Press release

BOSCH

Bosch, Vodafone, and Huawei
enable smart cars to communicate with each other

▶ Successful tests: V2X improves driver assistance systems
   that no longer just alert drivers, but actively support them as well

▶ For the first time in Europe: Bosch, Vodafone, and Huawei field-test
   5G cellular-V2X.

▶ In real time: car-to-car communication makes driving more relaxed, more
   efficient, and safer.

Stuttgart, Germany – It is Friday afternoon, and the traffic on the A9 freeway near
Munich is congested. Navigation requires complete concentration. Other vehicles
are constantly cutting in front of the car, forcing the driver to brake abruptly − which
is the cause of many accidents, slow-moving traffic, and stress. Intelligent mobile
telephony can alleviate some of these problems and help prevent potentially
dangerous driving situations from becoming even more critical.

Known as cellular-V2X (vehicle to anything), the technology makes it possible for
a car to communicate with other vehicles and its surroundings through mobile
telephony. Since February 2017, Bosch, Vodafone, and Huawei have been
performing trials of the new, high-performance technology − the first companies
in Europe to do so. The A9 freeway in Bavaria is the location for the field tests
with the first 5G test modules. For the first time, the companies are
demonstrating that driver assistance systems such as ACC adaptive cruise
control also benefit from the direct, instantaneous exchange of information
between vehicles.

Until now, cellular-V2X has been used as a real-time alert system when changing
lanes on the freeway or when the car ahead suddenly brakes. ACC not only warns
the driver, but also automatically accelerates and brakes. The new mobile
telephony system thus paves the way for automated driving. Achieving the goal
of fully connected traffic will involve teaching vehicles to communicate with each
other and exchange data directly. Direct communication between vehicles

provides information about what is happening in parts of an intersection not visible to the driver, over the crest of a hill, or on the freeway beside or behind the driver's own car.

Bosch's flexible V2X platform can accommodate either cellular-V2X or dedicated short range communication (DSRC) to provide partners with a global solution while also supporting region-specific communication requirements.

Seeing beyond the line of sight
ACC adaptive cruise control maintains the speed specified by the driver and − thanks to a radar sensor − the preset distance to the vehicle in front as well. ACC detects a vehicle that suddenly cuts in front as soon as it enters the radar sensor's detection range. When cars communicate directly and in real time using cellular-V2X, it is possible to detect such events sooner. Through mobile telephony, connected cars can directly transmit information, such as their position and speed, to all vehicles within a radius of more than 300 meters.

Moreover, they can do so without going through any intermediate channels via the base stations and with virtually no delay. As a result, a vehicle knows the driving behavior of others around it. If, for example, a car suddenly cuts in front of another vehicle, ACC knows what is about to happen − even before it registers with the driver or the radar sensor. The car then automatically adjusts its speed earlier than it would have before, so that the vehicle cutting in can do so smoothly. Once enough distance to the car in front has been re-established, ACC automatically accelerates to the preset speed. Even in congested traffic, this function makes driving even more relaxed and stress-free for drivers, while also preventing abrupt braking and acceleration on the freeway. Overall, traffic becomes smoother and more efficient. Thanks to the foresight provided by the technology, vehicles can go with the flow.

Further information:
[Real-time communication: Bosch, Vodafone, and Huawei use intelligent mobile telephony to prevent accidents](#)

Press photos: #1285163, #1285164, #1285569

Contact person for press inquiries:
Tim Wieland
Tim.wieland@us.bosch.com
248-876-7708

About Bosch
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The Bosch Group is a leading global supplier of technology and services. The company employs roughly 390,000 associates worldwide (as of December 31, 2016) and generated sales of 73.1 billion euros ($80.9 billion) in 2016. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected industry. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to create solutions for a connected life, and to improve quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 120 locations across the globe, Bosch employs 59,000 associates in research and development.

Additional information is available online at www.bosch.com, www.bosch-press.com, http://twitter.com/BoschPresse.

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