



# 5G Connected Automated Mobility (CAM) Across Borders

Maciej Muehleisen

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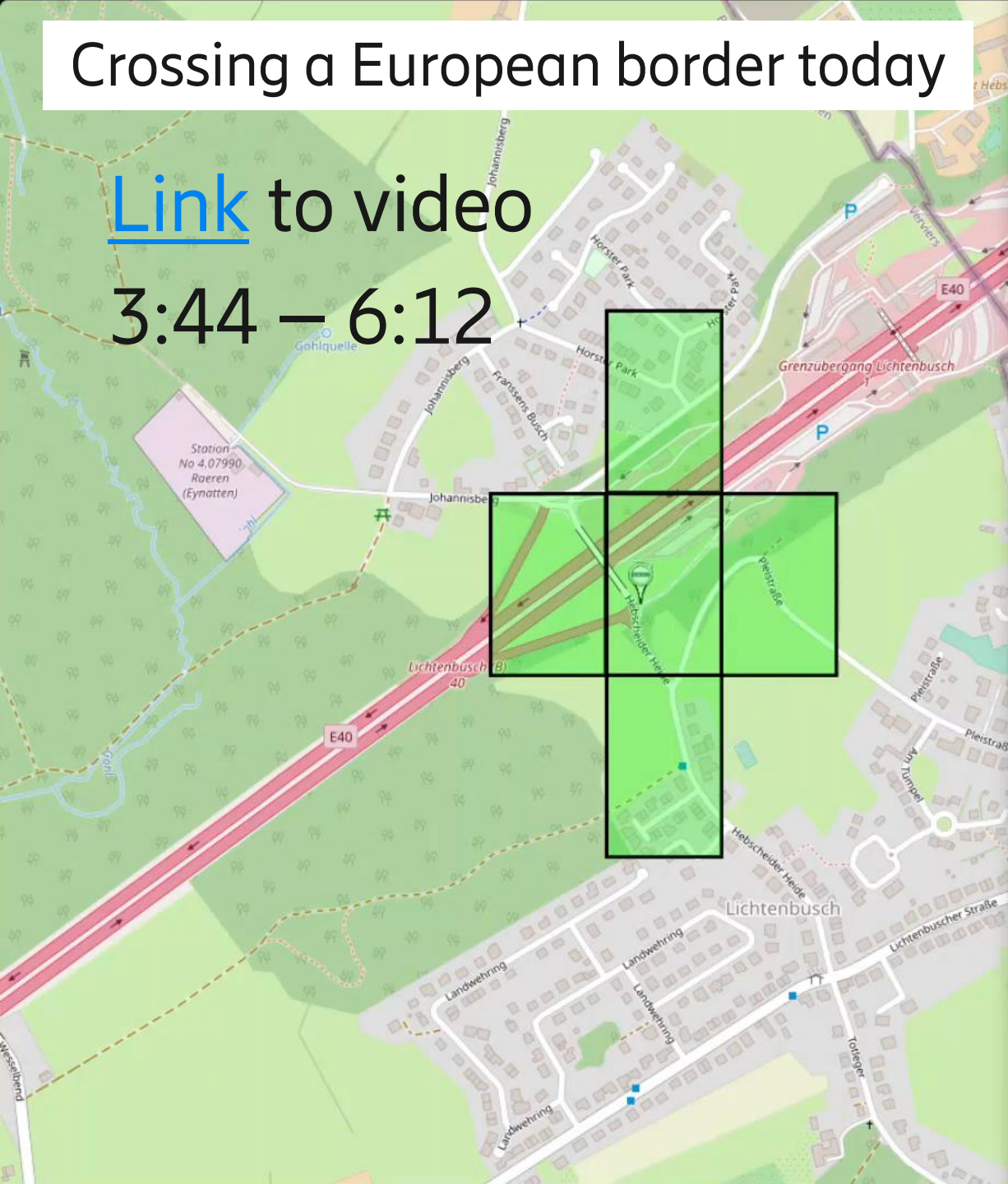
Ericsson

2021-11-04

# Crossing a European border today

[Link](#) to video

3:44 – 6:12



# 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**

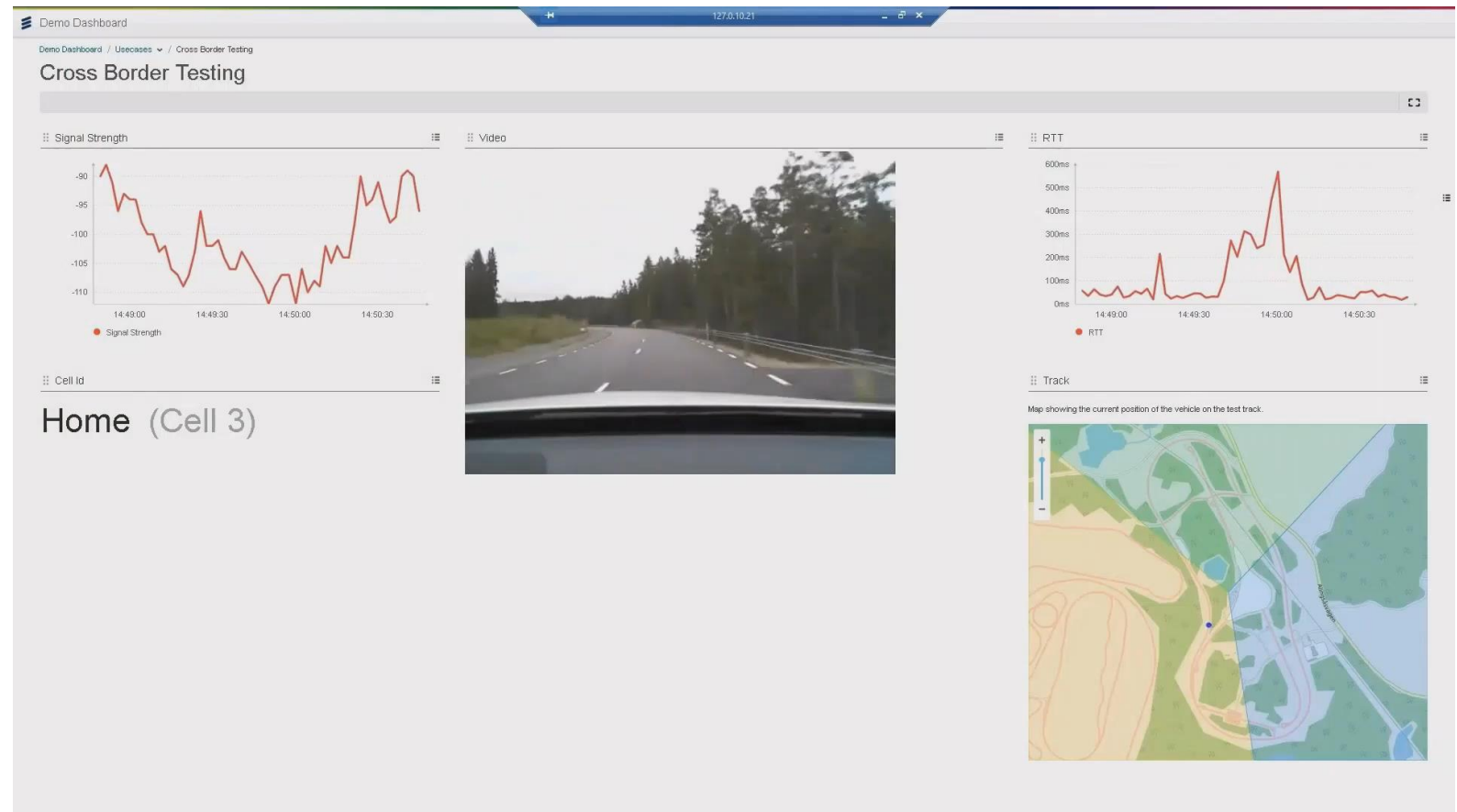


# First cross-border service continuity demo with Daimler 2019



[Link to video](#)

- 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 end of 2020 within 5GCroCo project



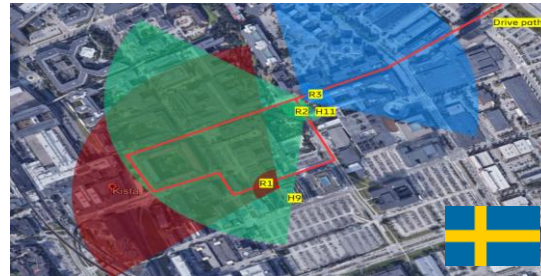
# Ericsson's connected vehicle research today



AstaZero



Kista 5G for Automotive Trial Site



Aldenhoven Testing Center 5G Mobility Lab



5G Automotive FieldLab Helmond



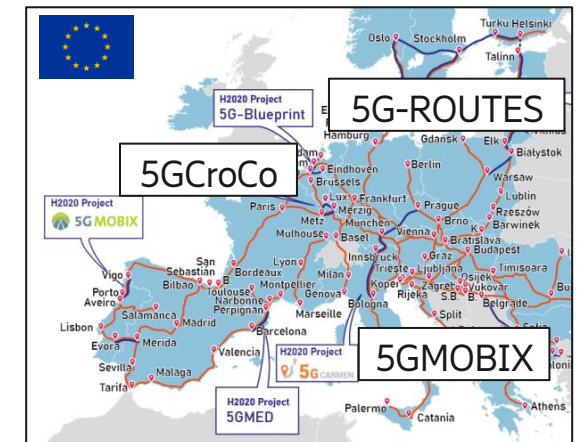
UTAC Ceram Monthléry



IDIADA



5G-ConnectedMobility Motorway A9 (until 2020)



# Ericsson's connected vehicle research today

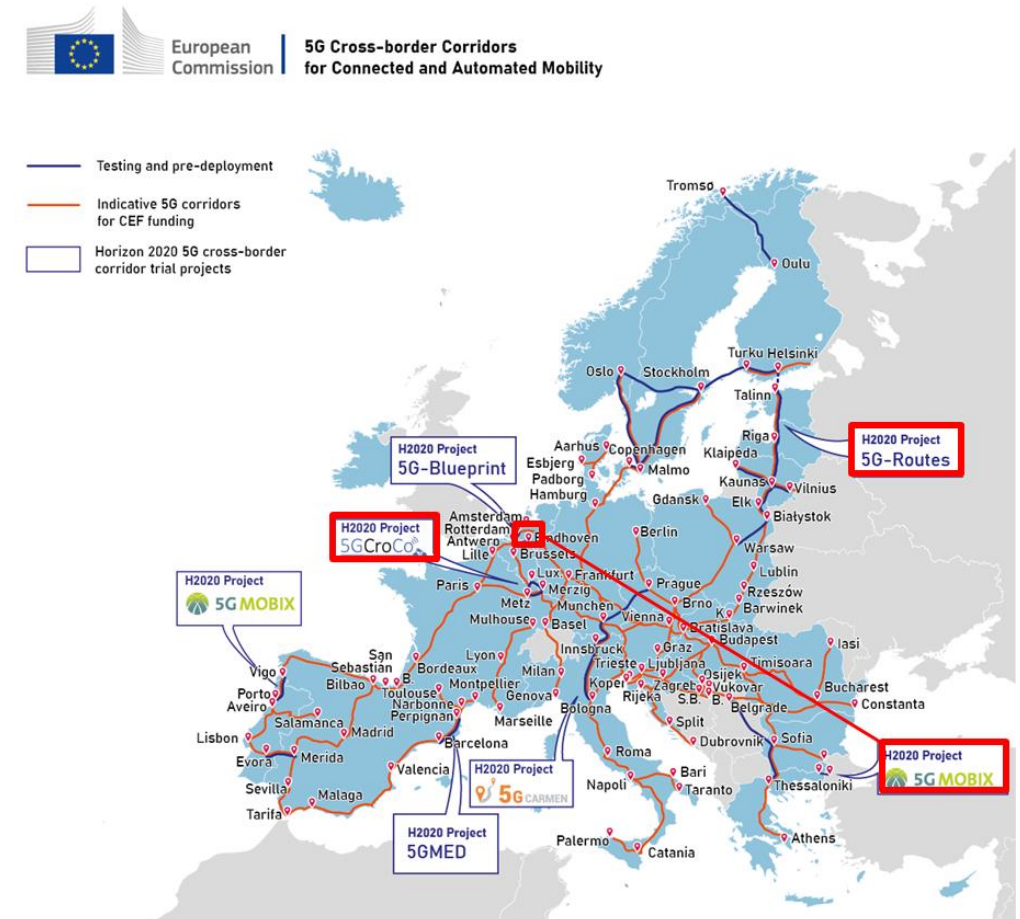


Ericsson is active in 3 of 6 5G cross-border projects (H2020 ICT-18 & -53):

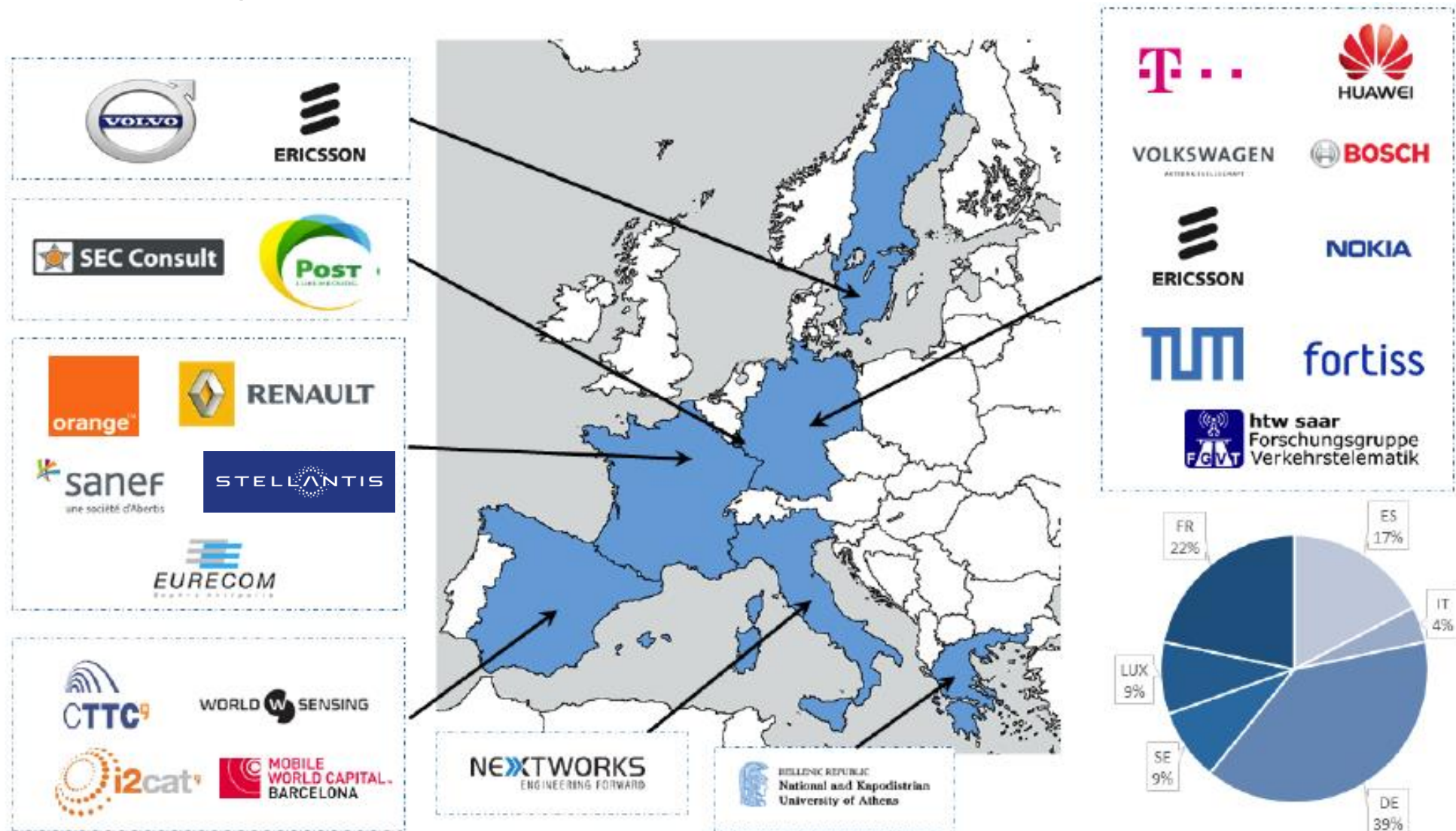
- 5GCroCo (ICT-18): France-Germany-Luxembourg
- 5GMOBIX (ICT-18): Greece-Turkey & Netherlands
- 5G-ROUTES (ICT-53): Finland-Baltics

Many synergies, but also unique properties:

- Four major automotive OEMs in 5GCroCo
- 5G stand-alone (SA) in 5GMOBIX
- Railway and sea ferries in 5G-ROUTES



# 5GCroCo project partners



# First 5G cross-border handover on public roads



Beginning of 2021 5GCroCo showed the **first 5G cross-border handover** on public roads



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825050-5GCroCo

[Link](#) to video 9:40 – 10:52

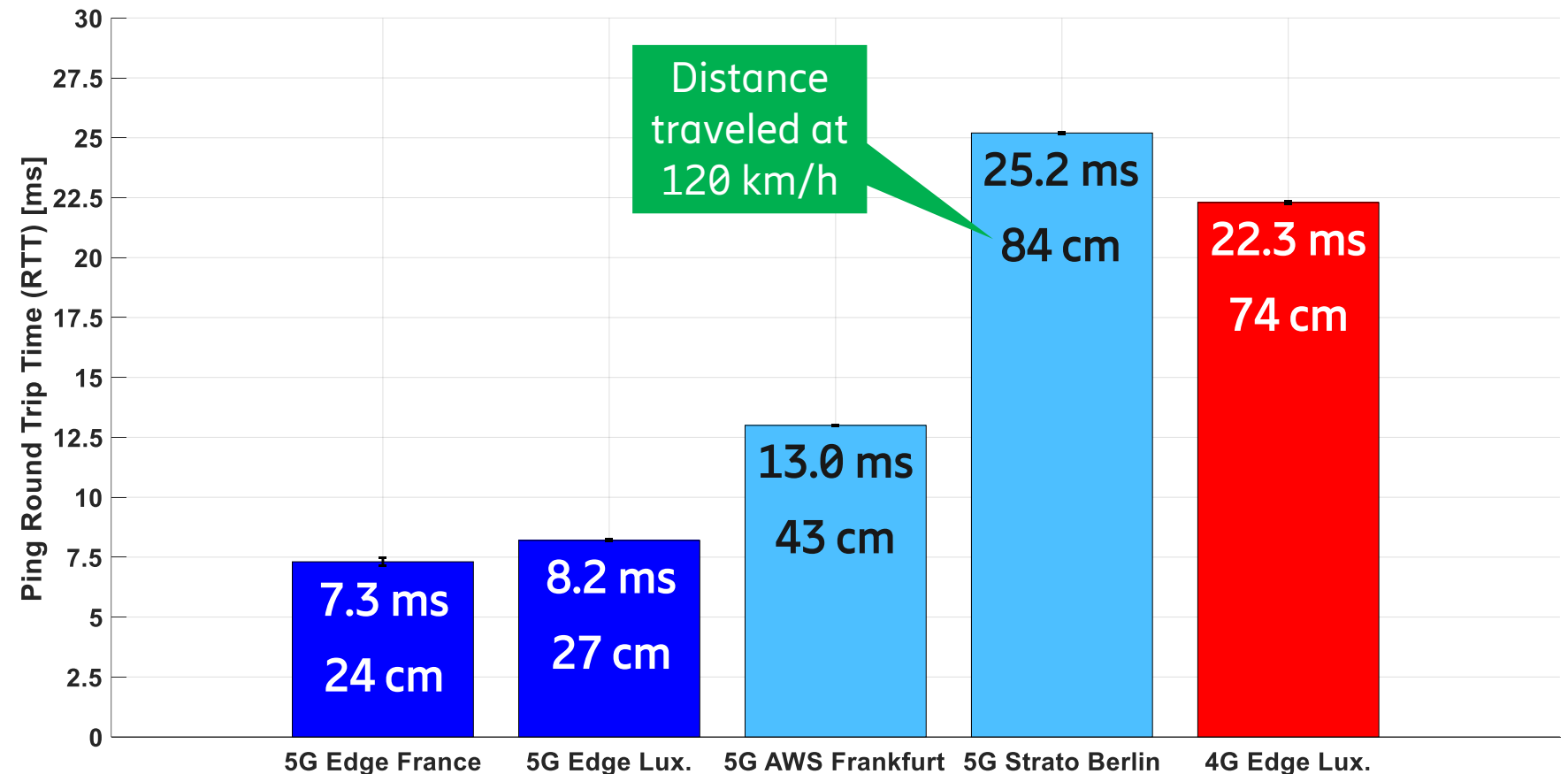


[Link to video](#)

# First 5G cross-border handover on public roads



Performance gain of  
5G vs. 4G and Edge vs.  
public Internet hosting



# Enabling technologies: Edge computing



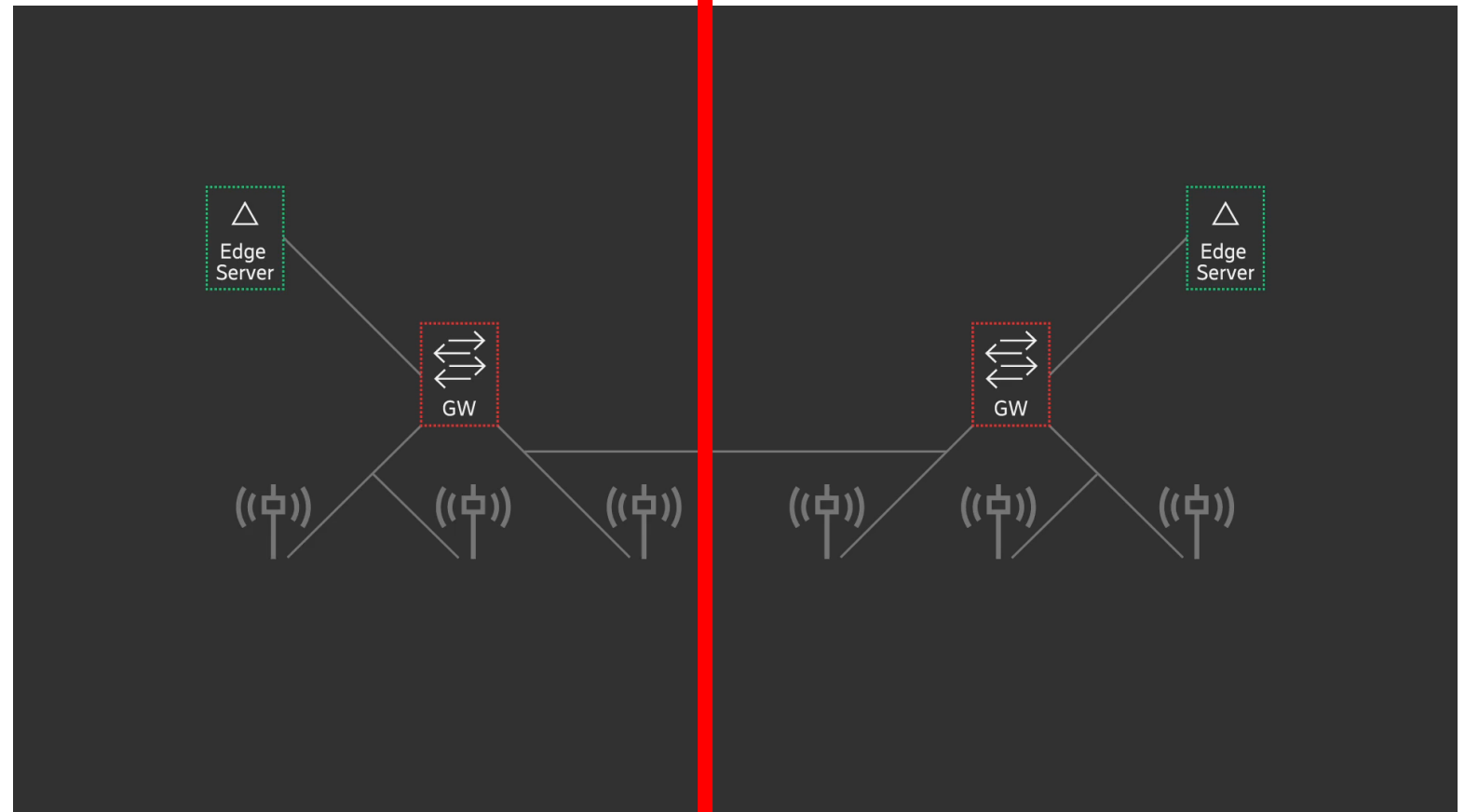
Standalone (SA) 5G Core supports seamless transition between Edge servers

Do not wait for this, start exploiting the benefit of Edge Computing now!

- Controlled E2E QoS
- Connectivity, hosting, and computation from MNO



[Link](#) to video  
12:50 – 13:22



# Enabling technologies: QoS prediction



[Link](#) to video  
13:22 – 14:22

Request from automotive  
industry:

„If you cannot guarantee  
same good QoS everywhere,  
at least tell us what we can  
expect on the road ahead“



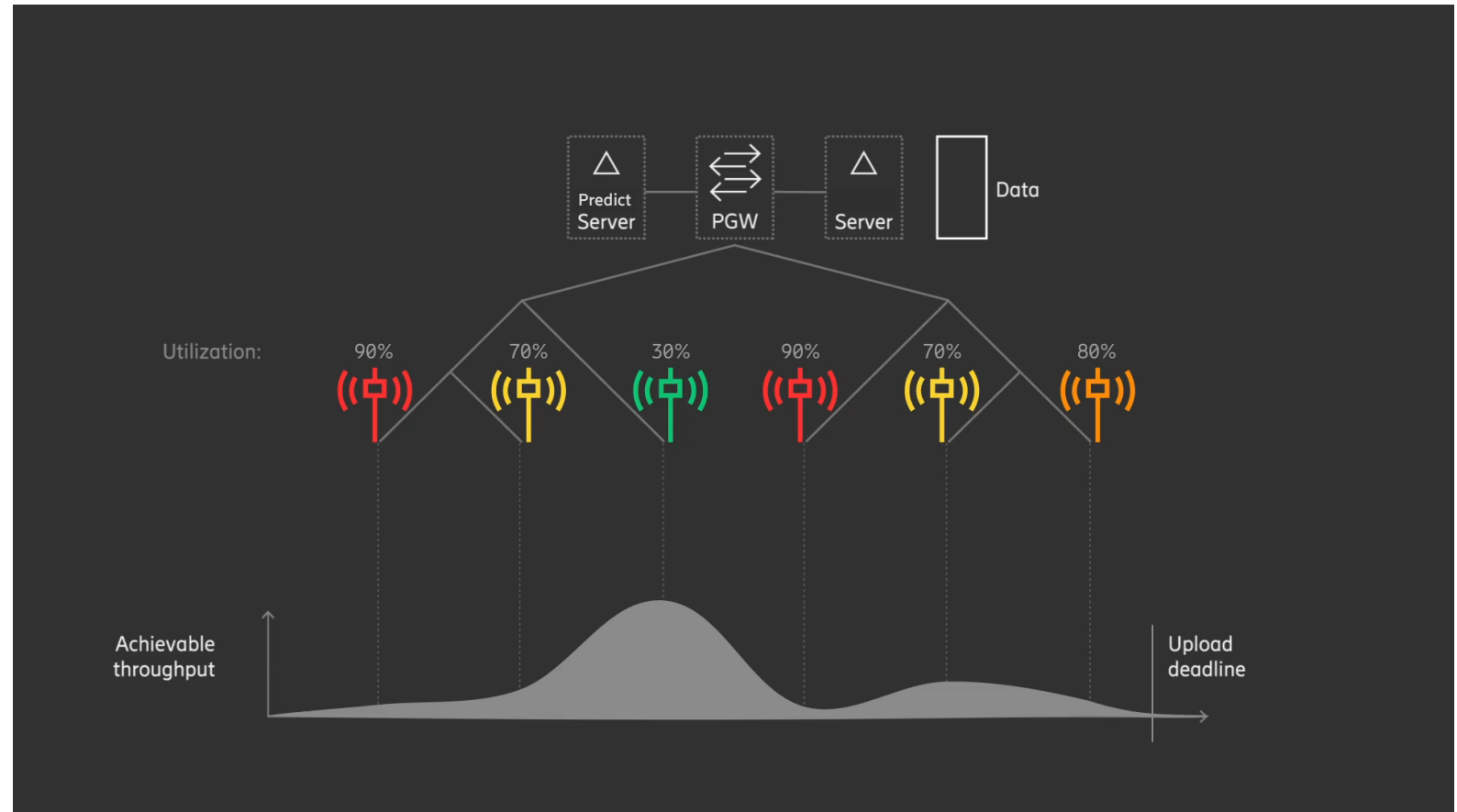
# Enabling technologies: Opportunistic Data Transfer

[Link](#) to video  
14:22 – 15:20

Many applications, like HD maps, have relaxed delay constraints

→ Network schedules transmissions for more uniform utilization

→ Rewards by reduced cost (like for smart-metering)



# Future vision: adaptive, distributed control



Adaptive, distributed control  
for safety and efficiency

More network control in high  
traffic density areas

On-board sensor based with  
network support in low  
traffic density areas

Same as for aircraft and  
maritime vessels

[Link to video](#)



# Summary and conclusion



- 5G cross-border service continuity was successfully demonstrated
- Also demonstrated further 5G features in cross-border settings, e.g.
  - Edge computing
  - QoS prediction
  - Opportunistic data transfer
- 5G can provide ultra-reliable services for connected-vehicles in **confined areas**
- We expect an **incremental** evolution to open roads soon, but **must evaluate it now**



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