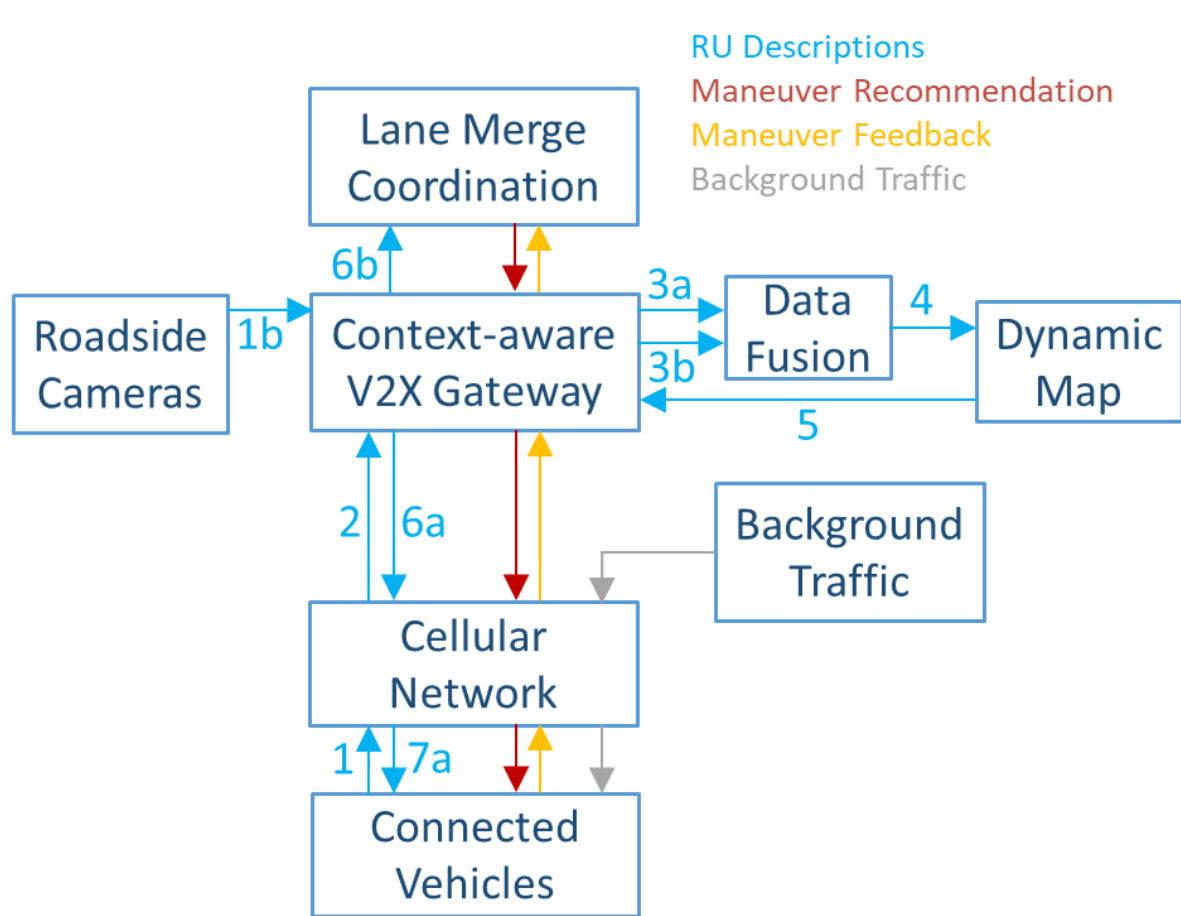
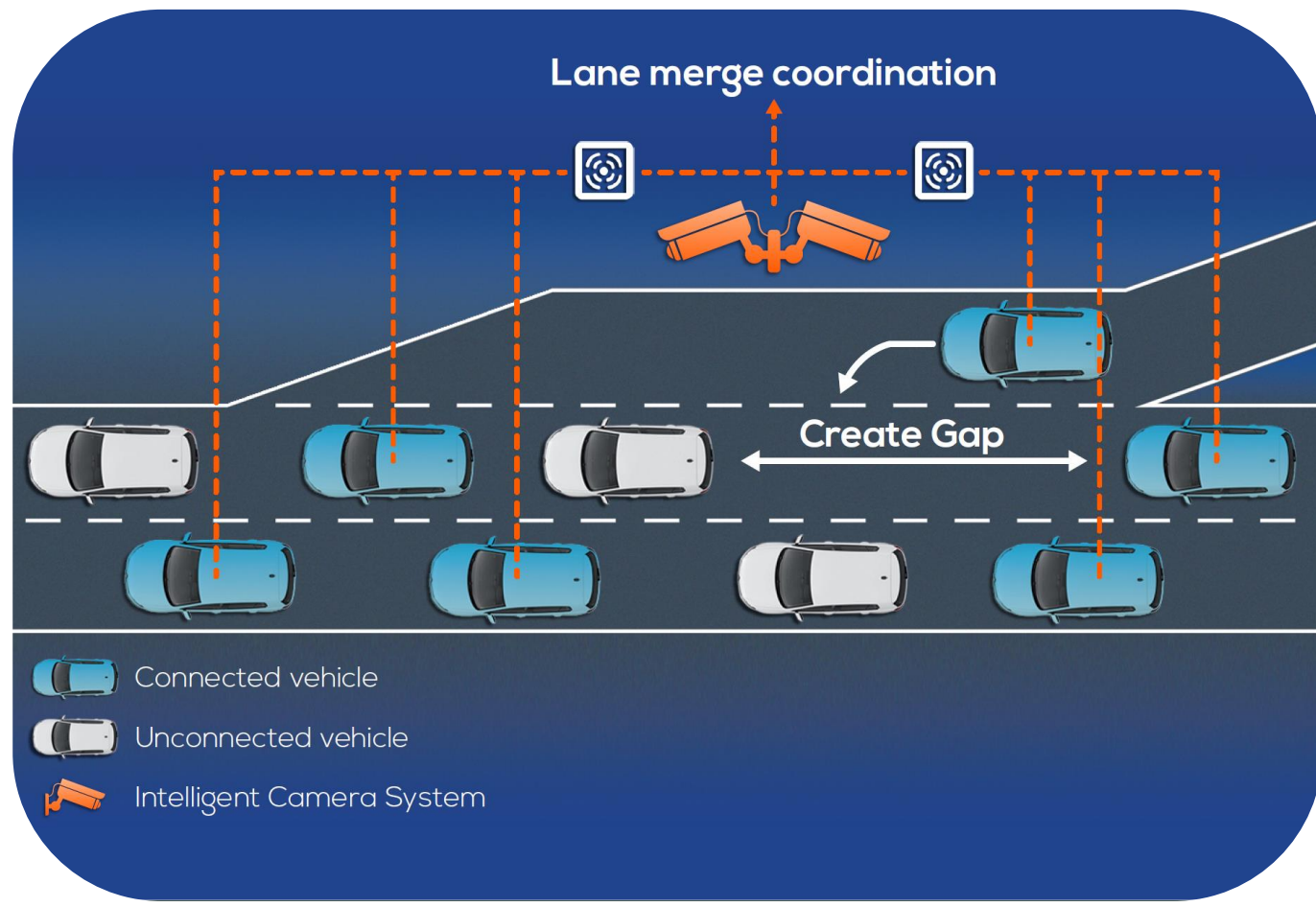


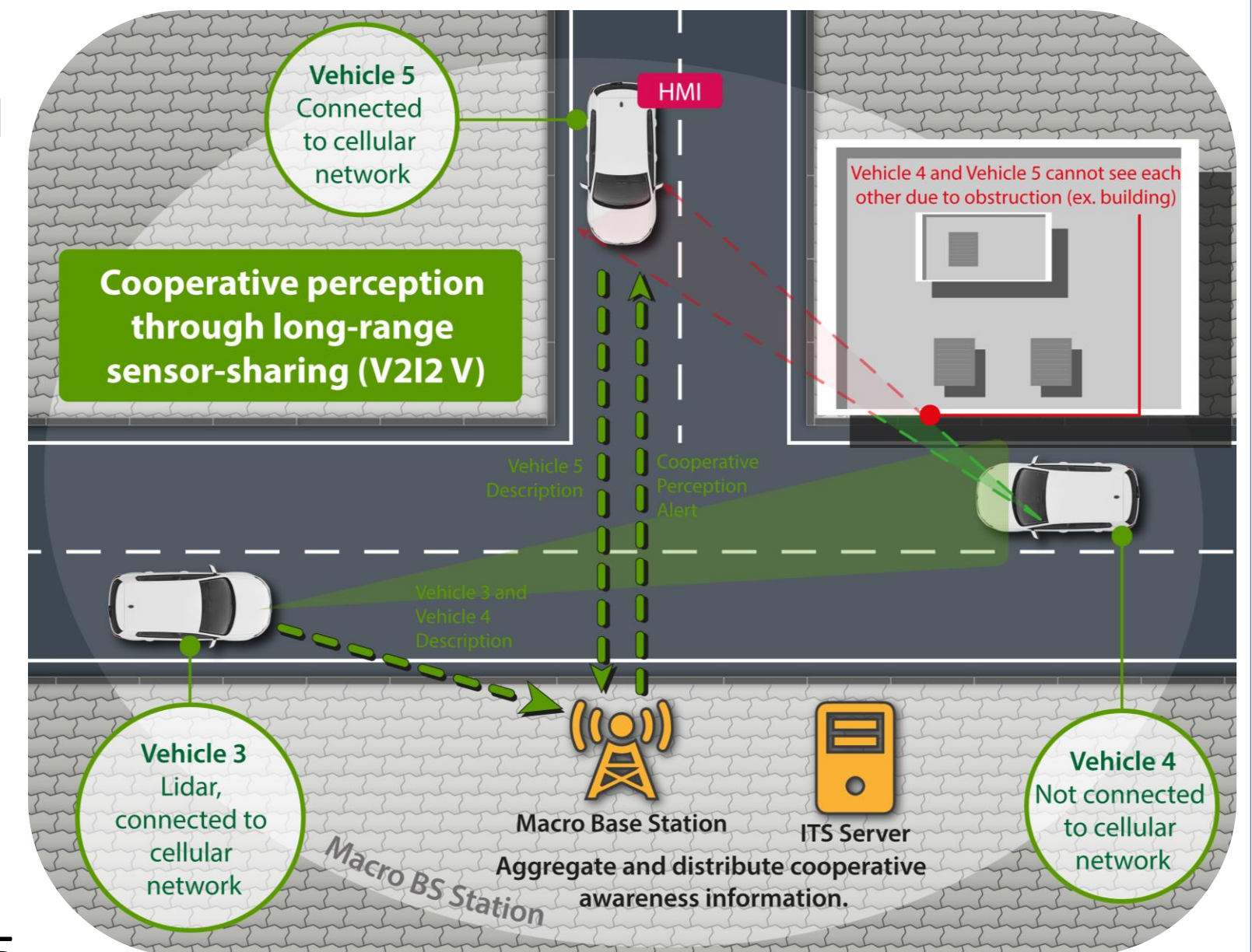
## Lane Merge Coordination

- **Connected vehicles** sharing their position and other sensor data
- **Roadside cameras** detecting vehicles on the road and estimating their position and other metrics
- **Data fusion** for combining data from roadside cameras and connected vehicles
- **Lane merge coordination** for coordinating trajectories among vehicles
- **Optimized message delivery** using low latency and high reliability communication among the different actors, as well as efficient and scalable distribution of messages over the top of cellular networks
  - **Cellular network** using Network Slicing and Quality of Service to isolate and prioritize the use case traffic from other traffic
  - **V2X gateway** is a context-aware messaging hub based on MQTT that can be cascaded for scalable deployments
  - **Dynamic map** serves as a database for storing and accessing road user information



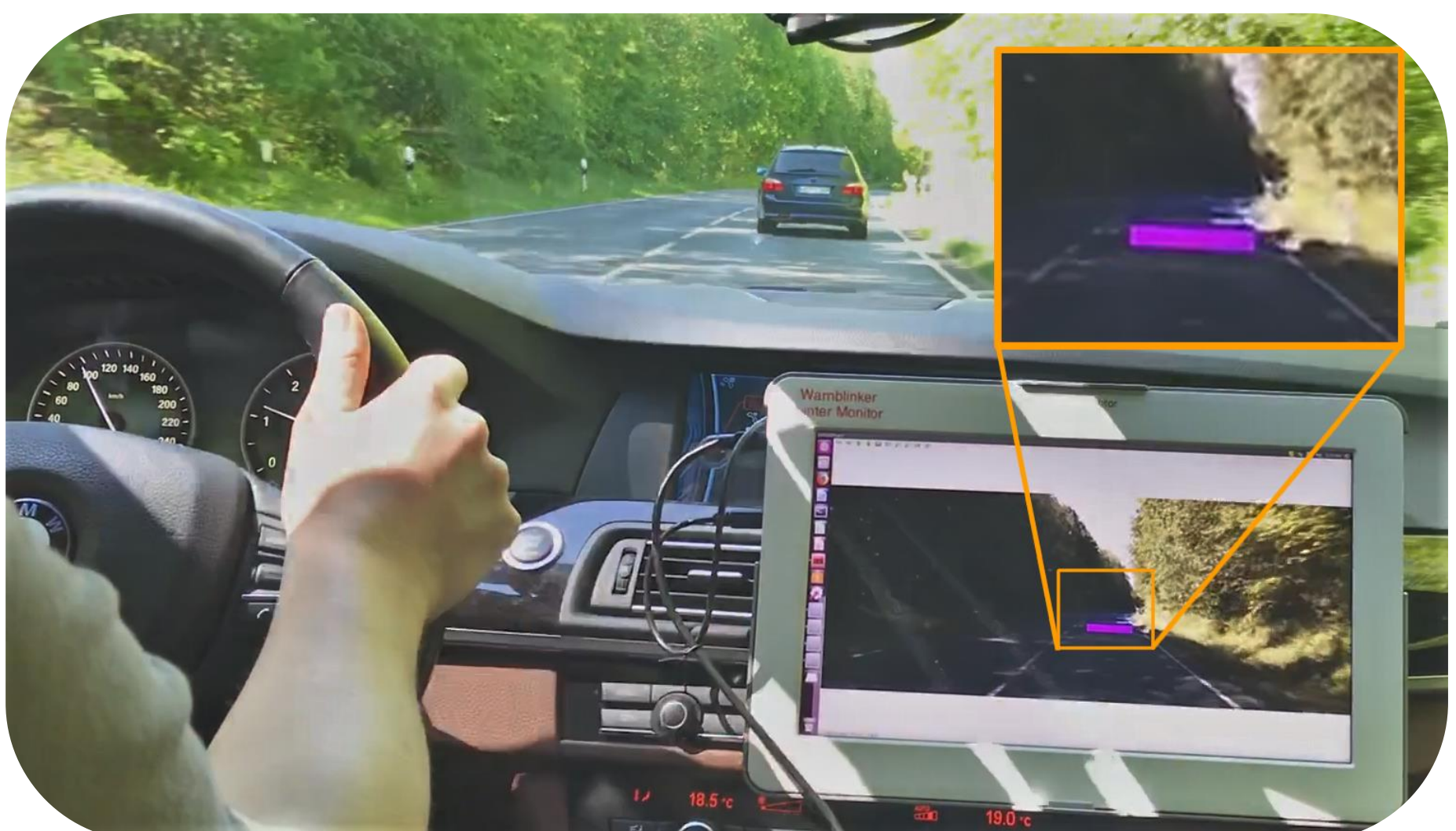
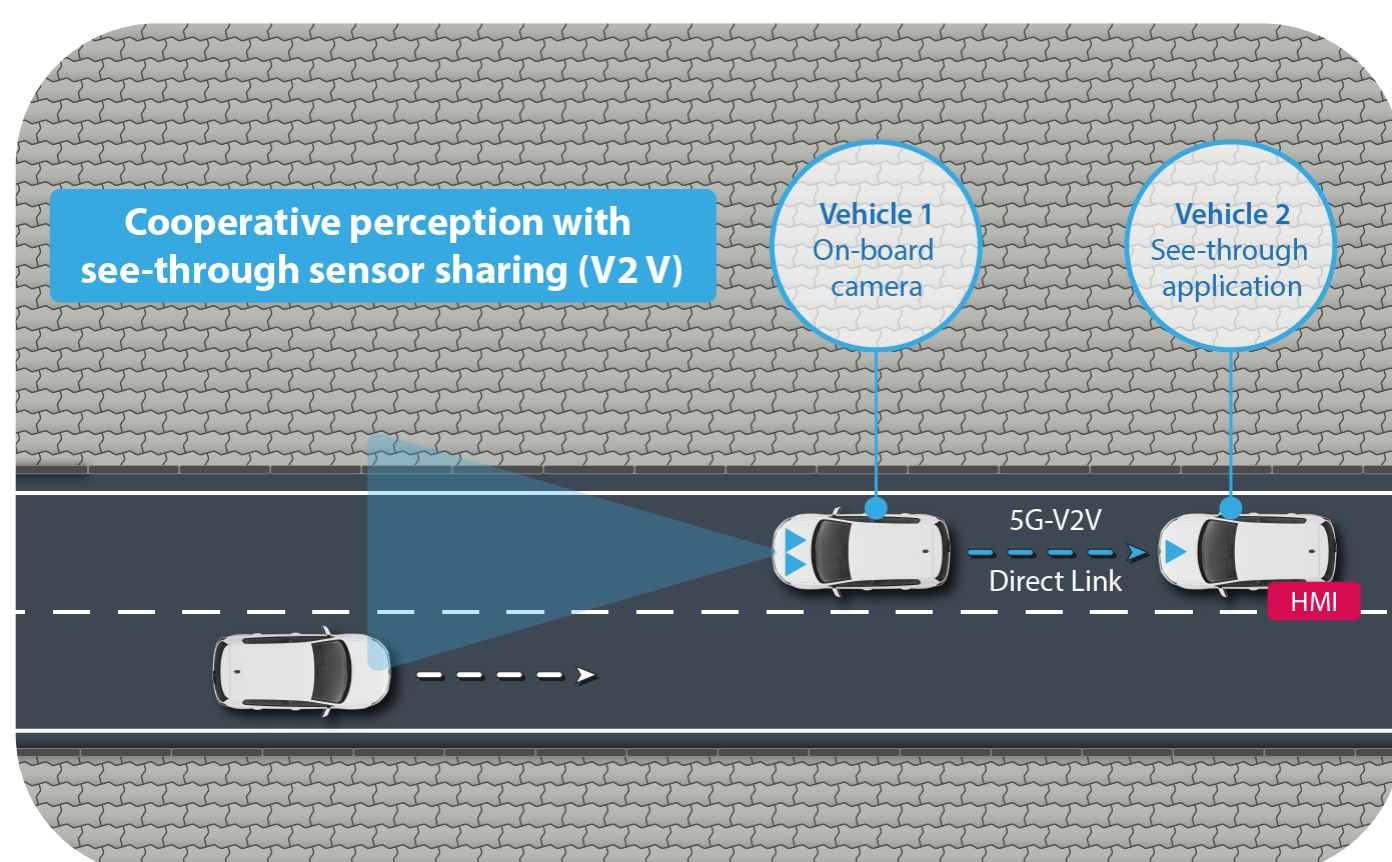
## Long Range Sensor Sharing

- **2 connected vehicles** share their position and other sensor data. One of them embeds a lidar detection system which is used to estimate the positions of other vehicles
- **1 unconnected vehicle** (vehicle 4) is visible by the lidar-equipped connected vehicle (vehicle 3), but not in line of sight for vehicle 5
- **Low-complex** trajectory estimation and map matching with motion models for vehicles
- **Ultra reliable** prediction of collisions with near-zero false alarm rate
- **Low latency** transmission of warning messages from mobile edge cloud to road users
- In case a collision is predicted, the non line of sight vehicle is warned by the system a few seconds in advance. This provides substantial support to human drivers and automated vehicles, allowing for smooth braking instead of an emergency break.

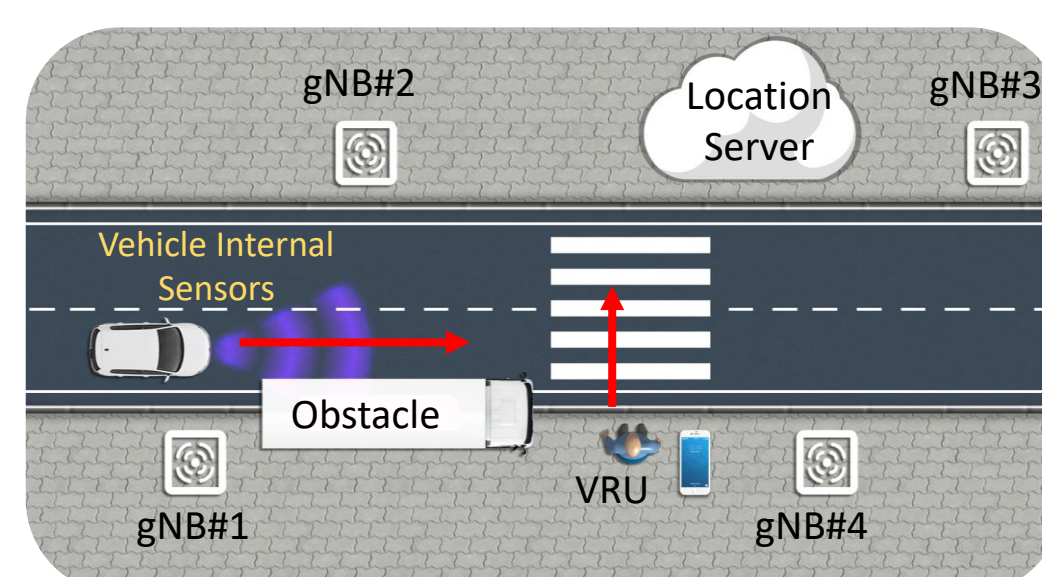


## See-Through

- A **cooperative perception** application to assist drivers and automated vehicles during overtaking manoeuvres
- A **camera vision system** at the front vehicle capturing the front scene and transmitting **sensor data** (real-time video) to rear vehicle
- **Video-only relative positioning** and pose estimation based on 3D Map and feature tracking
- **Reliable** and **low latency** unicast V2V communication for data exchange
- Few Mbps throughput over direct link in both coverage and **out of coverage** scenarios



## Vulnerable Road User Protection



- **Highly accurate** 5G radio-based localization of road users with compensation of multipath propagation
- **Resource efficiency** through lightweight protocol architecture
- **Low-complex** trajectory estimation and map matching with motion models for vehicles and pedestrians
- **Ultra reliable** prediction of collisions with near-zero false alarm rate
- **Low latency** transmission of warning messages from mobile edge cloud to road users

