

Traffic Guard

Merging sensor data and C2I/C2C information for proactive, congestion avoiding driver assistance systems

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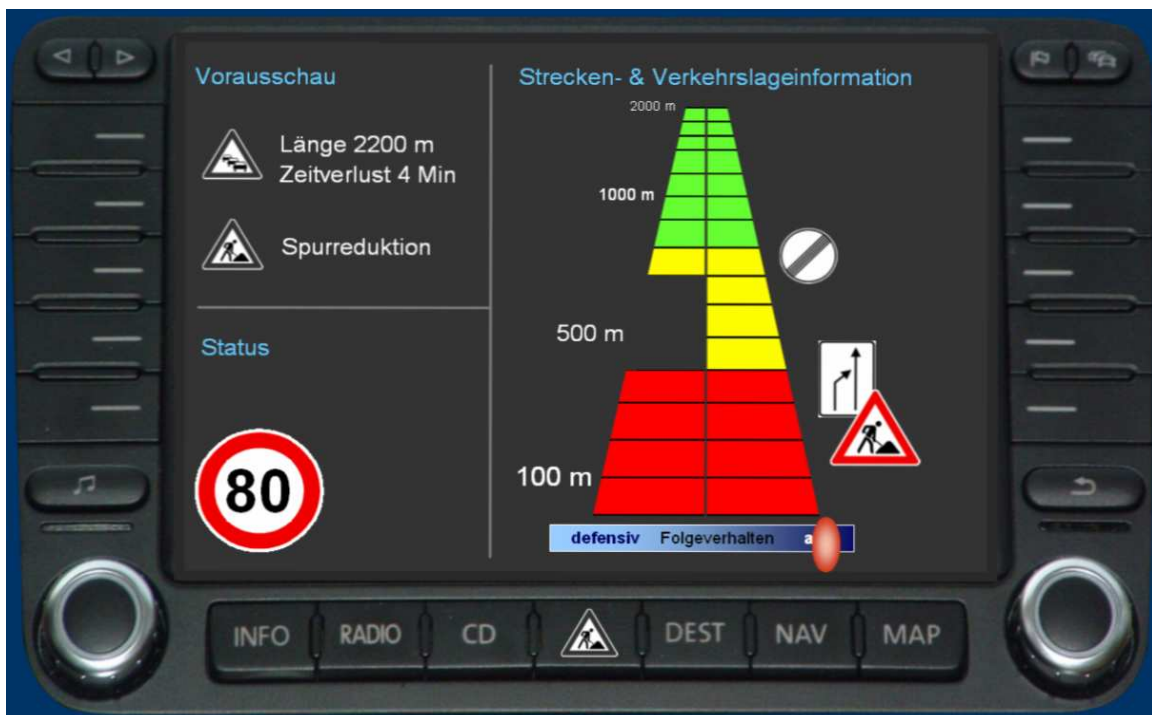
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The amount of motor miles covered on the roads, and thereby traffic density, will continue to rise in the coming years. Roadworks are already the number one cause of traffic congestion today. Due to the condition of the roads and the disproportionate rise in wear from heavy goods vehicles, a rise in roadworks across the national road network is to be expected. The real capacity of the road network will thereby increasingly be determined by roadworks.

Traffic simulations have shown that by traffic-optimised longitudinal control of the vehicles, a significant improvement in the flow of traffic and traffic capacity can be achieved. The potentials in this instance lie in the individual vehicle and ultra-dynamic adaptation of the following pattern. It seems appropriate, therefore, to use ACC systems as a technical basis to implement this behaviour. Assistance systems are particularly useful in the area of roadworks, also from the driver's perspective, as driving in congestion is not very pleasurable.

In contrast to previous, comfort-optimised ACC systems, the driving strategy has to be adapted according to the situation to ensure it is optimised for the traffic. Volkswagen is pursuing this consistent further development with other partners in the AKTIV research project (adaptive and co-operative technologies for intelligent traffic), which is promoted by the Federal Ministry for Industry and Technology (BMWi). The following aspects are considered

- (1) The vehicle has to obtain provident and precise geo-referenced information about its broader constructive environment and the current traffic situation ("Traffic Horizon") through C2C and C2I communication.
- (2) The controller is able to choose between different traffic-optimised ACC driving strategies on its own. It is based on information about the "Traffic Horizon" merged with the ACC sensor data. The driving strategies are selected proactively according to the traffic situation.
- (3) Suitable traffic simulators have to be used in the development process for configuration and optimisation. In contrast to other criteria, which can be verified in road tests, evidence of improved traffic flow can only be acquired through traffic simulations.



In summary, it can be said that ACC systems have originally been developed as convenience systems. Today also many safety relevant applications are now based on this technology. In future, traffic-optimised ACC systems can make a significant contribution to lowering traffic congestion by targeted increases in capacity at bottlenecks in conjunction with helpful information from the C2I and C2C network. Noticeable improvements will thereby also be seen in the flow of traffic, traffic safety and fuel consumption and CO₂ emissions.