



## Can driving data objectify the examiner's verdict?

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The pace of technological advancements in traffic and mobility is increasing. The developments influence the future role and task execution of the CBR (Dutch Driving Exam Organisation). For instance, the examination of self-driving cars or the developments of new systems for assessing, testing, and monitoring students and other adolescents.

The current driving exam is assessed by an examiner, as has been the practice since the introduction of the driving exam in The Netherlands (since 1927). The examiner bases their verdict on personal observation and is not supported by technology or provided with driving data. Nowadays, an examiner can only use his words to argue over his verdict, for example, telling a candidate he or she “drove too fast”. Such arguments can lead to confusion and discussion in the exam room, which leads to an unpleasant experience for the candidate, and possibly the examiner as well. However, the collection of real time driving data is evolving, and the CBR may potentially make use of it. The CBR has embarked on an exciting experiment with the goal of creating a data collection and measurement prototype capable of aggregating driving data and presenting it in a user-friendly dashboard for examiners. The metrics in the dashboards can then be used as a tool during the explanation of the examiner's verdict. For instance, changing the earlier stated argument to an objective argument: “You drove 10 km/h over the speed limit at the 4<sup>th</sup> intersection” instead of “you drove too fast”. Through this experiment, we are gaining valuable expertise in constructing and visualizing measurable data streams from an exam ride. This knowledge is essential as it paves the way for insights in shaping a robust data standard dedicated to promoting safe and responsible driving practices.

During the exam ride, mobile sensors in the vehicle collect driving data, including a GPS sensor, an OBD sensor, and an accelerometer. These sensors gather diverse data, which is then converted into relevant driving behaviour metrics for the examiners. The data is stored in a suitable data storage for streaming data directly into the cloud. Once the data is collected in the cloud, it is post-processed and expanded with various external inputs such as weather conditions and road types. After ending the data collection, the dashboard is ready for the examiners in two minutes. Examiners participating in the trial have determined which information streams are relevant. The examiners were part of the project team and have constantly given their feedback on the development of the prototype. In the final step of the proof of concept, we deployed the prototype during internal training sessions for examiners, allowing them to experience the value of driving data.

Traditionally, our driving exams have relied on vehicles provided by commercial driving schools, where examination candidates received their training. However, our recent experiment has provided us with valuable practical experience in handling driving data using our own fleet of vehicles and systems. The examiners who have used the prototype highlight that the



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prototype has the ability to better explain their verdict to candidates and help a candidate to better understand their driving behaviour with regards to traffic safety. This experience has shed light on important considerations. First and foremost, we noted that the installation of sensors and the utilization of the dashboard demands technical proficiency from our examiners. They emphasize the need for a setup that is both time-efficient and offers easy accessibility to information. In the current prototype, only one sensor is needed to measure all 30+ types of metrics. We also found that the quality of the data (GPS, accelerations) needs to be good. Additionally, we realized that measuring driving data is not only valuable during the exam but can also be used for other analytical purposes, such as analysing driving behaviour for the data standard of safe and responsible driving.

The CBR intends to start a Driving Data project after this proof of concept. In this project, we will conduct further research into suitable sensors and explore the possibilities of utilizing more data directly from the vehicle. We will also continue developing the dashboard and eventually make it available to examiners. Ultimately, our goal is to provide novice drivers with objective information via the dashboard to better explain encountered traffic situations after an exam. The CBR aims to use this innovative experiment to assess the value of driving data in equipping novice drivers with the tools needed to become safe and responsible road users during the road to their driver's license.