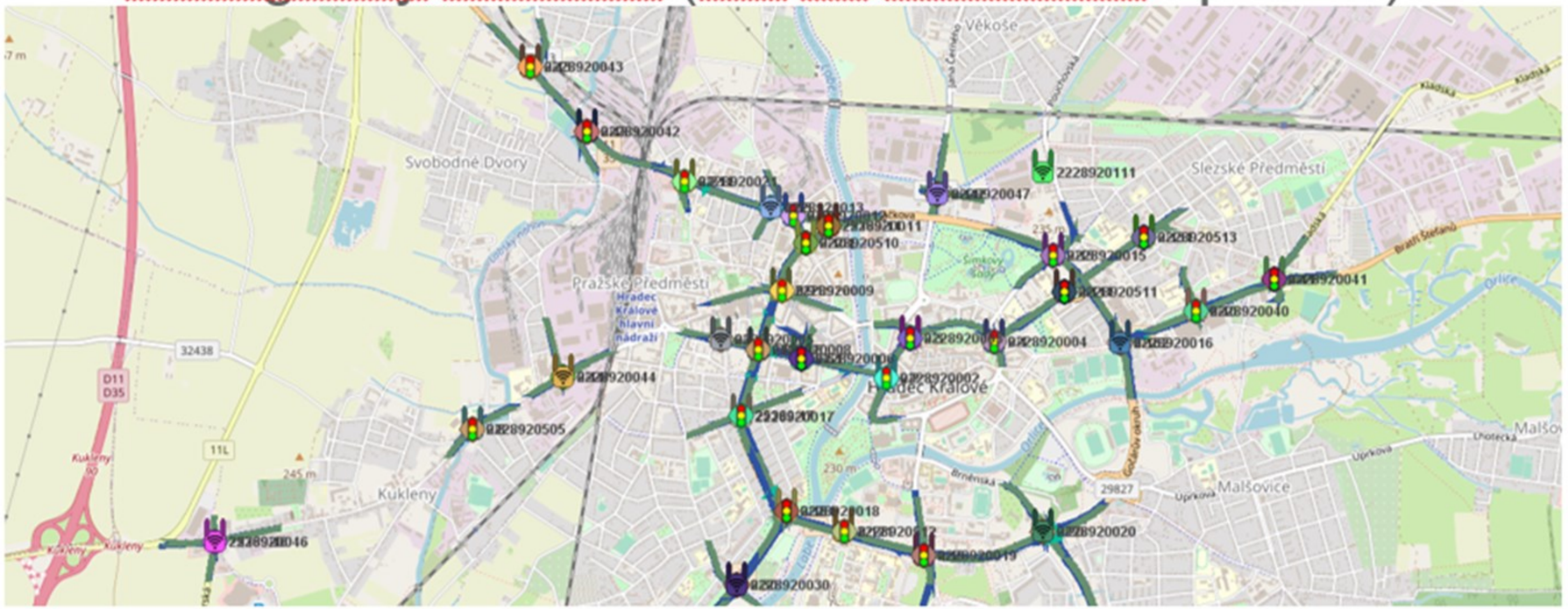
City of Hradec Králové (CZ)

- 40 RSU at intersections (all signalized intersections)
- 130 OBUs on public transport vehicles (full fleet)
- 7 roadwork vehicles
- 3 emergency vehicles (will be increased up to 25)



Next steps in Europe

- **Revised EU ITS-Directive**: renamed Priority Area IV: **ITS services for cooperative, connected and automated mobility**
  - The definition of necessary **measures to further progress the development and implementation** of cooperative (vehicle-vehicle, vehicle-infrastructure, infrastructure-infrastructure) intelligent transport systems, in particular to support CCAM
  - **Specifications** for services
  - Specifications for the EU C-ITS **security** credential management system

- **C-Roads Platform:**
  - Will support European goals
  - Future **focus is on operation** of the C-ITS Infrastructure in a multi-stakeholder environment
  - Continuation of deployments, including as well “new” focus areas (urban areas, blue-light organisations, public transport)
  - **Enlargement** of the community

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Thank you

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martin.boehm@austriatech.at
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