TTD September 22, 2026 - Bosch Detects Wet Roads by Sound

This is the Telemetry Transportation Daily for September 22, 2026, and I'm Sam Abuelsamid, Vice President of Market Research for Telemetry.

Whether you're building a basic anti-lock brake system or a fully automated vehicle, one of the core elements the system needs to understand is the condition of the road surface. Safely controlling functions like acceleration, braking, and steering depends on being able to accurately estimate how much traction is available between the tires and driving surface. On snow and ice, steering inputs need to be slower and more deliberate than they are on dry pavement.

Automotive supplier Bosch held an event at its North American proving ground in Flat Rock, Michigan, where a number of the latest technologies it's been developing were demonstrated. Among those was a new wet road detection system that uses the existing ultrasonic sensors that enable low-speed parking assistance. Ultrasonic sensors generate sound waves above 30 kHz and listen for the reflections to detect how close a vehicle is to other objects. They're simple and low-cost, and most modern vehicles are equipped with them. Unlike radar, cameras, and lidar, they don't have much resolution; they only detect when an object is within a relatively short range.

However, because they detect the reflected sound waves, they can also pick up other sounds. Parking assist typically only works at speeds below about 10 mph. Bosch has developed software that uses these sensors to detect wet roads. It turns out that as a tire rolls through water and displaces it, it generates sounds that can be characterized and the sound changes depending on the depth of the water. Bosch engineers trained machine learning algorithms to listen to the sound of the tires in the water and provide an estimation of the water depth. This information can be fed into driver assist systems like stability control to adjust factors like slip thresholds and braking performance. For an automated driving system, it could also be used to reduce speeds if the water depth is likely to cause hydroplaning.

Bosch engineers demonstrated the system on a Jeep Grand Cherokee. The hardware was stock, and only software was changed, making this a feature that could potentially be added to future vehicles with an over-the-air update. However, before that happens, it will need a lot more testing and development. Different tires, tread depth, and even the road surfaces can significantly affect the sound that is produced. Since this would be impacting a safety-critical

feature, it needs to function with a very broad array of hardware.

Thanks for listening.