



C-ITS DEPLOYMENTS ACROSS EUROPE

Martin Boehm



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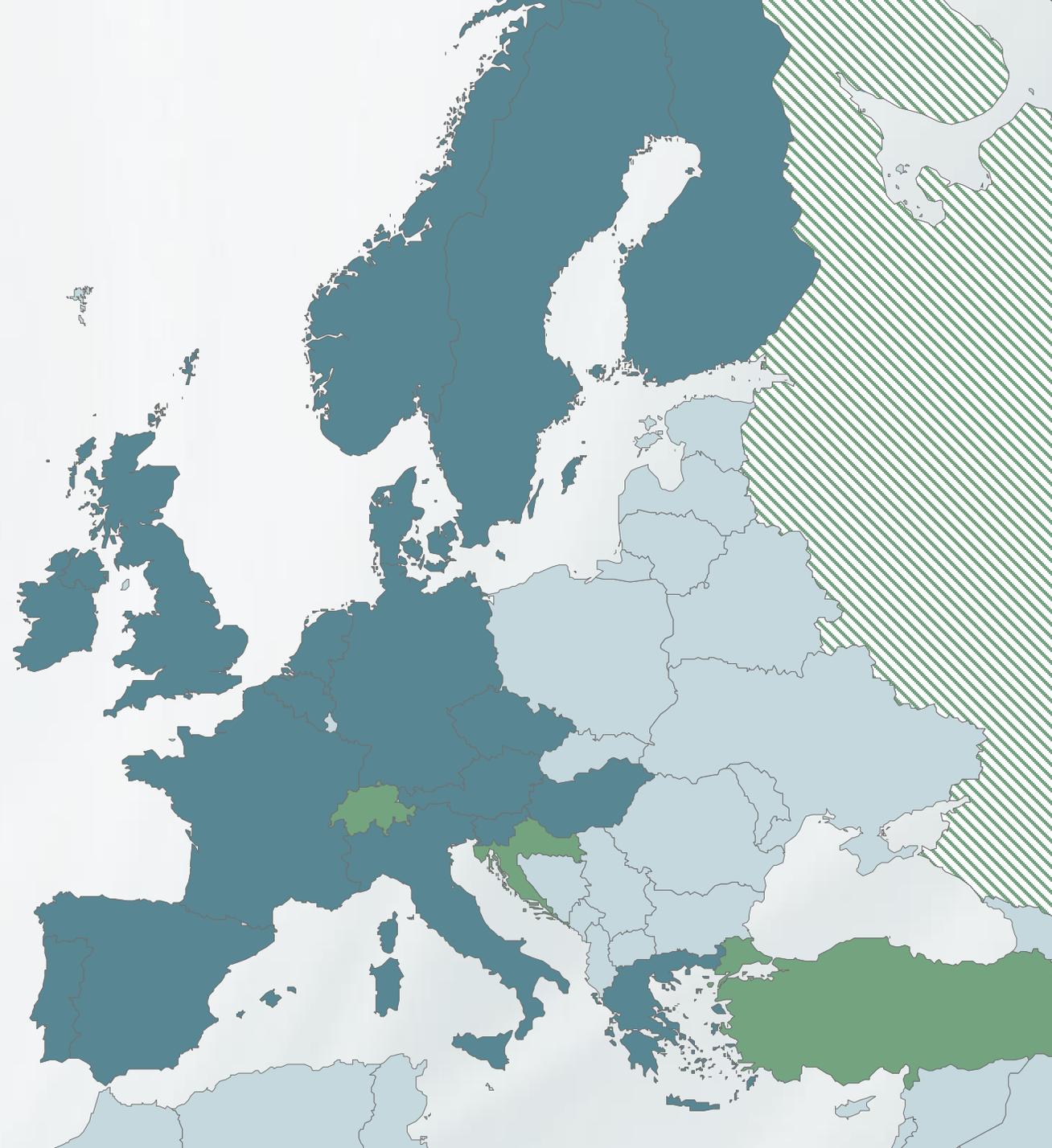
2016: Eight founding Member States

2017: Enlargement to 16 States

2019: Further enlargement to 18 States

Associated Countries

- Croatia
- Israel
- New Zealand
- Queensland/Australia
- Russia
- Switzerland
- Turkey





> 50 European cities

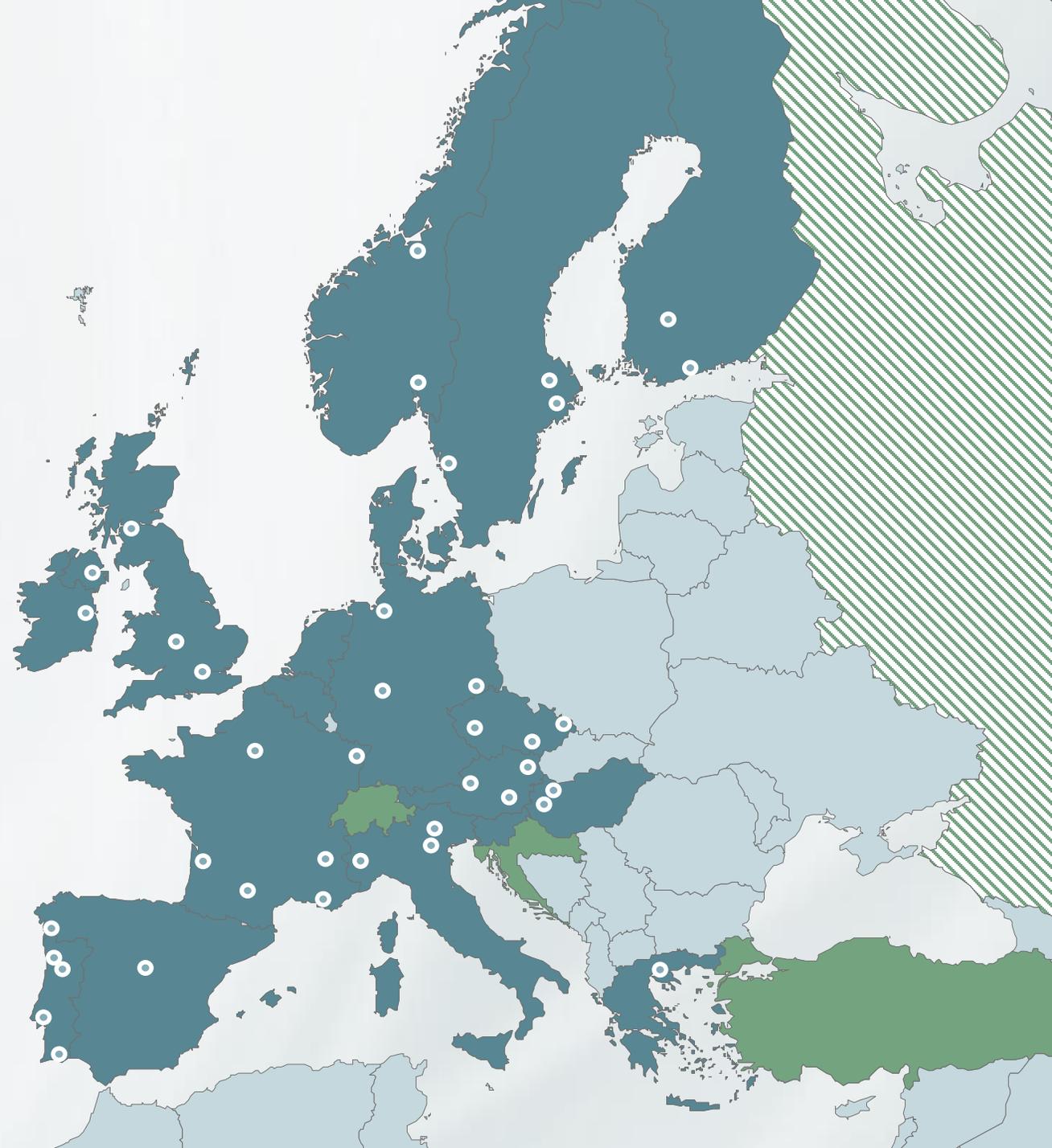
Starting with C-ITS deployment in urban areas

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

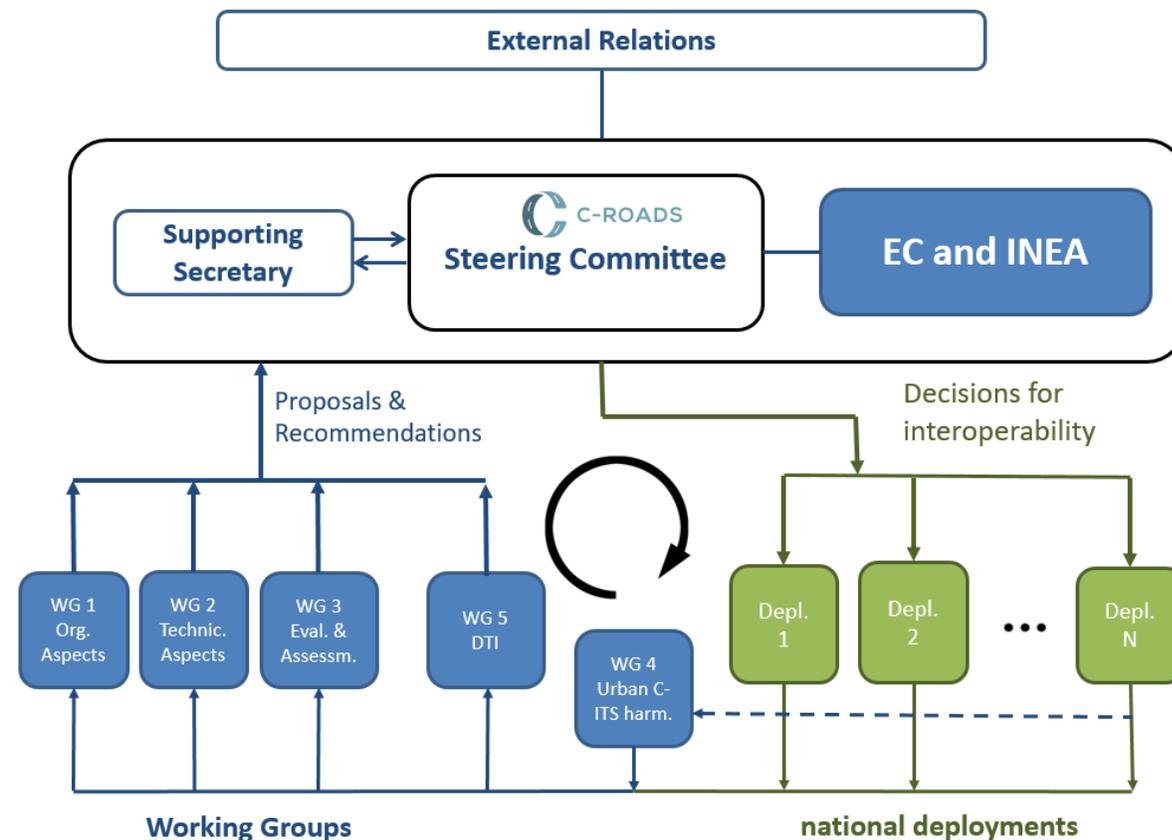


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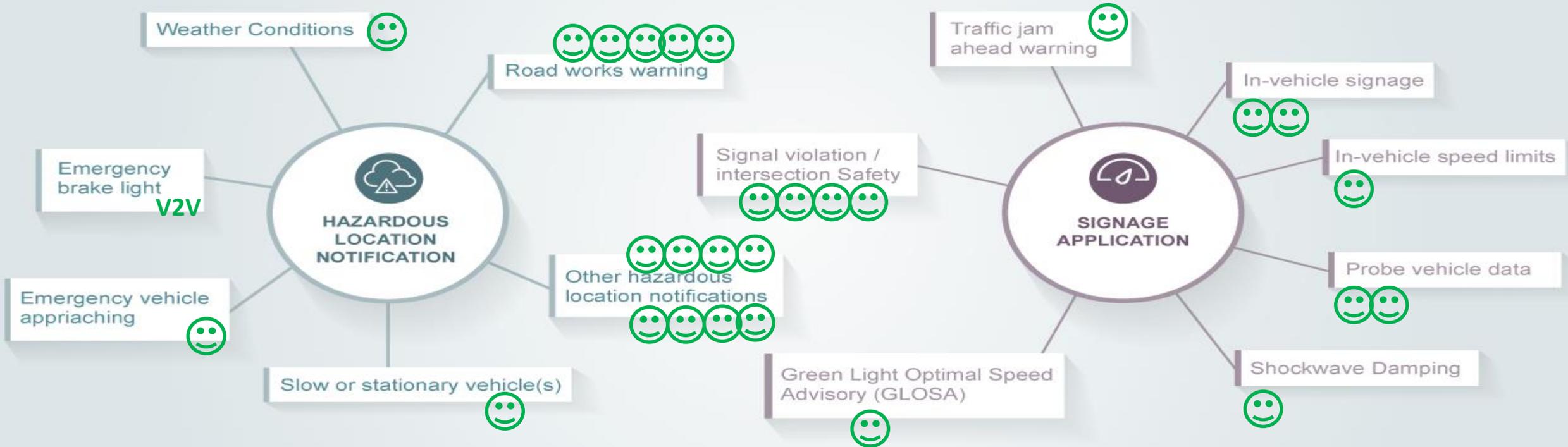
The aim of the C-Roads Platform

Starting in 2016 the aim was to

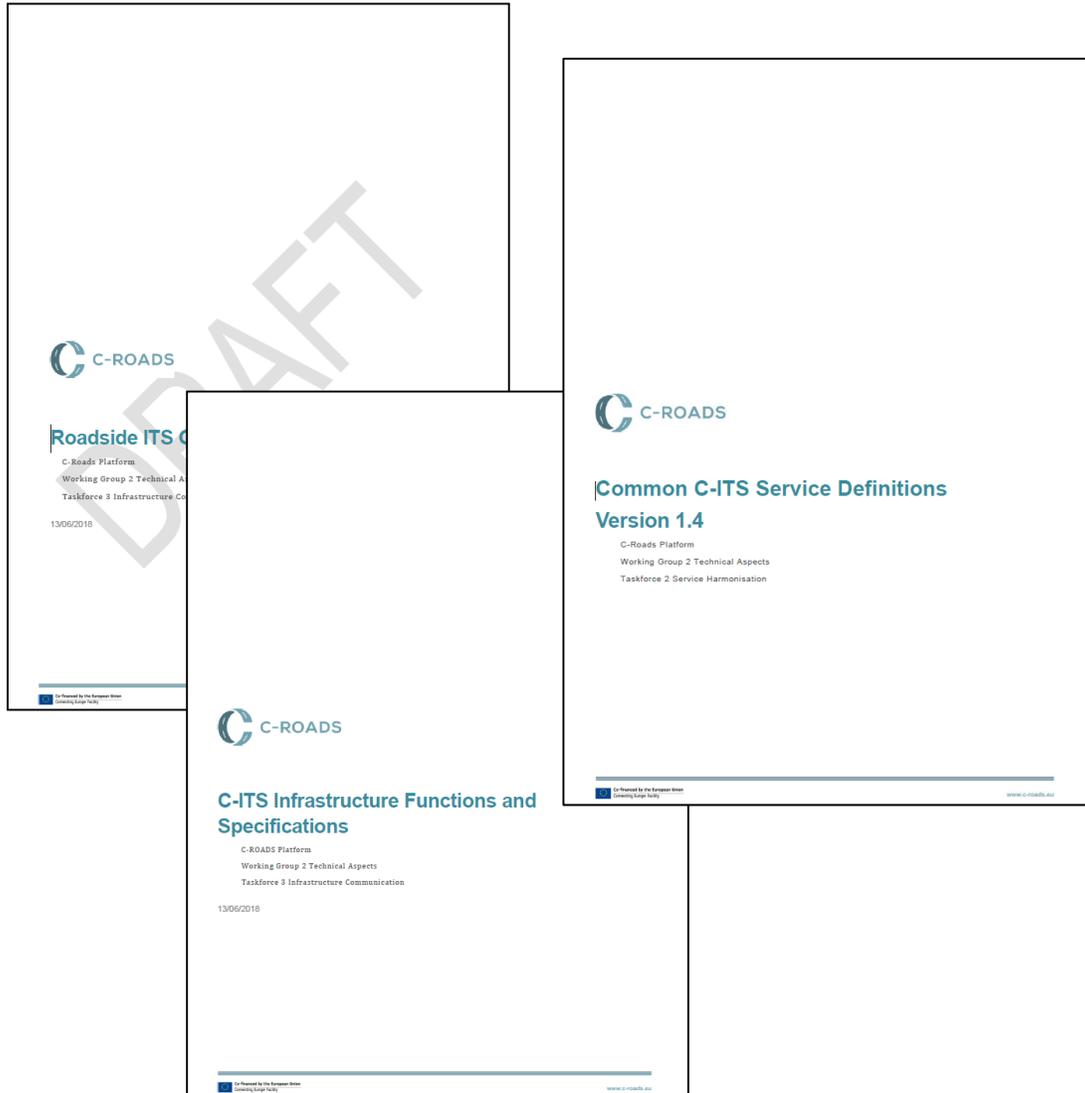
- link all **C-ITS deployments** across Europe
- develop, share and publish common **technical specifications** (including the common communication profiles) – available at www.c-roads.eu
- plan intensive **cross-testing** to verify interoperability
- develop system tests based on the common communication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



„Day 1 C-ITS Services“ – Published specifications



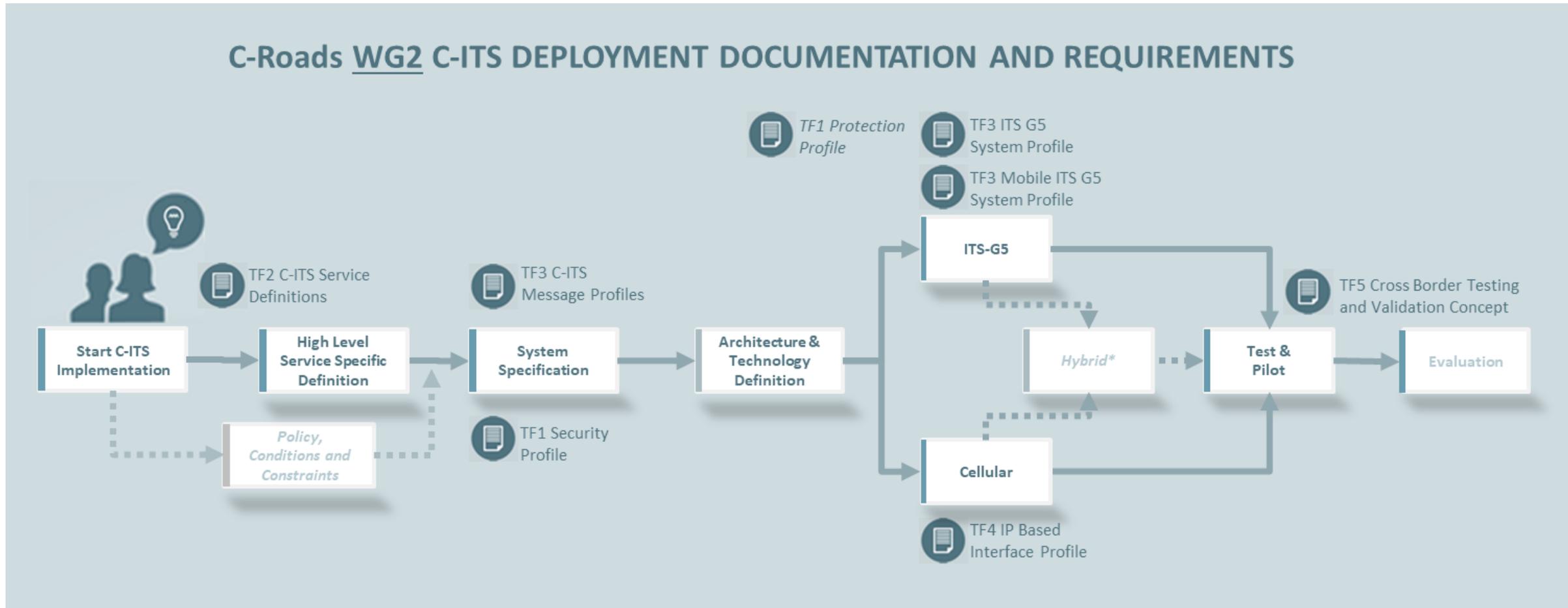
Publication of the Communication Profile



- Ⓒ Rel. 1.0 published on 14th of September 2017
- Ⓒ Rel. 1.1 published on 23rd of April 2018
- Ⓒ Rel. 1.2 published on 9th of July 2018
- Ⓒ Rel. 1.3 published on 23rd of October 2018 (harmonised with the Car 2 Car Communication Consortium)
- Ⓒ Rel. 1.4 published on 31st of January 2019
- Ⓒ Rel. 1.5 published on 8th of July 2019 – including the specification for interoperability of backend hybrid C-ITS communication
- Ⓒ Rel. 1.6 published on 6th of March 2020
- Ⓒ Rel. 1.7 published on 7th of August 2020 – includes the “Cross-Border Testing and Validation Concept”
- Ⓒ Rel. 1.8 published on 15th of March 2021
- Ⓒ 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. 2.0.3

- Ⓒ Available via www.c-roads.eu

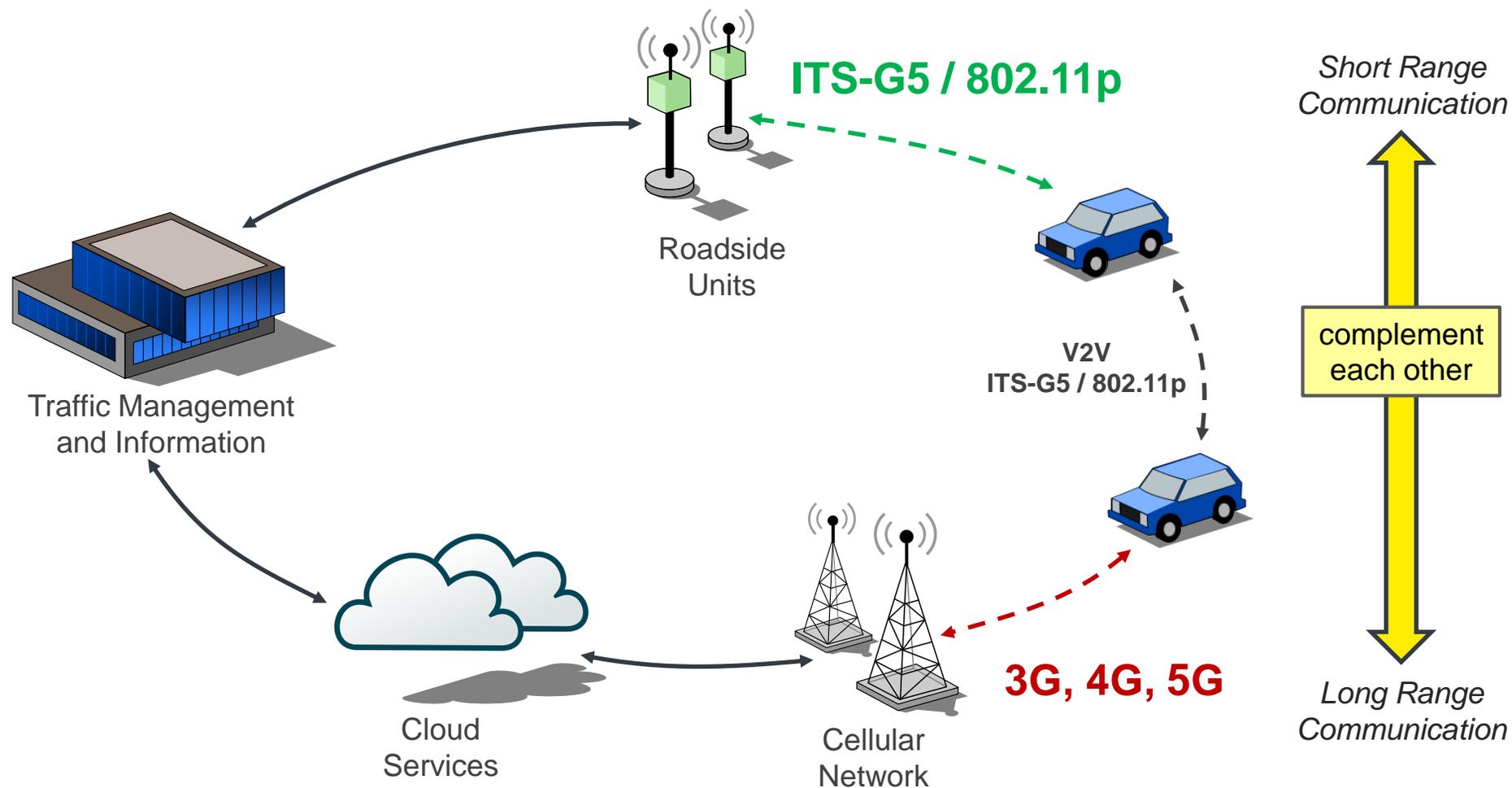
Links between specification documents



Overview document inserted to guide through the common specifications

C-ITS based on a hybrid communication mix...

Short and long range communication complement each other:



C-ITS based on a hybrid communication mix...

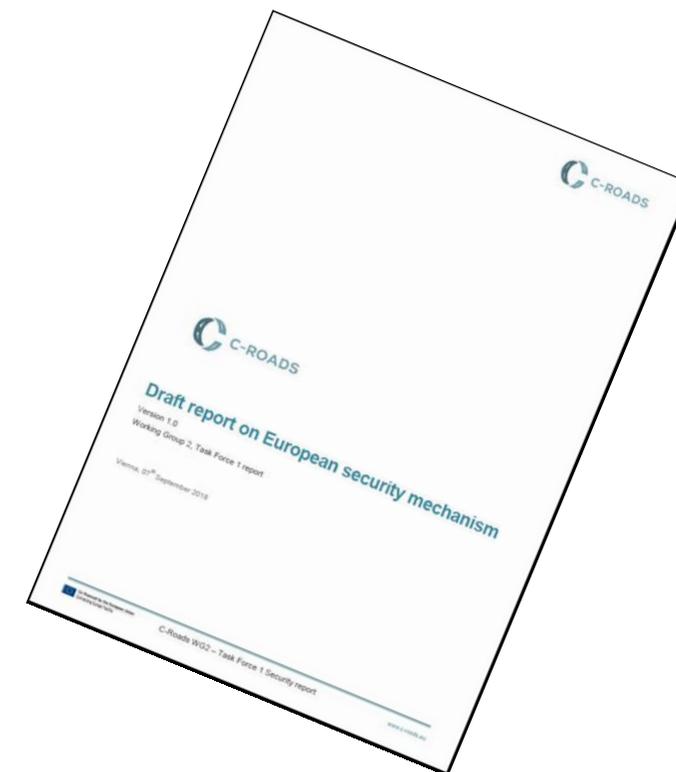
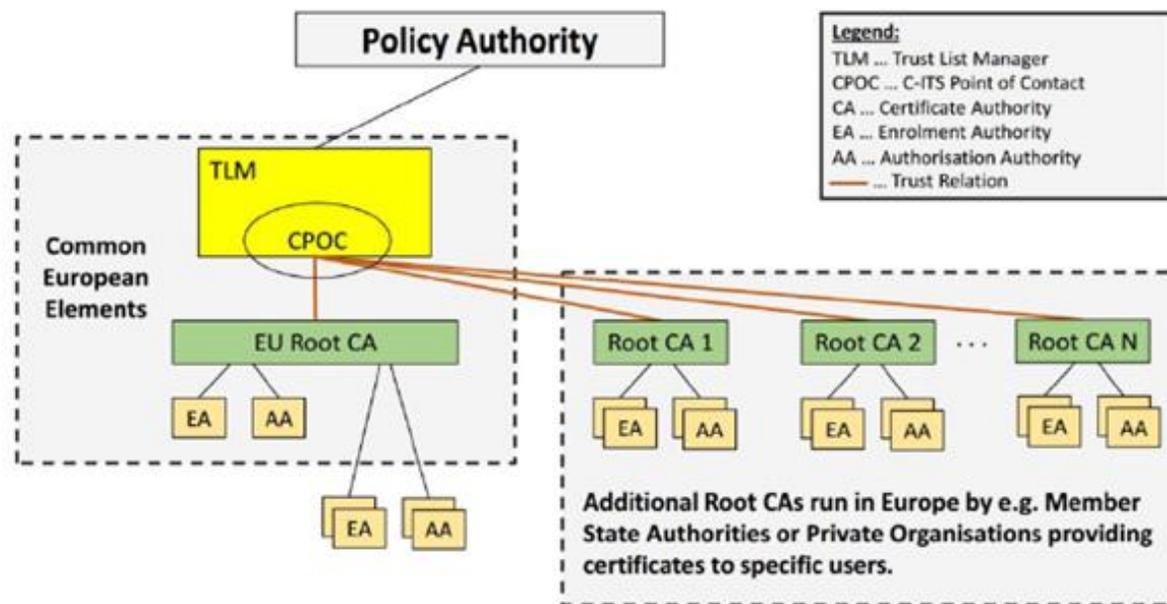
Short and long range communication complement each other:



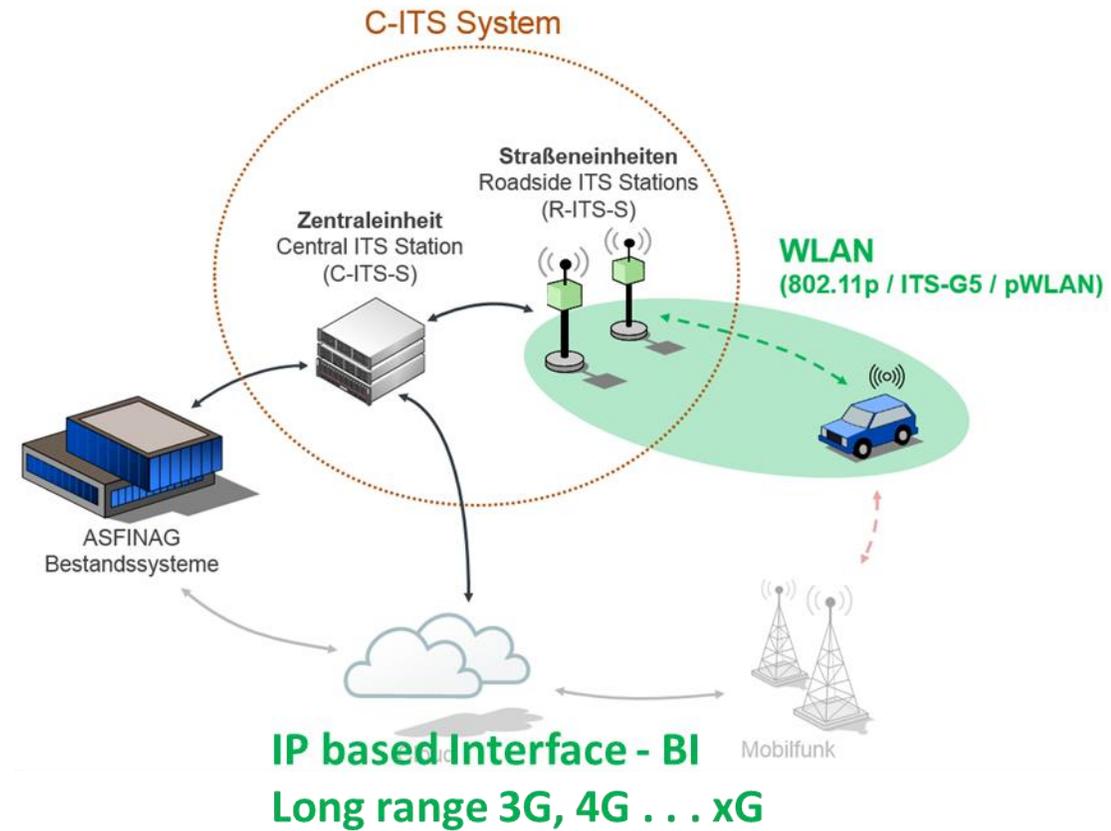
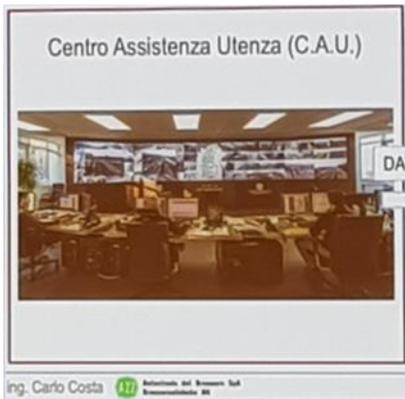
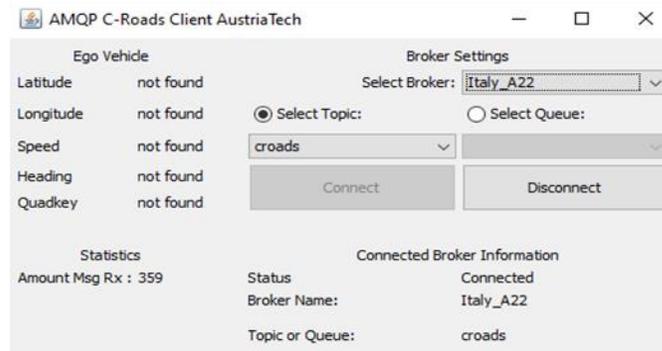
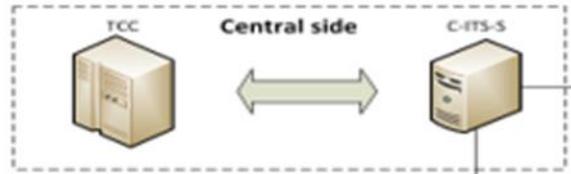
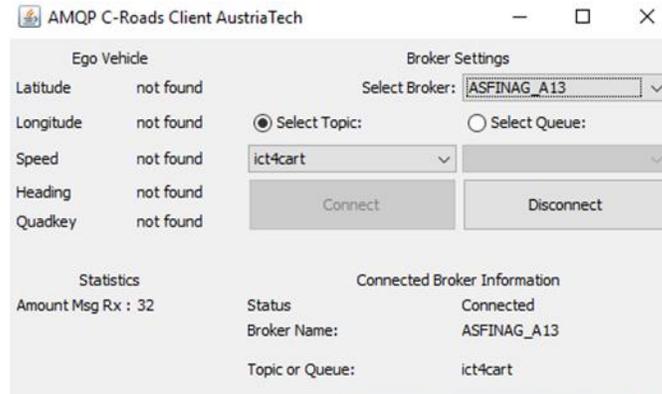
ROADS_09_ENG

...and includes security as core element.

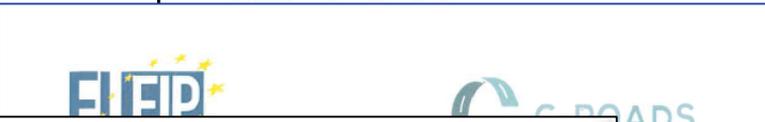
- with one single trust domain
- security elements for message transmission between C-ITS stations based on a PKI – Public Key Infrastructure
- Linking to the EU CCMS - EU C-ITS security credential management system



Cross border testing to show interoperability



Cooperation as key factor for success



the Amsterdam Group, the EU's C-ITS platform and CCAM platform as well its participation in many European projects on ITS and C-ITS. Indeed, Polis seeks to capitalise on the knowledge created and the learnings from earlier urban C-ITS projects, including CIMEC and CODECS, both of which offer a very good source of information for understanding the barriers and enablers to the deployment of C-ITS in urban areas.

POLIS and the C-Roads Platform agree to:

- Bring clarity on the potential C-ITS deployment paths and scenarios, including identifying the most suitable hybrid approach concerning timelines and use cases.
- Facilitate knowledge sharing about existing C-ITS procurements (lessons learnt, recommendations, etc.) and define general procurement principles and processes.
- Define new urban-focused use cases, in particular, those of interest to public authorities (V2I).
- Build understanding of the implications of integrating C-ITS into existing system architectures and legal and institutional frameworks.
- Provide contributions and inputs, which may help identifying possible standards extensions or gaps to accommodate for additional performance requirements, in order to ensure adequate applicability in urban areas.
- Consider which future Day-2-Uses-Cases could be pipelined.
- Build up a catalogue of cooperative services and profiles taking into consideration typical use-cases and city-specific and urban-interurban requirements.

Collaboration Process

Both signatories collaborate for mutual benefit in a logical and structured way along the following principles:

- Agree on and guarantee a continued co-operation and dialogue between the POLIS and the C-Roads Platform.
- Mutual information on work plans and exchange of relevant outputs.
- Brainstorming on topics of common interest that add value for both.
- Presentation of relevant C-Roads deliverables at POLIS events and vice-versa
- Information of project management and governance layer of both signatories, where additional actions have been or can be initiated

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DATEX II / C-ITS

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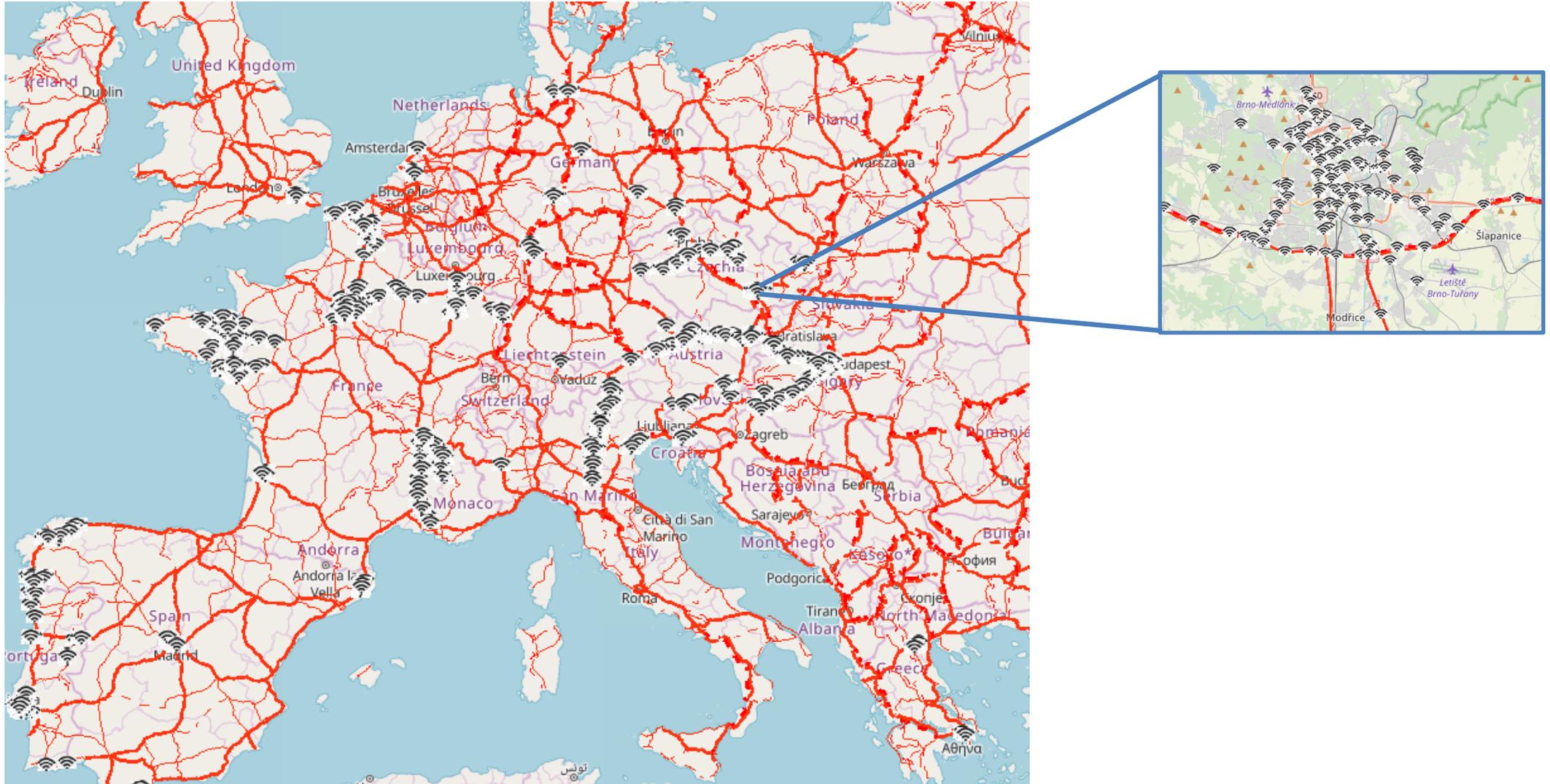
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m Secretary m

June 2017

Platform 4 3.2018

Deployment status of ITS-G5 road side units



Today we can state

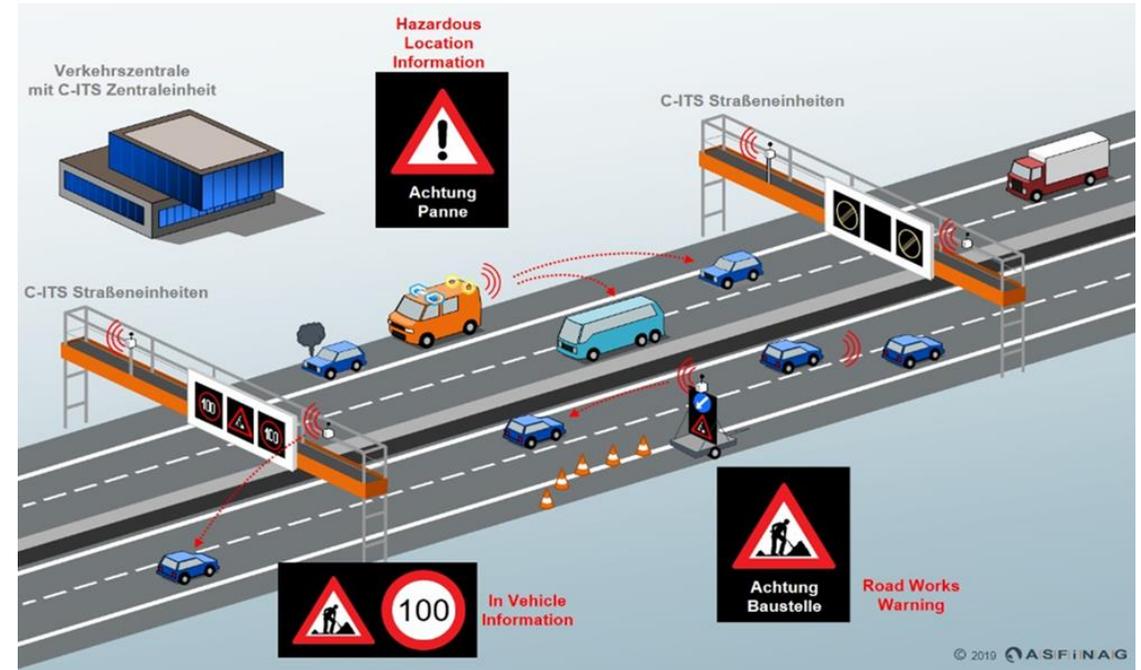
☉ We started along the motorways...



Road Side Unit



Roadworks trailer



Service vehicles

Today we can state

...but see huge potential in multimodal (urban) environments



Conclusion

- Even C-ITS services are deployed along the high level road network TODAY, we see an even higher potential in urban areas
 - C-ITS services are more than supporting drivers of individual cars
 - C-ITS services help public authorities to inform travellers about current active travel regulations (e.g. Urban vehicle access restrictions / UVARs)
 - Inclusion of public transport vehicles and emergency services are seen as high priority
- C-ITS is marking a new area of mobility
- Have a look at the current activities within single countries here: https://www.c-roads.eu/fileadmin/user_upload/media/Dokumente/C-Roads_Brochure_2021_final_2.pdf



THANK YOU!



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www.c-roads.eu | [@cRoadsPlatform](https://twitter.com/cRoadsPlatform)