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Mercedes-Benz Car-to-X Communication



Car-to-X Communication (part of the Mercedes-me Service) is a driver assistance system which warns drivers about potentially hazardous situations before they could be perceived by the driver or the car. For example, a car equipped with Car-to-X Communication might receive information about a broken-down vehicle on a highway before it becomes visible to the driver. Such warnings are generated by other vehicles equipped with the system and are dispatched through mobile network connections to and from a backend (cloud), in contrast to other systems which use short-range, direct car-to-car and car-to-infrastructure communication to provide a similar service. In simple terms, the system comprises a dedicated in-vehicle component and software which communicates with the Mercedes-Benz cloud using the mobile phone network.

The warnings which can be issued and received are:

- Risk of skidding
- Cross wind
- Mobile construction site
- Broken-down vehicle
- Speed bump and pothole
- General warning
- Reduced visibility
- Accident
- Heavy rain
- Hazard lights (e.g. indicating the rearmost vehicle of a tail-back or other hazard)

Several of these warnings are issued automatically by a car equipped with Car-to-X Communication. For example, if a slippery road is detected by the ESC (electronic stability control) system, the car will send information to the Mercedes-Benz cloud noting the location at which the hazard was encountered. The Car-to-X Communication system of a following vehicle continually sends its location to the cloud and, if the slippery road is in its vicinity, a warning is provided to the driver. Other warnings can be manually entered like, for example, when the driver sees debris being cleared from the road. Hazards are displayed in the navigation map but a spoken warning is also issued at speeds above 60 km/h (lower speeds for potholes or bumps).

SAFETY BENEFIT

The benefits of a system like Car-to-X Communication depends critically on the number of cars which are equipped with it or with a compatible system, in order to maximise the number of hazards which can be detected and signalled to others. The system is currently an option on all Mercedes-Benz and Mercedes-EQ models and users must agree to the data being sent. Large numbers of cars are already equipped with the system but it will take several years for the system to be in very widespread use. In the meantime, it is difficult to quantify the safety benefit. It is expected to be disproportionate to the numbers of cars equipped with the system, as the prompt response of one driver has positive knock-on effects on others (e.g. if a driver with advanced knowledge of a hazard slows down, that causes others to do the same).

HOW HAS IT BEEN ASSESSED

Mercedes-Benz conducted simulator studies, using naïve subjects (those with no prior knowledge of what the test would involve) to determine the effect on their driving of an early hazard warning such as that provided by the Mercedes-me Service. They found that, when a warning was provided, drivers tended to exercise greater caution, even though the hazard was not apparent to them at that time. This, in turn, meant that they were able to respond more effectively to the hazard than could those who received no advance notification. In addition, extensive testing has been done to ensure that the warnings automatically generated by the car are reliable and that all warnings are correctly received by the car and issued to the driver.

SYSTEM LIMITATIONS

Car-to-X Communication relies on the mobile network, both for cars sending information to the cloud and for those interrogating the cloud for potential hazards in the vicinity. The system utilises national roaming so that the network providing the strongest signal can be used. In urban environments, where network coverage is more comprehensive, driver attention is generally high and the higher traffic density provides earlier warning of hazards. The system is not switched on at vehicle delivery, in accordance with the GDPR (General Data Protection Regulation), and the customer must activate it by accepting the data protection agreement. Thereafter the system remains on by default, although it can be turned off by the driver.



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