

Knowledge and Perception of Advanced Driver Assistance Systems

Maria Fleischer MSc, KfV, Austria, maria.fleischer@kfv.at, **Mag.^a Raffaella Neustifter**, KfV, Austria, raffaella.neustifter@kfv.at

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Active safety systems and advanced driver assistance systems (ADAS) in cars evolved rapidly towards the end of the 20th century. They also shifted from their initial focus of safety and supportive assistance under normal conditions, to electronic systems designed to maximise comfort and relieve the driver of his duties in the long term and take over vehicle control. The modern car is equipped with a multitude of ADAS, which can support the driver with various stages of information processing while driving the vehicle and can decrease the risk of accidents up to 90% (an approximate value of man-made accidents in Austria over the last years). However, the driver could experience a new burden due to unfamiliarity with the systems or incorrect use. Additionally, there is a need of a parallel operation and monitoring of the individual assistance systems. Therefore, it is essential that every driver has a solid basic knowledge and acceptance on all driver assistance systems of the respective car to fully exploit the support of these systems and to overall improve road safety (Austrian Road Safety Board, 2020; Kienle, 2014; Lindgren & Chen, 2006)

In 2019, 2020 and currently in 2021, a survey was and is conducted by the Austrian Road Safety Board (KFV), with a focus on Austrian Citizens (holding a driving licence) and their knowledge on ADAS and attitude towards these systems. All surveys are representative for Austria, with a minimum of 1000 respondents per survey. Some of the most interesting questions were addressing the information status regarding the driver assistance systems of the driver, their estimation on support of the ADAS regarding accident prevention, their willingness to use the advanced driver assistance systems and the influence of these systems when purchasing a vehicle. The overall outcome of the surveys of 2019 and 2020 was, that there is a lack of information and trust regarding the systems and that many drivers were not familiar with the actual functionalities. Further, some participants stated that they actively do not make use of the driver assistance systems, which might be caused by the lack of understanding of the functionalities. However, as the results of the surveys have illustrated, that there is still a lack of knowledge and information, as well as a lack of trust in the systems, the KFV, in cooperation with other partners (BMK, AUVA, ARBÖ, AK Vienna, VVO), has implemented a new information platform for driver assistance systems (www.smartrider.at) (Austrian Road Safety Board, 2021).

To determine the attitude of the Austrian population towards the topic of advanced driver assistance systems and their functionality and handling, a questionnaire, which included various survey methods such as rating scales, as well as open and closed questions, was chosen as a suitable scientific tool to collect the data in 2021, as well as for the surveys which have already been conducted in 2019 and 2020. To obtain primary data, a market research institute was commissioned in the last two years and is now to collect up-to-date information. To reach as many people as possible, it was conducted as an

online survey. Due to the follow-up design, it is possible to make a comparison of the data over time and thus improve the results and present them in a comparable way. The results from 2019 and 2020 are presented below and the results from 2021 will only be available and presented in autumn 2021.

In the year 2019 and 2020, around 50% of the participants in the survey considered assistance systems to be important when buying a car. Furthermore, around 70% stated, that driver assistance systems would play a role in a future car purchase. The parking assistant, ACC and the lane keeping assist systems (LKAS) are the most important assistance systems for most people surveyed. In 2020, most respondents were aware of all the driver assistance systems surveyed (all over 60 %, almost all values have risen slightly compared to 2019), above all the cruise control, the parking assistant, the tyre pressure monitoring system, the collision warning, the speed limiter and the fully automatic parking (each over 85 % awareness). Comparatively less well known were the night vision assistant and the motorway assistant (each less than 65 % awareness). As in 2019, the most frequently used systems in 2020 were the speed limiter (65 %; 2019: 62 %) and the tyre pressure monitoring system (57 %; 2019: 52 %). The greatest effect on reducing accidents with material damage was attributed to the automatic emergency brake assistant, the collision warning (distance warning) and the blind spot assistant. Regarding personal injury and especially in the case of accidents involving vulnerable road user, the greatest impact was attributed to the automatic emergency brake assistant, the blind spot assistant and the night vision assistant. 21% of the respondents in 2020 (2019: 24%) have had already a (near) accident with cyclists or pedestrians as a driver and half of them (2019: 41%) believed, that a driver assistance system would have helped to avoid the accidents. The greatest influence on reducing accidents with pedestrians or cyclists, according to the respondents, was attributed to the night vision assistant, the automatic emergency brake assistant and the blind spot assistant. According to the surveys, respondents were most likely to obtain information on all assistance systems from car dealers and car manufacturers' brochures as well as on the internet, and women were more likely to obtain information from friends/acquaintances and men from car magazines or automobile club media. (More than) half of the respondents would wish to receive more information on insurance and liability issues, legal questions and the dangers of incorrect use of the assistance systems. In general, the need for information is high in all areas and the values have been at a similar level in 2019 and 2020. Further, about three quarters of the respondents believed that driver assistance systems will and should be part of the general driver training in the future (practical as well as theoretical part). Almost 60% were even willing to attend a half-day training course on driver assistance systems.

The Federal Highway Research Institute (BAST), Germany, published a report in 2019 which substantiates the need for training and information on ADAS. Further, they stated, that the training concepts additionally need to be adjusted depending on the competence levels of the user groups. (Weißgerber, Grattenthaler & Hoffmann, 2019)

Is there a need to improve the knowledge of driver assistance systems and to increase road safety? This was KfV's research question, which can clearly be answered with a yes. Many ADAS are not even known by 70% of the respondents and even much less used these systems. As 42% of the surveyed

people in 2020 requested further information on the handling of advanced driver assistance systems, there is an urgent need for action. The more drivers are aware of all available ADAS and are familiar with the handling of the systems, the higher is the potential for reducing accidents and increasing road safety, due to ADAS. The survey in 2021 additionally deals with the question, if the drivers are aware of the implemented platform (www.smartrider.at) and if the information and functionalities of ADAS are better known, than what the results have shown in the years before. From KfV's perspective, this survey should be repeated every two years, to evaluate the development of knowledge and perception of advanced driver assistance systems throughout the Austrian Citizens, to enable a setting of necessary measures.

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