

Daimler's Perspective on Car-to-X Technologies (5GAA member)



On the road until cars communicate directly ...

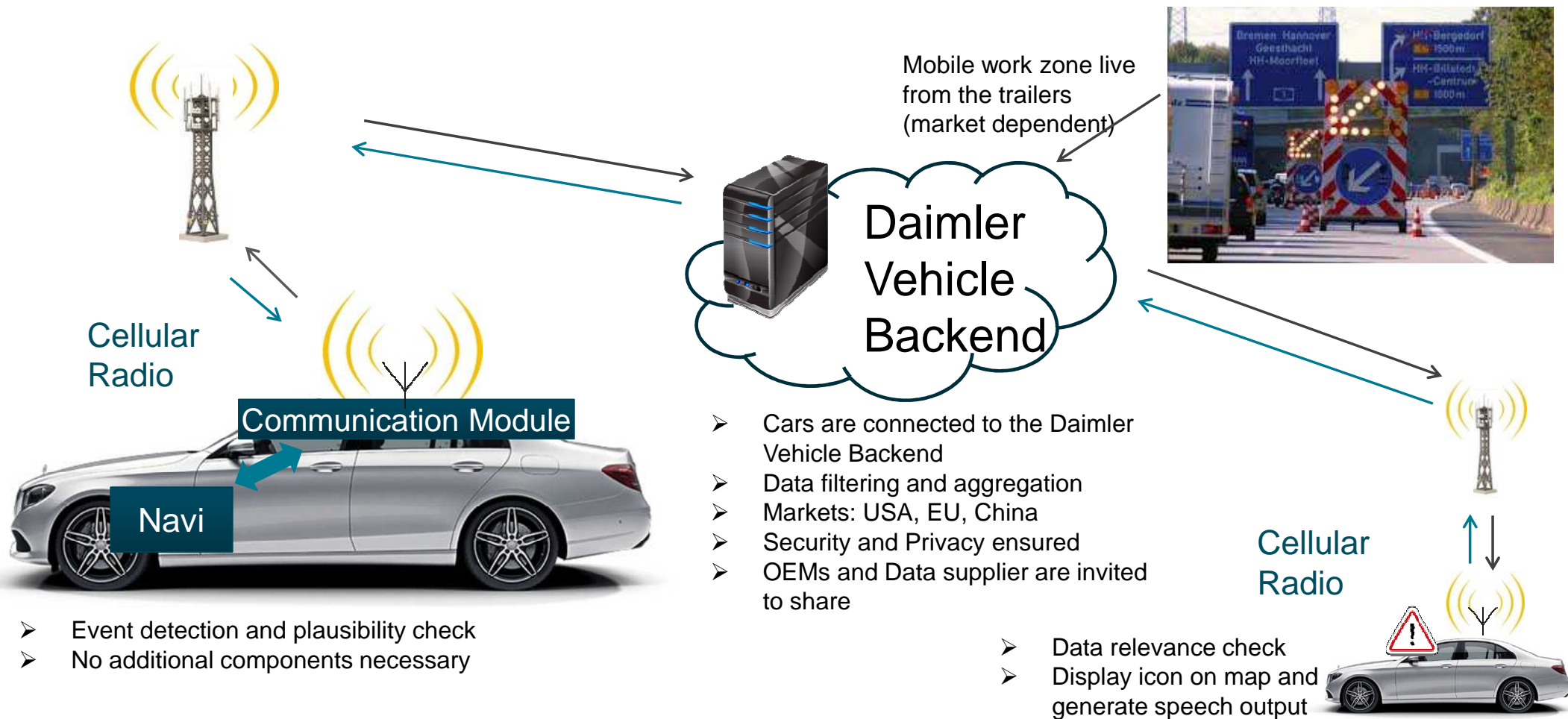
- Over 90% of new Mercedes-Benz cars are already connected worldwide
- Daimler runs reliable backends to bring connected services to cars since years

→ Why not using existing technology to enhance the safety experience now?









Mercedes-Benz offers **communication between cars** since new E-Class in 2016 – „Car-to-X communication **via backend**“:

- More safety to our customers earlier
- Manageable small implementation effort and very short development time
- Fast rollout to main markets (EU, US, CN)
- Easy technology adoption to further car lines (S-Class done, A-Class soon)
- Many safety use cases from Car-to-Car direct communication standards are covered

Car-to-X via Cellular Radio in E-Class 2016



Car-to-X via Cellular Radio in E-Class 2016

Event	Triggering Conditions	Icon on Map	Speech output
Broken down vehicle	Vehicle system signals		Yes
Vehicle accident	Air bag inflation and others		Yes
Hazard lights	Hazard light on		Yes
Heavy Rain	Highest wiper level for 20 s		No
Slippery road	Antilock braking system intervention		No
Fog	Rear fog light on		No
Mobile work zone	External data from work zone trailers		Yes
General Warning	Driver manual input		Yes

Next steps on Car-to-Car communication ...

- Enhance driver safety by
 - sharing data among different OEM platforms through **HERE**
 - receiving data from **ITS infrastructure and Smart Cities**
 - Improve data transfer by using **5G** technologies (e.g. QoS, latency)
 - Avoid even more safety hazards by continuously improving **sensor** technologies
- Direct communication can enable new safety use cases (e.g. V2P) and comfort driving use cases

This adds technical challenges including the debate on ITS G5 802.11p versus C-V2X:

- Low safety benefits and customer acceptance inhibited by **slow market penetration**
- Higher car **integration costs** expected to come along with 802.11p
- **Coexistence** of 802.11p and C-V2X in same ITS spectrum (5.9 GHz) is needed

Daimler's position on ITS G5 802.11p and C-V2X

- **Technology neutrality** is crucial
- Sufficient **spectrum allocation for technology coexistence** is required
- For cars **C-V2X is preferred** because it:
 - is the **natural path** to expand connected cars based on mobile networks
 - will be rolled out to cars much **faster** (update of mobile connectivity equipment)
 - will add additional potential **safety improvements** (e.g. to pedestrians)
 - will have **lower investment** impact to cars