The Federal Ministry of Transport checks the driving conditions of national highways and autobahns using special measuring vehicles. Devices called "pothole detectors" measure patches, cracks, etcetera and their courses, ruts, and fictitious water depths.

Predictive road maintenance.
Fighting potholes.

Germany's roads are under constant stress. Traffic has quintupled during the past 30 years. This increases the occurrence of road damage – and thus the cost of repairs.

COPY —— Roger Homrich

It was time again in May 2018. The German Federal Ministry of Transport sent special measuring vehicles on journeys through nine federal states. Their task: to capture the condition of more than 18,640 miles of driving lanes on highways. High-resolution sensors detect, among other things, condition characteristics such as longitudinal and transverse flatness. CDA – a "condition detection and assessment of roads" – is the process by which over 8,000 miles of federal highways and around 25,000 miles of federal roads are checked for damage. "Currently, however, this data is collected only every four years. Evidence of potential road damage is often detected late. This makes the repairs more complex and can drive up costs," says Martin Rous, computer scientist for Bosch.

CARS DETECTING ROAD DAMAGE
Bosch founded the start-up project StreetProbe together with additional partners and funded by the German Federal Ministry of Economics and Technology. StreetProbe is developing a procedure that permanently records the condition of roads – and does so incidentally. Sensors that already exist in vehicles, such as acceleration and wheel speed sensors, register movements caused by unevenness in the road or potholes.

To connect the vehicle sensors to a cloud, the test vehicles are equipped with a so-called connectivity control

Over 8,000 miles around 25,000 miles
of federal highways and federal roads are checked for damage by the CDA-process.

unit (CCU). It collects, stores, and processes the data in advance and sends it encrypted with GPS-accurate position information to the cloud. In this way, road damage can be detected early and cost-effectively repaired before large potholes are created. "It would be ideal to equip entire vehicle fleets. The data could complement the CDA information and thus more regularly monitor road conditions without the additional use of vehicles and personnel," explains Rous.

TARGETED REPAIRS COST LESS
StreetProbe is currently developing reference data and a damage catalog with a pattern recognition system based on test vehicle data. A test fleet then checks the results. This solution is of primary interest to public road construction authorities, who will no longer have to regularly drive the roads to assess their condition. If there are signs of damage at a given point, they can examine these in a targeted manner and, if necessary, repair them with little effort before a harmless pothole turns into a dangerous crater.

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