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IoT WebTalk
Delivering
5G QUALITY OF SERVICE
for Connected and Automated Driving
Tuesday, 3 November 2020 | 09:00 EST | 14:00 GMT | 15:00 CET

Speakers

JOHANNES SPRINGER

Program Lead 5G Automotive Program, Deutsche Telekom / T-Systems

JOACHIM KLINK

Head of Autonomous Driving and Integrated Mobility, Deutsche Telekom / T-Systems

AMIT ROSENZWEIG

CEO & Founder, Ottopia

PANEL MODERATOR

Dr Shane Rooney, Executive Director, IoT Networks, GSMA

Agenda

10 min	**Keynote: Introduction to 5G Quality of Service**	Johannes Springer, Program Lead 5G Automotive Program, **Deutsche Telekom / T-Systems International**
15 min	**Joint Keynote and Demonstration: Teleoperations**	Joachim Klink, Head of Autonomous Driving and Integrated Mobility, **Deutsche Telekom / T-Systems International** Amit Rosenzweig, CEO & Founder, **Ottopia**
30 min	**Interactive Panel Discussion and Live Audience Q&A**	Moderator: Dr Shane Rooney, Executive Director, IoT Networks, **GSMA** Johannes Springer, **Deutsche Telekom / T-Systems International** Joachim Klink, **Deutsche Telekom / T-Systems International** Amit Rosenzweig, **Ottopia**

The Socio-Economic Benefits of Connected Vehicles

Road Traffic Accidents

- In the top 10 causes of death globally across all age groups
- 1.35 million lives lost every year
- Over 90% of vehicle collisions caused by human error

Over 500 Million Connected Cars on the Road by 2025

Yearly Benefits of Connected Cars by 2025

- 11,000 lives saved
- 260,000 fewer accidents
- 400,000 tones of CO_2 emissions avoided
- 280 million hours of driving saved

Sources: Bosch, 2017 | Ericsson, 2019 | U.S. DOT, 2016 | WHO, 2018

Why C-V2X?

- **Commercially available** globally, leveraging the secure and established 4G LTE network infrastructure
- Seamless and sustainable evolution from **4G to 5G** while upholding **backwards compatibility**
- Superior levels of **security, range, latency and reliability** that vastly exceed the capabilities of alternative solution DSRC/802.11p

Why C-V2X?

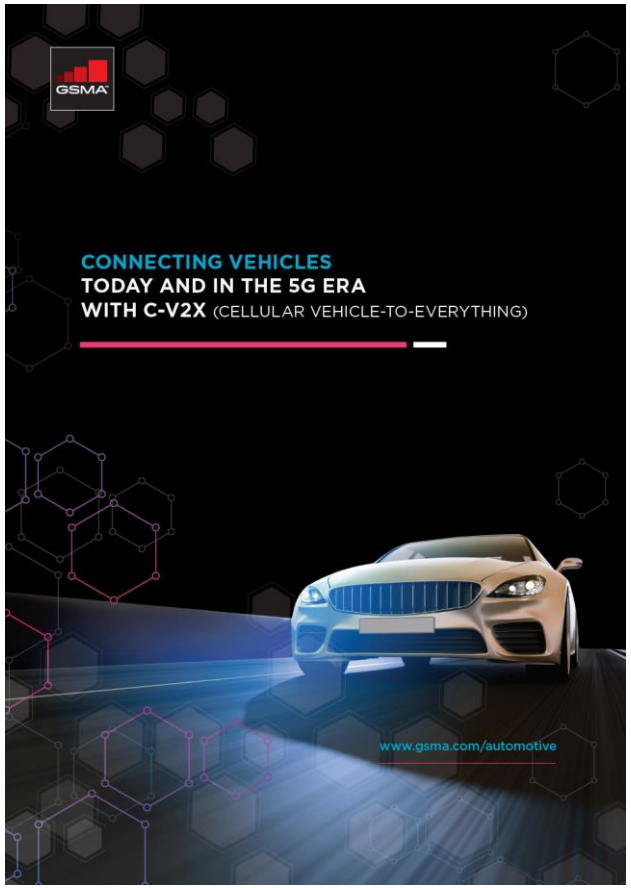
- Backed by a **global ecosystem** of 130+ leading mobile operators, vendors, automotive manufacturers, suppliers and companies from the wider industry

- C-V2X **security** is based on internationally recognised interoperable standards leveraging the security services provided by mobile networks, including eSIM

- **Mobile operators** are the experienced, trusted and licensed providers of an already established network infrastructure and are best placed to provide and manage connected vehicle solutions with the necessary scale, coverage, reliability and end-to-end security

What is the GSMA doing?

- The GSMA is working with mobile operators, automotive OEMs and suppliers, industry associations and regulatory bodies to accelerate the growth of the connected vehicle market by agreeing a common approach to security, regulatory and infrastructure solutions.
- To find out more, visit www.gsma.com/automotive



Find Out More:

gsma.com/automotive

Get in Touch:

automotive@gsma.com

Stay Up to Date:

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5G – Quality of Service (QoS) for Connected and Automated Driving

Dr. Johannes Springer | 5G Program @ Automotive
Deutsche Telekom AG / T-Systems International
GSMA WebTalk, November, 2020

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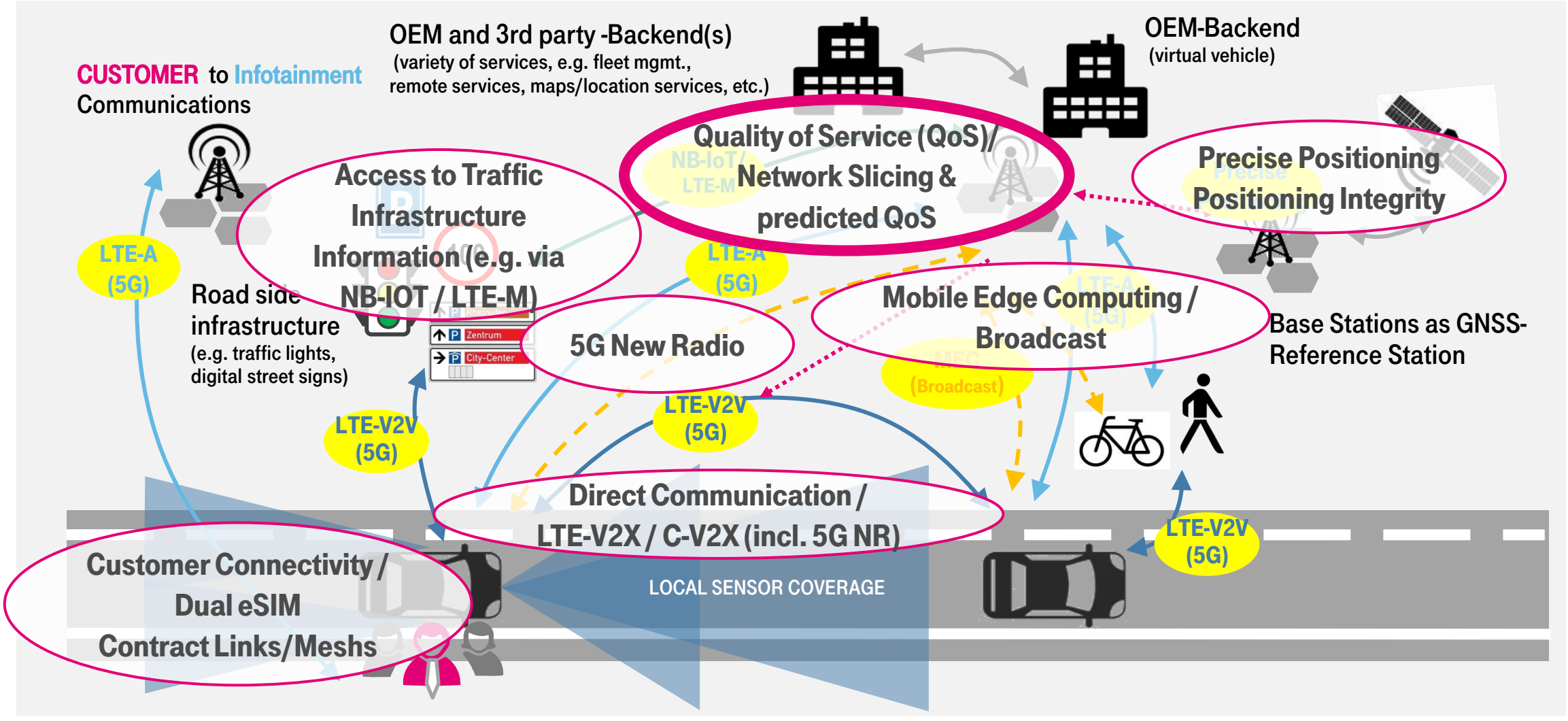
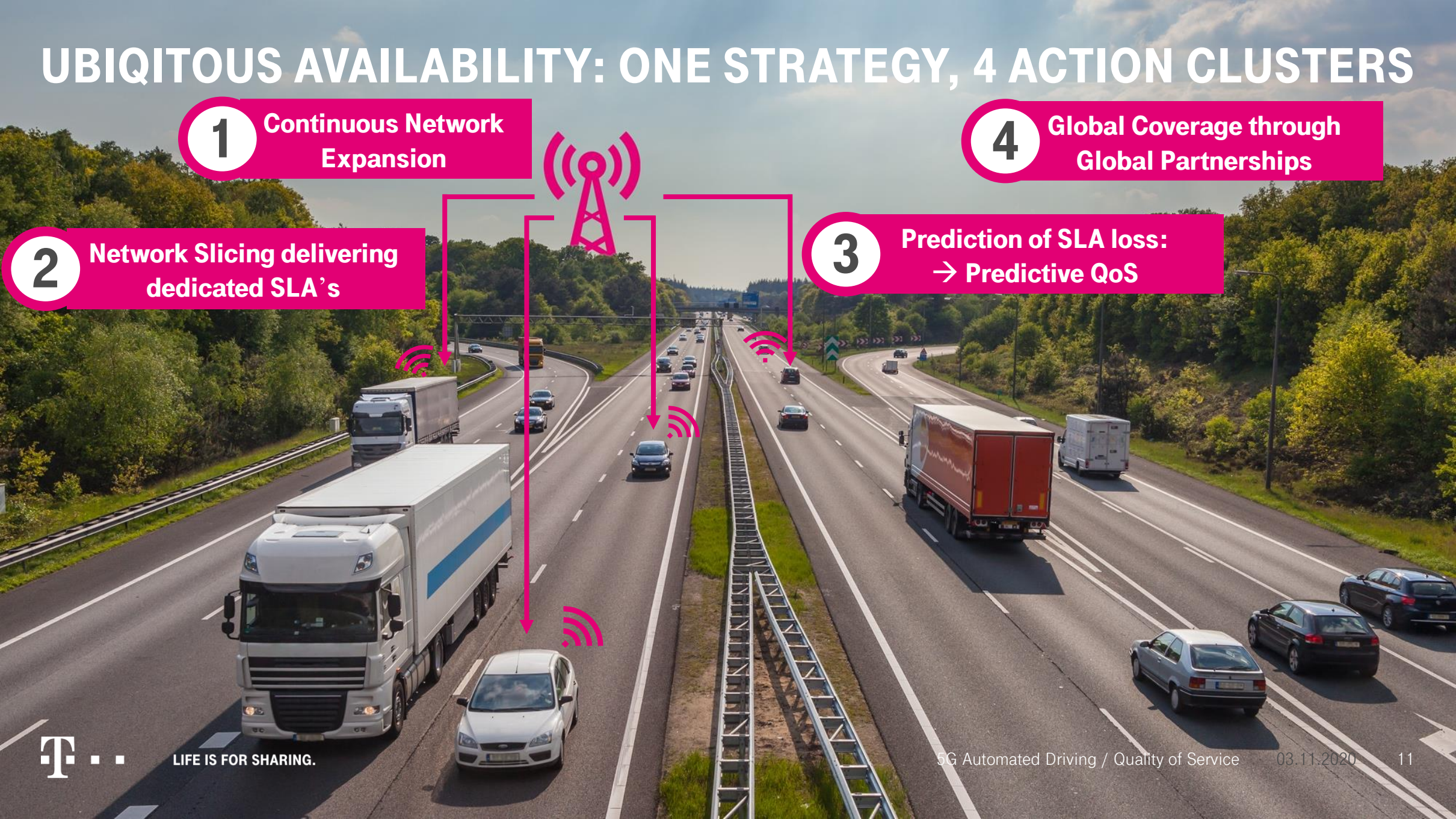
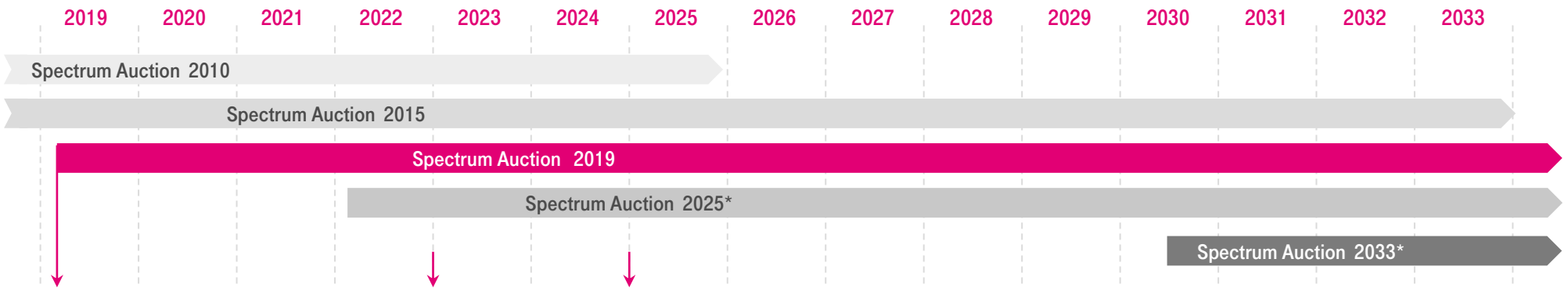
AUTOMOTIVE CELLULAR CONNECTIVITY / TOPICS



UBIQITOUS AVAILABILITY: ONE STRATEGY, 4 ACTION CLUSTERS



SPECTRUM AUCTIONS: → COVERAGE (EXAMPLE GERMANY)



Auction
2 GHz und 3,6 GHz

Coverage Obligations 2019
Step 1 (12/2022):

- 98% of households in every federal state
- All motorways
- Main primary roads
- Primary rail tracks
- 5G base stations 1.000
- Base Stations white spots 500

Coverage Obligations 2019
Step 2 (12/2024)

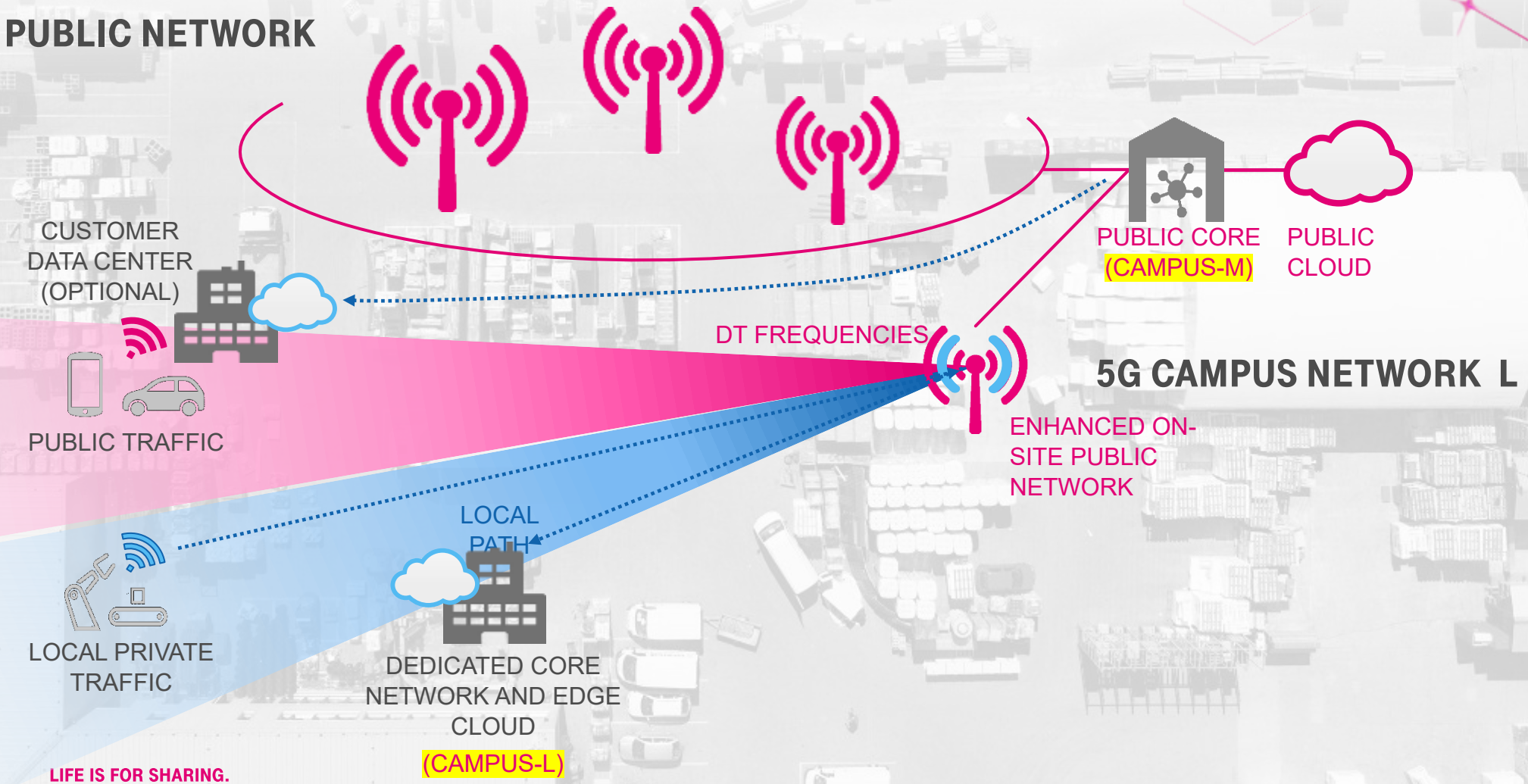
- Remaining primary roads
- Secondary and rural roads
- All rail tracks
- Harbors and important inner-country waterways

100 Mbit/s 50 Mbit/s 10 ms

* incl. 2 years preparation time

Quelle: Bundesnetzagentur

ARCHITECTURE OF A 5G CAMPUS NETWORK L

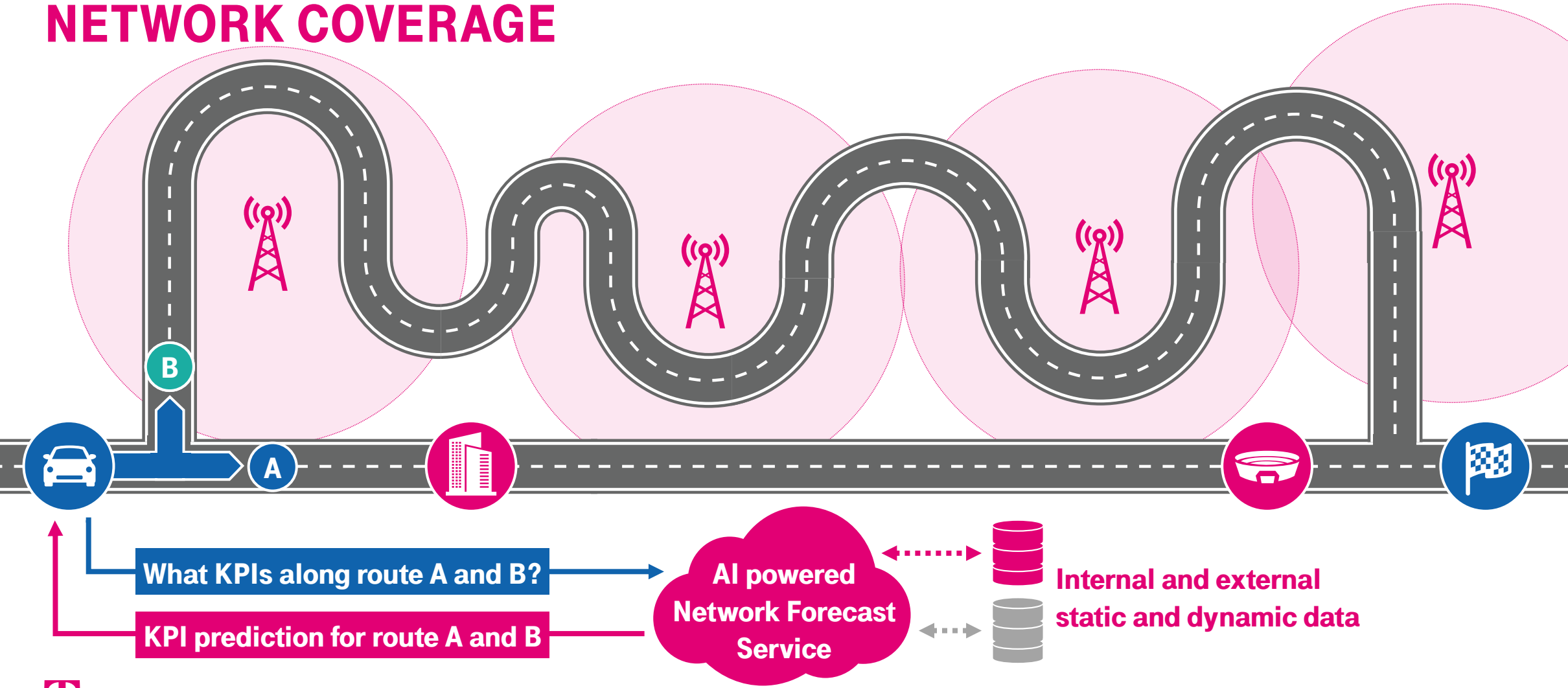


EXAMPLE FOR NETWORK SLICING: TELE-OPERATIONS AS PART OF AUTONOMOUS DRIVING

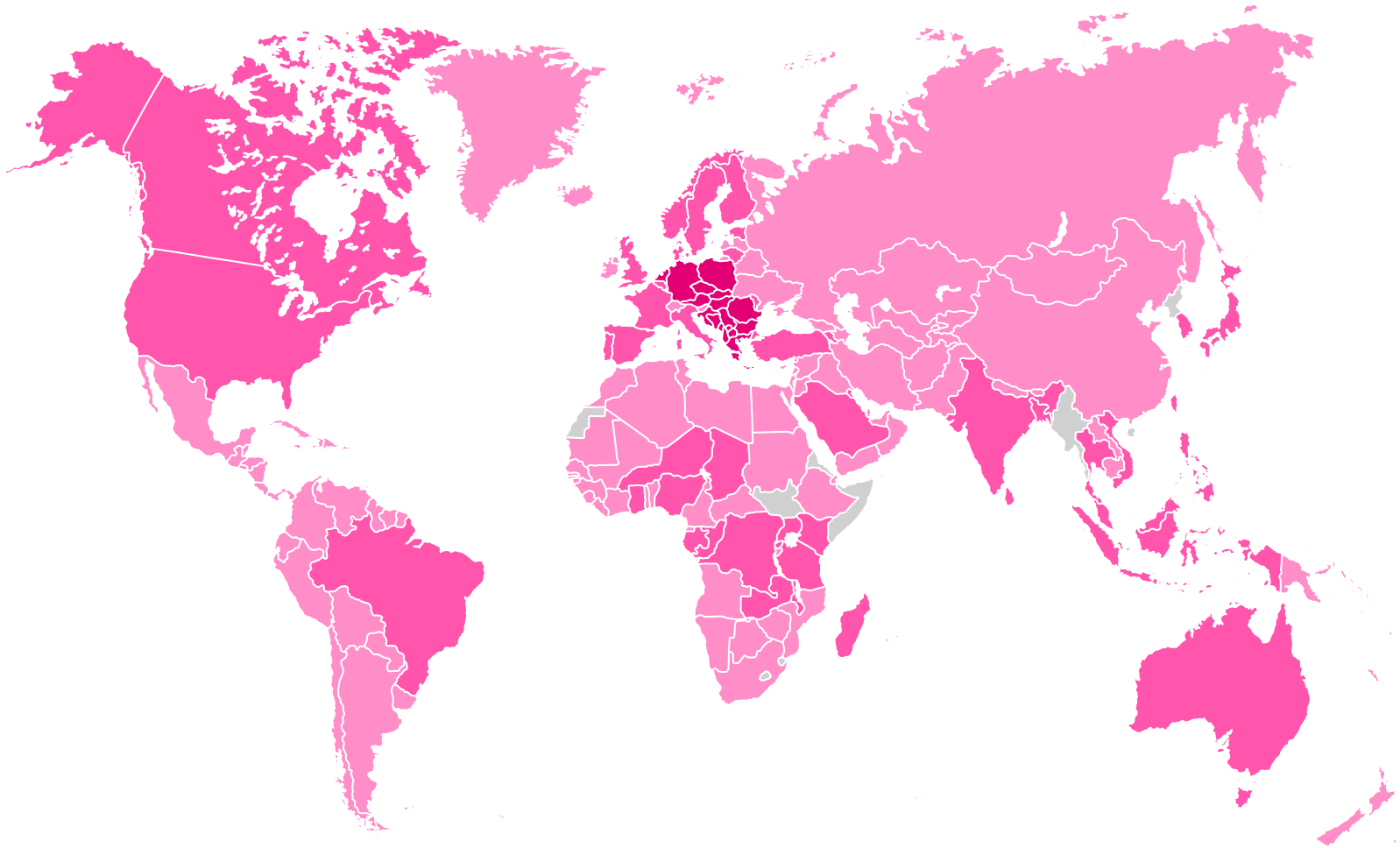
5G managed low latency and high bandwidth are key capabilities

Human driver at vehicle control center takes over in case of accident, technical problems, identification or decision issues

PREDICTIVE QUALITY OF SERVICE HELPS TO ANTICIPATE NETWORK COVERAGE

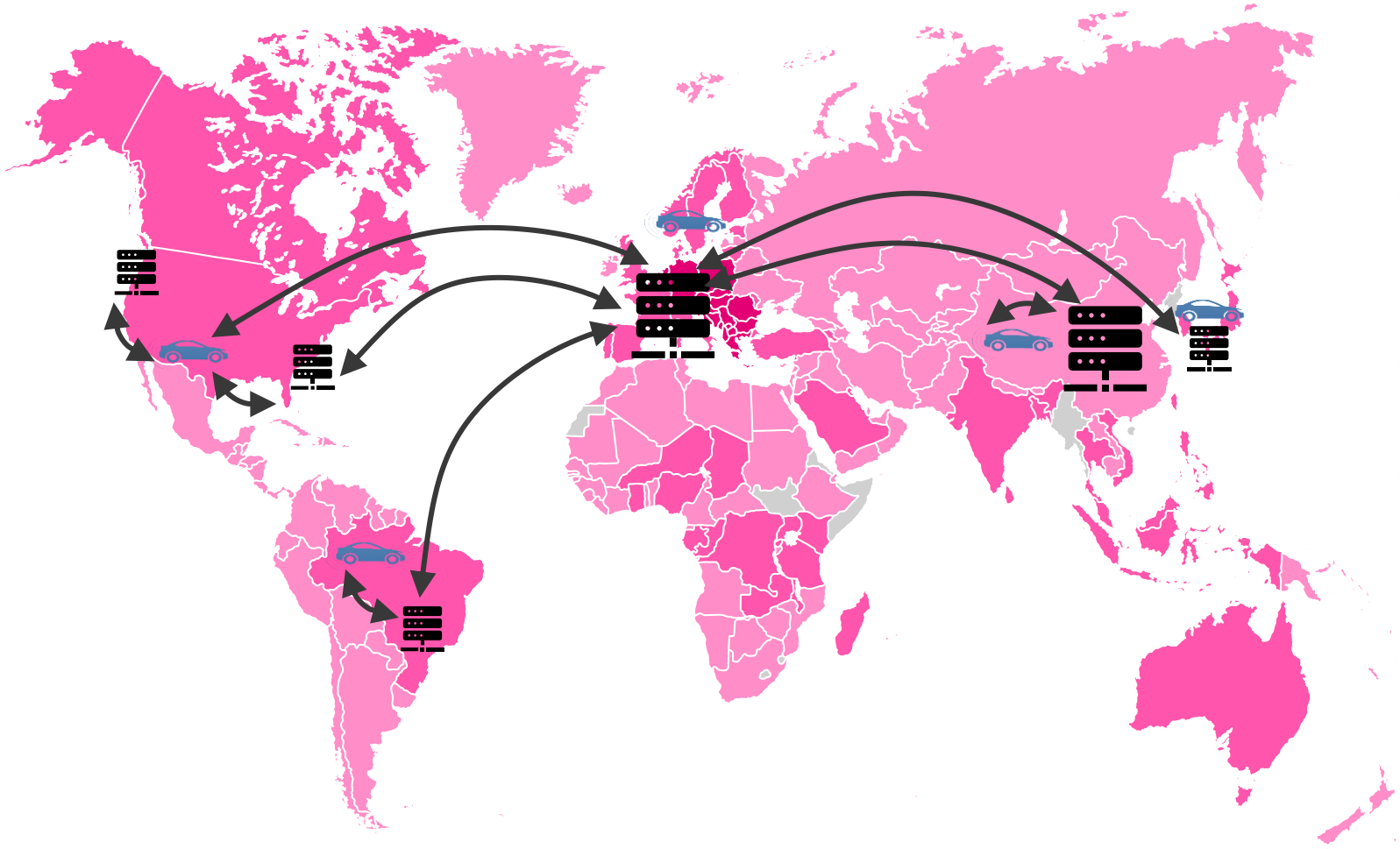


5G CAPABILITIES NEED TO BE PROVIDED GLOBALLY

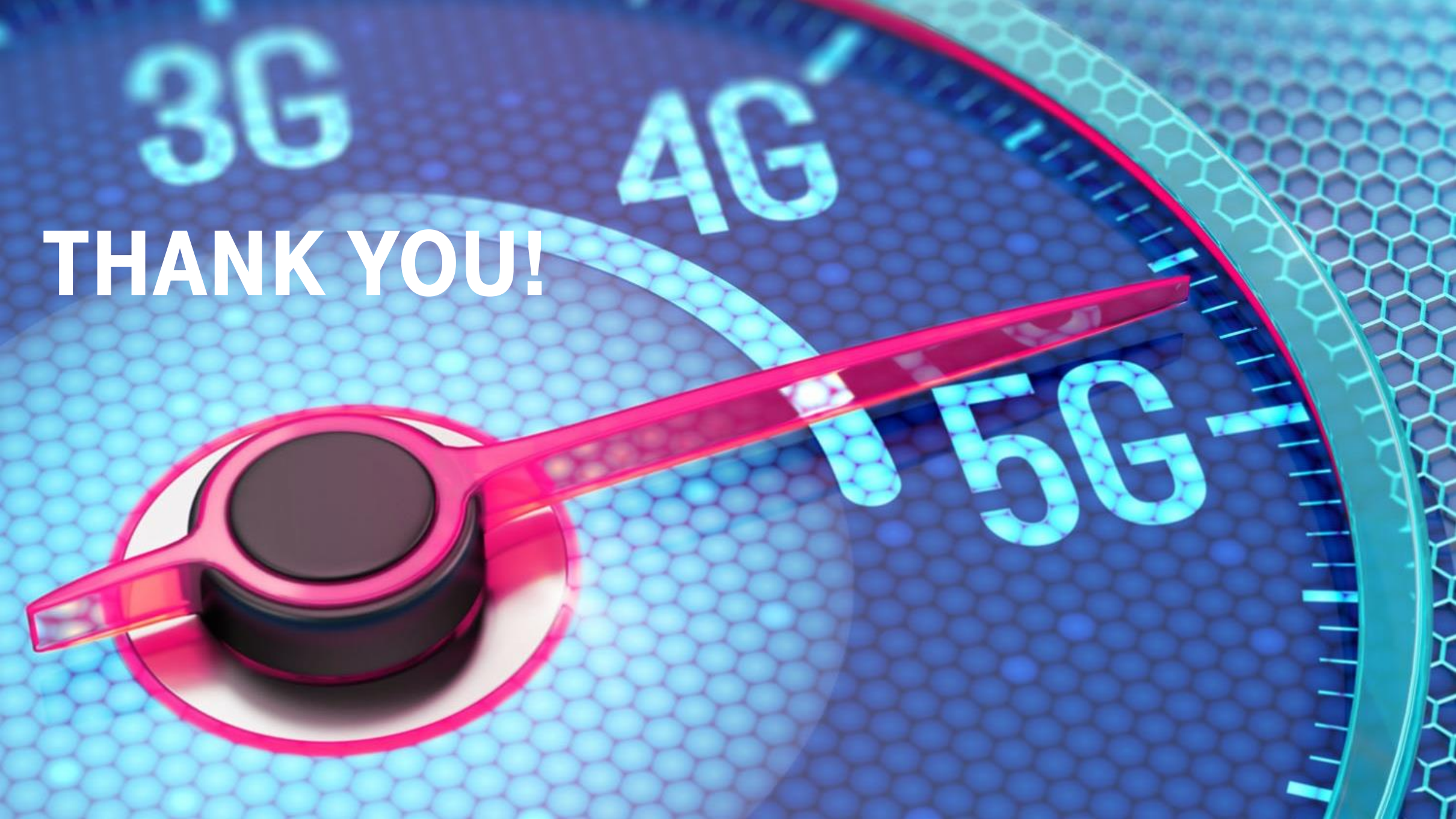


- High quality global access portfolio
- Connectivity services via own infrastructure or tier one partners:
  - Deutsche Telekom own network
  - GMA + GMA Bridge Alliance
  - Roaming Partners

GLOBAL AVAILABILITY AND SMART ROUTING



- Smart routing for latency critical us cases (e.g. remote control)
- Legal constraints, e.g. South Korea, Brazil, Turkey
- Centralization / decentralization of management features (e.g. SOTA / FOTA / MapUpdate)


3G
4G
5G
THANK YOU!

IoT WebTalk: Delivering 5G Quality of Service (QoS) for Connected and Automated Driving

Joachim Klink, T-Systems International
Amit Rosenzweig, Ottopia

Photo: Ottopia

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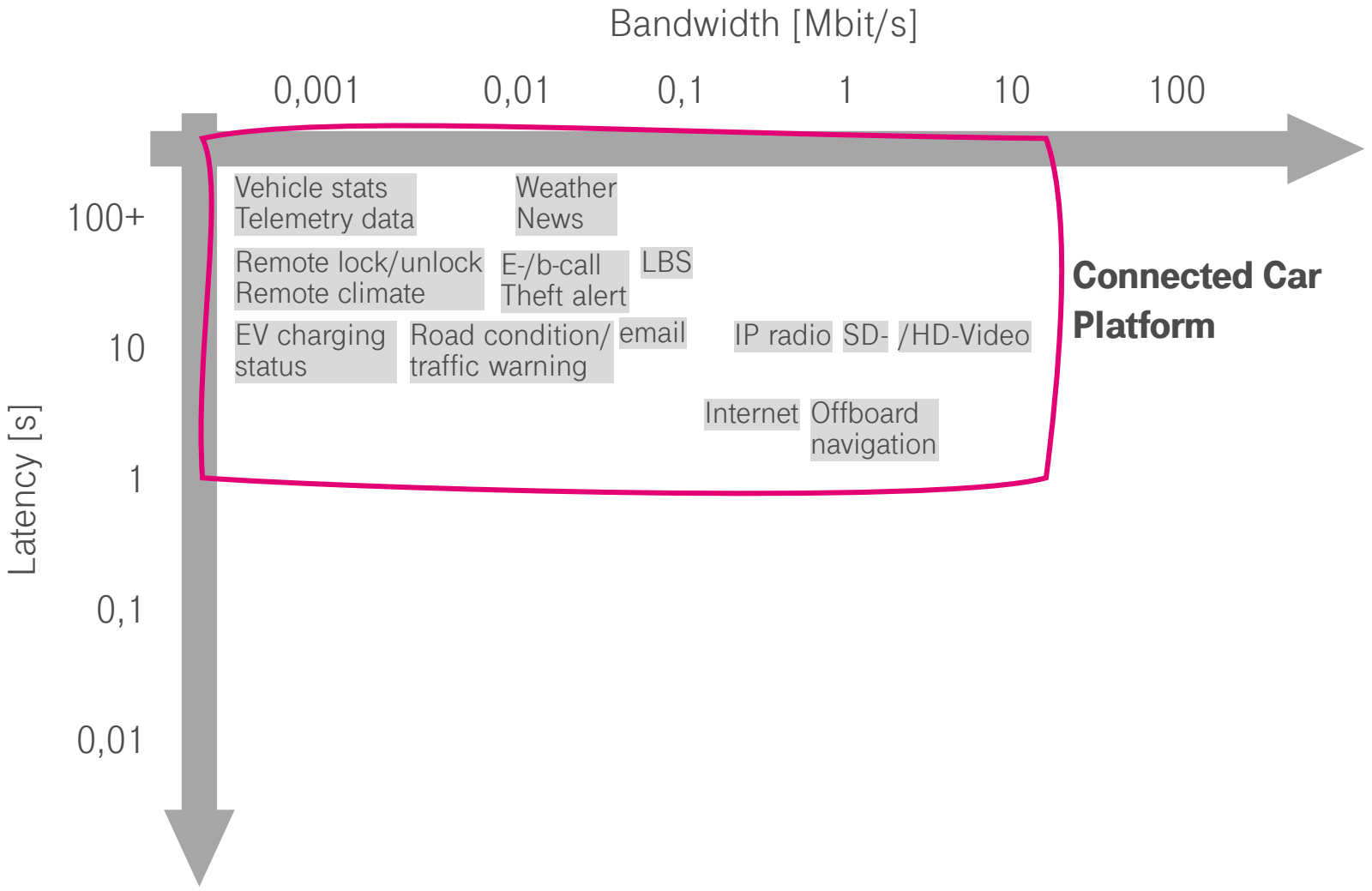
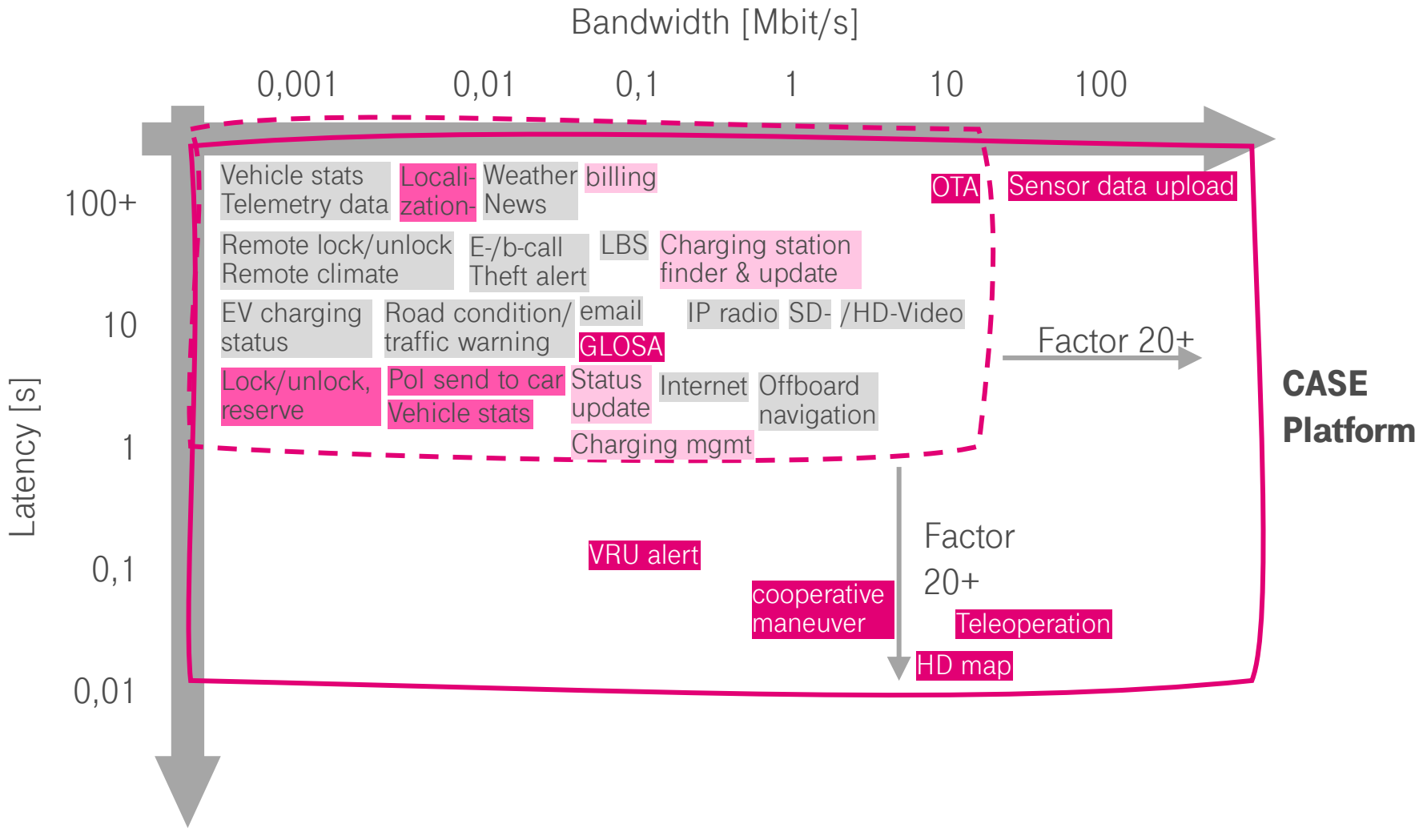
The difference between today's connected car portfolios and CASE...

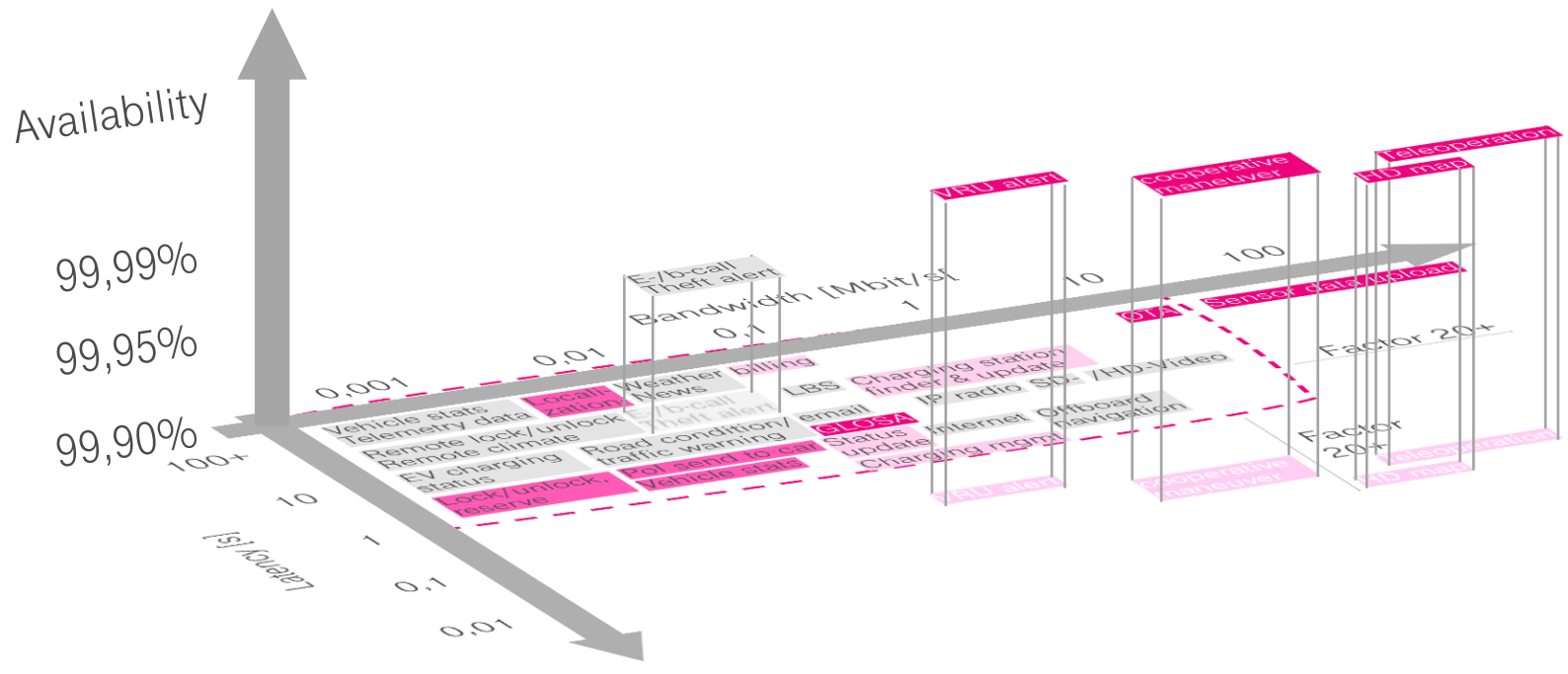


… are „just“ 20+ times more challenging requirements.



And QoS is THE key differentiator to literally save lives.

Connected car
Autonomous driving
Car sharing
Electric vehicle



Example for ultra-reliable, high bandwidth and low latency requirements: Teleoperation – Why is it a challenge?

Your perception is limited...

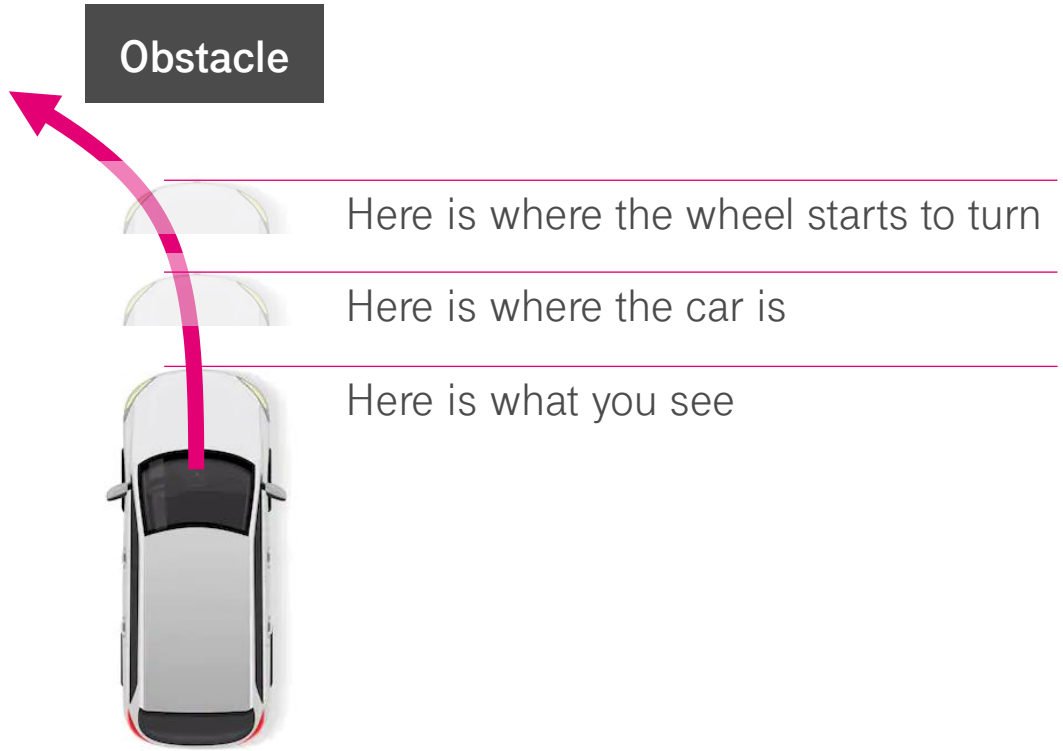
4 HD Video Streams

=

50 times less than one human eye

50 % of a single radio cell

Your control command comes (too) late

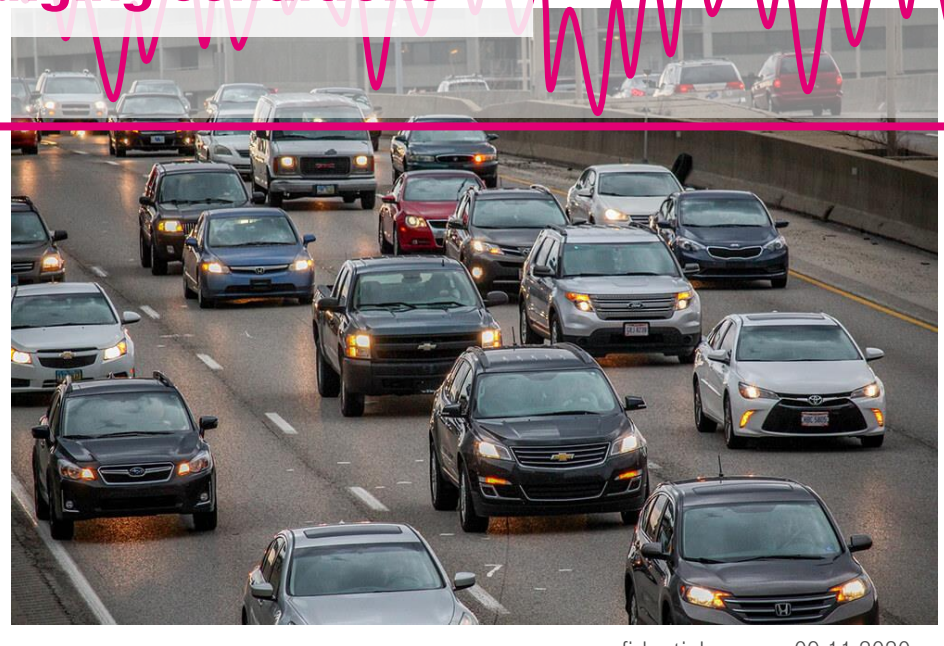


Imagine...

Bad signal

Permanently changing conditions

Many consumers



Safe teleoperation to enable automated/autonomous driving

Amit Rosenzweig, CEO and Founder, Ottopia

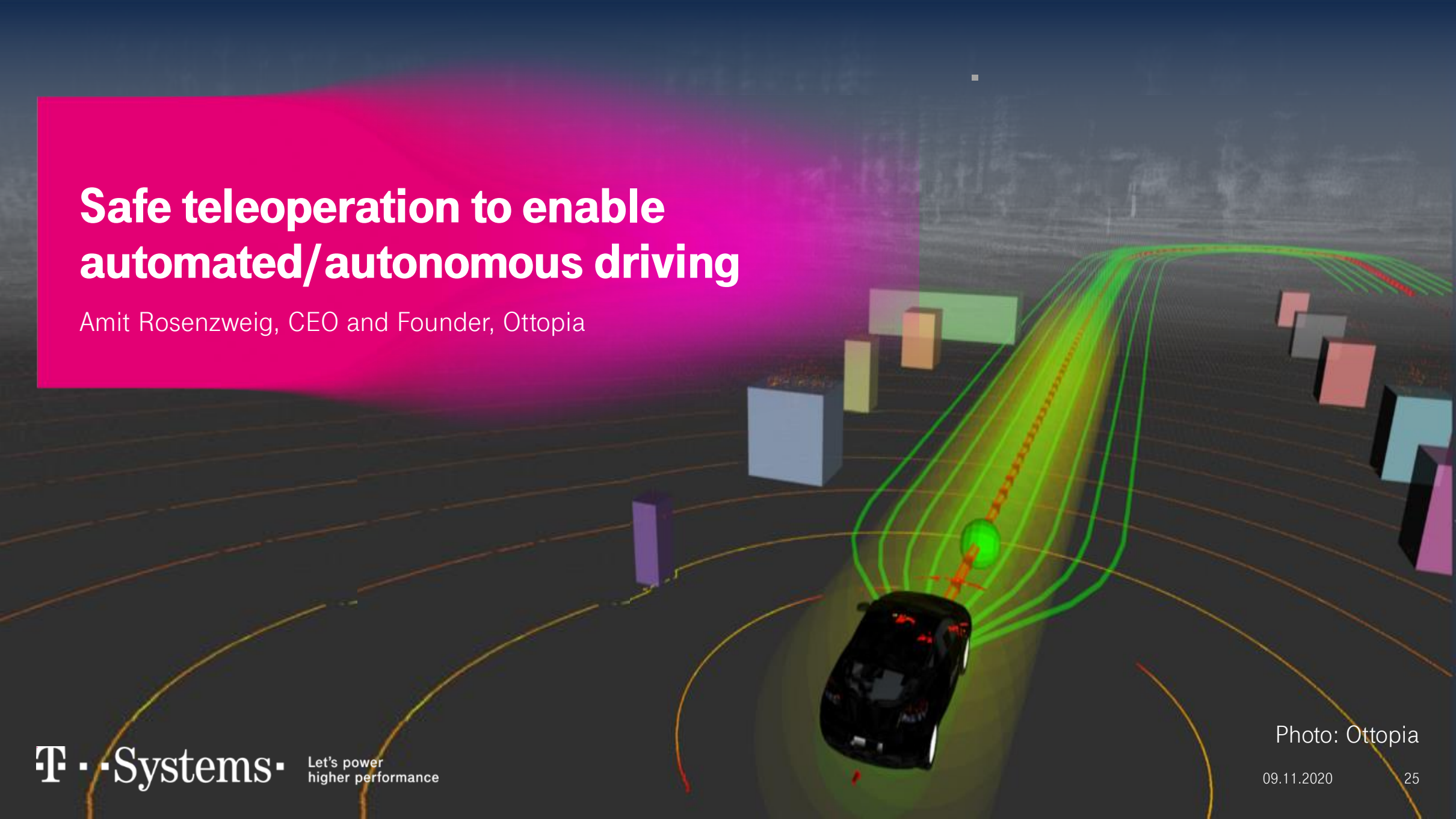


Photo: Ottopia

Panel Discussion and Audience Q&A