

A photograph showing the interior of a car from the driver's perspective. A woman with long brown hair is driving. The car's dashboard features a large central touchscreen displaying a navigation map with a blue route and a red warning box. The speedometer shows 35. The car is on a multi-lane bridge with a metal railing. In the background, a dense urban skyline with tall glass skyscrapers is visible under a clear blue sky. The car's interior is modern and dark-colored.

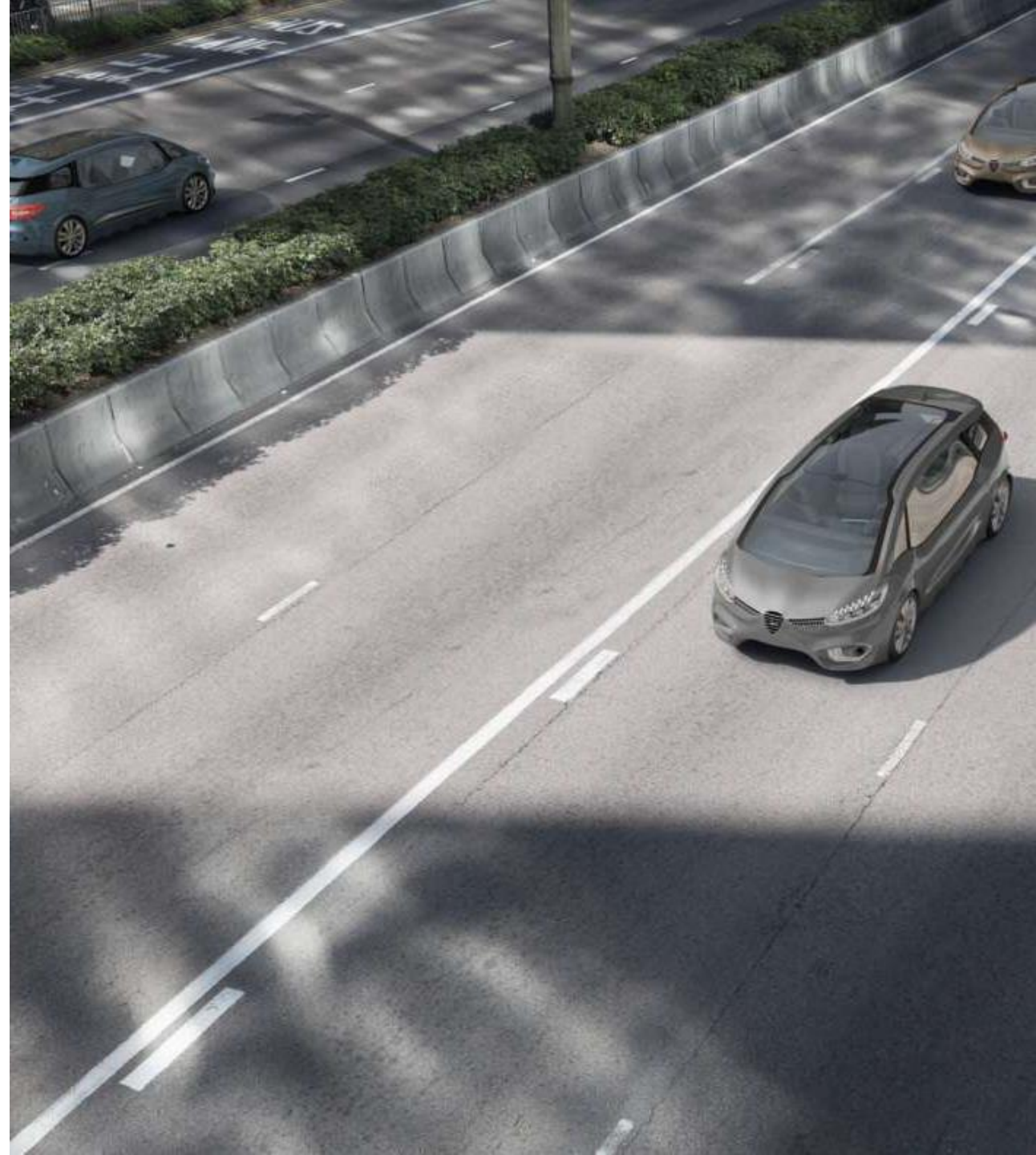
# Unterbrechungsfreie, Grenzüberschreitende 5G-Kommunikation für Straßen- und Schienenfahrzeuge

Maciej Muehleisen, Ericsson GmbH  
Leiter der Forschungsgruppe "Radio  
Network Concepts for Verticals"

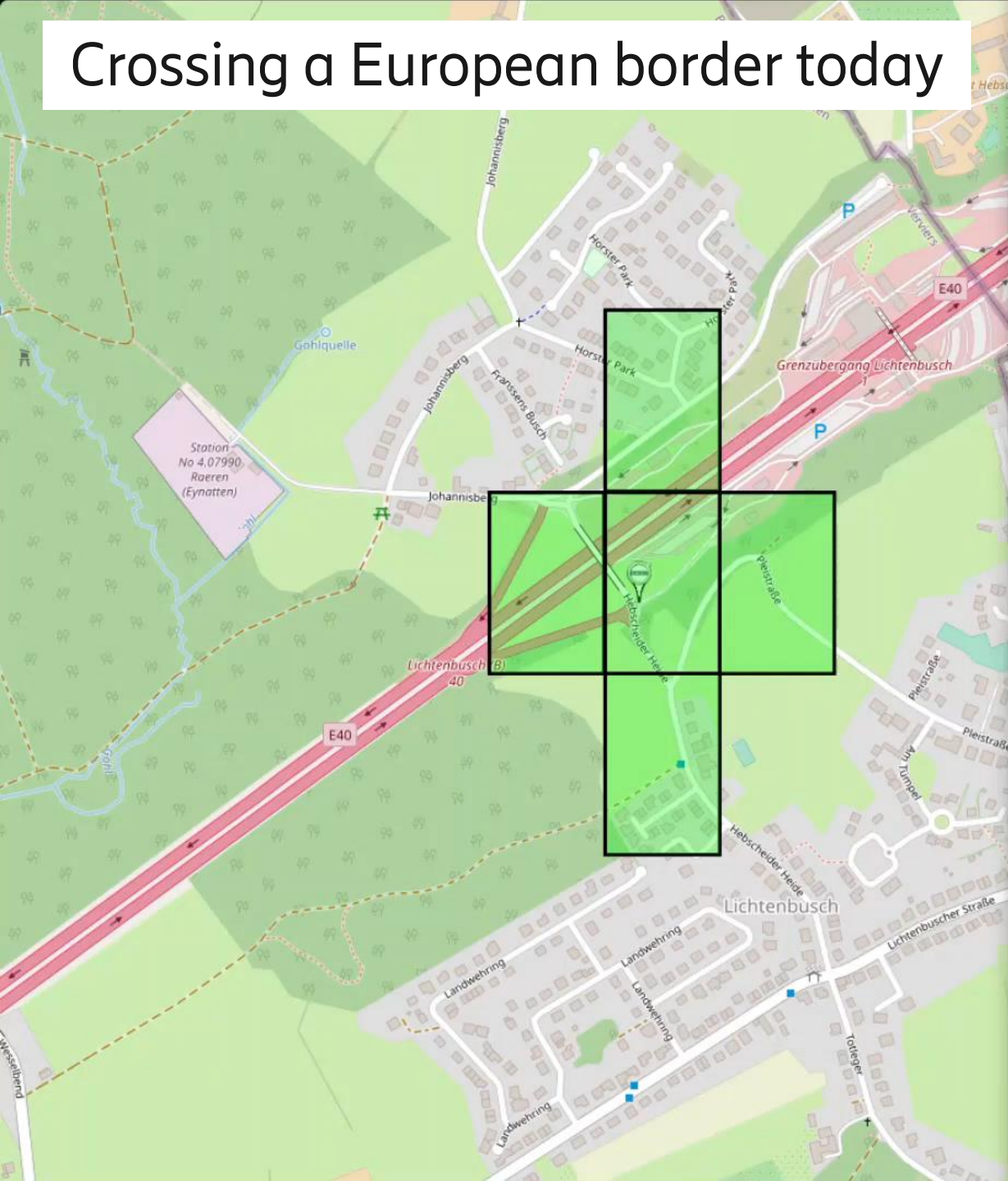


# Outline

- Crossing a European border today
- Cross-border service continuity in European Innovation projects
- CEF2 Digital EU deployment funding for uninterrupted cross-border 5G communication
- Service requirements and their fulfilment
- Summary and conclusion



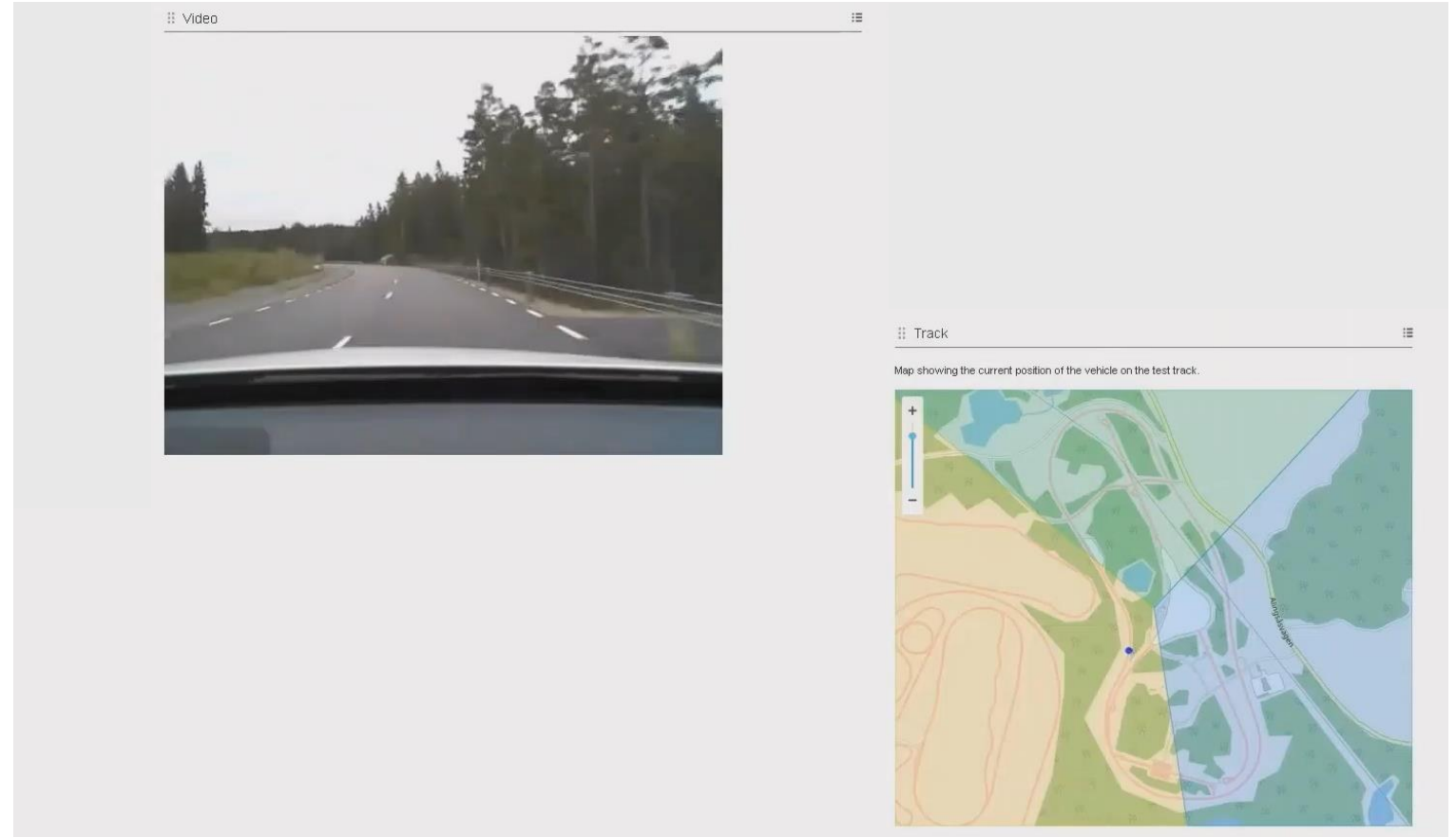
# Crossing a European border today



# First cross-border service continuity demo with Daimler 2019



- April 2019 - AstaZero proving ground Sweden: First demonstration with Daimler
- 4G network
- Less than 100 ms service interruption  
➔ **Not visible in live video stream**
- Done with 5G in **seven** Horizon 2020 innovation projects, at least three involving Ericsson
  - 5GCroCo, 5G-MOBIX, 5G-CARMEN, 5G-ROUTES, 5GMED, 5GBlueprint, 5GRAIL
- **Commercial deployment in seven (status 11/2023) EU co-funded projects ([Link](#))**



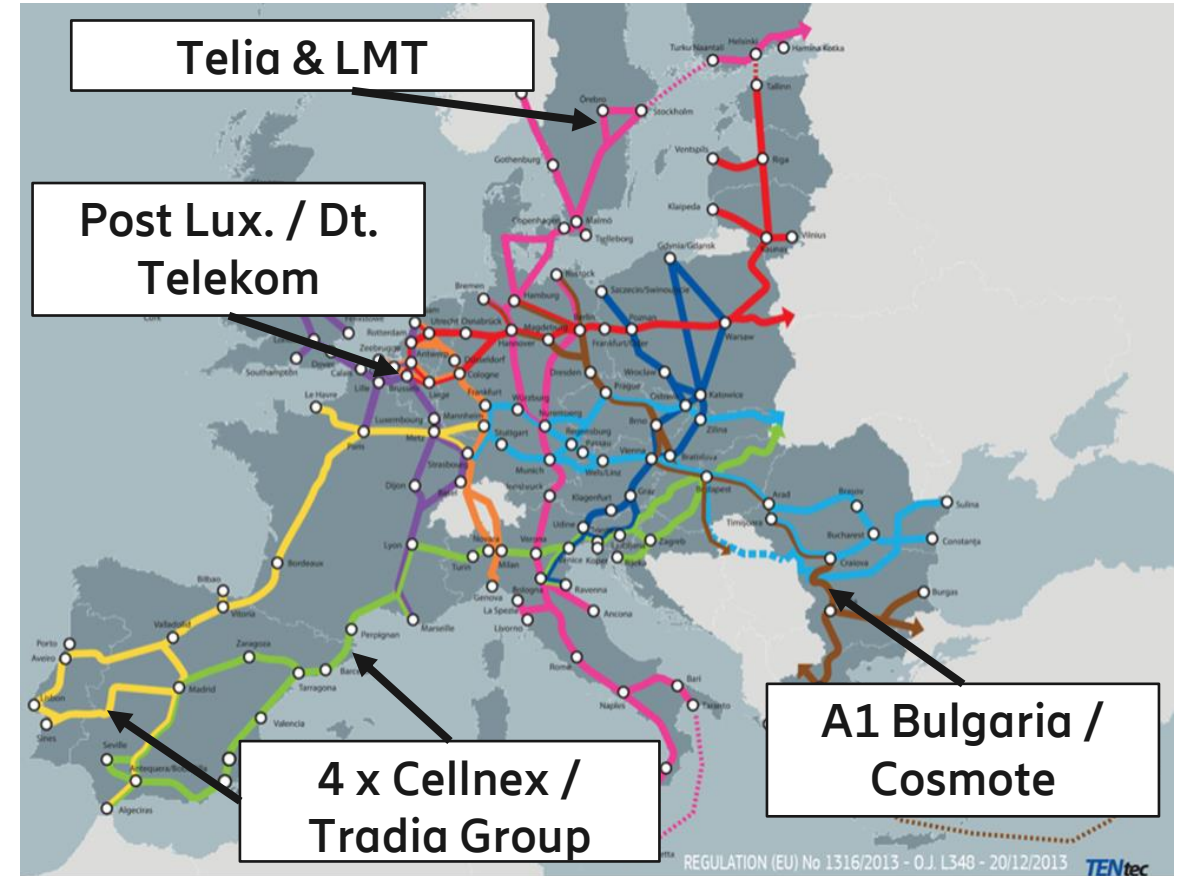


# CEF2 Digital – 5G Corridor EU deployment funding



## CEF2 Deployment (“Works”) projects

- EU funds 50% of cost for deploying **commercial** Connected Automated Mobility (CAM) and/or rail-focused networks:
  - Networking and IT equipment (servers, radios, ...)
  - Civil works (masts, deploying optical fibres, ...)
  - Preparatory studies
- Initial focus on country borders
- Calls:
  - Call 1: 01/2023 – 12/2025
  - Call 2: Selected projects will be announced soon
  - **Call 3: Open, submission deadline 20.02.2024 ([Link](#))**
  - Call 4: Expected Q3/Q4 2024



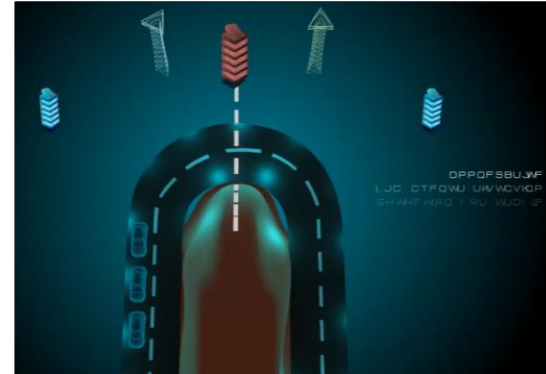
Granted “1st Wave” CEF2 Digital Deployment projects

# CEF2 Digital – 5G Corridor EU Deployment funding: Key findings from Innovation projects – Use Cases



Call for proposals - CEF 2 Digital -  
5G coverage along transport  
corridors, 2021:

*"[...] service providers should be able to obtain a certain level of return on investment from the start based on other digital services, [...], in particular on high traffic sections of highways."*



**~1 s latency  
requirement for  
end of traffic jam  
warning**

Source: 5GCroCo  
Deliverable [2.1](#) & [2.2](#)

- Let's stop "guessing" what the "killer application(s)" will be  
→ Provide the (Connected) Road Vehicle stakeholders the infrastructure to figure it out
- Let's aim for the 99 % services of value now and in near-future  
→ Stop chasing the 1 % with "ultra" requirements
- For railways, services and requirements mostly well-defined

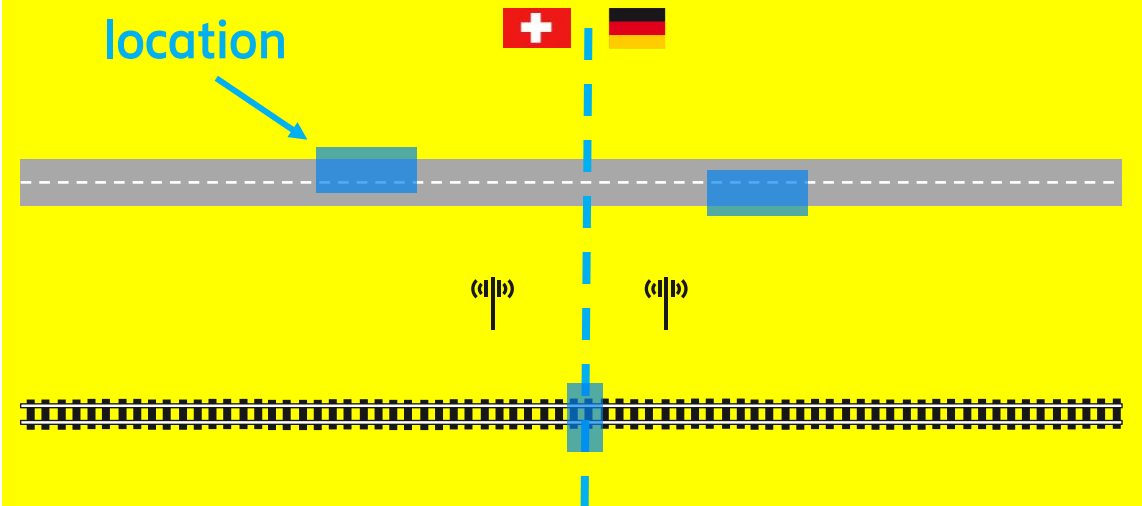
# Differences between rail and road services



**Future Rail Mobile  
Communication System (FRMCS)  
provides full service spec and  
requirements**

**For FRMCS: "Handover" must  
happen at political border**

Handover  
location

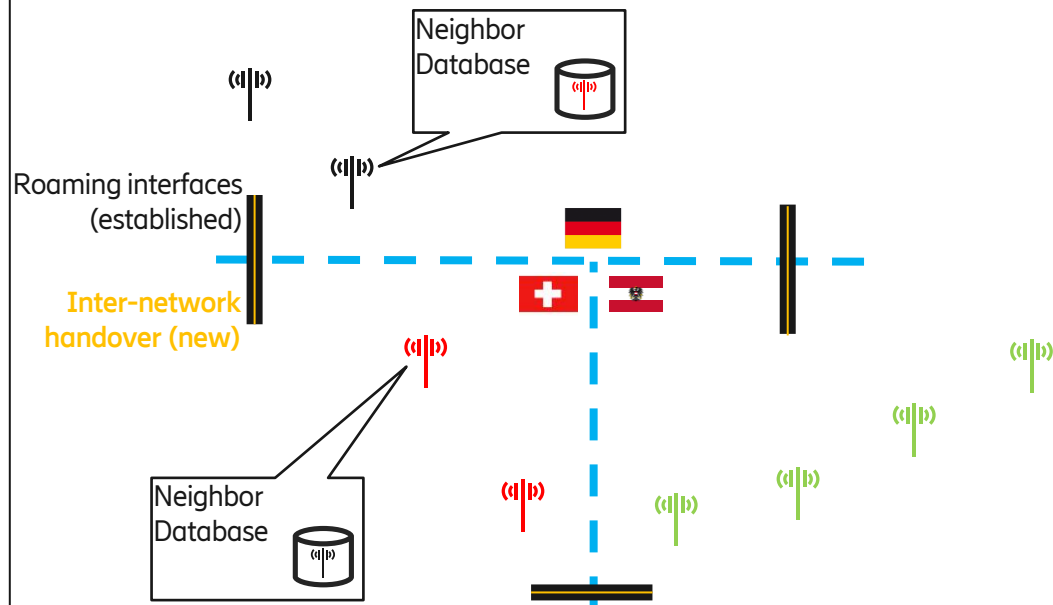


# Key enablers: coverage & capacity



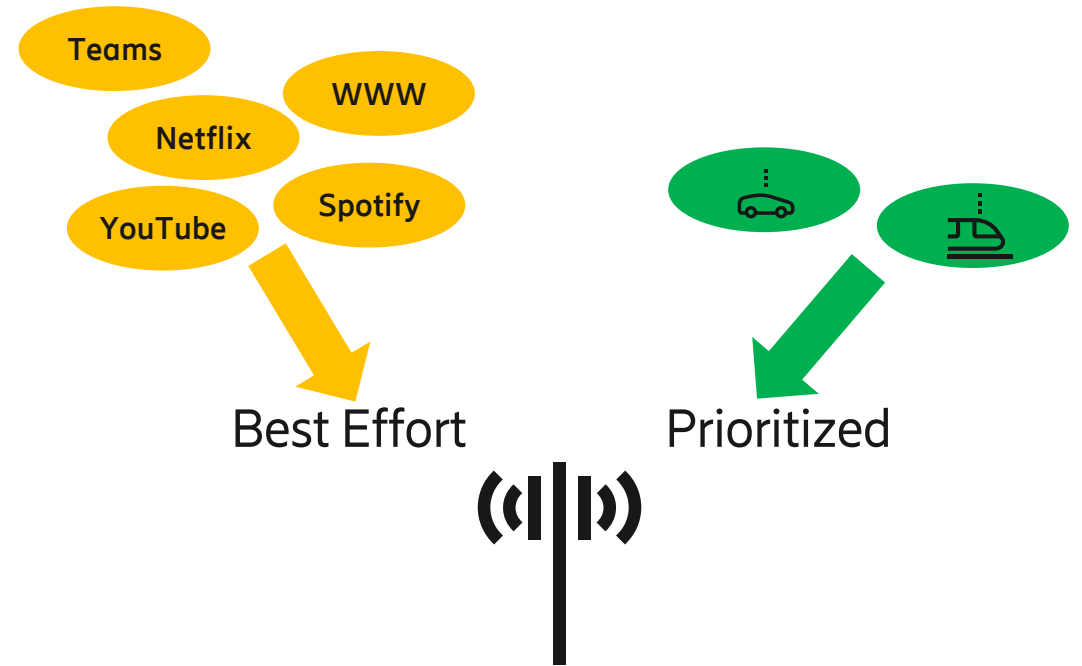
## Coverage:

- Densify (if needed)
- Enable cross-border service continuity



## Capacity:

- Service differentiation (QoS)







## Summary and conclusion



- **The key for connected roads and railways are coverage and capacity**
- Coverage, incl. seamless service continuity, must also be assured at country borders
- EU CEF2 Digital program provides up to 50% deployment funding (proposal deadline 20. Feb. 2024)



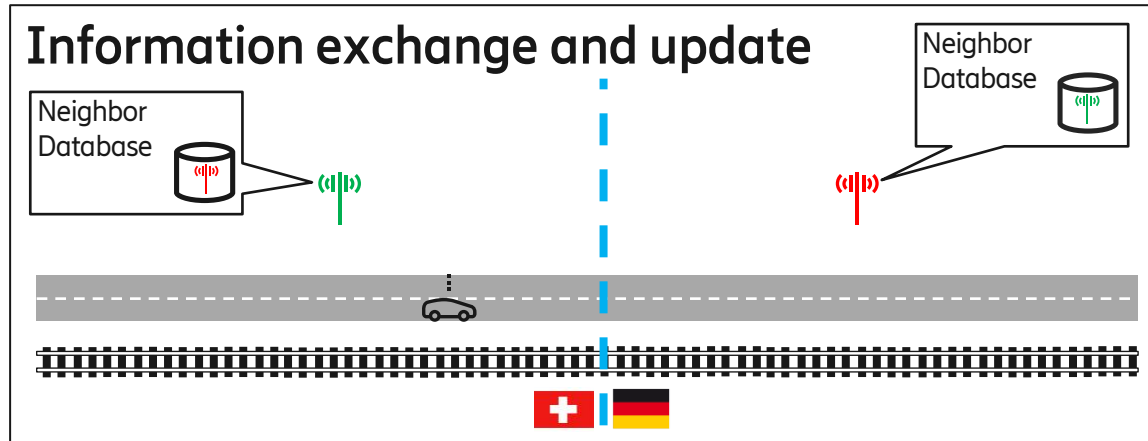
[ericsson.com/future-technologies](https://ericsson.com/future-technologies)

# Backup Slides

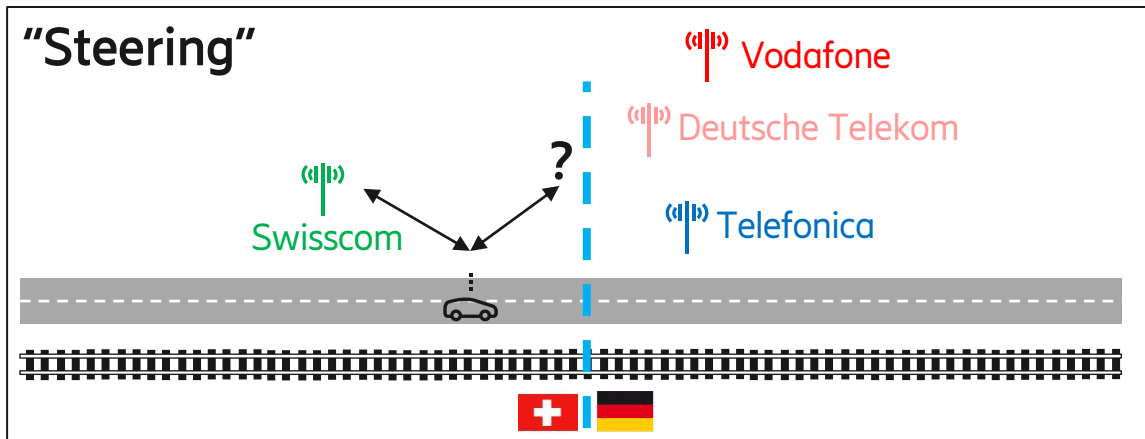
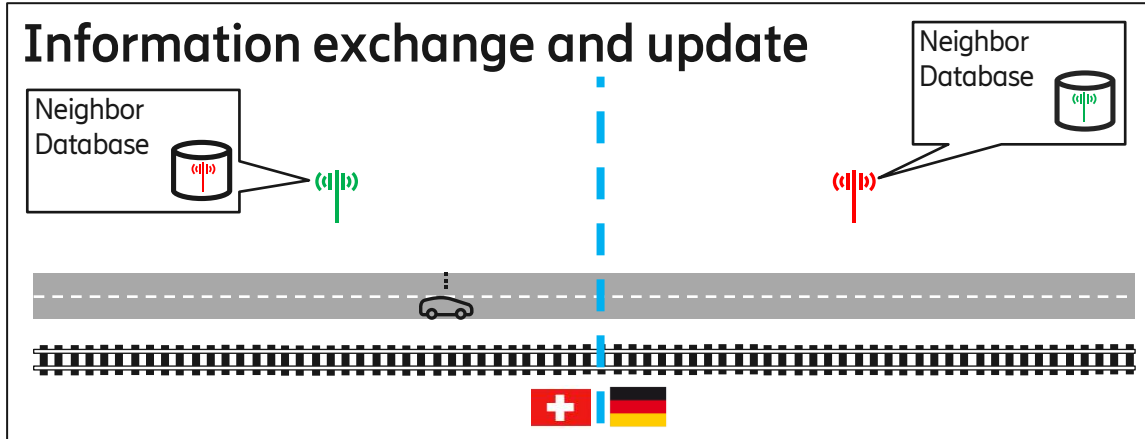




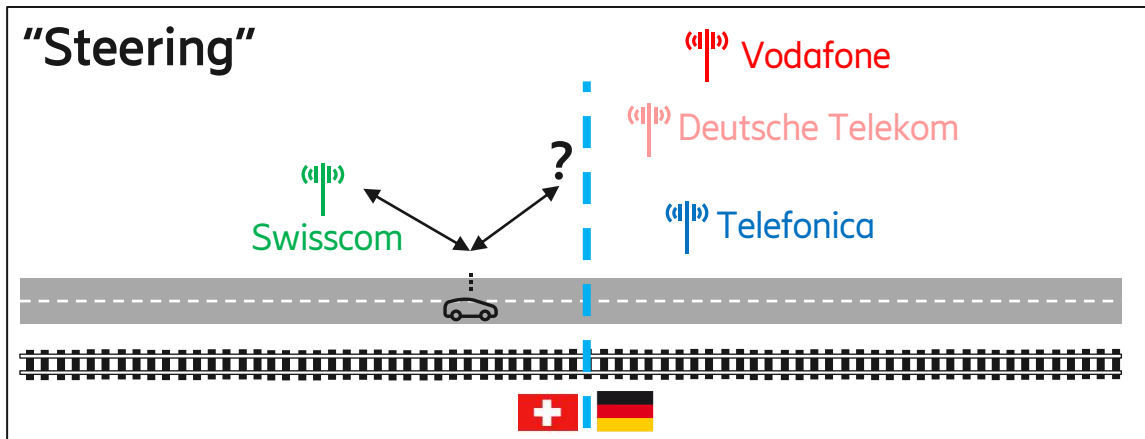
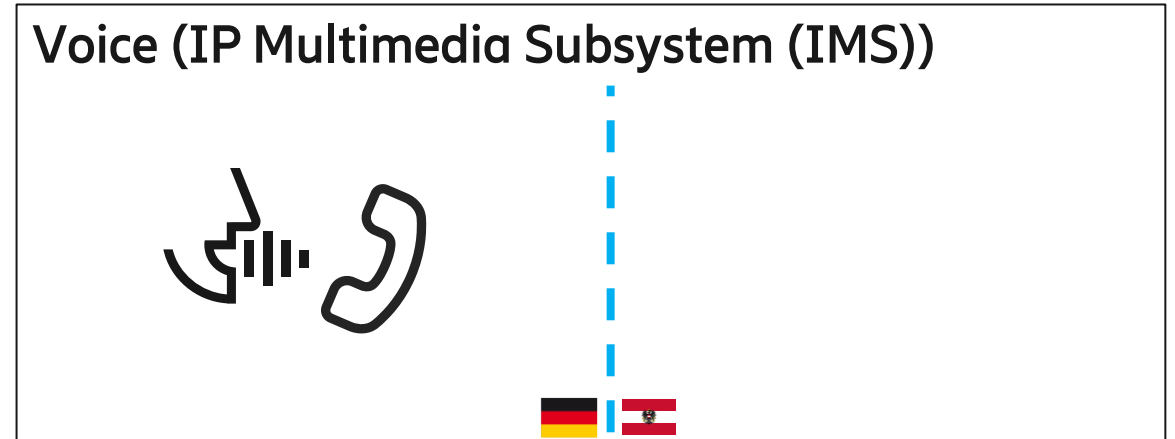
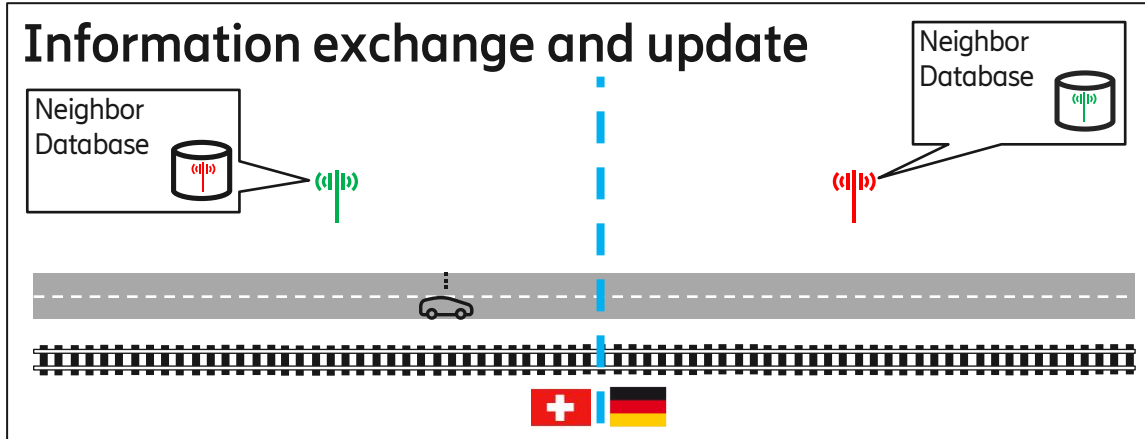
# CEF2 Digital – 5G Corridor EU Deployment funding: Key findings from Innovation projects – Open questions



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