

The impact of self-driving vehicles on road traffic safety



Client

Swiss Traffic Safety Fund (FVS)

Facts

Period 2017 - 2018

Project Country Switzerland

Statistics indicate that human error accounts for around ninety percent of all road traffic accidents in Switzerland. Can we therefore expect an increase in the percentage of self-driving vehicles to lead to a reduction in automobile accidents? Or will specific hazards associated with human error be replaced by new hazards associated with automated driving systems? Working together with lawmakers, transportation experts, insurance company representatives and law enforcement officials, EBP examined these questions and the extent to which they reveal a need for further research and intervention.

An increasing percentage of self-driving vehicles outfitted with an ever higher degree of vehicle automation can be expected to have a clear impact on the frequency and nature of road traffic accidents in Switzerland. However, this trend towards automation is likely to result in a mixed bag of factors variously contributing to enhanced or diminished levels of safety, with the net effect rather uncertain. The factors that can be expected to enhance safety and reduce traffic accidents include improved superordinate systems of traffic control and individual driver-assistance systems such as emergency braking systems.

The factors that may diminish safety include potentially error-prone procedures for transferring control between the vehicle and human passenger-drivers, the interaction of self-driving vehicles with conventionally operated vehicles (e.g. non-automated cars, motorcycles and bicycles) and accidents resulting from unprotected (hacked) vehicle-software systems.

Working on behalf of the Swiss Traffic Safety Fund (FVS), EBP approached the issue of safety by:

- Defining and characterizing various levels of automation
- Evaluating the current accident statistics for Switzerland
- Estimating the anticipated degree of safety enhancement for each level of automation
- Identifying new potentially hazardous factors associated with greater levels of automation and estimating their impact
- Describing future scenarios with different percentages of automated and conventionally operated motor vehicles
- Ascertaining the safety potential (expected reduction in the number of accidents on Swiss roads) for each scenario
- Ascertaining current need for further research and intervention

On balance, our study shows that automated driving technology can be expected to

have a positive impact on traffic safety. However, as indicated by plausible future scenarios, new hazards are to be expected; hazards that could even lead to an increase in accidents unless proactive measures are introduced.

Follow-up studies as a part of a total package

The project was a part of a comprehensive [study on the large-scale introduction of automated vehicles](#). The study gave rise to a [preliminary analysis](#) and revealed a need to conduct follow-up studies relating to the following subjects:

- [Traffic engineering](#)
- [Data and IT infrastructures](#)
- [New offerings for shared transportation](#)
- [Freight transportation and city logistics by road](#)
- [Impact on resources, environment and climate](#)
- [Challenges for cities and other urban areas](#)

Study results

We compiled our findings in a [synthesis](#): Large-Scale Introduction of Automated Vehicles - Applications and Effects in Switzerland, Report of September 5, 2018

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