To beep or not to beep: Implications of the low sound emission of electric vehicles.

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Electrically propelled vehicles (EVs) emit substantially less noise during operation than conventional internal combustion engine vehicles (ICEs). In this context concerns have been raised about negative consequences for traffic safety. Vulnerable Road Users (VRUs), in particular blind pedestrians are affected by the low sound emission of EVs as they need to rely on acoustic cues for navigation. Up to now, most studies on the acoustics of EVs evaluated either accident rates or focused on the perceptibility of these vehicles.

In the present study we report results from the second half of a one year field study on driver experiences with electric vehicles. Forty Drivers drove an electric vehicle in a naturalistic driving study setup and were repeatedly interviewed throughout the study. Regarding the low noise emissions, drivers were interviewed about their specific experiences in everyday traffic after three and after six months. After three months drivers evaluated the experience of driving a vehicle with low sound emissions. The overall majority of the test drivers evaluates the low sound emission positively. For the drivers the lack of noise is rather a gain in comfort than a safety critical issue. Nevertheless after six months some drivers report to have been missed by other road users such as pedestrians and cyclists. Drivers report to have learned to pay more attention in low speed environments, where the greatest difference to conventional ICE vehicles in sound emission exists.

As currently technical solutions such as sound at low speeds are intensely discussed, this issue was accounted for, as well. Drivers rated different solutions to address potential hazards due to the lack of noise. On average the status quo (no tone, increased awareness) received higher ratings compared to
technical solutions such as outward sound at low speeds and pedestrian detection.

The findings from the interviews suggest that for the drivers the lack of noise is regarded rather as an increase of comfort for all road users than a decrease of traffic safety. Drivers only rarely report critical incidents, which result from the low sound cues of the EV. Compared to the status quo (no sounds), artificial sounds – which are currently discussed to contribute to more safety for VRUs – are not preferred.